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From Barriers to Opportunities: Renewable Energy Issues in Law and Policy

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Report Number 11

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A report on the work of the Renewable Energy and International Law Project (REIL), 2006–2007

Leslie Parker, REIL; Jennifer Ronk, REIL; Bradford Gentry, Yale School of Forestry & Environmental Studies; Martijn Wilder, Baker & McKenzie; James Cameron, Climate Change Capital, EDITORS

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Table of Contents

FOREWORD

Foreword to the pre-publication edition of the REIL report published for the 2nd annual REEEP REIL Yale event on renewable energy and law, April 28-29, 2007

To the Participants of 2007 Yale Event and to the Governing Board of REEEP:

This publication is a compilation of much of the work REIL has done to date in analyzing and assessing barriers and opportunities in policy and law for the development of the global clean energy market.

REIL arose out of a "think piece" for the IEA Renewable Energy Working Party, in the run up to the September 2002 World Summit on Sustainable Development – at which Tony Blair launched REEEP.

Since then, the world has changed dramatically.

At the risk of belaboring the obvious, concerns about clean energy and climate change have come from the fringes to the mainstream. The clean energy market is awash with capital. It is less the lack of money than the lack of projects or companies to fund, or the bottlenecks facing manufacturing or supply that is vexing financiers. Countries without obligations under Kyoto, such as China, India, and Mexico have or are drafting renewable energy legislation. Russia has renewable energy legislation being reviewed by Ministers and by the Duma. There are currently 8 climate change bills* before the Congress of the United States, a non Kyoto ratifier. As a Senate Energy Committee staffer memorably said, "You cannot throw a stone around here without hitting someone going to a climate change or clean energy hearing!" It is a new day.

* That is, bills that actually seek to regulate greenhouse gases. There are actually a total of 46 bills that specifically refer to climate change in some way!

REIL itself was founded to:

- assess the law and policy issues impacting the development of the clean energy markets;
- find ways to expand the markets for clean energy even further;
- bring together the policy makers and the financiers and industry players.

Four years ago, it is fair to say, these two camps still were a bit wary of each other. Now, legislators and finance/business have become partners in designing market mechanisms and policy strategies that help promote the market and internalize the real costs of our energy choices. The April 2007 Fortune magazine is its "green" issue, and it trumpets the fact that business has come around to understanding that "green is good."

This Yale publication and this event are outputs of REIL's mission to both provide content for and to foster the dialogue between these allies.

What REIL has learned over its four years is that one of its key contributions and functions has been to "connect the dots" (whether the dots are people or issues or sectors). Without this, effective enabling policy and legislative and finance frameworks will not be constructed.

Below is an extract from Martijn Wilder's and James Cameron's foreword to the Finance section of April's edition of Environmental Finance. The passage draws upon and summarizes some of the conclusions of the 1st Yale meeting of April 2006.

> "It is necessary to reconceptualise energy. We need to view energy as a means to deliver energy services to the community, rather than a commodity in itself. Energy policy has for too long been stymied by the limitations of traditional thinking, dominated by the idea of the utility monolith and the need for long-distance power transmission. By conceptualising energy as the consumer does – as a means to deliver housing, food and transport – we pave the way for a paradigm shift in energy policy. Suddenly, the focus moves from kilowatt hours and generation capacity to infrastructure and distribution; from fuel sources to end uses. With this understanding, energy decentralisation and investment in different delivery options becomes more rational, and the myth that the bulk of a city's energy needs can be delivered by only monolithic coal plants with large-scale transmission lines is debunked. An investment in a solar photovoltaic system is not the development of another commodity power contributor, but the purchase of an asset – of permanent infrastructure – to deliver the same energy services to the owner as traditional electricity sources at reduced cost. By improving our infrastructure with investments in this type of renewable energy asset, therefore, we improve efficiency, lower costs and allow renewable energies access to the market."

This publication will be finalized over the summer and will incorporate the findings of the 2007 Yale meeting.

In the meantime, we are very grateful to have all of you as our partners in what has been a rewarding and fun endeavour to date. We look forward to continuing to work with you and thank you sincerely for both the keen insights and thoughtfulness that you have brought to the table!

Sincerely,

Leslie Parker for the REIL founding team (James Cameron, Brad Gentry, Leslie Parker, and Martijn Wilder)

The currents and eddies of right and wrong, I can't navigate. I'm no voyager. But in the thickets of the law, there I am a forester . . . This country's planted thick with laws . . . and if you cut them down, d'you really think you could stand upright in the winds that would blow then."

– As Robert Bolt has Thomas More say on the importance of the rule of law, from his play, *A Man for All Seasons*

ACKNOWLEDGEMENTS

REIL is in association with the Renewable Energy and Energy Efficiency Partnership, the Yale Center for Environmental Law & Policy, the Center for Business and the Environment at Yale, and Baker & McKenzie's Global Clean Energy and Climate Change Practice.

We would very much like to thank our partners for the Yale events – Climate Change Capital, the Australian Greenhouse Office, the UN Foundation, The German Marshall Fund, and the Yale Climate Change Initiative – for their material and non-material support.

And also, of course, our thanks to Jane Coppock, editor of the Yale School of Forestry & Environmental Studies Publication Series, without whom producing this report for the April 28-29 Yale event would not have been possible! And our core team and editors: Martijn Wilder, Brad Gentry, James Cameron, our Deputy Director, Jennifer Ronk, and all our authors.

Thanks to all for their very hard work, great ideas and dedication to REIL and the Yale events!

SECTION 1

NEW ARTICLES FOR REIL MEETING AT YALE UNIVERSITY APRIL 28-29, 2007

Wind Turbines and International Biodiversity-Related Agreements: Emerging Trends and Recommendations[1]

Maria Socorro Z. Manguiat
Legal Officer, IUCN Environmental Law Centre
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London, England

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Washington, D.C.

> *". . . the debate over whether wind energy should be promoted is largely a dead issue in many countries, the issue for today and tomorrow is how . . . nations get this development right."*
>
> *Carol A. Smoots*
> Editor, Oil, Gas & Energy Law Intelligence
> Volume 3, Issue 2 (June 2005)

I. INTRODUCTION

Discussions on wind energy tend to generate a lot of excitement regardless of whether one supports or opposes its development. Wind energy is the fastest growing source of renewable energy, and it is currently viewed as the most viable renewable energy source because of its cost competitiveness. Wind energy also is gaining greater prominence because of the commitments made by most industrialized countries under the Kyoto Protocol to reduce their greenhouse gas emissions to agreed levels by

[1] All statements in this paper are personal to the authors and should not be attributed as the official views or positions of the institutions with which they are affiliated. The authors also would like to acknowledge the valuable contributions of the various reviewers who provided comments, particularly Loic Blanchard of the European Wind Energy Association.

[2] Ms. Manguiat is currently working with the Compliance Programme of the UNFCCC Secretariat United Nations. However, her contributions to this paper were made as a Legal Officer to the Environmental Law Center of the World Conservation Union (IUCN).

2012. In addition, wind energy and other renewable sources serve to reduce imports of natural gas and oil from politically unstable regions of the world, thereby improving energy security and increasing fuel diversity. Thus, the image of wind turbines has come to symbolize the shift to clean and secure energy and to a carbon-free lifestyle.

Wind energy also results in substantial additional environmental benefits compared to traditional fossil fuel fired generation. Wind generation is not only produced with zero emissions of carbon dioxide but it also can eliminate emissions of toxic pollutants (e.g, mercury) and conventional air pollutants (e.g. smog-forming nitrogen dioxide and acid-rain forming sulphur dioxide), and it avoids serious water pollution. Furthermore, the adverse impacts caused by mountaintop mining and strip mining of coal, including acid mine drainage and land subsidence are avoided, and the negative effects of nuclear power, including radioactive waste disposal, security risks, and nuclear proliferation risks, are not created. Finally, wind power can have a long-term positive impact on biodiversity by reducing the threat of climate change – the greatest threat to biodiversity. At the same time, the construction and operation of both onshore and offshore wind turbines can result in potential negative local environmental impacts on birds, bats and cetaceans, landscapes, sustainable land use (including protected areas), and the marine environment.[3]

[3] It should be noted that experts also have identified some local positive impacts of wind turbines, including: new bird species appearing near wind farms because the area is excluded from hiking and hunting; revitalization of fish stocks in some offshore areas because of prohibitions on commercial fishing and because the turbine foundations can serve as natural "reefs."

The focus of this article is on biodiversity-related international agreements and their relationship to wind energy development. The article seeks to summarize the major biodiversity-related international agreements, to analyze the implications of these agreements on wind energy development, and to recommend actions that seek to harmonize biodiversity, climate protection, and wind development goals.

In most instances, the text of biodiversity-related multilateral agreements and instruments and the decisions, resolutions or recommendations adopted by their decision-making bodies do not pose a *direct* barrier to the development of wind energy. It is generally the implementation of the obligations under these instruments, i.e. the concrete policies and measures adopted by parties carrying out these obligations that can create potential barriers to the development of wind energy. The mixture of policies and measures adopted by a country in implementing an international agreement will depend on that country's particular circumstances. Therefore, it is difficult to generalize about the positive and negative effects of an international agreement at the national level.

There are, however, a few international agreements where direct references to the risks posed to biodiversity by the development of wind farms have given rise to obligations on parties. These agreements are most notably the Convention on Migratory Species and Wild Animals (CMS or the Bonn Convention) and the Agreement on the Conservation of Populations of European Bats (EUROBATS). Section II of this paper will examine the impacts of the direct provisions in the CMS and EUROBATS agreements on the development of wind energy. Section III surveys other international legal instruments which may also impact the development of wind energy. Section IV provides conclusions and recommendations.

II. CMS, EUROBATS AND WIND TURBINES

While it is acknowledged that the potential impacts of wind energy development on biodiversity[4] need to be examined further, the information that is currently available has been deemed sufficient by at least two of the decision-making bodies of international biodiversity-related agreements to impose specific obligations on parties to the agreements. These are the Convention on Migratory Species and Wild Animals (CMS) and the Agreement on the Conservation of Populations of European Bats (EUROBATS).

CMS Article 3.4(b) requires parties that are Range States of a migratory species "to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species." The question of whether wind farms could constitute an activity that seriously impedes or prevents the migration of species has clearly been answered in the affirmative, as the recommendations discussed below will show.

The Conference of the Parties (COP) of the CMS recognizes that climate change may significantly affect the behaviour, distribution and abundance of migratory species and may change the ecological character of their habitats.[5] At its fifth meeting, the CMS COP, in Recommendation 5.5 (Climate Change and its Implications for the Bonn Convention), requested the CMS Scientific Council to review the results of past and present scientific work on the ecological and other effects of climate change, assess the relevance and importance of such work for the conservation of migratory species, review existing scientific links between the CMS and other bodies undertaking work in this area, formulate proposals for improving and strengthening such links, and report its conclusions and make recommendations to the next meeting of the Scientific Council.

While climate change can be a major threat to migratory species, the measures taken to mitigate climate change themselves can pose a threat to these species. Thus, as a result of the mandate in CMS Recommendation 5.5, the CMS Scientific Council recommended the adoption of a resolution on wind turbines and migratory species at the seventh meeting of the CMS COP.[6] Resolution 7.5 (Wind Turbines and Migratory Species) acknowledges the environmental benefits of wind energy, 'especially for addressing climate change', as well as the significance of reducing climate change for the long-term survival of migratory species.[7] Nevertheless, the resolution notes that wind turbines, especially those in marine areas, represent a new method of large-scale energy production whose actual effects on nature and on the different components of biodiversity cannot be fully assessed or predicted at present.[8] The resolution then goes on to list some of the possible negative impacts of wind turbines on migratory species of mammals and birds, as well as on their food sources and habitats, including the following:

- Destruction or disturbance of permanent or temporary feeding, resting and breeding habitats;

[4] See, for instance, "Windfarms and bird: an analysis of the effects of wind farms on birds, and guidance on environmental assessment criteria and site selection issues," (CMS/ScC12/Inf.27) available from the secretariat of the Convention on Migratory Species.

[5] CMS Resolution 8.13, Climate Change and Migratory Species, 4th prefatory statement.

[6] The seventh meeting of the COP of the CMS was held in Bonn, Germany from 18 to 24 September 2002.

[7] 6th prefatory clause, CMS Resolution 7.5, available at http://www.cms.int/bodies/COP/cop7/proceedings/pdf/en/part_I/Res_Rec/RES_7_05_Wind_Turbine.pdf

[8] *Id.*, 7th prefatory clause.

- Increased collision risk for birds in flight, noting especially the potential risk that several hundred offshore wind turbines with heights of up to 150 meters may present as obstacles in flyways;[9]
- Risks arising from electric and magnetic fields of connecting power cables; and
- Emission of noise and vibrations into water.[10]

In view of these concerns, CMS Resolution 7.5 calls upon parties[11] to take the following specific actions:

- To identify areas where migratory species are vulnerable to wind turbines and where wind turbines should be evaluated to protect migratory species;
- To apply and strengthen, where major developments of wind turbines are planned, comprehensive strategic environmental impact assessment procedures to identify appropriate construction sites;
- To evaluate possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines;
- To assess the cumulative environmental impacts of installed wind turbines on migratory species; and
- To take full account of the precautionary principle[12] in the development of wind turbine plants, and to develop wind energy parks taking account of environmental impact data and monitoring information as it emerges and taking account of exchanges of information provided through the spatial planning process.[13]

Relevant intergovernmental organizations as well as the European Community and the private sector also are invited to cooperate with the CMS in efforts to minimize the possible negative impacts of offshore wind turbines on migratory species.[14]

> The CMS COP also instructed its Scientific Council to assess existing and potential threats from offshore wind turbines in relation to migratory mammals and birds (including their habitats and food sources), to develop specific guidelines for the establishment of these facilities, and to report to the COP at its next meeting. The Working Group on Threats – Windfarms & Powerlines of the CMS Scientific Council, which met from 16 to 18 November 2005, did not complete the proposed guidelines for submission to COP 8, which took place from 20 to 25 November 2005 in Nairobi, Kenya.[15] Therefore, these guidelines will have to be presented for adoption at the next CMS COP, which is not expected to be convened before 2008.

The issue of migratory species and wind farms, however, did find its way into CMS Resolution 8.18, Integration of Migratory Species into National Biodiversity Strategies

[9] *Id.*, 12th prefatory clause.

[10] *Id.*, 9th prefatory clause.

[11] As at 1 December 2005, CMS had 95 Parties.

[12] CMS itself does not have a specific provision on the precautionary principle. Principle 15 of the Rio Declaration on Environment and Development adopted at the United Nations Conference on Environment and Development (UNCED) that took place from 3 to 14 June 1992 in Rio de Janeiro, Brazil, states:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats to serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

[13] *Id.*, paragraph 1.

[14] *Id.*, paragraph 3.

[15] See action no. 2.31.10 and its corresponding indicators and milestones, Draft Strategy Implementation Plan 2006-2011 of the CMS Scientific Council, available at http://www.cms.int/bodies/ScC/13th_scientific_council/pdf/en/ScC13_Doc_03_Draft_Strategy_ImpPlan_2006_2011_E.pdf A copy of said draft guidelines are currently not available online.

and Action Plans and into On-Going and Future Programmes of Work under the Convention on Biological Diversity (CBD). Annex II lists information on measures to regulate or manage processes or activities that represent a significant adverse effect on migratory species and provides details of relevant impact assessment measures designed to avoid or minimize adverse impacts of proposed projects on migratory species. *Potential threats from power transmission lines and wind farms* are listed among the categories of information on migratory species to be considered in the development of a national biodiversity strategy and action plan under the CBD. In addition, CMS Resolution 8.22, Adverse Human Induced Impacts on Cetaceans, acknowledges that human induced impacts on cetaceans are increasing.[16]

EUROBATS, one of the agreements under the CMS, also has devoted a specific resolution to wind turbines. Like CMS Resolution 7.5, EUROBATS Resolution No. 4.7 (Wind Turbines and Bat Populations) adopted by the EUROBATS Meeting of the Parties (MOP) recognizes the environmental benefits of wind energy.[17] It notes, however, that the actual effects on bats of potential large-scale development of wind turbines have not yet fully been assessed or predicted and that there is existing evidence of mortalities of bats from wind turbines.[18]

The possible negative impacts of wind turbines on bat populations, their prey and habitats identified under EUROBATS Resolution 4.7 are as follows:

- Destruction and disturbance of habitats and commuting corridors;
- Destruction and disturbance of roosts;
- Increased collision risk for bats in flight; and
- Risks from emission of ultrasound noise.[19]

In light of the limited data available on bat populations potentially affected by wind turbines and the wish to minimize the possible adverse effects of such developments on bat populations, the EUROBATS MOP has requested its Advisory Committee to assess the evidence of the impacts of wind turbines on bat populations and, if appropriate, to develop guidelines for assessing the potential impacts on bats and for the erection of wind turbines in accordance with the ecological requirements of bat populations.[20]

The Advisory Committee's Inter-sessional Working Group (IWG) on Wind Turbines and Bat Populations presented draft guidelines for the planning of wind farms, including the assessment of sites where wind turbines can be placed, at the Advisory Committee's 11th meeting held in Luxembourg from 8 to 10 May 2006.[21] Comments on the draft guidelines were requested by 15 June 2006,[22] and a final version of the guidelines was presented to the fifth meeting of the EUROBATS MOP held in Slovenia from 4 - 6 September 2006.[23]

The IWG report and guidelines have been annexed to EUROBATS *Draft* Resolution 5.6 – Wind Turbines and Bat Populations.[24] The Preamble of the *Draft* Resolution begins by '[n]oting the importance that wind energy has in the implementation of the Kyoto protocol to reduce CO_2 emissions in context of combating climate change'.

[16] 11th prefatory clause.

[17] Resolution No. 4.7, Wind Turbines and Bat Populations, Annex 10 to the Record of the 4th Session of the Meeting of Parties Sofia, Bulgaria, 22 – 24 September 2003 available at http://www.eurobats.org/documents/pdf/MoP4/Record_MoP4_complete.pdf

[18] *Id.*, 5th and 6th prefatory clauses.

[19] *Id.*, 7th prefatory clause.

[20] *Id.*, paragraph 1.

[21] Doc.EUROBATS.AC11.15.Rev.1, *available at*, http://www.eurobats.org/documents/pdf/AC11/Doc_AC11_15_Rev1_ReportWindturbines.pdf.

[22] *See* 11th Meeting of the Advisory Committee City of Luxembourg, Luxembourg, 8 – 10 May 2006 Record of the Meeting (EUROBATS.AC11. Record) p. 12, *available at* http://www.eurobats.org/documents/pdf/AC11/AC11_Record.pdf

[23] *See* Annex II of the Record of the Meeting of the 10th meeting of the EUROBATS Advisory Committee (EUROBATS.AC10.Record.Annex2), *available at*, http://www.eurobats.org/documents/pdf/AC10/AC10_Record_Annex2(IWGreports).pdf

[24] Doc.EUROBATS.MoP5.12, *available at*, http://www.eurobats.org/documents/pdf/MoP5/PDF/Doc_MoP5_12_DraftRes5_6_Rev_1_Wind Turbines.pdf.

The substantive provisions of the Draft Resolution urge Parties and Range States to:

1. Raise awareness of the impacts that wind turbines might have on bat populations;
2. Raise awareness of the existence of some unsuitable habitats or sites for the construction of wind turbines at a local, regional and national scale;
3. Make developers of wind energy plants aware of the necessity of supporting research and monitoring;
4. Recognise the necessity to find suitable methods for assessing bat migration corridors;
5. Adopt and implement the document "Wind Turbines and Bats: Guidelines for the planning process and impact assessment" attached as Annex 1.[25]

[25] *Id.*

The primary purpose of these guidelines is to raise awareness among developers and planners of the need to consider bats and their roosts, their migration routes and feeding areas when they are assessing applications for wind turbines.[26] The guidelines are meant to be voluntary and assist in the planning and impact assessment processes to reduce the impact of wind turbines on bats. The publication of Resolution 5.6 in its final form is expected later in 2006.

[26] *Id.*

These guidelines also have been identified by the IWG as a potential contribution by EUROBATS to the CBD/CMS Joint Work Programme (JWP) from 2006 onwards. Thus, the JWP, which was welcomed by the Conference of the Parties to the CBD at its eighth meeting in March 2006, could be the vehicle by which the applicability of whatever guidelines are adopted by EUROBATS could be extended to a significantly larger group of parties.[27]

[27] As at 1 December 2005, EUROBATS had 31 Parties out of its 48 Range States. As at 31 January 2006, the CBD had 188 Parties. It should be noted, however, that COP 8 restricts the collaboration amongst parties of the CMS and CBD. Only those countries party to both conventions are invited to collaborate.

Until the task of developing guidelines is completed, parties and Range States[28] are asked to take full account of the precautionary principle in the development of wind farms and to take account of bats in planning processes relating to the siting of wind turbines, especially along migration routes and in areas of particular value to bat populations.[29] Parties and non-party Range States are also encouraged to initiate and support further investigations and research on the impacts of wind turbines on bats.[30]

[28] These are defined as "any State (whether or not it is a Party to the Convention [CMS]) that exercises jurisdiction over any part of the range of a species covered by this Agreement." Article 1(c), EUROBATS. Annex I contains the bat species occurring in Europe to which the Agreement applies.

[29] *Id.*, paragraph 2.

[30] *Id.*, paragraph 3.

Analysis of 'Barriers'

The first question to be asked is whether the provisions of the resolutions described above form barriers to the development of wind energy. If these provisions are considered barriers, then the next question is whether they are *unreasonable* barriers. Finally, we must ask how these barriers can be reconciled with the challenge of fully harnessing the potential of wind energy as an alternative to fossil fuel generation.

In most instances, the text of biodiversity-related multilateral agreements and instruments and the decisions, resolutions or recommendations adopted by their decision-making bodies do not pose a *direct* barrier to the development of wind energy. It is generally the implementation of the obligations under these instruments (i.e. the concrete policies and measures adopted by parties carrying out these

obligations) that can create potential barriers to the development of wind energy. The mixture of policies and measures adopted by a country in implementing an international agreement will depend on that country's particular circumstances. Therefore, it is difficult to generalize about the positive and negative effects of an international agreement at the national level.

However, it should be noted that the wording of the wind farm-related provisions in both the CMS and EUROBATS resolutions is very general in nature. Thus, when it comes to implementation, parties will have some latitude in interpreting their obligations under either the CMS or EUROBATS, especially relative to other policy considerations and obligations under other international, regional or bilateral agreements. Without the benefit of clarifying guidelines, which, in the case of the CMS, may not be available until 2008, the potential for uneven application of the wind farm provisions among parties may give rise to uncertainty. This uncertainty could be minimized by a call for parties to provisionally apply any guidelines developed by the Scientific Council in the period before the next session of the COP.

Careful review and involvement by all stakeholders is particularly necessary during the development of the specific language of the guidelines implementing the CMS and EUROBATS agreements. Unduly burdensome guidelines may create barriers to wind energy development if they are adopted in national policies by Member nations.

Based on arguments raised by opponents to wind farms in several national siting controversies, it can be expected that certain language that seems balanced on its face could be construed by such opponents to impede wind energy development. Therefore, the wording of guidelines developed under CMS Resolution 7.5 and EUROBATS Resolution 4.5 should be carefully crafted with the full recognition of this fact.

In order to avoid unreasonable barriers to wind energy, development of concrete implementing guidelines for CMS Resolution 7.5 should involve input from all relevant stakeholders, including not only environmental groups and wildlife experts from academia and government but also the wind industry. The specific language included in guidelines to implement the following provisions of the two resolutions is particularly important:

- "evaluation of possible negative ecological impacts of wind turbines on nature, particularly migratory species, *prior to* deciding upon permission for wind turbines" (emphasis added);
- assessment of the cumulative environmental impact of installed wind turbines on migratory species;" and
- "taking full account of the precautionary principle in the development of wind turbine plants."

In addition, if vague or ambiguous language, such as that contained in the actual resolutions, is contained in the final guidelines, such language can expose wind developers to substantial delays and uncertainties and increased costs in permitting projects. For example, wind developers can be expected to argue that the precautionary principle favors the adoption of wind generation because it safeguards

the global environment from greenhouse gas emissions even though the complete local environmental consequences of such wind generation are not fully known. However, opponents of wind energy have cited the same language of the precautionary principle to argue for regional moratoriums on the construction of any individual wind farms until comprehensive regional studies and comprehensive studies of the cumulative environmental impact of multiple wind farms can be completed.

In other words, some wind farm opponents have urged national and state governments to reject permit approvals for any and all wind farms until extensive additional study is completed on avian and wildlife impacts. Some have asserted that site-specific pre-construction and post-construction monitoring is not adequate, and others have argued for an assessment of the cumulative negative impacts of wind generation without a balanced assessment of cumulative positive benefits, including reduced greenhouse gas emissions from multiple wind farms.

The implications of a broad interpretation of cumulative impacts are highlighted by a June 30, 2006 letter from the Virginia Department of Environmental Quality (DEQ). In this letter, DEQ provides recommendations to the permitting agency on the Highland New Wind Development project – a proposed 39 MW wind farm consisting of up to 20 turbines in the Allegheny Highlands. In the letter, the DEQ recommends the conduct of a cumulative impact analysis as a prerequisite to the approval of the individual project. According to the environmental agency, such a cumulative impact would consider "the cumulative impact of "wind turbines proposed or planned at 34 facilities within the Allegheny Highlands of Virginia, West Virginia, Maryland, and Pennsylvania."[31] This impact analysis would need to encompass not only the applicant's own project but also 88 currently operating wind turbines, 457 permitted wind turbines, and 480 utility-scale wind turbines proposed or planned at these 34 facilities.[32]

According to one of the comments filed in this permitting proceeding, "this cumulative impact assessment would require the public utility commission to consider, among other things, *what might occur in the future* at nearly three dozen wind power projects in three jurisdictions (West Virginia, Maryland, and Pennsylvania) before issuing a CPCN [Certificate of Public Convenience and Necessity] for a single proposed project . . . in the Commission's jurisdiction."[33] This commenter further points out that the applicant would face the task of obtaining "permission from the dozens, if not hundreds, of property owners involved (including competitors in the wind industry) to adequately sample even a very small number of the presumably thousands of acres of property involved" for an untold number of species impacts. He concludes that such a cumulative impact assessment would be "neither legally nor commercially feasible" to perform.[34]

Another important question relates to the issue of the acceptable threshold. There is a critical difference between the goal of "zero mortality" of birds, bats and other wildlife affected by wind turbines (e.g., "prevention" of any adverse impacts) and a goal of assuring the "mitigation" of adverse impacts on wildlife through the implementation of "best practices." Of course, the latter option would involve tolerance of a certain level of mortality.

[31] Letter from Michael Murphy, Director, Division of Environmental Enhancement, Virginia Department of Environmental Quality, to Joel H. Peck, Virginia State Corporation Commission, June 30, 2006 (Case No. PUE-2005-00101). See http://docket.scc.virginia.gov:8080/vaprod/main.asp

[32] *Ibid.*

[33] Letter from Michel King to Joel H. Peck, Virginia State Corporation Commission, July 13, 2006. (Case No. PUE-2005000101). See http://docket.scc.virginia.gov:8080/vaprod/main.asp

[34] *Ibid.*

The authors urge that the "mitigation"/"best practices" approach should be adopted rather than an approach based on "zero-tolerance" or the prevention of any and all adverse impacts. In many circumstances, known measures are available to mitigate the impact of wind farms on migratory species. These "best practices" involve approaches that seek to minimize adverse impacts on avian species and wildlife through actions, such as careful siting based on pre-construction studies, retrofitting of power poles to prevent electrocution of birds, construction of turbines on taller towers (above flight paths), re-powering of older sites to use fewer (but more efficient) turbines, and the emission of audible signals to birds and other species.

III. POTENTIAL IMPACT OF OTHER INTERNATIONAL INSTRUMENTS ON WIND ENERGY DEVELOPMENT

While the CMS and the EUROBATS agreements are the only two biodiversity-related agreements which specifically consider wind farms in relation to the protection and conservation of species, a number of more general provisions in other international legal instruments also may directly impact the development of wind energy resources. This section *surveys* these instruments, which are organised under three broad headings:

(1) protection and conservation of species;

(2) protection and conservation of habitats; and

(3) assessment of impacts.

It should be noted that this analysis will not consider those international agreements which may impact offshore wind installations outside of the three instruments agreed under the auspices of the CMS.[35]

Protection and Conservation of Species

The following biodiversity-related agreements, including three concluded under the auspices of the CMS, have provisions that could significantly impact the development of wind energy.

Convention on Biological Diversity (CBD, 1992)

The CBD is the central biodiversity-related agreement in the international arena. It was signed in 1992 at the United Nations Convention on Environment and Development in Rio de Janeiro along with the conventions on climate change and desertification. One of the CBD's primary objectives is the conservation of biological diversity,[36] which is accomplished either through in-situ[37] or ex-situ means.[38] One of the tools for achieving in-situ conservation is the establishment of protected areas. These will be discussed further in the subsection that follows. The CBD has impact assessment requirements[39] as well, which also are discussed below.

Parties to the CBD are required to integrate the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and poli-

[35] For a comprehensive analysis of international instruments relevant to offshore wind installations, see S. Shaw, M.J. Cremers, G. Palmers, 'Enabling Offshore Wind Developments' (European Wind Energy Association – Brussels 2002). This report is often called the 'Sealegal' Report. In addition, work on marine and renewable energy issues is being completed separately under the auspices of the Renewable Energy and International (REIL) Project.

[36] CBD, art 1, *available at*, www.biodiv.org.

[37] 'In-situ conservation' is defined as the conservation of ecoystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties. CBD, art 2. The obligations of parties in respect of in-situ conservation are set out in CBD, art 8.

[38] 'Ex-situ conservation' the conservation of components of biological diversity outside their natural habitats. CBD, art 2. The obligations of parties in respect of ex-situ conservation are set out in CBD, art 9, which states explicitly in the chapeau that ex-situ measures serve to complement in-situ measures.

[39] CBD, art 14: Impact Assessment and Minimizing Adverse Impacts.

cies.[40] Parties also are required to integrate the conservation and sustainable use of biological diversity into national decision-making processes.[41] Such decision-making processes would include the energy sector, and this is one way that the CBD could directly impact wind energy decisions.

The CBD has 'joined forces' with four other biodiversity-related conventions to explore the inter-linkages between the issues each addresses, and the potential complementary aspects of their monitoring and implementation processes.[42] At COP 8 in March 2006 in Brazil, the CBD welcomed the revised joint work programme with the CMS (2006-2008). To the extent that the joint work programme results in the incorporation of CMS initiatives into national biodiversity strategies and action plans, it could provide an entry point for CMS guidelines on migratory species and wind farms.

Ramsar Convention on Wetlands (Ramsar Convention, 1971)

The Ramsar Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It is the only global environmental treaty that deals with a particular ecosystem. Parties to the Convention are spread geographically across the globe.[43] This global coverage is available because the definition of wetlands used by the Ramsar Convention is very broad, and this definition includes swamps and marshes, lakes and rivers, wet grasslands and peat lands, oases, estuaries, deltas and tidal flats, nearshore marine areas, mangroves and coral reefs, and human-made sites, such as fish ponds, rice paddies, reservoirs, and salt pans.[44]

Although the Ramsar Convention may be viewed primarily as a habitat conservation treaty, the fundamental importance of wetlands as habitats for waterfowl is considered in the Preamble, and the international importance of wetlands to waterfowl is one of the key criteria for designating wetlands for protection.[45] According to the treaty, if a listed wetland is deleted or restricted in the national interest, compensation for any loss to wetland resources should be made, in particular for the protection of waterfowl.[46] Parties to Ramsar must endeavour to increase the population of waterfowl on appropriate wetlands.[47]

Bern Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1979)

The aim of the Bern Convention is to ensure the conservation of wild flora and fauna and their natural habitats and to protect endangered migratory species through cooperation between contracting parties. Although the Bern Convention is primarily an instrument for the conservation of European biodiversity, it counts as parties four African nations,[48] and this agreement considers the protection of migratory species.[49]

In 2004 the Standing Committee of the Bern Convention adopted a recommendation,[50] which recalls both CMS Resolution 7.5 and EUROBATS Resolution 4.7, and recommends that parties take appropriate measures to minimize the potential adverse effects of wind turbines on wildlife.[51] The recommendation also asks parties to improve their understanding of the impact of wind farms on wildlife

[40] CBD, art 6(b).

[41] CBD, art 10(a).

[42] See Joint Web Site of the Biodiversity Related Conventions, *available at*, http://www.biodiv.org/cooperation/joint.shtml. The five biodiversity-related conventions are the Convention on Biological Diversity (CBD), the Convention on Conservation of Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands (Ramsar Convention) and the World Heritage Convention (WHC).

[43] See Ramsar Convention website, *available at*, http://www.ramsar.org/.

[44] Ramsar Convention, art 1.1, *available at*, http://www.ramsar.org/key_conv_e.htm. See also id.

[45] Ramsar Convention, art 2.1.

[46] Ramsar Convention, art 4.2.

[47] Ramsar Convetion, art 4.4.

[48] Burkina Faso, Morocco, Senegal and Tunisia.

[49] *See* information on the Bern Convention on the Council of Europe's website, *available at*, http://www.coe.int/DefaultEN.asp.

[50] Recommendation No. 109 (2004) on minimising adverse effects of wind power generation on wildlife: advises contracting parties to take appropriate measures to minimise the negative impact of wind turbines in wildlife, *available at*, http://www.coe.int/.

[51] *Id.*

by involving the wind energy sector.[52] Observer states also are invited to take note of and implement the recommendation.[53]

Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas Convention for Cetaceans (ASCOBANS, 1992)

ASCOBANS was concluded under the auspices of the CMS, but it is a free-standing international agreement. The agreement covers all species, subspecies or populations of small cetaceans in the Baltic Sea and North Sea, with the exception of the sperm whale. The area covered by the agreement consists of the marine environment of fifteen Range States, including the European Community, around the shores of the Baltic and North Seas. The parties to the agreement have agreed to extend the coverage area to cover parts of the North Atlantic and to incorporate waters adjacent to Ireland, Portugal, and Spain. The extension will close the gap for some species of small cetaceans between the ASCOBANS and its sister agreement, the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS).[54]

ASCOBANS includes a Conservation and Management Plan that describes the conservation, research, and management measures that should be applied by the parties to the agreement. Paragraph 1 of the Plan requires parties to work towards the reduction of activities which may affect the food resources of the cetaceans covered by the agreement, and to prevent other significant disturbances, especially those of an acoustic nature.[55] While no formal text has been adopted yet by the parties, concerns over the effects of noise on cetaceans have been expressed.[56] Wind farms operate in marine areas covered by a number of the parties to the ASCOBANS agreement, and further elaboration of the Plan could affect future offshore wind farm development.

Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area (ACCOBAMS, 1996)

ACCOBAMS, another of the agreements concluded under the auspices of the CMS, applies to all cetaceans that have a range that lies entirely or partly within the area covered by the agreement or that accidentally or occasionally frequent that area. Unlike ASCOBANS, ACCOBAMS protects both large and small cetaceans, including the sperm whale, the fin whale, and the long-finned pilot whale.

The area covered by the agreement encompasses the Black Sea, the Mediterranean Sea, and the Atlantic coasts of Morocco and Portugal. There are twenty-eight Range States included in this area. It is important to note that membership in the agreement is also open to non-coastal or 'third party' States whose vessels are engaged in activities that may affect cetaceans within the area covered by the agreement.[57]

While the primary focus of ACCOBAMS is the deliberate and incidental taking of cetaceans in the area by fishing vessels, its overall aim is to conserve all cetaceans in the area's waters by reducing threats to their existence. To this end, parties to ACCOBAMS are obligated to cooperate in the creation and maintenance of a network of cetacean conservation areas.[58] These protected areas are to be established within the framework of the Convention for the Protection of the Mediterranean Sea

[52] *Id.*

[53] Observer states include Algeria, Belarus, Cape Verde, the Holy See, Kazakhstan, Kyrghystan, Mauritania, Tajikistan, Turkmenistan and Uzbekistan. See Documents of the Bern Convention, *available at*, http://www.coe.int/.

[54] *See* the ASCOBANS webpage, *available at*, http://www.cms.int/species/ascobans/asc_bkrd.htm. For a discussion of ACCOBAMS, see the following section of this paper.

[55] ASCOBANS, Annex, ¶1, *available at*, http://www.cms.int/species/ascobans/asc_text.htm.

[56] Resolution n. 5: Effects of noise and of vessels, Meeting of the Parties at Esbjerg, Denmark, Aug 2003

[57] *See* websites for both ACCOBAMS, available at, http://www.accobams.org/ and the overarching CMS agreement, *available at*, http://www.cms.int/species/accobams/acc_bkrd.htm.

[58] ACCOBAMS, art II.1, *available at*, http://www.cms.int/species/accobams/acc_text.htm.

against Pollution[59] or within the framework of other appropriate instruments.[60]

African-Eurasian Waterbird Agreement (AEWA, 1995)
Developed under the auspices of the CMS, like ASCOBANS and ACCOBAMS, AEWA is an independent international treaty. AEWA covers 235 species of birds ecologically dependent on wetlands for at least part of their annual cycle over an area of 117 countries from Europe, parts of Asia and Canada, the Middle East, and Africa. It provides for coordinated and concerted action to be taken by the Range States throughout the migration system of the waterbirds to which it applies.[61]

The fundamental principles of the agreement require parties to take coordinated measures to maintain migratory waterbird species in a favourable conservation status or to restore them to such a status on the basis of the precautionary principle.[62] The Action Plan accompanying the agreement[63] specifically requires parties to 'promote high environmental standards in the planning and construction of structures' and to 'consider steps to minimize the impact of structures already in existence.'[64] Parties also should 'endeavour to take measures to limit the level of threat' caused by human disturbances. 'Appropriate measures might include . . . the establishment of disturbance-free zones in protected areas where public access is not permitted.'[65]

Protection and Conservation of Habitats

Most biodiversity-related agreements or provisions consider the protection and conservation of habitats as critical to ensuring against biodiversity loss. Even where the preservation of habitats is not the primary aim of an agreement, it is used as a tool for the protection and conservation of species.

Convention on Biological Diversity (CBD, 1992)
The conservation of habitats is provided for in article 8 (In-situ Conservation) of the CBD. One of the key tools for achieving the in-situ conservation of biodiversity is the establishment of a system of protected areas.[66] Where necessary, parties are to develop guidelines for the selection, establishment, and management of protected areas,[67] and they must regulate the conservation and sustainable use of biological diversity whether inside or outside the protected area.[68] Parties have a duty to promote sustainable practices in areas adjacent to protected areas to guard against spillover effects.[69]

CBD COP decision VII/28[70] on protected areas (in tandem with decision VII/5[71] on marine and coastal biodiversity) reaffirms the importance of protected areas to attaining the objectives of the convention. At its eighth meeting in Curitiba, Brazil in March 2006, the COP re-affirmed the importance of the protected areas programme of work and recognised the need for adequate technical, institutional and financial capacities for the implementation of the programme.[72]

Ramsar Convention on Wetlands (Ramsar Convention, 1971)
The main aim of the Ramsar Convention is habitat protection, and more specifically, the conservation and wise use of wetland habitats.[73] Wise use is defined as 'sustainable

[59] Otherwise known as the UNEP Barcelona Convention. The relevant protocol to this Convention is called Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean which was adopted on 10 June 1995. The protocol is *available at*, http://www.unepmap.org/Archivio/All_Languages/WebDocs/BC&Protocols/SPA95_eng.pdf.

[60] ACCOBAMS, Annex II ¶3, *available at*, http://www.cms.int/species/accobams/acc_cp.htm

[61] See AEWA website, *available at*, http://www.unepaewa.org/.

[62] AEWA, art II, available at, http://www.unep-aewa.org/documents/agreement_text/eng/agree/agree_text.htm.

[63] AEWA, Annex 3, available at, http://www.unep-aewa.org/documents/agreement_text/eng/agree/ag_a3.htm.

[64] AEWA, Annex 3, item 4.3.5.

[65] *Id.*

[66] CBD, art 8(a).

[67] *Id.* at 8(b).

[68] *Id.* at 8(c).

[69] *Id.* at 8(e).

[70] CBD COP 7 decision VII/28: Protected areas (articles 8(a) to (e)), *available at*, http://www.biodiv.org/decisions/default.asp.

[71] CBD COP 7 decision VII/5: Marine and coastal biological diversity, *id.*

[72] *See* CBD COP 8 decision

utilization for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem.'[74] 'Sustainable utilization' is understood to mean 'human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations'.[75]

Wetlands are protected through a listing process. Parties designate wetlands to be listed on the basis of their international significance. International significance is determined using the following criteria: ecology, botany, zoology, limnology, or hydrology.[76] Changes to listed wetlands must be reported, including those resulting from technological developments, pollution, or other human interference.[77] Where possible, parties must compensate for losses to wetland resources.[78]

Bern Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1979)

The Bern Convention, is essentially a European treaty, and it is implemented through the European Community's (EC) Birds[79] and Habitats[80] Directives. The Birds Directive provides for habitat protection by establishing the requirement for EC Member States to designate special protection areas (SPAs).[81] The corresponding areas in the Habitats Directive are known as special areas of conservation (SACs).[82] The combination of SPAs and SACs across Europe make up the Natura 2000 network, which is considered the cornerstone of EU nature protection policy.[83] Exceptions exist in both directives which allow for development to occur within the Natura 2000 protection network.[84]

African-Eurasian Waterbird Agreement (AEWA, 1995)

AEWA allows parties to take the same actions as those allowed by the CMS in protecting listed endangered species.[85] This action includes the conservation and restoration of critical habitats.[86] It also includes the prevention and removal of obstacles to migration of these species.[87] Given AEWA's direct tie to the conservation provisions of the CMS, it may not be unreasonable to presume that CMS guidelines regarding wind farms would be paid serious attention.

The AEWA Action Plan requires parties to endeavour to establish protected areas to conserve habitats important for listed populations and to develop and implement management plans for these areas.[88]

Assessment of Impacts

Pre-project assessment requirements may impact the ability of wind farm developers to receive planning permission.

Convention on Biological Diversity (CBD, 1992)

The CBD requires parties to introduce environmental assessment procedures for proposed projects that may have adverse impacts on biodiversity, to the extent possible and where appropriate.[89] The convention also requires that the potential negative impacts of programmes and policies should be considered.[90] Activities taken

VIII/24: Protected areas, *available at*, http://www.biodiv.org/decisions/default.asp?m=cop-08.

[73] Ramsar, art 3.1, *available at*, http://www.ramsar.org/key_conv_e.htm.

[74] See 'Guidelines for the Implementation of the Wise Use Concept', first adopted as an annex to Recommendation 4.10 of the 4th Meeting of the Conference of the Contracting Parties (Montreux, Switzerland, 1990), *available at*, http://www.ramsar.org/key_guide_wiseuse_e.htm.

[75] *Id*.

[76] Ramsar, art 2.2.

[77] *Id*. at art 3.2.

[78] *Id*. at art. 4.2.

[79] Directive 79/409/EEC, *available at*, http://europa.eu.int/comm/environment/nature/home.htm.

[80] Directive 92/43/EEC, *id*.

[81] Birds Directive, art 4.

[82] Habitats Directive, art 4.4.

[83] See European Commission DG Environment website, available at, http://europa.eu.int/comm/environment/nature/mission_statement/index_ en.htm.

[84] Habitats Directive, arts 6 and 7.

[85] AEWA, art 3.2(a), *available at*, http://www.cms.int/species/aewa/aew_text.htm.

[86] CMS, art 3.4(a), *available at*, http://www.cms.int/documents/convtxt/cms_convtxt.htm.

by one party that may adversely affect the biodiversity of another party are subject to notification, information exchange, and consultation as agreed by the parties;[91] and where the actions of one party put the biodiversity of another party in imminent harm or danger, a system for immediate notification and mitigation must be in place.[92] Measures for dealing with national emergencies also should be in place, and parties should encourage international cooperation as a supplement to national efforts.[93] Parties to the CBD are required to examine the issue of redress and liability.[94]

Espoo Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention, 1991)

Parties to the Espoo Convention have a duty to assess the environmental impact of certain activities at an early stage of planning. The convention also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.[95]

For those activities listed in Appendix I to the convention, parties must establish environmental impact assessment procedures that permit public participation.[96] The assessment documentation must be prepared as set out in Appendix II to the convention.[97] The list of activities in Appendix I includes 'major installations for the harnessing of wind power for energy production (wind farms).'[98] The assessment documentation must include at a minimum the following information:

(a) A description of the proposed activity and its purpose;

(b) A description, where appropriate, of reasonable alternatives (for example, locational or technological) to the proposed activity and also the no-action alternative;

(c) A description of the environment likely to be significantly affected by the proposed activity and its alternatives;

(d) A description of the potential environmental impact of the proposed activity and its alternatives and an estimation of its significance;

(e) A description of mitigation measures to keep adverse environmental impact to a minimum;

(f) An explicit indication of predictive methods and underlying assumptions as well as the relevant environmental data used;

(g) An identification of gaps in knowledge and uncertainties encountered in compiling the required information;

(h) Where appropriate, an outline for monitoring and management programmes and any plans for post-project analysis; and

(i) A non-technical summary including a visual presentation as appropriate (e.g., maps, graphs).[99]

[87] *Id*. at art 3.4.(b).

[88] AEWA, Annex 3, item 3.2.1, *available at*, http://www.cms.int/species/aewa/aew_ap.htm.

[89] CBD, art 14.1(a), *available at*, http://www.biodiv.org/convention/articles.asp?lg=0&a=cbd-14.

[90] *Id*. at art 14.1(b).

[91] *Id*. at art 14.1(c).

[92] *Id*. at art 14.1(d).

[93] *Id*. at art 14.1(e).

[94] *Id*. at art 14.2.

[95] *See* Espoo Convention website, *available at*, http://www.unece.org/env/eia/eia.htm.

[96] Espoo Convention, art 2.2, available at, http://www.unece.org/env/eia/eia.htm#appendix1.

[97] *Id*.

[98] *Id*. at Appendix I, item 22.

Even where wind farm development is not deemed a 'major installation,' it still may be subject to an environmental impact assessment by virtue of its size, location, or effect.[100] For the purposes of this analysis, the proximity of a project to an international border should be taken into consideration.[101] While environmental impact assessments are to be applied at the project level, parties should endeavour to apply the same measures to policies, plans, and programmes.[102]

[99] *Id.* at Appendix II.

[100] *Id.* at art 2.5 and Appendix III.

[101] *Id.* at Appendix III.

[102] *Id.* at art 2.7.

IV. CONCLUSIONS AND RECOMMENDATIONS

International agreements to protect biodiversity and to reduce greenhouse gas emissions all pursue similar objectives – securing a sustainable future and reducing the impact of humans on natural values. However, the interpretations of these agreements can lead to contradictory results, particularly in the case of wind energy development. In some instances, there has been a disproportionate focus on the short-term negative impacts of wind development on biodiversity and an inadequate focus on the long-term benefits of wind energy in reducing the effects of climate change – one of the largest threats to biodiversity. In addition, in some cases, the impacts of wind energy – both positive and negative – have been viewed in isolation and have not been compared to the far more serious environmental impacts of producing electricity from other energy sources, particularly fossil fuel sources, including coal, oil, and natural gas, as well as nuclear power and large-scale hydropower plants.

Increased efforts should be focused on assuring a balanced approach that seeks to harmonize the goals of protecting biodiversity and reducing greenhouse gas emissions. This approach should seek to mitigate the negative, local impacts of wind turbines on biodiversity while avoiding policies that create serious impediments to well-designed and carefully sited wind farms. Without such a balanced approach, policies designed to protect biodiversity may actually contribute to continued reliance on conventional electric generating technology and the consequent aggravation of global climate change and pollution on wildlife and habitats on a large scale.

In pursuit of these objectives, wildlife experts, environmental organizations, and wind developers should collaborate in evaluating the issues raised by biodiversity agreements for the development of wind energy resources[103] and in developing guidelines to govern development. The following specific actions should be considered:

[103] In 2005 the transportation and energy (DG TREN) and environment (DG ENV) directorates at the European Commission created an ad hoc working group on wind energy and biodiversity. The group is comprised of industry, governmental and non-governmental representatives. In August 2005, the European Wind Energy Association (EWEA), the group's wind industry representative, issued a memorandum on findings, recommendations and conclusions. Copy on file with authors.

Planning

National and regional authorities should develop and use Geographic Information System (GIS) tools to map environmentally sensitive areas as well as areas suitable for wind farm development and should make the maps readily accessible to the wind industry;

- The planning process should be used to pinpoint specific locations of ecological concern and to demonstrate the sensitivities of particular locations to development;

- Based on this mapping, national and regional authorities, following public consultation, should designate areas suitable for wind farm development ("go-areas) in their planning (as implemented in Denmark) rather than focusing solely on "no-go areas";
- The absence of such maps in the near-term should not be used as a barrier to development given the substantial time and effort requiring to conduct such mapping work.

Research

- Research priorities relating to the environmental impacts of wind turbines and successful mitigation measures should be established on a collaborative basis by international agencies, National and State governments, academic experts, environmental organizations, and the wind industry, and this cooperative effort should result in a prioritized research "roadmap."
- Increased funding should be made available to pursue the proposed research "roadmap," and the results of such research should be peer-reviewed and made publicly available.

Development of Guidelines

The development of new environmental assessment guidelines for wind farms, including the guidelines under development pursuant to Resolution 7.5 of the Convention on Migratory Species and Wild Animals (CMS) and Resolution 4.7 of the Agreement on the conservation of Populations of European Bats, should:

- Involve early and continuing input from all relevant stakeholders, including state regulatory experts, knowledgeable members of the environmental community, independent consulting biologists with expertise in the field, and the wind industry;
- Avoid vague wording and general considerations based on limited site data;
- Take advantage of the most up-to-date information about wind power development and its impact on wildlife and avoid reliance on studies based on outdated wind technology;
- Rely on an evidence-based approach that focuses on what is known and clarifies the issues requiring further study;
- Incorporate a mitigation/best practices approach rather than a zero-tolerance approach for reducing potential adverse impacts of wind farms, except where endangered or threatened species are involved. A mitigation/best practices approach is appropriate in recognition of the comparative benefits of wind farms compared to fossil fuel generation in reducing greenhouse gas emissions and the related adverse climate change impacts on the ecosystem;

- Implement reasonable requirements for pre-construction and post-construction monitoring that:
  - ➢ Avoid requirements for pre-construction monitoring at comparative reference sites in view of the limited benefits and high costs of such requirements;
  - ➢ Recognize that excessive site-specific studies can render a particular project as infeasible and that certain studies are more appropriately directed as part of a broad-scale research agenda (rather than as part of a project-specific permit process) and pursued through a government-industry collaboration.
- Eliminate requirements for assessment of impacts on certain species if generic research has demonstrated no (or minimal) adverse impacts and the impacts are not site-specific; and
- Seek to limit the adverse impact on projects already approved by national authorities;
- Any guidelines should contain provisions for periodic updating on the basis of new research and monitoring results.

The development of biodiversity guidelines affecting wind power development must be viewed in the context of multiple national, regional, and international commitments to preserve biodiversity, combat climate change, and to increase renewable energy use. With a balanced approach, States can ensure that they comply with their international obligations to preserve biodiversity, while developing clean, efficient and renewable sources of energy and reducing greenhouse gas emissions.

International Investment Agreements and Investments in Renewable Energy*

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1.0 EXECUTIVE SUMMARY

International investment law consists of a number of bilateral investment treaties, multilateral investment treaties, and plurilateral sectoral agreements, layered over customary international law. Investment in renewable energy is also influenced by policies intended to promote particular energy sources (including renewables) and to address climate change, as well as broader market forces in the energy sector.

In order to build an international legal framework that helps to increase investment in renewable energy, the current barriers to such investment must be considered, as well as the history of the debates over international investment agreements (such as for the Multilateral Agreement on Investment and the Free Trade Agreement of the Americas).

While our review of issues at the intersection of international investment law and investments in renewable energy is continuing, our preliminary results suggest that the following areas should be considered when developing any international legal framework designed to help bring more investment into the renewable energy sector:

- Identify clearly the benefits of the potential investment agreement to businesses (increase predictability of host state action and investor responses thereto), host states (affirm right to regulate within traditional boundaries, attract more private investment), and civil society organizations (more investment in cleaner energy solutions) so that the negotiations have broad and strong support.
- Be as transparent as possible in and around the negotiations, including outreach to a wide range of stakeholders in both business and civil society.
- Include clear definitions of "investment," "investor," and "expropriation" so that parties to the agreement can understand the balance being created between private and public interests.
- Include a broad enough definition of "investment" to ensure that investments in "hybrid property" such as tradable renewable energy certificates (TRECs) and greenhouse gas emission allowances are protected.
- Clearly support the host states' "right to regulate" in a non-discriminatory (at least with respect to foreign investors) manner on matters relating to climate protection and cleaner energy.
- Expressly provide that energy from renewable sources is not "like" energy from non-renewable sources for purposes of government support.

In addition, even in the absence of any new international agreements on investment in renewable energy or more generally, action should be considered in the following areas to help expand the investment in renewable energy:

- Supporting efforts to articulate general investment principles to reflect in any international investment agreement (IIA), other international agreement, national or regional policy regime.

- Continuing to encourage national and international policy makers to incorporate clean energy into their infrastructure investment planning efforts.
- Pursuing the opportunities offered by the post-Kyoto discussions to expand the incentives for investments in renewable energy.
- Continuing to build the infrastructure for linking private investors into such policy discussions.
- Continuing to build the infrastructure for linking public and private pots of money dedicated to expanding the use of cleaner energy.

2.0 OVERVIEW

This paper analyses the links between the provisions of international investment agreements and the expansion of investment in renewable energy projects. It does not include an analysis of investment issues related to research and development.[1] In addition, while the paper considers a range of policies being used to promote renewable energy in a number of countries, it does not evaluate the specific policies adopted in any individual country.

[1] In addition, this paper does not include a discussion of the United States Constitution or the European Union treaties, although they are also agreements affecting investment across political boundaries.

The first part of this paper provides an introduction to the variety of international agreements that exist on investment, as well as the key concepts reflected in those different agreements. The second part provides an introduction to the market for investment in renewable energy, as well as the policies adopted by governments to promote additional investment. The third part links these two areas by looking at both: (1) the potential barriers to government efforts to increase investment in renewable energy arising from the provisions of international investment agreements; and (2) the potential opportunities to use international investment initiatives to increase such investment. The final section offers some suggestions for further work on using international legal activities to increase investment in renewable energy.

3.0 INTRODUCTION TO INTERNATIONAL INVESTMENT AGREEMENTS

In the late 18th century, countries began negotiating bilateral[2] commercial treaties that addressed some of the issues facing both international investment and trade.[3] (UNCTC/ICC, 1992.) (US DOT Maritime Administration, 2004). The first multilateral efforts to address both investment and trade issues came in 1948 with the Havana Charter, an attempt to form the International Trade Organization (ITO) (Koulen, 2001). This effort failed, in part, because the United States (US) Senate would not ratify the treaty. One of the Senate's primary concerns was the investment section (Cosbey et al., 2004).

[2] "Bilateral" treaties are those between two countries (such as between the UK and China). "Multilateral" treaties are those involving more than two countries (such as the NAFTA agreement among the US, Canada and Mexico).

[3] For example, the United States Treaties of Friendship, Commerce and Navigation, which includes treaties with Sweden and Norway (1827), Republic of New Grenada (1846), Hawaii (1849), Brunei (1850), Switzerland (1850), Costa Rica (1851), Argentina (1853), Bolivia (1858), Paraguay (1859), and Honduras (1864), among others.

While the broader ITO effort failed, the General Agreement on Trade and Tariffs (GATT) was established, which covered trade but not investment (WTOa). In 1955, the GATT Resolution on International Investment for Economic Development was

adopted. The resolution recommended that bilateral investment treaties (BITs) and multilateral investment treaties (MITs) (together, international investment agreements (IIAs)) be used to stimulate investment (Koulen, 2001). However, the GATT signatories took little follow-up action on the MIT front. The first BIT was executed in 1959 by Germany and Pakistan, and was soon followed by other countries, including Switzerland, France, and the Netherlands (UNCTC/ICC, 1992).

Other international organizations also started to focus on international investment in the 1960s. In 1961, the Organization for Economic Cooperation and Development (OECD) was formed and adopted the Codes of Liberalisation of Capital Movements and of Current Invisible Operations (OECD, 2003). The driving force behind the codes was the belief that the free circulation of capital, investment, and services across national borders would lead to economic growth, employment and development. This was followed by a Draft Convention on Investment in 1967.[4]

[4] See 7 International Legal Materials (ILM) 117 (1968).

In 1965, the Executive Directors of the World Bank drafted the Convention on the Settlement of Investment Disputes between States and Nationals of Other States, which established the International Centre for Settlement of Investment Disputes (ICSID) (ICSID, 2005). The purpose of the ICSID is to provide facilities for conciliation and arbitration of investment disputes between Contracting States and nationals of other Contracting States (ICSID, 2005).

Debate over international investment issues intensified in the 1970s. For example, data collected by the Center for Multinational Studies in Washington DC noted that the mid-1970s saw the highest number of nationalizations ("expropriations") of foreign-owned property by governments ever recorded (Chifor, 2002). The 1976 OECD Declaration on International Investment and Multinational Enterprises was one response. Its purpose was to create a "policy commitment to improve the investment climate, encourage the positive contribution multinational enterprises can make to economic and social progress and minimize and resolve difficulties which may arise from their operations." (OECD, *n.d.*a)

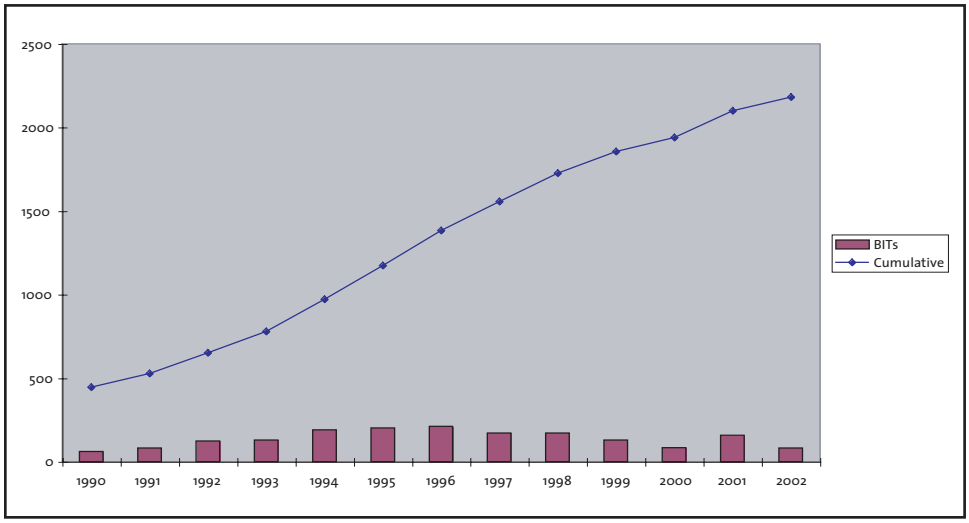
By the 1980s, however, international attitudes were changing, and foreign direct investment (FDI) was generally seen as an opportunity for growth and prosperity around the world (UNCTAD, 2004a). This led to a rapid increase in the number of international investment agreements being adopted, particularly BITs. For example, the US released its first model BIT in 1982 (UNCTC/ICC, 1992).

The result is that over the past few decades, thousands of BITs have been agreed, several plurilateral sectoral agreements have been adopted (particularly in the energy area), and considerable effort has been spent attempting to expand the number of MITs in force. The basic goal of all of these IIAs is to find a balance between protecting the rights of investors (so that they will invest more) and the rights of the public in the recipient country (so that the investment will have beneficial effects within that country). As such, they share a small number of key concepts for addressing the areas of historical dispute between investors and states. These key concepts are discussed in section 3.5 below, after more detailed descriptions of some of the major IIAs.

3.1 Bilateral Investment Treaties

The United Nations Commission on Trade and Development (UNCTAD) defines BITs as "agreements between two countries for the reciprocal encouragement, promotion and protection of investments in each other's territories by companies based in either country."(UNCTAD, 2004b). Germany and Pakistan signed the first modern bilateral investment treaty in 1959 (World Bank Group, *n.d.*). However, BITs were not common until the 1980s. It is important to note that until 1985, most BITs did not have provisions allowing for arbitration of disputes between investors and States. They only provided State-State arbitration. In 1989, 389 BITs had been ratified. With the huge increase in foreign investment during the 1990s, the number of BITs increased to 2,265 by 2003 (UNCTAD, 2004b). Over 170 countries were signatories to BITs as of 2003.

Figure 1 BITs 1990–2002



Source: UNCTAD BIT database

While, by definition, each BIT is different – as they are agreements between two sovereign nations – they are often built around "model" agreements. For example, Model BITs have been developed and released by the Canadian (Canada, 2003), Chinese (UNCTAD, 2004c), Indian (Republic of India, *n.d.*) and US (US, 2004) governments. These four model BITs are used for the analysis of key concepts and linkages with investments in renewables presented below.

3.2 Multilateral Treaties with Investment Provisions

In addition to BITs, there has also been an increase in MITs and regional trade agreements with investment provisions. Theses include:

- The Energy Charter Treaty (ECT, 2004)
- The North American Free Trade Agreement (NAFTA, *n.d.*)

- The Central American – Dominican Republic Free Trade Agreement (CAFTA-DR, 2002)
- Various other regional agreements

The perceived success of NAFTA, combined with the proliferation of BITs in the 1980s, also led to a series of efforts to adopt both new regional and global agreements with investment provisions. The three leading efforts in this regard are:

- The Free Trade Area of the Americas (FTAA, 2003)
- The Multilateral Agreement on Investments (MAI) proposed by the OECD
- The investment discussions taking place within the context of the World Trade Organization (WTO)

Finally, in reaction to the debates over how environmental and social issues are addressed in these proposed agreements, the International Institute for Sustainable Development (IISD) has offered a model investment agreement that specifically addresses sustainable development issues.

Each of these existing and proposed MITs is described briefly below.

3.2.1 Energy Charter Treaty

The ECT "establishes a multilateral legal framework for cross-border energy co-operation. It covers energy trade, investment, and transit in a comprehensive manner."(Karl et al., *n.d.*). The ECT evolved as an outgrowth of the European Energy Charter Declaration signed in The Hague in December 1991, and currently adopted to by 54 countries. The ECT process began in 1992, the treaty was signed in 1994, and it has been in force since 1998. "The ECT is an international agreement in the meaning of the Vienna Convention on the Law of Treaties 1969. It establishes rights and obligations of [contracting parties] in a legally binding manner."(Karl et al., *n.d.*).

The ECT grew out of energy security concerns at the time of the collapse of the Union of Soviet Socialist Republics (now Commonwealth of Independent States) (USSR). According to the *Energy Charter Treaty: A Readers Guide* (Karl et al.), the purpose of the ECT is to create "a stable, comprehensive and non-discriminatory legal foundation for cross-border energy relations . . . [that] . . . reduces political risks associated with economic activities in transition economies . . . [with a] . . . commitment to achieve the following common goals:

- To provide open energy markets, and to secure and diversify energy supply;
- To stimulate cross-border investment and trade in the energy sector;
- To assist countries in economic transition in the development of their energy strategies and of an appropriate institutional and legal framework for energy, and in the improvement and modernization of their energy industries."

The ECT promotes FDI in the energy sector by protecting foreign investors against discrimination, expropriation, losses resulting from strife, transfer restrictions, and

the breach of individual investment contracts. It also contains a strong mechanism for dispute resolution that includes investor-state arbitration and state-state arbitration.

As part of the ECT, the energy charter conference was formed as the governing and decision-making body for the Energy Charter process. All states that have signed or acceded to the Treaty are members of the Conference. The purposes of the energy charter conference are to: discuss policy issues affecting energy cooperation among the signatories; review implementation of the treaty and the Protocol on Energy Efficiency and Related Environmental Aspects; and consider possible new instruments and projects on energy issues (ECT website, *n.d.*).[5] In addition, the ECT allows for interested parties to have informal contact (observership) with the ECT.[6]

3.2.2 NAFTA

NAFTA's history begins in the 1980s, a time when the US government did not believe that the GATT was addressing its trade issues and so began pursuing more regional agreements (McKinney, 2000). In 1984, the US Congress passed the Trade and Tariff Act, which proclaimed the US's desire to negotiate free trade agreements. The US and Canada began discussing a bilateral free trade agreement in 1985 at the Shamrock Summit in Quebec. Negotiations for such an agreement began in 1986, the agreement was signed on January 2, 1988, and it went into effect January 1, 1989. (McKinney, 2000).

At the same time, in response to economic pressures, Mexico began instituting trade liberalizing policies (McKinney, 2000). Mexico signed a bilateral trade agreement with the US in 1985, (McKinney, 2000) joined GATT in 1986, and in 1987 implemented a framework of principles and procedures for consultation regarding trade and investment relations. In 1990, the US and Mexico expressed their desire to negotiate a free trade agreement between the two countries.

As a result, the Canadian government was concerned that there would be an incentive for companies to locate in the US instead of Canada because the US would have unrestricted access to the entire North American market (McKinney, 2000). Therefore, on February 5, 1991, Canada, the United States, and Mexico, agreed to begin formal negotiations on a North American Free Trade Agreement (NAFTA).

NAFTA negotiations formally began on June 12, 1991. NAFTA was signed on December 17, 1992 and entered into force on January 1, 1994 (NAFTA Secretariat, 2004). NAFTA formed the world's largest free trade area at that time, representing about one third of the world's gross domestic product (USTR, 2004a).

NAFTA Chapter 11 covers investors and investments. The purpose of the investment portion of NAFTA is to foster "an environment of confidence and stability required to make long-term investments and partnering commitments . . . [w]ith a strong, certain and transparent framework for investment."(USTR, 2004b). Since the adoption of NAFTA, North America has attracted record levels of FDI, including:

- "In 2000, FDI by other NAFTA partners in the three countries reached US$299.2 billion, more than double the US$136.9 billion figure registered in 1993."(USTR, 2004c)

[5] Members of the energy charter conference include: Albania, Armenia, Austria, Australia*, Azerbaijan, Belarus*, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, European Communities, Finland, France, Georgia, Germany, Greece, Hungary, Iceland*, Ireland, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Mongolia, Netherlands, Norway*, Poland, Portugal, Romania, Russian Federation*, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, Uzbekistan, and the United Kingdom. (* – denotes state in which ratification of the Energy Charter Treaty is still pending).

[6] Observers to the energy charter conference include: Algeria, Bahrain, People's Republic of China, Canada**, Islamic Republic of Iran, Republic of Korea, Kuwait, Morocco, Nigeria, Oman, Pakistan**, Qatar, Saudi Arabia, Serbia and Montenegro**, Tunisia, United Arab Emirates, United States of America**, and Venezuela, along with several international organizations including: Association of Southeast Asian Nations (ASEAN), European Bank for Reconstruction and Development, International Energy Agency (IEA), OECD, UN Economic Commission for Europe, World Bank, WTO, Commonwealth of Independent States (formerly the USSR) Electric Power Council, Black Sea Economic Cooperation Pact, and the Baltic Sea Region Energy Co-operation. (** – denotes observer state which has signed the 1991 Energy Charter Declaration).

- "NAFTA has also stimulated increased investment from countries outside of NAFTA. North America now accounts for 23.9 percent of global inward FDI and 25 percent of global outward FDI."(USTR, 2004c)

In part, NAFTA was able to help enhance this environment of investment confidence because NAFTA was the first investment treaty to have a formal dispute resolution system (McIlroy, 2002). Disputes under NAFTA have been one of the most active areas in examining the balance between investors' and governments' interests in the expropriation arena (see below).

3.2.3 Central American-Dominican Republic Free Trade Agreement (CAFTA-DR)

The Central American-Dominican Republic Free Trade Agreement (CAFTA-DR) grew out of the successful NAFTA negotiations and the stalled FTAA negotiations (described below). On October 1, 1992, the US Congress was informed of the President's desire to negotiate a free trade agreement with Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. CAFTA negotiations formally began in January 8, 2003. On August 4, 2004 the US Congress was informed of the President's desire for the negotiations to include the Dominican Republic. Negotiations with the five Central American countries were completed on May 28, 2004. The Dominican Republic negotiations were completed on August 5, 2004. By December 31, 2005 the United States, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua have all ratified CAFTA-DR. As of December 31, 2005 Costa Rica had not yet ratified the treaty. The treaty has a rolling implementation process. The US completed the implementation legislation in August 2005. As of January 31, 2006 none of the other signatories had completed the implementation process.

The CAFTA-DR contains both investment and trade provisions. Similar to NAFTA, the purpose of CAFTA-DR is to eliminate barriers to trade, facilitate the movement of goods and services, promote fair competition, and increase investment opportunities. Unlike NAFTA, which addresses environmental issues in a separate side agreement, CAFTA's environmental provisions are enforceable parts of the core trade agreement. In particular, it is notable that CAFTA specifically notes that nondiscriminatory regulatory actions to protect public welfare do not constitute "indirect expropriations" except "in rare circumstances." (USTR 2005a).[7] In addition, CAFTA has a more open and transparent investment arbitration process than NAFTA (USTR 2005b). For example, in CAFTA hearings and documents are open to the public and *amicus curiae* submissions are authorized. (USTR 2005a)

[7] Note that this appeared before in the Chile-US FTA. It is also part of the Annex of expropriation.

3.2.4 Other Regional Investment Agreements

In addition, there are numerous other regional investment agreements and model treaties. Some of these include:

- Asia Pacific Economic Conference (APEC) Agreement on Investment Principles (APEC website, *n.d.*)
- Mercado Comun del Cono Sur (MERCOSUR; Southern Cone Common Market) (MERCOSUR website, *n.d.*)

- 1994 Treaty on Free Trade between Colombia, Mexico and Venezuela (Free Trade Agreement between Colombia, Mexico and Venezuela website, *n.d.*)
- Framework Agreement on the Association of Southeast Asian Nations (ASEAN) Investment Area adopted in 1998 (ASEAN, *n.d.*)
- Asian-African Legal Consultative Committee (AALCC) model BITs (AALCC website, *n.d.*)

In general, all such regional agreements are designed to improve the climate for investment and include provisions similar to those found in other regional investment agreements (see discussion below). As such, they will not be considered further in this paper.

3.2.5 Proposed Multilateral Agreement on Investment

In the 1980s and early 1990s, foreign direct investment (FDI) was generally seen as having a positive influence on host country economies (Sikkel, 2001). The OECD determined there was a strong case for a Multilateral Agreement on Investment (MAI) to help expand FDI still further (Sikkel, 2001). Negotiations for the MAI began in May 1995. The MAI was intended to be a "free standing international treaty, open to all OECD Members and the European Communities, and to accession by non-OECD Member Countries [that would] provide a broad multilateral framework for international investment with high standards for the liberalization of investment regimes and investment protection and with effective dispute settlement procedures." (OECD, *n.d.*b).

The draft MAI contained many of the same clauses found in typical BITs. Negotiations initially progressed well, however, several areas of disagreement remained on key concepts (see discussion below). Other problems also began to surface in early 1996, when grassroots advocacy organizations in the US and Canada expressed concern about the lack of openness in the negotiations and the possible environmental consequences of the MAI. In response, the MAI negotiators convened a discussion group on the environment in October 1996 (Sikkel, 2001).

The draft MAI included proposed language in the preamble that addressed sustainable development. However, the MAI draft negotiating text notes indicated that there was considerable disagreement as to whether the proposed language provided for the proper balance between encouraging investment and protecting the environment.[8]

[8] MAI negotiation documentation can be accessed at http://www1.oecd.org/daf/mai/toc.htm

A group of 50 non-government organizations (NGOs) released a Joint NGO Statement on the MAI on October 27, 1997. Among other things, the statement expressed concerns about the expropriation and performance requirements sections of the MAI. It is worth noting that these concerns were similar to those being expressed about the impact of NAFTA on the ability of member states to regulate environmental issues within their borders.

In May 1998, amid the on-going controversy, the negotiations stalled. In December 1998 the negations were discontinued (OECD, *n.d.*b). There are several reasons the MAI negotiations failed. In addition to NGO opposition, the MAI had only limited

support among the business community (UNCTAD, 1999; Sikkel, 2001). As Sikkel noted "with regard to the treatment of established investors regarding subjects like expropriation or transfers of currency, no real problems exist. Dispute settlement may not always be quick or cheap, but in general there is a lot of trust in the instruments available at present." (Sikkel, 2001). So, the business community did not perceive that the MAI offered protections that were not already available under other instruments. In addition, the MAI did not address many of the market access concerns of the business community, such as subsidies (Sikkel, 2001).

The opposition from NGOs and the weak support from the business community were coupled with limited government support. Many of the OECD countries had elections and subsequently underwent political changes toward a more protectionist stance. Many of the OECD governments also perceived few problems with the existing investment regime. That combined with the opposition of the NGOs and limited support of the business community, led to a reduced enthusiasm for the MAI (UNCTAD, 1999). All of these factors converged at a time when the OECD was working under a tight deadline for resolving the MAI negotiations. The deadline, weak support, and strong opposition, all led to the ultimate failure to reach an agreement on the MAI.

3.2.6 Proposed Free Trade Area of the Americas

NAFTA went into effect on January 1, 1994. Subsequently, at the Summit the Americas in December 1994, 34 governments decided to progressively eliminate barriers to trade and investment by creating a Free Trade Area of the Americans (FTAA) by the year 2005. The FTAA was essentially intended to expand NAFTA to every country in Central America, South America and the Caribbean, except Cuba.

Negotiations for the FTAA started at the Santiago Summit held in Santiago, Chile in April 1998. The Trade Negotiations Committee was formed at this summit. There were several subsequent ministerial-level meetings, including in Quebec City in April 2000, Buenos Aires in April 2001, and in Quito, Ecuador in October 2002. Then, at the Ministerial in Miami in November 2003, negotiators reduced the scope of the FTAA, reportedly because of growing divergences between the negotiating parties (Global Exchange, 2005).

The most recent published draft agreement was released in 2003. Chapter 17 covers investors and investment. Negotiations continued in Puebla, Mexico in February 2004 and Buenos Aires, Argentina in April 2004. The trade negotiations committee co-chairs met in Washington DC in February 2005 and issued a statement that negotiations were moving forward and that they planned to meet again in March (FTAA Trade Negotiations Committee, 2003). No record of a March meeting has been released to the public.

The FTAA was again discussed at the Fourth Summit of the Americas, held in Mar del Plata, Argentina in November 2005. The resulting November 5 ministerial "Declaration of Mar del Plata" item 19 addressed the FTAA. Item 19 identified two different positions that the declaration signatories maintained with respect to the FTAA. One position was that while there have been significant difficulties in the

FTAA negotiations these parties remained committed to creating a "balanced and comprehensive FTAA Agreement that aims at expanding trade flows and, at the global level, trade free from subsidies and trade-distorting practices, with concrete and substantive benefits for all, taking into account the differences in the size and the levels of development of the participating economies and the special needs and special and differential treatment of the smaller and vulnerable economies." (Mar Del Plata Declaration, 2005). The countries maintaining this position went on to instruct their trade negotiators to resume meetings in 2006. The other position was that "[o]ther member states maintain that the necessary conditions are not yet in place for achieving a balanced and equitable free trade agreement with effective access to markets free from subsidies and trade-distorting practices, and that takes into account the needs and sensitivities of all partners, as well as the differences in the levels of development and size of the economies."(Mar Del Plata Declaration, 2005).

In response to the opposing viewpoints, there was an agreement to evaluate further both positions after the next WTO ministerial meeting, held in Hong Kong in December 2005. However, our research did not reveal any major subsequent activities in this area.

3.2.7 Proposed Agreement on Sustainable Investments

The International Institute for Sustainable Development (IISD) is a non-profit, policy research institute founded 1990. The IISD's mission is "to champion innovation, enabling societies to live sustainably." (IISD, 2006). IISD engages governments, NGOs, and others in an effort to promote "open and effective" international negotiations.

IISD has been involved in investment issues since 1999. In the spring of 2002, IISD participated in a series of meetings on NAFTA Chapter 11. In April 2003, IISD and Chatham House, London, jointly convened an experts' workshop on "Trade and Sustainable Development Priorities Post-Doha" that discussed investment issues. IISD also participated in investment workshops held as part of the "Americas Trade and Sustainable Development Forum," which was convened concurrently with the 2003 Ministerial Meeting of the FTAA.

These discussions led IISD to publish "Investment and Sustainable Development: A Guide to the Use and Potential of International Investment Agreements" in 2004. The guide acknowledged the importance of investment for sustainable development and discussed the role of IIAs. The IISD noted that many IIA arbitration decisions had significant ramifications for issues of public policy, for example a host state's "right to regulate." The guide stressed the need for IIAs to balance the rights of investors with a host state's rights. The IISD further argued that "investment should foster *sustainable* development" (Cosbey, 2004) [emphasis added]. The IISD emphasized that in order for such a goal to be achieved, an IIA would need to both protect investors' rights and a host states' "right to regulate."

The IISD then expanded upon this idea of a new type of IIA by publishing "A Model International Investment Agreement for the Promotion of Sustainable

Development" in November 2004 (von Moltke, 2004). The purpose of the model agreement is to shift the traditional IIA emphasis of protecting investor rights to a broader emphasis on sustainable development. The model aims to "identify possible issues for inclusion in an investment treaty and to develop a structure that could serve as a template for such a treaty . . . [r]ather than seeking to establish a system of investor rights, the Agreement seeks to establish an institutional structure that permits a continuous balancing of investor rights and public goods in a manner that is legitimate, transparent and accountable."

The model agreement contains a general provisions section, similar to that of traditional IIAs, but all the provisions emphasize the goal of investment for sustainable development. It also has a section on foreign investor rights and standards of treatment that is similar to traditional IIAs. However, there are several key differences between traditional IIAs and the IISD Model, including:

- A section on foreign investor responsibilities (e.g. corporate social responsibility)
- A section on host state's rights, including the host state's to regulate and right to maintain environmental standards
- A section on the host state's responsibilities
- A section on the agreement's relation to other IIAs, trade agreements, and international environmental agreements.

The model IISD agreement differs from other IIAs in its focus on rights and responsibilities in an effort to create an agreement that will encourage investment for sustainable development.

3.2.8 World Trade Organization Activities on Investment

The World Trade Organization (WTO) is addressing the issue of investment in three main areas (WTO, *n.d.*b):

Trade Related Investment Measures

On January 1, 1995, the Trade-Related Investment Measures (TRIMS) Agreement went into effect, as part of the Uruguay Round of negotiations. The purpose of TRIMS is to prohibit member countries from making the approval of investment conditional on compliance with laws, policies or administrative regulations that favor domestic products (UK DTI). The TRIMS agreement requires that host states not impose any TRIM that is inconsistent with the national treatment and quantitative restriction prohibitions in the GATT (see discussion below). The TRIMS agreement does not include a definition of "investment" or "trade related investment measure," and does not require "most-favored nation status."(Cosbey, 2004). The proponents of TRIMS saw the agreement as the WTO's first step toward a more comprehensive investment agreement, however, many countries are resisting further WTO involvement in addressing investment issues (Cosbey, 2004).

General Agreement on Trade in Services

The General Agreement on Trade in Services (GATS) also went into effect on January 1, 1995, addressing foreign investment in services. All members of the WTO are signatories to the GATS. GATS contains rules that address foreign service suppliers establishing a "commercial presence" in a foreign market (WTO, 2001). The investment implications of GATS are primarily related to Article I.2, which implies that the basic protections of the GATS extend to investments that are integral to the service that is provided (Cosbey, 2004). The only use of the word "investment" in GATS occurs in Article XVI, market access, although investment provisions are also subject to Article XII (Restrictions to Safeguard the Balance of Payments) and Article XIV (General Exceptions) (Cosbey, 2004). These provisions bear little resemblance to the investment provisions found in other IIAs.

World Trade Organization Working Group on Trade and Investment

In 1996, a WTO Working Group was established to evaluate the relationship between trade and investment. The purpose of the WTO working group was to review existing IIAs and evaluate the usefulness of negotiating a multilateral framework for investment rules under the WTO. Although the WTO has addressed some investment issues with the TRIMs and GATS agreements, most investment is still regulated by BITs and MITs.

At the Doha Ministerial in 2001, several WTO members supported a recommendation to begin WTO negotiations for rules relating to foreign direct investment. Supporters of the recommendation noted that a multilateral framework for investment through the WTO could provide clarity and consistency not possible with the over 1,700 BITs then in effect. Supporters also tried to clarify that the new WTO framework would not be related to the OECD's failed MAI attempt. Detractors stated that existing IIAs already provide adequate legal protection for investments and questioned the ability of a WTO investment framework actually to increase foreign direct investment (WTO, 2001). Because of the diverging views, the Draft Doha Ministerial Declaration of September 1, 2001, offered two options for further exploring the WTOs involvement in investment. Ultimately, a decision was made to continue the working group's research. Members were directed to clarify core issues and examine broader objectives. There was no consensus, and the members agreed on August 1, 2004 drop investment from the Doha agenda.

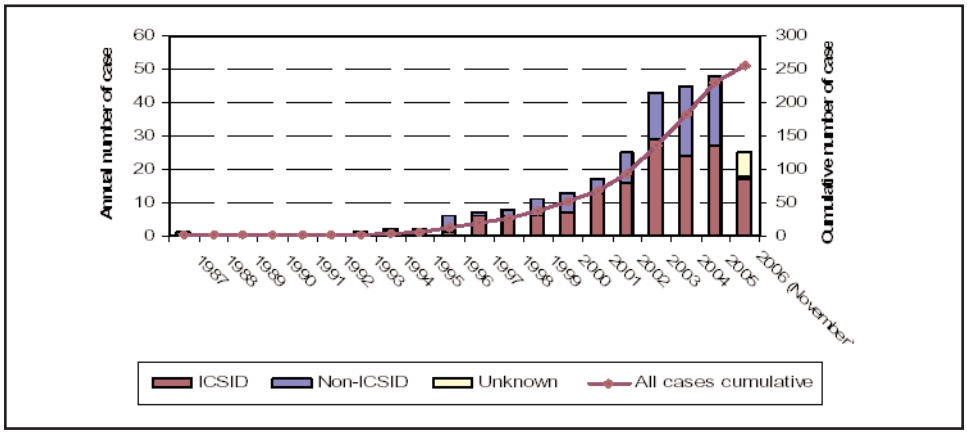
3.3 International Investment Dispute Resolution Agreements

Along with the proliferation of IIAs has come an increase in international investment disputes. Most international investment disputes are arbitrated through the World Bank Group's International Centre for Settlement of Investment Disputes (ICSID). But, many IIAs allow investors to choose between ICSID and other arbitration organizations, such as United Nations Commission On International Trade Law (UNCITRAL, 1976), the International Chamber of Commerce (ICC) Court of Arbitration in Paris, the Stockholm Chamber of Commerce Arbitration Institute, the

London Court of International Arbitration and various other regional arbitration centers, particularly Singapore and Cairo.

It is difficult to determine the precise number of international investment disputes that have been arbitrated because ICSID is the only dispute resolution organization that has a public registry of claims. However, the ICSID data confirms that investment disputes have been on the rise.

Figure 2 Known investment treaty arbitrations (cumulative and newly instituted cases, 1987 – November 2006



Source: UNCTAD, 2006.

3.4 Core Concepts in International Investment Agreements

Although there are many different types of IIAs (as described above), they all share several core concepts. The primary concern is fairness – that foreign investors will be treated fairly by host country governments and that host countries will be treated fairly by investors. As such, IIAs are generally designed to provide protection for foreign investments beyond those available under domestic law, and to reduce the non-commercial risks that such investments face (UNCTC/ICC, 1992). International legal and dispute resolution structures that are not dominated by local governments are viewed by many international investors as providing a much more secure foundation for ensuring the agreements they reach are interpreted and applied fairly. As such, investors are more likely to invest. Host country governments, however, need to be confident that they can protect their national interests against unfair exploitation by investors. These "investor-state" disputes take several major forms and addressing those areas of dispute is the core purpose of IIAs.

As such, most IIAs offer a wide range of protections for both investors and states. Most investment agreements begin with a general statement that the agreement is being established to encourage investment and provide investment protections. A description of the coverage and scope of the agreement and a definition of the terms used in the agreement typically follow the general introduction. The agreements then typically address general standards of treatment, such as nondiscriminatory treatment, national treatment, and most-favored nation status. The agreements also

typically address specific standards of treatment such as prohibitions on performance requirements, transfers of funds and currency, expropriation and compensation, and dispute resolution. Some of the more recent investment agreements also include a discussion of environmental or social issues, specify exceptions from the agreement, or have other clauses to address issues not traditionally covered. A comparison of how several different IIAs address these issues is discussed below. The implications of these core concepts for efforts to increase investments in renewable energy are discussed in Section 5 below.

3.4.1 Coverage and Scope

The coverage and scope portions of an IIA describe the parties to the agreement, define the geographic coverage of the agreement, and typically set out when the agreement enters into force, the duration of the agreement, and the date for termination of the agreement. The coverage and scope section also defines key terms, such as what constitutes an "investment," an "investor," a "national," a "company," and "returns". It may also include definitions for things like "protected information," "regional level of government," "state enterprise," "territory," and others.

The specifics of these definitions have far-reaching implications related to the rights and obligations of the contracting parties (UNCTC/ICC, 1992). For example, many agreements include a broad definition of "investment" that can include just about any kind of asset, while others purposely limit the definition in various ways to support the host country's economic and development policies (UNCTAD, 2004a). "Investment" can also be defined as only including "direct investment" or may also include "portfolio investment" and "intangible assets" such as intellectual property (UNCTAD, 2004a). The specifics of the definitions can have significant implications related to renewable energy policies. For example, the definition of a TREC can influence which, if any, protections apply (see discussion in Section 5 below).

In addition, the scope and coverage sections often include exceptions to the agreements. Exceptions are usually for critical sectors such as energy and certain types of finance. These could potentially present barriers to investment in renewable energy. For example, under NAFTA, the generation, transmission, distribution, and sale of electricity is a "strategic area reserved to the state" of Mexico (Annex 602.3 1(c) and Annex III to the investment chapter) (Watkins, 1999). Therefore, while there are opportunities for private investment in electricity generation in Mexico, any power that is not used on-site must be sold to Mexico's State-owned electric company. These Mexican energy exemptions under NAFTA could also create disincentives for purchasing renewable energy from foreign investors (Harmin, *n.d.*).

Conversely, plurilateral sectoral agreements typically limit the coverage of the agreement based on the sector the agreement is designed to address. For example, in the Energy Charter Treaty, "'investment' refers to any investment associated with an economic activity in the energy sector and to investments or classes of investments designated by a contracting party in its area as 'charter [energy] efficiency projects'"(ECT, 1994).

Table 1 Core Concepts in Investment Agreements and Sample Investment Agreements

Treaty	Energy Charter	NAFTA	FTAA Draft	CAFTA	IISD Model	US BIT	Canada BIT	China BIT	India BIT
Concept									
Scope & Definitions	■	■	■	■	■	■	■	■	■
General Standards of Treatment*	■	■	■	■	■	■	■	■	■
Perf. Reqs.	■	■	■	■	■	■	■		
Fund Transfs.	■	■	■	■	■	■	■		■
Expropriation	■	■	■	■	■	■	■	■	■
Dispute Res.	■	■	■	■	■	■	■	■	■
Envtl	■	■	■	■	■	■	■		
Social		■	■		■	■			
Other?	Taxation measures Umbrella Clause	Information requirements	Information requirements; transparency	Information requirements	Information requirements, national authority, investor responsibility	Transparency	Monopolies and state enterprises; taxation measures		Compensation for losses

Notes: Shaded – indicates clause is included
Blank – indicates clause is not included
* – General standards of treatment include 'fair & equitable treatment,' 'non-discrimination,' 'national treatment' or 'most favored nation status' clauses

Some IIAs also stipulate that investments are subject to the approval of the host country, although this is often limited by clauses for "national treatment" or "most-favored nation status" (see below) (UNCTC/ICC, 1992). The potential implications of these coverage and scope provisions for efforts to increase investment in renewable energy are considered in Section 5.1 below.

3.4.2 General Standards of Treatment

The general standards of treatment in IIAs are typically based on the concepts of "fair and equitable treatment" and "nondiscrimination" that are a standard under customary international law (UNCTC/ICC, 1992). The general standards of treatment are frequently tied to provisions of "national treatment" and "most-favored nation status."(UNCTAD, 2004a). "National treatment" requires that foreign investors be accorded no less favorable treatment than that accorded to investors from the host nation.

It is not uncommon for there to be exceptions from the "national treatment" standards for (Brewer, 1998):

- National security (usually an exception to all obligations – not just national treatment)
- Highly regulated industries
- Industries where there are monopolies or significant government ownership
- Industries that are central to the economy
- Other politically sensitive industries

There are differences in how these exceptions are noted across different IIAs. In some IIAs, there is a clear list of exceptions, while all other "investments" (and possibly "investors") are granted "national treatment." In other agreements, there is a list of industries and areas that are granted "national treatment," with no *a priori* general right to "national treatment." (UNCTAD, 2004a) In addition, in most IIAs "national treatment" is a standard that applies post-establishment – i.e. after an investor has obtained access to a market. However, recent U.S. and Canada BITs and NAFTA apply a pre-establishment standard, allowing foreign investors the same market access as domestic investors (UNCTAD, 2004a). The ASEAN Agreement for the Protection and Promotion of Investments is notable because it does not grant national treatment.

"Most-favored nation" status requires that the agreement signatory be accorded treatment no less favorable than it accords investors from other countries in "similar circumstances." Because most agreements include both "national treatment" and "most-favored nation status," this allows investors to use the more favorable of the two standards of treatment.

Because the energy sector is typically highly regulated, often with significant government ownership, and central to the economy, it is not unusual for IIAs specifically to exclude the energy sector. In these situations, a sector-specific

agreement, such as the ECT, can be used (see Section 3.2.1). These agreements may confuse an already complex investment market, but also may "facilitate the horizontal integration across policy areas; thus investment policy-trade policy and investment policy-technology policy linkages can be address on a sectoral basis." (Brewer, 1998). The potential implications of these standards of treatment for renewable energy policies are discussed in Section 5.2 below.

3.4.3 Performance Requirements

Early BITs commonly included "performance requirements," or standards or conditions that investors had to meet, often expressed as obligations to purchase local goods and services. These "performance requirements" were frequently combined with incentives that required a company to behave in a certain way, such as exporting a minimum amount of production or buying local goods (UNCTC/ICC 1992). Host countries would screen investors by using these "performance requirements" and incentives.

However, most recent IIAs include a "prohibition on performance requirements" and thereby limit a host country's ability to restrict imports of foreign goods or services and do not allow host countries to require or prefer domestic goods or services. Some agreements with prohibitions on performance requirements, such as the Canadian Model BIT (2003), specifically allow measures that require investments to use a technology to meet generally applicable health, safety or environmental requirements (Canadian Model BIT Article 7, 2A).

3.4.4 Transfers of Funds and Currency

This IIA section describes the protocols for transferring funds. Transfers may occur because of income generated from invested capital, refunds, compensation, loan payments, proceeds from sales, and other sources. This clause is typically based on the principle that capital should move freely and without restrictions (UNCTC/ICC, 1992) by requiring that the transfers be allowed to be made in "freely usable currency" at "current rates of exchange."

3.4.5 Expropriation

IIAs typically protect foreign investments from "takings" by host country governments without the payment of fair compensation (UNCTAD, 2004a). At the same time, such protections need be balanced against the government's ability to protect its interests through regulation and the more general exercise of its police and taxing authorities. Finding this balance has proven to be one of the most contentious issues under IIAs.

In customary international law and IIAs, States have the legal right to "take" or "expropriate" foreign investments in their territories as long as three conditions are met: 1) the "expropriation" is for a "public purpose;" 2) it is done in a "non-discriminatory" manner; and 3) it includes "fair and equitable compensation." (UNCTC/ICC, 1992; UNCTAD, 2004a). Some IIAs also have a fourth requirement that the "expropriation" be done with "due process" (UNCTAD, 2004a).

Of major concern are the types of government measures that will trigger the expropriation clauses in an IIA. There are a wide variety of definitions for expropriation across various investment agreements. Some agreements narrowly define expropriation as "direct takings," such as "nationalization" (the state's taking control of an economic sector or industry) or "expropriations" (the state assuming control of a business or property) by taking title to or physical possession of the property. Others have broader definitions of expropriation that include "indirect takings," such as "regulatory takings," or "creeping expropriation" where government actions such as taxation or regulation may diminish the value of an investment (Werksman, 2001). With indirect takings, government action results in "the effective loss of management, use or control, or a significant depreciation of the value, of the assets of a foreign investor." (UNCTAD, 2004a).

There is no clear, consistent legal definition to determine what constitutes an "indirect taking" that requires investor compensation versus a legitimate exercise of the government's right to regulate or tax that does not. For example, most host states retain the right to tax the investments (within reason) and to assess monetary penalties if there is a violation of a law without compensation to the investor. Some IIAs even define a government's right to protect the environment as non-compensatory (UNCTAD, 2004a). In other instances though, "regulatory takings" have been determined to be compensatory (OECD, 2005a). This could be problematic if supply-side renewable energy promotion policies were to been seen as "taking" from traditional energy sources (see discussion in Section 5.3 below).

3.4.6 Dispute Resolution

IIAs would not be effective if there were not some mechanism to resolve disputes over their terms outside of the courts in the host country. Therefore, nearly all IIAs include provisions for dispute resolution (UNCTC/ICC, 1992). In general, only the investor can initiate the arbitration because IIAs are generally designed to protect investors. However, recent precedent discusses the right of the State to counterclaim where the IIA contains an umbrella clause[9] (Alvarez, 2006). There are many different ways that dispute resolution might be addressed, such as diplomacy, court systems and binding arbitration. Some agreements establish institutions for dispute resolution, but most IIAs rely on binding arbitration under external organization such as ICSID or UNCITRAL Rules (ICSID, *n.d.*).

[9] An IIA with an umbrella clause extends jurisdiction beyond claims of treaty violations to "any dispute relating to investments" (OECD, 2006).

It is through the dispute resolution process that interpretations are made on conflicts that arise related to issues such as coverage and scope, discriminatory practices and expropriation. Because of differing substantative provisions in the various IIAs, and the lack of a permanent court to adjudicate all investment disputes, questions arise as to the consistency between both the resolutions of various disputes and of the choice of the law applied in individual disputes, particularly when there are conflicts between different laws (UNCTC/ICC, 1992). For example, while the ICSID Convention calls for the application of domestic law in certain circumstances, most IIAs rely on international law. Nonetheless, application of domestic law to certain issues (i.e., the nationality of the investor or the existence or certain rights)

may be inevitable.[10] Several arbitration cases that may affect policies to promote investment in renewable energy are discussed in Section 5 below.

[10] See, for instance, Soufraki v UAE or Thunderbird v Mexico, Occidental v Ecuador or Encana v Ecuador (UNCTC/ICC, 1992).

3.4.7 Environmental Clauses

It is only recently that IIAs have begun to address environmental issues (UNCTAD, 2004a). Environmental clauses have been included in some IIAs in an attempt to ensure that investment instruments do not impede a State's "right to regulate" the environment, as well as to prevent the State from failing to enforce its environmental regulations in order to attract new investment. These clauses may also provide a framework for the transfer of "clean" technologies.

Environmental clauses are typically written in general terms, supporting the principles of environmental protection and sustainable development. One exception to this is the Model BIT proposed by the IISD (see above) (Mann et al., 2005). In response to the disputes over the environmental implications of NAFTA's investment chapter[11] and the proposed Multilateral Agreement on Investment, the IISD has offered this model agreement containing extensive clauses covering both investor and host state rights and responsibilities. IISD's purpose is to ensure that investment is consistent with sustainable development in addition to the goals normally pursued through IIAs (Mann et al., 2005).

[11] See NAFTA article 1114 and the Environmental Side Agreement to NAFTA (NAFTA Secretariat Website, 2004).

3.4.8 Other Clauses

Other clauses address topics such as: agreements that governments will not interfere with the operation and management of the industry; an acknowledgement that the agreement covers not just the "investment" but also activities associated with the investment; and tax measures. Few of these have major implications for renewable energy policies, although the tax measures could have implications for taxes relating to the energy sector.

In addition, some IIAs, such as the ECT and the US-Argentina BIT contain an "umbrella clause" which is a broad statement that obligates the contracting State to honor its obligations to investors from the other contracting State. This has led some to argue that the clause allows an investor to seek arbitration under the IIA for breach of contract. Others have argued that an investor may only seek arbitration if an action of the government interferes with an investment when it is acting in a sovereign capacity. The broader reading of an umbrella clause would provide an energy investor additional protections for contracts with host States (Winter 2004).

3.5 Other International Activities Affecting Investment

Finally, in addition to formal investment agreements, there are a number of other initiatives underway at the international level to encourage more investment in developing countries, particularly in cleaner technology. Brief descriptions of some of the major activities are described below.

3.5.1 UNCTAD and Investment Promotion

The first UN Conference on Trade and Development (UNCTAD) was held in 1964. The purpose of the conference was to address the concerns of developing countries in the international trade area. At the conference, the members generally agreed that foreign direct investment should be encouraged between industrialized and developing countries (Fredriksson, 2003). Recommendations included the comment that countries should "take all appropriate steps to encourage the flow of private investments to developing countries, such as tax exemption or reductions, giving investment guarantees to private investors, and facilitating the training of managerial and technical staff." (Fredriksson, 2003).

This positive view of FDI expressed in the 1960s began to change in the 1970s. At the third UNCTAD Conference in Santiago, Chile in 1972, discussions of FDI focused on the rights of states to regulate, and expressed concerns about possible negative effects of FDI. Concerns about FDI led the UN to prepare a report *Multinational Corporations in World Development*. Based on this report, the UN created the United Nations Centre on Transnational Corporations (UNCTC) in 1974. The UNCTC became active in 1975. The UNCTC was the focal point within the United Nations system for all matters related to transnational corporations (TNCs) and FDI. Meanwhile, UNCTAD continued to address issues related to investment, including aiding in the preparation of the Multilaterally Agreed Equitable Principles and Rules on Restrictive Business Practices, which was adopted by the General Assembly in 1980 (Fredriksson, 2003).

In 1992, the UNCTC was disbanded and the Programme on Transnational Corporations was transferred to the United Nations Department of Economic and Social Development. Then, in 1993, the program was transferred to UNCTAD, and is now being implemented by UNCTAD's Division on Investment, Technology and Enterprise Development. Its focus is now on analyzing trends in foreign direct investment and its effect on development, along with helping countries promote international investment and understand the issues involved in IIAs (UNCTAD, 2002).

Some of these activities include the following:

- UNCTAD has been responsible for many publications on international investment flows, including the annual World Investment Reports, as well as numerous issue papers, including those examining key issues in IIAs.
- UNCTAD provides technical assistance to the WTO and developing countries on issues of investment. (UNCTAD, *n.d.*a)
- UNCTAD's Global Investment Prospects Assessment (GIPA) assesses future patterns of FDI flows at the global, regional, national and industry levels. (UNCTAD, n.d.b)
- ICC and UNCTAD jointly prepare investment guides for developing countries. These country specific guides contain information on the investment environment in the individual countries, including investment opportuni-

ties, operating conditions, private-sector perceptions, and current foreign investors. (UNCTAD, n.d.c)

- UNCTAD's program on Investment Policy Reviews helps countries improve investment promotion policies and institutions that deal with FDI. The intended result is an increase in the country's ability to attract and benefit from FDI. (UNCTAD, n.d.d)

3.5.2 OECD, Investment, and Renewable Energy

"A core mission of the OECD is to enhance the contribution of international investment to growth and sustainable development worldwide, by advancing investment policy reform and international co-operation." (OECD, *n.d.*c). This core mission of the OECD is primarily implemented by the Investment Committee, which has five main goals:

- Encouraging investment for development
- Preparing guidelines for international enterprises to encourage sustainable development
- Analyzing and explaining IIAs
- Preparing investment statistics and accompanying analysis
- Creating OECD investment instruments

The OECD member governments have both agreed to standards of conduct for themselves and recommended standards for multinational enterprises in two documents: the OECD Codes of Liberalisation; and the Declaration and Decisions on International Investment and Multinational Enterprises. The Code of Liberalisation of Capital Movements and the Code of Liberalisation of Current Invisible Operation are legally binding rules for OECD member states that require progressive, non-discriminatory liberalization of capital movements, the right of establishment, and financial services and other current invisible transactions (OECD, *n.d.*d). The Declaration and Decisions on International Investment and Multinational Enterprises is a political agreement for cooperation on a wide range of investment issues. It includes the National Treatment instrument, the Guidelines for Multinational Enterprises, an instrument on incentives and disincentives to international investment, and an instrument on conflicting requirements. All 30 OECD member countries, and eight non-member countries have subscribed to the Declaration (OECD, *n.d.*d).

In addition to these legal instruments, the OECD countries participating in the Arrangement on Officially Supported Export Credits have agreed to special financing terms for renewable energy projects. The special financing terms began on July 1, 2005 and will continue on a trial basis for two years. Under the special terms, financing can be extended for 15 years for renewable energy projects (OECD, *n.d.*b).

3.5.3 "Post-Kyoto" Discussions

United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol provide much of the framework for international climate change efforts. The Kyoto Protocol entered in to force on February 16, 2005. The target period for the Kyoto Protocol is 2008 to 2012. However, this is only a first step in meeting the goals of the Climate Change Convention. The United Nations Conference on Climate Change (UNCCC), held in Montreal in November 28 through December 9, 2005, established a working group to address post-2012 commitments for developed countries. The working group convened in May 2006 and November 2006. The Chair summary of the first in-session workshop of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol in November 2006 stated that "the carbon market still has tremendous potential, but the Kyoto mechanisms require continuity after the first commitment period to continue their expansion. And the demand for credits generated through the mechanisms is expected to increase in future commitment periods to sustain the market value of carbon."(UNCCC, 2006a). The Further Commitments for Annex I Parties and Programme of work Draft conclusions noted that "further sessions will be scheduled with a view to completing the work of the AWG as early as possible and in time to ensure that there is no gap between the first and the second commitment periods under the Kyoto Protocol." (UNCCC, 2006b).

Although serious negotiations have not begun on post-2012 climate policy commitments (Torvanger, et al., 2005), there are many ongoing discussions about options for addressing climate change beyond 2012 (Bodansky et al., 2004).[12] The outcomes of these discussions could have significant effects on renewable energy policy and investment in renewable energy. A few examples of the on-going discussions are as follows:

[12] One platform for the on-going discussions is the Future International Action on Climate Change Network. http://www.fiacc.net/

G8

Climate change issues were also discussed at the 2005 G8 Summit. The Group of Eight (G8) consists of Canada, France, Germany, Italy, Japan, the United Kingdom (UK), the United States of America, and the Russian Federation. Among other resolutions, the G8 agreed to have a continuing "Dialogue on Climate Change, Clean Energy and Sustainable Development." The UK agreed to host the on-going dialogue in 2005. A report on the dialogue is planned for the G8 summit scheduled for 2008 (G8, 2005a). However, the G8 also agreed that the UNFCCC is the appropriate forum for negotiating future action on climate change. The G8 Climate Change Roundtable also issued a statement to the World Economic Forum that the current regulatory scheme, including the Kyoto Protocol targets that do not extend past 2012, can be problematic for potential long-term investors, particularly for investors in power projects, (which can have a 25-50 year lifecycle), or for investors in tradable emissions credits and low carbon projects in developing countries. The statement urged global policies that "[e]stablish a long term, market-based policy framework extending to 2030 that will

give investors in climate change mitigation confidence in the long term value of their investments . . . [e]stablishing indicative signals extending to 2050 would also be beneficial." (G8, 2005b).

As part of the G8 discussions, the World Bank is leading a discussion on an "Investment Framework" for climate change. The World Bank is working with multilateral banks, export credit agencies, private sector financiers, and re-insurers "to generate a long-term investment framework for low carbon economic growth, specifically, for finance for energy efficiency, clean energy, and adaptation to climate change and variability." (World Bank, 2006).

The Clean Energy Group

The Clean Energy Group[13] prepared a white paper for the Montreal Strategic Climate Change Workshop for Sub-National Strategies for Clean Energy Investment, Technology Deployment and Innovation. The white paper emphasized the need for long term incentives for innovation and concluded that "[t]o move beyond Kyoto requires new market, technology and finance solutions that are firmly rooted in an economic development approach."(Milford, 2005). The Clean Energy Group is also working with the UK's Carbon Trust on a trans-Atlantic dialogue to increase investment in clean energy.

The Clean Energy group also formed the Clean Energy Investment Working Group. Established by institutional investors, it provides a forum to examine opportunities and strategies for investment in clean energy and climate technologies. The working group is managed as a collaboration between Ceres' Investor Network on Climate Risk and the Clean Energy Group. Participants have been "exploring ways to reduce the environmental and associated financial risks to their portfolios and to enhance long-term investment returns by looking beyond the important current conversations about climate risk to consider the possibilities of making prudent investments in appropriate clean energy and climate change-related technologies." (Clean Energy Investment Working Group, *n.d.*).

[13] The Clean Energy group is an NGO that promotes renewable energy programs and policies. Among other activities, it manages the Clean Energy States Alliance and Public Fuel Cell Alliance. More information can be found at www.cleangroup.org.

Pew Center on Global Climate Change

The Pew Center on Global Climate Change[14] has convened a series of discussions on what a post-2012 framework might look like. Participants from 15 countries met on four separate occasions from 2004 through 2005 and published a report of their dialogue in November 2005. The report described several possible approaches to the post-2012 negotiations. One of these outlined ways to increase investments with positive impacts on climate, while decreasing those with negative impacts (Pew, 2005). The report also noted that emissions targets and international emissions trading should be a key aspect of the on-going international effort, although these targets could take many forms. The report also discussed the possibility of various forms of commitments for key sectors (including energy), and technology cooperation to facilitate the deployment of clean technologies.

[14] The Pew Center on Global Climate Change is an NGO that works to provide 'a forum for objective research and analysis and for the development of pragmatic policies and solutions' to global climate change. More information can be found at www.pewclimate.org.

Renewable Energy and Energy Efficiency Partnership

The Renewable Energy and Energy Efficiency Partnership (REEEP)[15] facilitated the Sustainable Energy Asia Forum[16] in 2005. The purpose of the forum was to bring together policy makers, energy investors, project developers, and others involved in energy management. The forum discussed numerous issues including impact of Kyoto Protocol, privatization of energy utilities, and renewable energy. REEEP also chaired a session whose presentations focused on clean development mechanism (CDM), carbon trading in Asia, and the need for innovative approaches to finance. In addition, REEEP has created REEGLE – the Information Gateway for Renewable Energy and Energy Efficiency – which is designed to be 'a one-stop shop for high quality information on renewable energy and energy efficiency.'[17]

4.0 INTRODUCTION TO THE RENEWABLE ENERGY INVESTMENT MARKET

In order to understand the barriers to and opportunities for increased investment in renewable energy that are created by International Investment Agreements, a basic understanding of the investment market for renewable energy is necessary. This section provides such an overview. It describes briefly the:

- Main types of investments and investors in renewable energy projects
- Projections for future investments in renewable energy
- Major barriers to investments in renewable energy
- Main types of policies being adopted by national governments in an effort to increase investment in renewable energy

This section only offers an introduction to this complex field. Many more detailed reports have been written on these subjects[18] and the market is changing rapidly. As such, the purpose of this section is only to familiarize the reader with the basic concepts before proceeding to an analysis of the links between IIAs and renewable energy investments in Section 5.

4.1 Investments in Renewable Energy Projects: An Overview

The renewable energy life cycle can be divided broadly into three main stages: (1) technology research and development (R&D); (2) system and product development; (3) and market/project development. Each stage in this process currently involves investment by both the public and private sectors. These investments take different forms depending upon a wide variety of global and local factors.

This chapter focuses on the last stage in this cycle – the expansion of markets to support investments in renewable energy projects as these are the investments most obviously affected by IIAs. As such, it starts with an overview of renewable energy projects, including a summary of the project development cycle and examples of "typical" deal structures.

[15] REEEP is an international NGO that is a public-private partnership whose purpose is to "actively structure policy initiatives for clean energy markets and facilitate financing mechanisms for sustainable energy projects." For more information see www.reeep.org

[16] see http://www.environmex-asia.com/sustainable.html

[17] see http://www.reegle.info/

[18] For example: see Painuly, J.P. "Barriers to Renewable Energy Penetration: A Framework for Analysis." Renewable Energy. 24 (2001) 73-89; "Section 5: Barriers and Opportunities for GHG Mitigation through Technological Change." IPCC Third Assessment Report. http://www.grida.no/climate/ipcc_tar/wg3/213.htm; Beck, Fred and Martinot, Eric. "Renewable Energy Policies and Barriers." Forthcoming in Encyclopedia of Energy. Cutler J. Cleveland, ed. Academic Press/ Elsevier Science. 2004; Union of Concerned Scientists. "Backgrounder: Barriers to the Use of Renewable Energy Technologies." http://www.ucusa.org; "Renewable Energy and Sustainable Development: Breaking Down the Barriers." http://www.sustainable-development.gov.uk/documents; Sonntag-O'Brien and Usher, Eric. "Mobilising Finance for Renewable Energies: Thematic Background Paper." Basel Agency for Sustainable Energy and UN Environment Program. International Conference for Renewable Energies. Bonn, Germany. January, 2004; Perry, Deb and Grossman, Leslie. "Renewable Energy Generation: The Benefits and Barriers. A Paper for the Major's Green Building Task Force." Mass Energy Consumers Alliance. 26 November, 2003.

One important distinction among renewable energy projects is on-grid versus off-grid projects, which describes how the produced electricity is delivered to users. On-grid projects are projects that feed into a larger electricity system or "grid." A grid is typically defined as an integrated transmission and distribution system serving many customers (US DOE, 2005). A grid can be national, regional or local, but is controlled by a centralized authority. Off-grid projects are individual energy installations that are not connected to a larger electricity grid, such as a roof-top solar system providing power directly to the building on which it is located. On-grid and off-grid projects require different amounts of investment, often involve different types of investors, and typically have different financing structures. They also have differing risks, benefits, and barriers to investment. Some of the major differences are described below.

A renewable energy project evolves from concept to reality in several stages, usually grouped into phases: project planning; implementation; and operation. While the details and specifics vary from project to project, the following is an overview of the typical process.

Box 1

Renewable Energy Project Development

Project Planning

- Financial analysis, feasibility analysis, due diligence
- Contract negotiation
- Financial structuring, risk management

Implementation

- Design, construction and installation

Operations

- Operation, management amd monitoring of facility
- Sale of renewable energy
- Issuance of Renewable Energy Certificates

The project planning stage, when most investment decisions are made, is devoted to due diligence to assess the financial and physical feasibility of the project. Many of these tasks occur simultaneously. In this stage, a developer creates a project proposal by conducting a basic technological feasibility assessment, assessing the market, developing cost estimates for project development, and constructing a financial model to estimate the expected rate of return. It often takes several years and requires considerable funding to evaluate a project's feasibility, apply for permits, and conduct environmental assessments. Such resources may be attained from a variety of sources including, development company budgets, private finance, venture capitalists, private equity funds or government grants (Sonntag-O'Brien and Usher, 2004a).

One of the most important steps in this stage is also one of the most important for the entire project – securing a power purchase agreement (PPA) if one is available. A PPA is a contractual commitment from a power off-taker to purchase the electricity produced by the proposed facility. A PPA is important to the financing, and therefore the implementation of the renewable energy project, because it creates a longer-term, predictable revenue stream.

In some circumstances, however, independently operated renewable energy facilities are "merchant plants." These merchant plants feed power into a "power pool" and are financed without a PPA.[19] Merchant plants are not guaranteed that anyone will buy their power at any particular time, volume or price and must respond to market needs. Therefore, merchant plants try to fill specific, continuing niches in the market, such as providing power: for "baseload" operation; to regional power pools: at times of peak demand; or to a single user (EPSA, *n.d.*a). Financing merchant plants is often more difficult given the absence of a PPA and therefore a less predictable revenue stream over time.

[19] For example the Ridgewood Renewable Power Penobscot plant. http://ridgewood power.com/plants/ penobscot1.html

In addition to understanding who is going to buy the power, the developer must also consider other risks such as licenses and permits, land ownership, rights-of-way, interconnection and transmission, contractors and suppliers, technological risks, and environmental risks. Each of these issues presents its own unique challenges and requires extensive time and money for due diligence as the developer attempts to understand the project's profitability and risks. Financial institutions must be approached early in the project development process in order to determine investor interest and estimate financing costs. However, financing commitments, especially loan agreements, are typically final only after all significant engineering, contracting, and permitting requirements are met (Wiser and Pickle, 1997).

While the financing of renewable energy projects is similar to that of large-scale conventional power projects, it is not the same. Renewable energy, although subject to the same broad market forces as conventional power, involves markedly different technologies and thus their financing requires new thinking, new risk management approaches and new forms of capital (O'Brien and Usher, 2004). As O'Brien and Usher point out, for renewable energy, "the finance continuum . . . is generally incomplete and the gaps can often only be filled with niche financial products, some of which exist and some of which need to be created." (O'Brien and Usher, 2004).

Managing the actual and perceived risks associated with renewable energy technologies is a crucial element in financing renewable energy projects. Differences between renewable and conventional energy projects, such as in scale, dependency on government incentives and subsidies, fuel sources, and technology have created a need for investors to utilize a variety of financial instruments to transfer risk between developers, lenders, insurers (Petricone, 2006). Due to different financing needs and risks, financing instruments and deal structures vary considerably between on-grid and off-grid projects.

Typical On-Grid Financing

Once a project is deemed feasible, project developers seek to locate external equity and debt financing. External equity may be provided by project developers and as well as by external investors. For large, on-grid projects, a substantial portion of equity investment (typically 20 to 30 percent of the total financing or more) is required in order to secure the additional debt finance necessary.

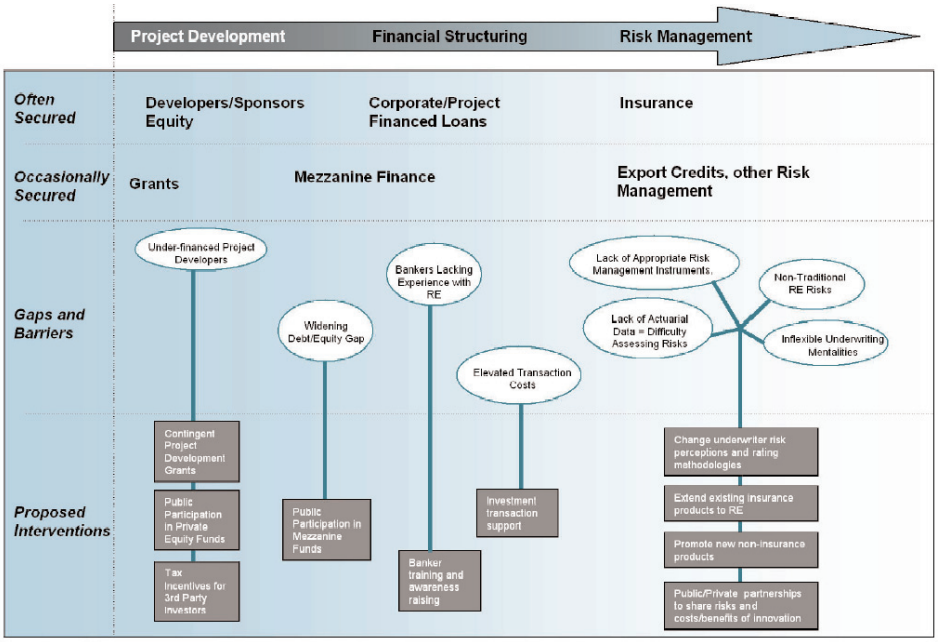
Projects may use two different types of debt financing: corporate and project finance. Corporate finance is borrowing directly by a company based on the strength

of its balance sheet and its track record. It is the preferred approach to debt for small projects (<$15 million), because it has lower transaction costs than project financing (Sonntag-O'Brien and Usher, 2004b).

However, project financing is the most frequent means of financing large, capital-intensive renewable energy projects. Project finance structures use anticipated project revenues as the primary basis for credit analysis and source of loan repayment, instead of simply lending based on the credit standing of the developers. This structure allows different risks to be distributed to the parties best able to manage them across all of the entities involved in project development, a critical aspect of risk management (Buljevich and Park, 1999). Project financing agreements often include requirements for long term PPAs, guarantees for project completion and performance, and the lender's right to take over operation of the project in the event of default.

A variety of related structures have also been developed to address gaps that sometimes exist between equity and debt financing. For example, "mezzanine finance" "groups together a variety of structures positioned in the financing package somewhere between the high risk/ high upside equity position and the lower/risk fixed returns debt position." (Sonntag-O'Brien and Usher, Eric. 2004a).

Figure 3 On-Grid Finance



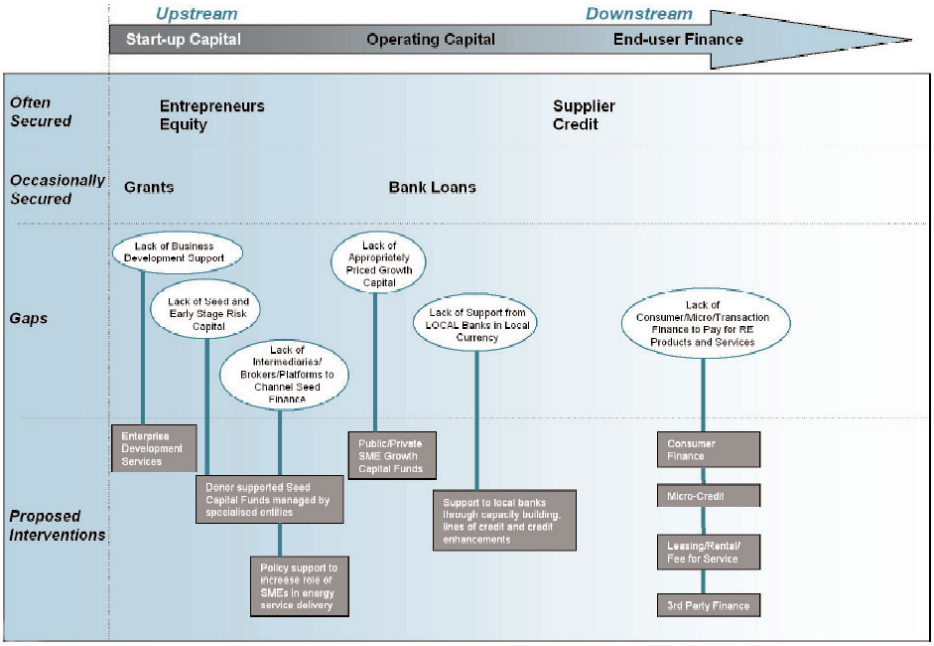
Source: Sonntag-O'Brien and Usher, 2004a

Typical Off-Grid Financing

Off-grid financing projects are generally smaller than on-grid projects and require less capital. However, these projects still require financing at a variety of stages. This

is particularly true given that many off-grid project developers are smaller entrepreneurs (Sonntag-O'Brien and Usher, 2004a). Project developers often need start-up or seed money due to the upfront costs of establishing decentralized infrastructure and relatively high transaction costs. Commercial lenders are rarely interested in financing small to medium off-grid projects because of high levels of perceived project risk (Usher, 2003). Hence, financing is often obtained from private equity investors or donors. Several types of financing structures also help manage the risks associated with investments in off-grid projects. However, financing gaps remain a major issue for off-grid projects, especially in developing countries (Usher, 2003).

Figure 4 Off-Grid Finance



Source: Sonntag-O'Brien and Usher, 2005a

A wide range of both public and private investors are providing debt, equity, grants, insurance and other financing support for renewable energy projects.[20] Some of the major types of investors in renewable energy include:

- Development Banks, such as the World Bank, International Finance Corporation, European Bank for Reconstruction and Development, Asian Development Bank, Inter-American Development Banks and others
- Donor Agencies, both multilateral (such as the Global Environmental Facility [GEF] and the United Nations Environment Programme [UNEP]) and bilateral (such as the UK development agency DFID)

[20] For example, see UNFCCC. 2005. Secretariat Report on Sources of Investment for Climate Mitigation and Adaptation Activities in Developing Countries. presented to the 1st Conference of the Parties/Meeting of the Parties in Montreal, Quebec, November.

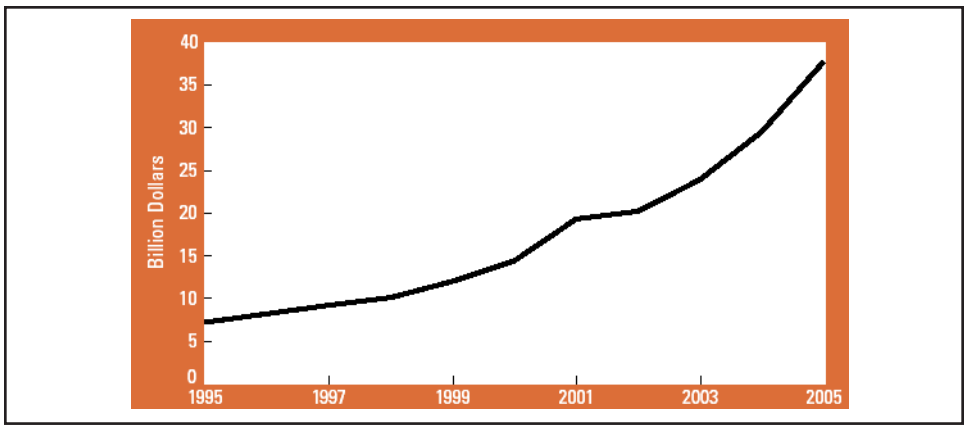
- Commercial and Investment Banks, such as Goldman Sachs, Citigroup, ABN Amro, Fortis Bank, and others
- Private equity/Venture funds, such as Renewable Ventures LLC, Private Energy Market Fund, The Carlyle Group, Technology Partners, NexGen Power LLC, Blue Moon Fund, and others
- Insurers, such as Swiss Re and others
- Multinational developers/equipment suppliers, such as GE, ABB, BP Solar, Sharp, Shell, and others
- International Foundations/NGOs, such as the Rockefeller Brothers Fund, Winrock International, the New Ventures program of the World Resources Institute, and others

Private investments in renewable energy are driven by the same profit motive that drives any private investment – once the expected return on the project has been determined, the lender/investor will determine whether the project meets its internal hurdle rate requirements. However, renewable energy investment is also affected by other considerations. Issues such as the negative environmental and health impacts associated with conventional energy sources, the increasing prices of conventional fuels and concerns over energy security also drive governments' interests in supporting policies that encourage investments in renewable energy (see discussion below). Similarly, the goal of NGOs investing in off-grid projects is to capture the "social return" of providing cleaner power to underserved areas, not to receive a purely financial return on the investment.

4.2 Global Trends in Investment in Renewable Energy

So, what is the result of this variety of efforts to invest in renewable energy? Renewable energy remains a small percentage of total energy production, but is growing rapidly – as shown in the following figure.

Figure 5 Annual Investment in Renewable Energy 1995-2005

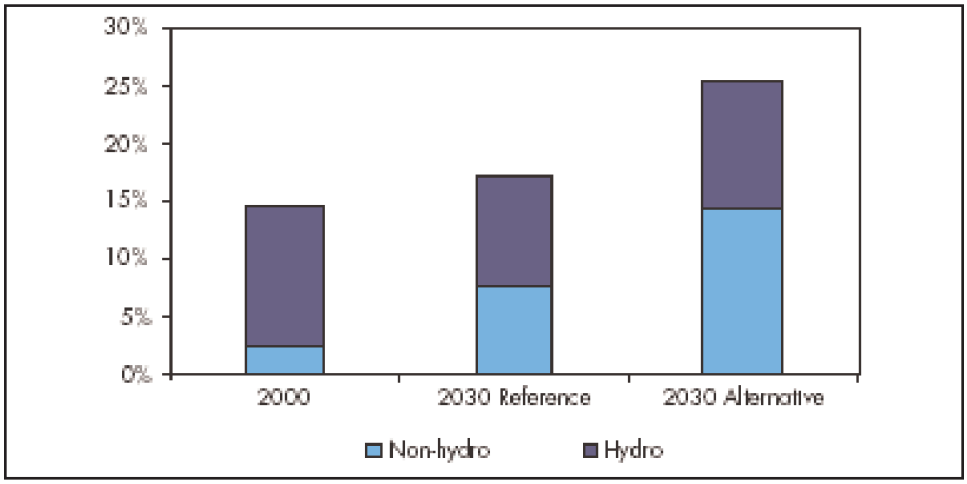


(Source: Dr Eric Martinot, Renewables Global Status Report, 2006 Update Ren12 Policy Network. http://www.ren21.net/globalstatusreport/download/RE_GSR_2006_Update.pdf

In a review of International Energy Agency (IEA) member countries, the IEA noted that in the past 30 years the percentage of renewable energy in the total primary energy supply has been increasing. However, the most rapid growth occurred between 1970 and 1990, with the growth rate slowing after 1990. In particular, production from well-developed renewable energy technologies such as hydro and geothermal declined in the 1990s. However, newer technologies such as wind and solar projects continue to experience significant growth. Because they are such a small percentage of the total electricity produced, however, the percentage of renewable technology fueling total electricity production has fallen since 1970. Even so, solar and wind markets expanded by an average of almost 18 percent per year over the period from 1970 to 2001 (OECD/IEA, 2004).

Global trends in the use of renewable energy are heavily influenced by government policies. The OECD/IEA World Energy Outlook for 2003 evaluated possible future investment needs for renewable electricity generation capacity. As part of the evaluation, they considered a 'reference scenario' that analyzed policies that were in place before mid-2002. In addition, they analyzed an 'alternative policy scenario' that evaluated the potential effect on energy markets if existing policies to reduce CO_2 emissions and electricity consumption were strengthened. Under the alternative policy scenario renewables are anticipated to make up 25 percent of total electricity generated by 2030, compared to 17 percent in the reference scenario (OECD/IEA, 2003).

Figure 6 OECD Share of Renewables in Electricity Generation in the Reference and Alternative Policy Scenarios



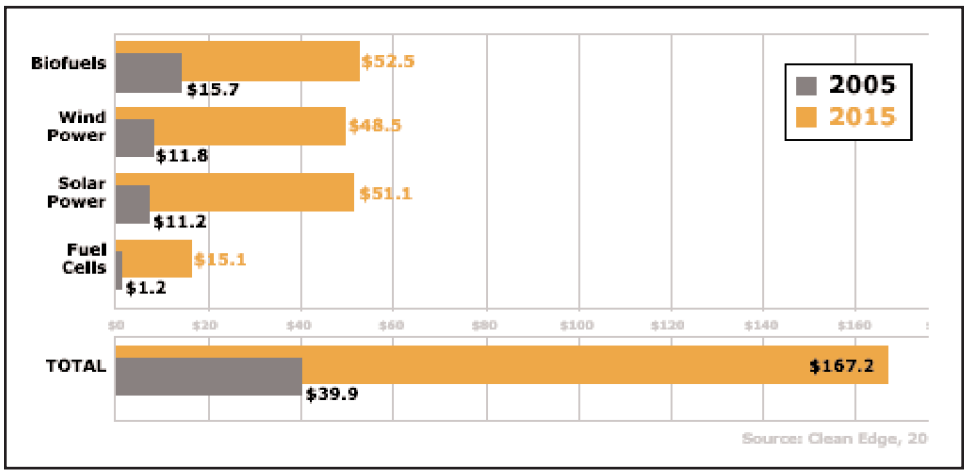
(Source: IEA, 2003)

In the reference scenario, the OECD/IEA estimates that US$477 billion will be invested in renewable electricity generation between 2000 and 2030; under the alternative policy scenario the estimate increases to a US$724 billion (IEA, 2003). The report noted that "to achieve investment in renewables at the level expected in the Alternative Policy Scenario, OECD governments will have to develop vigorous incentive strategies." (IEA, 2003).

In the developing world, The World Bank has estimated that between US$140 and 160 billion of investment *per year* is needed to finance the power sector between 2002 and 2020 (Deloitt 2004). However, recent years have shown a reduction in the willingness on the part of donors and investors to support large infrastructure development projects, such as for energy, in developing countries (Kabbaj, 2004; Le Soleil, 2004). The peak of private investment in the energy sector was about 45 billion US dollars in 1998, and by 2002 had dropped to about 35 billion US dollars (Deloitt, 2004).

The Global Environment Facility (GEF) has estimated that as the demand for cleaner energy increases and the costs of providing it decreases (with technological advances), "these trends set the stage in coming years for a significant deployment of investment capital into the development and finance of projects that deliver reliable, efficient and cleaner forms of energy." (Clean Edge, 2004). These projections are echoed in the projected growth of clean energy by the Clean Edge consulting group.

Figure 7 Clean Energy Projected Growth 2005-2015 ($US Billions)



(Source: Makower, et al., 2006)

4.3 Major Barriers to Investment in Renewable Energy

What barriers are standing in the way of even more investment going into renewable energy? Specific answers to this question vary dramatically across technologies, locations, investors and a host of other factors. At the same time, many studies of such barriers have been done and there appears to be a common set of major barriers that are shared across many of these factors.[21] The following chart is an effort to summarize some of the major barriers to investment in renewable energy that have been identified in several of these studies. The chart does not include more general barriers that also apply to non-renewable projects, such as economic instability or government corruption. Nor does it attempt to identify how any of these or other barriers play out in particular countries. Rather it focuses on the most critical barriers identified as facing investments in renewable energy in both developed and developing countries. Its purpose is to enable a comparison to be done

[21] See: Painuly, J.P. "Barriers to Renewable Energy Penetration: A Framework for Analysis." Renewable Energy. 24 (2001) 73-89.
"Section 5: Barriers and Opportunities for GHG Mitigation through Technological Change." IPCC Third Assessment Report. http://www.grida.no/climate/ipcc_tar/wg3/213.htm.
Beck, Fred and Martinot, Eric. "Renewable Energy Policies and Barriers." Encyclopedia of Energy. Cutler J. Cleveland, ed. Academic Press/ Elsevier Science. 2004.
Union of Concerned Scientists. "Backgrounder: Barriers to the Use of Renewable Energy Technologies." http://www.ucusa.org
"Renewable Energy and Sustainable Development: Breaking Down the Barriers." http://www.sustainable-development.gov.uk/documents
Sonntag-O'Brien and Usher, Eric. "Mobilising Finance for Renewable Energies: Thematic Background Paper." Basel Agency for Sustainable Energy and UN Environment Program. International Conference for Renewable Energies. Bonn, Germany. January, 2004.
Feo, Ed. Milbank, Tweed, Hadley & McCloy LLP. "Financing of Renewable Energy Projects." 17th NREL Industry Growth Forum. 18-20 October, 2004.
Petricone. Steve. "Debt Investment in Renewable Energy." General Electric Financial Services. Presentation at Yale University. 16 November, 2005.
Perry, Deb and Grossman, Leslie. "Renewable Energy Generation: The Benefits and Barriers. A Paper for the Mayor's Green Building Task Force." Mass Energy Consumers Alliance. 26 November, 2003.

between these major barriers and the provisions of IIAs and other international investment initiatives in order to identify opportunities where those initiatives might help overcome these barriers.

Table 2 Summary Listing of Major Barriers to Investment in Renewable Energy

Market Barriers	
Inertia of the existing electricity system	Renewable energy a threat to traditional utility dominance/ profit; infrastructure created around conventional energy system; conventional energy has established customers/demand
Lack of information on renewable energy options	Lack of transparency; need to determine resource availability; information on availability often not available; potential customers know less about renewable energy options; need for public education
High transaction costs	Relatively higher transaction costs on a per-kilowatt (kW) capacity basis compared with conventional energy plants; increased market barriers within countries; under-developed R&D; fewer skilled personnel; minimal funds for lobbying organizations
Limited access to/ development of technology	Lack of technology transfer; policies or taxes limiting technology imports; need for further R&D in developed and developing countries; limited warranties to support technology
Inadequate infrastructure	Under-developed supply chains; integration issues connecting renewable technology to energy grid system due to intermittency and distributed generation; capacity limitation in infrastructure; safety concerns about integration
Negative externalities of traditional energy not considered in price	Costs of pollution, GHG emissions, etc. from traditional energy sources not considered in price of conventional energy; conventional power project risks often underestimated
Siting, permitting and construction hurdles	Need time and money to acquire adequate information on relevant natural resource availability (solar, wind etc.); lack of established procedures on siting and permitting; specific environmental concerns (ex. wind power and migratory bird paths); "Not in My Back Yard" issues
Evolving technology	Risk of new technologies; costs of development; concern about premature technological obsolescence in term of financing; lack of track record needed by project financiers; different perceptions of R&D risk between entrepreneurs and project financiers
Intermittent energy availability	Technologies dependant on natural resource availability (sun, wind, etc.); potentially higher resource-availability risk; intermittent energy sources a challenge for utility interconnections
Unfavorable power pricing rules	Limited infrastructure for distributed generation; lower prices given to intermittent renewable sources; difficulty transmitting energy due to some renewable sources distance from population centers
Lack of access to credit	In rural areas of developing countries microcredit lending for household, small renewable energy systems may not be accessible; loans may not be long term enough for renewable system long term return on investment

Government Regulation	
Government monopolies	Entry into market often restricted by regulation; independent power producers often unable to sell electricity to utility or directly to users; in some areas new uncertainties with electricity restructuring
Uncertainty in government incentives/policies	Profits often dependent on regulation; "boom bust" pattern with changing regulations; lack of investor confidence in long-term value of renewables market
Utility interconnection requirements	Lack of uniform utility interconnection requirements may increase transaction costs; utilities may create burdensome (especially for small power producers) interconnection requirements due to safety and quality concerns; additional charges due to intermittent energy generation; charge for difficulty scheduling energy inputs
Conventional energy subsidies	Public subsides that benefit conventional energy and put renewable energy to a greater disadvantage include: direct budgetary transfers, tax incentives, R&D contributions, liability insurance, leases, land right of way, and guarantees to mitigate project financing/ fuel price risks; minimal penalties for more polluting fuel uses
Capital Risks	
Higher initial capital costs	Renewables often need more up-front financing for the equivalent kilowatt hour; as a result, lending rates often higher; lack of seed capital limits off-grid projects
Financing gaps	Lack of support by local banks for off-grid projects; debt/equity gaps
High perception of risk	Reduced availability of funds for project financing; higher discount rates; most lending institution/ project financiers averse to investments in higher risk technologies; difficulty securing a long- term PPA; lack of consideration of future fossil fuel price risks; lack of actuarial data to assess risks
Insurance gaps	Difficult to diversify risks, project risks often less insurable because they are less established; underwriters have fewer strategies to deal with risk
Preference to short payback periods	Initial investments high and long term investments needed to benefit from long term lower fuel and operating costs

4.4 Policies to Promote Investments in Renewable Energy

In order to address such barriers, governments have developed a number of policies to promote investment in renewable energy (IEA, 2004). This section summarizes some of the major policy tools governments are using to address energy supply, capacity, generation and demand. Again, it must be noted that this is just a summary – much more detailed descriptions of national and sub-national policies to promote investments in renewable energy are provided in other reports.[22]

Government policies have important implications for the market for investment in renewable energy. For example, Ernst & Young publishes regular "Renewable Energy Country Attractiveness Indices."[23] While the indices consider factors such as wind speed and days of sunshine, most of their data covers governance related items such as:

[22] In particular, the IEA Renewable Energy Market & Policy and Trends provides a thorough description of market deployment policies (IEA, 2004).

[23] see http://www.ey.com/global/content.nsf/UK/ECU_-_library#2

- Electricity market regulatory risk;
- Planning and grid connection issues;
- Access to finance;
- Power off-take attractiveness;
- Tax climate;
- Grant/soft loan availability; and
- Market growth potential (based on policy targets).

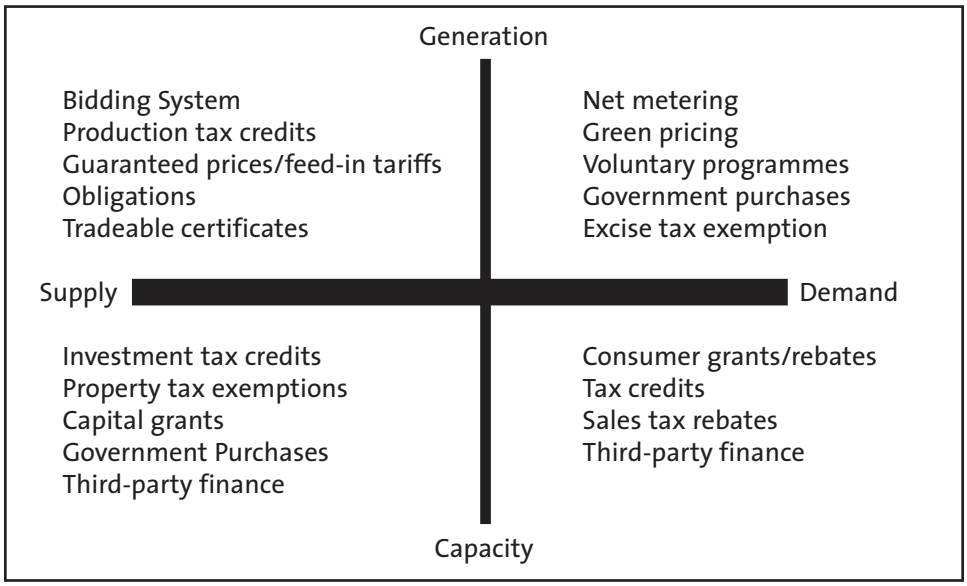
While many different groups are now encouraging governments to adopt policies designed to spur investment in renewable energy, the approaches they recommend tend to fall into a relatively small number of major categories concerning government regulation, taxation, spending and information programs. A few examples are provided below.

As shown in Figures 3 and 4 above, Sonntag-O'Brien and Usher identify a number of gaps in and barriers to the financing of on- and off-grid projects (Sonntag-O'Brien and Usher, 2004a). They then go on to propose a number of policy interventions to address those issues, including those involving government:

- Spending (grants, public-private financing partnerships)
- Taxation (deductions/credits)
- Information (education/capacity building)
- Regulation (access rights to the grid)

A broader review of national policy instruments being used to expand markets for renewable energy was published by the IEA in 2004 (IEA, 2004). While the IEA structured its analysis around the market segments described in Figure 8, the basic categories of policy tools considered remained the same. Summary descriptions of these main policy tools are provided below.

Figure 8 Market Deployment Policy Instruments



Source: IEA, Renewable Energy Market & Policy Trends in IEA Countries, 2004

4.5.1 Policies Addressing Supply and Generation

Policies used to address supply and generation include incentive tariffs, tax measures, regulatory requirements, and tradable certificates.

Incentive Tariffs

Incentive tariffs are those set at rates above market rates, often referred to as "guaranteed price systems" or "feed-in tariffs." These incentive tariffs are a government established price per unit of electricity that a utility must pay for a unit of electricity from a private generator. The government, not the market sets the price. The first guaranteed price system was enacted in the United States in 1978 – the Public Utility Regulatory Policies Act (PURPA) (IEA, 2004). Its purpose was to encourage development of new sources of electricity and encourage energy efficiency. One of the ways it did this was to require utilities to buy a percentage of their power from independent power producers operating "qualifying facilities" (QFs). The power had to be purchased at the utility's "avoided cost," i.e. the cost the utility would have incurred to generate that same amount of energy. In addition, PURPA required the utilities to connect with the QFs, contract with them at reasonable terms and conditions, and provide back up power to them (EPSA, *n.d.*b). PURPA is credited with adding 12,000 megawatts of non-hydro renewable energy capacity to the US system (UCS, 2002). Germany, Italy, and Spain also have "avoided cost" based incentive tariffs. This policy and other renewable energy promotion policies are credited with encouraging the development of 12,000 megawatts of wind energy capacity in Germany and 4,830 megawatts in Spain (IEA, 2004).

A bidding system is a variant of an incentive tariff. Bids are submitted to produce renewable power at above market rates. The lowest bidder is awarded a PPA. Utilities are required to purchase the power at the market rate, with the government agreeing to pay any above market costs (Wiser, 2002). Bidding systems are used in the in UK's Non Fossil Fuel Obligation and Ireland's Alternative Energy Requirement (IEA, 2004).

Tax Measures

Tax measures can also be used to encourage investment in renewable energy generation. However, in order to be successful, the tax incentives must be sufficient to cover the higher cost of renewable energy generation compared to traditional generation methods. For example, the US production tax credit has encouraged investment in domestic wind generation, but not other forms of renewable energy generation (Wiser, 2002). The time period the tax measure is in effect can also affect its results. For example, although the US production tax credit has encouraged development of wind generation projects, the on and off nature of the policy since 1999 has led to a "boom and bust" cycle of wind generation project development (Wiser, 2002).

Regulatory Requirements

Examples of regulatory requirements include renewable portfolio standards (RPS) and obligation systems. RPSs require electricity providers to obtain a percentage of their power from a range of renewable sources. Because the market determines which renewable energy technology is chosen, RPSs are seen as encouraging the development of renewable energy generation systems at the lowest cost (Wiser, 2002). Often central to RPSs are Tradable Renewable Energy Certificates (TRECs, discussed below). TRECs are certificates evidencing the fact that a given amount of power has been produced from renewable sources. TRECs are a separate commodity from the power itself (AWEA, 1997).

Obligation systems, like those used in the European Union and Australia, set requirements for individual renewable energy technologies. In order for obligation systems to be effective, penalties for non-compliance must be higher than the cost of compliance. In addition, effective obligation systems should take into account resource availability, and should be in effect for a long enough period of time that investors can be confident they will recoup the cost of the investment (IEA, 2004).

Tradable Certificates

As noted above, a TREC is a commodity that provides evidence that electricity has been produced from renewable sources. The certificates can be sold in voluntary green power markets or used to prove compliance with a regulatory obligation such as an RPS. Unlike other methods, TRECs by themselves do not encourage investment in renewable energy generation. Instead, they provide a useful mechanism for market flexibility as they aid in the implementation of other policy instruments such as RPSs (IEA, 2004).

There are many different TREC systems. The IEA has noted that several issues need to be addressed before TRECs can be used on a larger scale (IEA, 2004). For example, administrative costs must not be prohibitive, different TREC systems need to be compatible, and the relationship between TRECs and carbon certificates needs to be clarified. The REEEP has noted that in order to facilitate trade, TREC systems should have common definitions of eligible renewable energy sources and technologies, as well as standards for verification. (REEEP, *n.d.*)

4.5.2 Policies Addressing Supply and Capacity

Investment incentive policies that address supply and capacity issues include capital grants, concessionary finance, tax measures, and government purchases.

Capital grants and third-policy finance incentives encourage investment by using public funds to reduce the cost or risk of private investment in renewable energy. For example, capital grants are seen as a driving force behind the success of Japan's rapid photovoltaic (PV) deployment (IEA, 2004). Concessionary, where the government provides low interest loans or assumes specified risks, is credited with the rapid growth of wind generation capacity in Spain (IEA, 2004).

Finally, government purchases can also provide incentives for investment. For example, the US General Services Administration Region 2 purchases 33 percent of its power from biogas and wind sources (US EPA, 2006). In addition, governments have purchased on-site renewable systems, such as solar hot water systems, for public buildings (IEA, 2004).

4.5.3 Policies Addressing Demand and Generation

Policies addressing generation and demand include voluntary measures and tax measures.

Voluntary programs include green pricing and net metering. With green pricing options, customers can choose to pay an additional fee to support renewable energy generation or purchases by their regular electricity provider (US DOE, 2006). Net metering policies allow electricity customers that produce their own energy from renewable sources to "bank" excess production so that the customer-generator only pays for the net electricity actually used over the course of a billing cycle (AWEA, 1998). In addition, there are several examples of a government requesting utilities to purchase a portion of their capacity from renewable sources and for the utilities to comply voluntarily. For example, Japan developed a voluntary plan in 1992 that is in large part credited with the expansion of their solar and wind capabilities (IEA, 2004).

Tax measures such as a biodiesel tax exemption have been used to encourage production of biofuels.[24] Carbon taxes can make traditional energy sources less attractive by raising prices, thereby making energy from renewable sources more cost competitive (IEA, 2004).

[24] For example the Nebraska Ethanol and Biodiesel tax exemption and the Illinois biodiesel tax incentive.

4.5.4 Policies Addressing Demand and Capacity

Policies addressing demand and capacity include investment incentives and tax measures.

Investment incentives include consumer grants and third party finance. Consumer grants lower the capital cost of installing on-site, distributed renewable energy capacity. For third party finance, governments assume a portion of the risk using methods like the provision of low interest loans (IEA, 2004). Tax credits, system rebates, and sales tax rebates can also be used to help customer-owned renewable energy systems recoup their capital costs (IEA, 2004).

4.5.5 Key Categories of Policies To Expand the Use of Renewable Energy

For purposes of the analysis in the following section of this chapter, the policy tools being used by national governments to encourage investments in renewable energy can be summarized as falling into the following four categories:

- Government regulation – monopoly (access, pricing, sourcing), environmental (internalizing externalized costs and benefits)
- Government taxation – reductions (credits/deductions), increases (carbon taxes)
- Government spending – grants, concessional finance, public-private partnerships, procurement
- Government information – educational programs, disclosure requirements

Using these four categories, the potential impact of the core concepts in IIAs on national government efforts to promote investment in renewable energy will now be considered.

5.0 ANALYSIS OF THE LINKS BETWEEN INTERNATIONAL INVESTMENT LAW AND EFFORTS TO EXPAND INVESTMENT IN RENEWABLE ENERGY

Having identified the core concepts in International Investment Agreements in Section 3, as well as the major barriers to such investments and the key policy tools being used by governments to help overcome those barriers in Section 4, the purpose of this Section 5 is to examine the links among those different factors. Section 5.1 looks at the potential barriers created by IIA core concepts to national governments' abilities to use the key policy tools. Section 5.2 considers the potential opportunities offered by IIAs to help overcome the major barriers to investment in renewable energy. Finally, Section 6 below offers some conclusions and suggestions for further work at the international level to encourage investment in renewable energy.

5.1 Potential Barriers in International Investment Law to National Policies Promoting Investments in Renewable Energy

International Investment Agreements are expressly designed to help promote foreign investment, including in renewable energy. As such, one would not expect to find that they create many barriers to efforts to expand such investment. A number of questions have been raised, however, about whether the core concepts in IIAs may unintentionally restrict the ability of host country governments to adopt policies promoting investment in renewable energy – as opposed to other sources of the energy. In addition, concerns have also been raised that the protections in IIAs may not extend to the full range of "investments" associated with renewable energy. All of these issues are examined below.

A useful starting point for this analysis is shown in Table 3 below, which identifies the areas in which the core concepts of IIAs may pose issues for the key policy tools being used to promote renewables:

Table 3 Key Policies to Promote Investment in Renewable Energy and Interactions with Core Investment Agreement Concepts

Core Concepts / *Policy*	Coverage & Scope	Treatment Standards	Performance Reqs.	Fund Transfers	Expropri-ation	Dispute Resolution	Environ-mental
Regulation							
Bidding Systems							■
Guaranteed Prices/feed-in tariffs		■			■		■
RPSs/Obligations		■			■		■
TRECs	■						■
Net metering							■
Green pricing							■
Taxation							
Production tax credits		■					■
Excise tax exemption		■					■
Investment tax credits		■			■		■
Property tax exemptions		■					■
Tax credits		■			■		■
Sales tax rebates		■					■
Spending							
Government purchases		■					■
Capital grants		■					■
Third party finance		■					■
Consumer grants/rebates		■			■		■
Information							
Education/capacity building							■

Note: shading indicates key policies that have a potential interaction with IIA core concepts.

As shown in the chart, possible the areas of conflict include coverage and scope, treatment standards and expropriation. Each of these areas are discussed below.

5.1.1 Coverage and Scope

Questions of coverage can be more complicated than might first be thought. For example, what precisely constitutes an "investment?"

> The notion of investment is one of the most controversial in law and in economic science. It has been variously described as 'untraceable,' 'inexistent,' 'nebulous' and 'used in law without an established definition.'(Hamida, 2005).

While there seems to be little doubt that investments made in legally recognized property or contractual rights are covered by IIAs, questions have been raised about the status of so-called "hybrid property"[25] such as TRECs. Depending on the definitions used, a TREC can be regulated as a commodity, service, or security (Climate Change Legal Foundation, 2002). At the same time, in many countries the laws establishing TRECs and air pollution control allowances (such as for SO2, NOx and greenhouse gasses) specifically state that they are not "property."[26]

If TRECs and other tradable allowances are not considered property, the question has been raised as to whether they will be afforded the same protections as other investments under IIAs? While it does not appear that this issue has been raised in any IIA arbitration to date, it has been debated under NAFTA. NAFTA defines an investment broadly as: "interests arising from the commitment of capital or other resources in the territory of a Party to the economic activity in such territory."[27] The Climate Change Legal Foundation analyzed the issue of TRECs and NAFTA and concluded that:

> NAFTA Chapter 6 applies measures related to investments in energy and basic petrochemicals. If [TRECs] were classified as investments, both Chapters 11 and 6 would cover them. [TRECs] exported in combination with their underlying electricity could also fall within the Chapter 11 definition. If [TRECs] are created in pursuant to a contract for investment in Mexico by a U.S. company, they might be characterized as investment property. Investment by a U.S. company in Mexico is subject to Mexican foreign investment laws, the WTO Agreement on Trade Related Investment Measures and NAFTA Chapters 6 and 11 (Climate Change Legal Foundation, 2002).

Others believe that this is an overly broad interpretation of NAFTA as Chapter 6 applies primarily to trade in energy and basic petrochemical goods. Only *Annex 602.3* may be said to be related with investment but, very discretely: (i) by reproducing the reservations otherwise expressed in Annex III to the Investment Chapter; (ii) by permitting performance clauses in service contracts with Pemex and CFE; and (iii) by encouraging independent power production in paragraph 5 (Alvarez, 2006). Such differences suggest that care should be taken in any renegotiation of an existing IIA

[25] See, for example, Rose, Carol. 1998. "The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems." 83 Minn. L. Rev. 129.

[26] Such as the US Clean Air Act 1990 Amendments Sec. 403 (f) which states "An allowance allocated under this title is a limited authorization to emit sulfur dioxide in accordance with the provisions of this title. Such allowance does not constitute a property right."

[27] NAFTA. Chapter 11, Section C, Article 1139.

or negotiation of a new IIA to make sure that investments in TRECs and other tradable allowances are covered.

5.1.2 General Standards of Treatment

IIA core concepts of "fair and equitable treatment," "national treatment," "most-favored nation," and "non-discrimination" under the general standard of treatment have also been discussed as possibly limiting a host country government's ability to use some of the key policy tools described in Section 5.

For example, a debate has arisen on whether RPSs are problematic under NAFTA's national treatment rule if they are interpreted as discriminating against investment in energy projects that are not included in the RPS. Hydro Quebec has argued that RPSs might be prohibited by NAFTA if they do not include large-scale hydropower (North American Commission of Concerned Scientists, 2005). In response, the North American Commission on Environmental Cooperation (CEC) commissioned a study to evaluate potential conflicts between NAFTA and RPSs (North American Commission of Concerned Scientists, 1999). The CEC paper concluded that there may be conflicts arising from non-discrimination issues relating to RPSs, but "portfolio requirements may well survive a challenge under NAFTA if applied in an equal and non-discriminatory way to all electricity production, regardless of origin." (North American Commission of Concerned Scientists, 1999). In response, the Union of Concerned Scientists provided comments supporting their opinion that RPSs are not inconsistent with NAFTA because "requiring a seller to demonstrate compliance with governing laws is not discriminatory." (UCS, *n.d.*b). The Office of the Massachusetts Attorney General also submitted a letter to the CEC concurring with the UCS conclusion that there is no inconsistency between well drafted RPSs (those that are consistent with the principles of free trade and do not discriminate against foreign electricity provides) and NAFTA (Ericson, 2002). No cases have been taken to arbitration on the RPS issue, so the question is still open.

In addition, arbitrators have not yet addressed the question of whether energy created by renewable sources is "like" energy created by non-renewable sources for purposes of the non-discrimination clauses of IIAs. If renewable and non-renewable sources are considered to be in "like circumstances," this would be a problem both for RPSs, as well as for any special incentives (tax or grant) given by a host state to investors in renewable energy (Werksman et al., 2001; UNCTC/ICC, 1992). In a related paper, Robert Howse has discussed the issue of "likeness" in relation to trade issues. He notes that "[t]here is simply nothing in the jurisprudence that would justify a *per se* exclusion of production methods from the analysis of 'likeness' or 'directly competitive or substitutable' nor, on the other hand, is there anything to suggest that production methods could be, on their own, dispositive of a finding of 'unlikeness' or a lack of direct competitiveness or substitutability . . . Further, evidence that consumers care about whether energy is renewable or not would be highly probative of 'likeness' or direct competitiveness or substitutability." (Howse, 2005).

The UNCTAD has stated that an assessment of "like" circumstances should include an evaluation of whether two enterprises are in the same sector, the effect of

the policy objectives of the host state, and the motivation behind the measure (UNCTAD, 2004a). In UNCTAD's view: "The key issue in such cases is to 'ascertain whether the discrimination is motivated, at least in part, by the fact that the enterprises concerned are under foreign control.'" (UNCTAD, 2004a). Because efforts to support or "discriminate" in favor of renewable energy are usually motivated by a desire to produce cleaner, more secure power and not to discriminate against foreign investors, it seems reasonable to conclude that energy from renewable sources is not "like" energy from non-renewable sources for the purpose of the general treatment provisions of IIAs.

While there may be some concern about policies to promote renewable energy technology and general standards of treatment, the general standards of treatment can also provide important protections for the foreign energy investor. For example, in the Nykomb Synergetics Technology Holding AB ("Nykomb") v The Republic of Latvia case, Nykomb owned the Latvian company Windau. Latvia and Windau entered into a contract to build a co-generation plant. Latvian companies are paid a "double tariff" as an incentive to build cogeneration plants, but Windau was not eligible because of its 100 percent foreign ownership. The Arbitral Tribunal held that this was discriminatory in violation of Article 10(1) of the ECT (The Arbitration Institute of the Stockholm Chamber of Commerce, 2003).

5.1.3 Expropriation

The tension between the right of investors to have their investments protected against "takings" by government and the right of a host state to regulate the impacts of any such investments is increased under IIAs that include "indirect" or "regulatory takings" in the definition of expropriation (Werksman, et al., 2001). The key question appears to be the extent of the impact on the value of an investment that is required before a legitimate exercise of regulatory authority becomes a taking. While this issue has not yet arisen in the renewable energy context, it is hypothetically possible that an investor in a non-renewable energy source might challenge newly adopted incentives for renewable energy on the grounds that they reduce the value of its investment (Werksman, et al., 2001).

Several arbitrations have considered the issue of regulatory takings under NAFTA. For example, in Metalclad v. Mexico, it was found that the environmental regulations that restricted the investor from operating a landfill constituted an indirect expropriation (ICSID, 2000). The issue in Metalclad was whether certain assurances given to the investor by the Mexican Federal government generated legitimate expectations that the investor would be permitted to operate the landfill. The investor alleged that it was given assurances by Federal officials that a missing municipal construction permit would be issued. The investor proceeded to construction of the facility in reliance on those assurances. The facility was eventually shut down by the municipality. Subsequently a sub-federal agency issued an environmental decree to protect a rare cactus that clearly prevented operation of the facility. The Tribunal found that the investor had in fact been given assurances that, prior to investing and as a means to lure the investment, it would be permitted to operate. The landfill had

been "fully approved and endorsed by the federal government" when the municipality, Guadalcazar, denied Metalclad a construction permit because of environmental concerns.

Mexico petitioned the Supreme Court of British Columbia for a statutory review alleging that the Tribunal had exceeded its jurisdiction and that enforcing the award would violate public policy (NAFTA, 2005). In its review, the Supreme Court of British Columbia noted:

> The Tribunal held that expropriation under the NAFTA includes covert or incidental interference with the use of property which has the effect of depriving the owner, in whole or in significant part, of the use or reasonably-to-be-expected economic benefit of property. This definition is sufficiently broad to include a legitimate rezoning of property by a municipality or other zoning authority. (Supreme Court of British Columbia, 2001)

The Supreme Court of British Columbia found that the expropriation decision by the tribunal was at least partly based on perceived violations of minimum treatment standards (in particular, transparency) and that this 'infected its analysis' of the expropriation issue. The Court did note that the definition of expropriation used by the Tribunal was broad, but that 'the definition of expropriation is a question of law with which this Court is not entitled to interfere'(Supreme Court of British Columbia, 2001). The Court further agreed that given the broad definition of expropriation, the tribunal was not "patently unreasonable" in its determination that the Environmental Decree was tantamount to expropriation (Supreme Court of British Columbia, 2001).

However, the record of the matter quite clearly showed that the Environmental Decree to protect "rare cactus" was but a last minute instrument tailor made by the municipality to prevent the facility from operating, and it has been asserted that the facts of this case do not support an argument of interference with bona fide regulation to protect the environment (Alvarez, 2006). As the NAFTA secretariat noted:

> Each NAFTA Chapter 11 case is very fact specific and does not set a binding precedent for future cases. Therefore one should not draw general conclusions based on the outcome of a particular case. Neither the Tribunal nor the Court in Metalclad v. Mexico call into question the right of a local government to regulate on environmental and public health grounds. The decision of the Tribunal in Metalclad found that changes to the rules by the state government, after Metalclad had been led to believe that it had all necessary authorisations and had invested a substantial amount in its operation (the plant was ready to open), were tantamount to expropriation. That is not the same as denying the right of government to regulate.(NAFTA, 2002)

In a similar case, Pope & Talbot, Inc. v. Government of Canada, the investor claimed that government regulations were tantamount to expropriation (International Trade Canada, 2006). The Tribunal disagreed, stating that government

"interference," including government regulation, is not expropriation unless it "*interferes substantially* with the owner's ability to use, enjoy or dispose of its property." (International Trade Canada, 2001).

Similar results have been reached under other IIAs. For example, in an arbitration under the BIT between Spain and Mexico, Técnicas Medioambientales Tecmed, S.A. v. United Mexican States. Tecmed commenced an arbitration under ICSID rules after the Mexican government declined to renew a license to operate a landfill (ICSID, 2003). The Mexican government claimed that the refusal to renew was based on environmental violations. Tecmed asserted that revoking the license was not proportionate with the seriousness of the violations and that doing so was an indirect expropriation without compensation. Mexico responded that they had the ability to grant or deny licenses in accordance with domestic law, and that the action was appropriate to protect public health and the environment. The tribunal found that:

> A measure could be a de facto indirect expropriation by its effects when the measure was adopted by the State, whether being of a regulatory nature or not, was permanent and irreversible, and the assets and rights object of such a measure were affected in such a way that was impossible to exploit such assets and rights, thus depriving them of any economical value. It also stated that a regulatory measure could be an indirect expropriation by its characteristics when there was a lack of proportionality between the measure, the interest sought to be protected by such a measure and the protection of the investment, and as a result the economic value of the investment was destroyed.

The tribunal ruled that economic and commercial operations at the landfill had been "fully and irrevocably destroyed." Also, because the site was a hazardous waste landfill, it had limited alternative uses. Thus, the tribunal ruled out the possibility of selling the property in the open real estate market. The tribunal also found that Mexico's actions were not proportional to a 'legitimate social goal.' Mexico was ordered to pay for the expropriation, but was also given title to the property (thereby retaining any residual value of the property).

Host country policies designed to encourage investments in renewables seem unlikely to have a sufficiently large impact on the operations of non-renewable power sources to constitute a regulatory taking under the provisions of IIAs. Renewable power, while growing rapidly, remains a small percentage of total power production. In many countries, non-renewable fuels themselves enjoy production subsidies (IEA, 1999). While legislation banning outright the continued operation of non-renewable energy sources might well constitute a regulatory taking, support for expanded use of renewable energy seems unlikely to qualify.

5.1.4 Environmental Clauses

Environmental clauses in IIAs are not intended to protect investors' rights. Their purpose is to clarify and make explicit host states' rights to regulate environmental issues in a non-discriminatory manner. Therefore, strong environmental clauses in

IIAs can be helpful in supporting a host country's right to adopt policies that encourage investment in renewable energy projects.

For example, in June 2005 the US Trade Representative (USTR) submitted an environmental review of CAFTA-DR (USTR, 2005c). The review included an assessment of the potential effect of CAFTA-DR's investment provisions on the right to regulate the environment. USTR concluded that "we were unable to identify any concrete instances of US environmental measures that would be inconsistent with the Agreement's substantive investment obligations . . . we do not expect the CAFTA-DR's investor-state mechanism to significantly increase the potential for a successful challenge to U.S. environmental measures. The CAFTA-DR's innovations in the substantive obligations and investor-state mechanism should provide coherence to the interpretation of the FTA's investment provisions." (USTR, 2005c).

The IISD model agreement includes environmental clauses as part of the host state obligations. Host states are obligated to maintain environmental standards and are obligated to establish minimum standards of environmental protection. The implications of this analysis for future efforts to renegotiate existing or negotiate new IIAs are considered in Section 6 below.

5.2 Potential Opportunities to Use International Investment Agreements to Help Overcome Barriers to Investments in Renewable Energy

In addition to their potential impact on national policies, IIAs may also offer opportunities to help overcome the major barriers to investments in renewable energy identified in Section 4.3 above.

Table 4 suggests two major areas of potential linkages with the overwhelming majority of IIAs (i.e. non-energy sector specific). First, the general provisions protecting investors' rights (coverage, expropriation, fund transfers, dispute resolution and others) can be of immense benefit to all investors, including those in renewable energy. Second, if the non-discrimination provisions of an IIA were held to prohibit a host country government from providing special incentives to renewable energy sources that were not also available to non-renewable sources then presumably the reverse would also be true – that countries could not provide special treatment to non-renewable sources that are not also available to renewables. Given that many of the issues facing renewables stem from the existing web of institutional structures and incentives supporting non-renewable energy, a finding that those existing programs were in violation of the non-discrimination clause of an IIA could be of major value to investors in renewable energy sources.

Table 4 Key Barriers to Investment in Renewable Energy and Links with Core Concepts in International Investment Agreements

Core Concepts / *Barriers*	Scope	Nondiscrim.	Perf. Reqs.	Fund Transfs.	Expropri-ation	Dispute Res.	Environ-mental	Other
Inertia of existing electricity system		■						
Lack of information on renewable options								
High transaction costs								
Limited technology development								
Inadequate infrastructure								
Negative externalities not internalized		■						
Siting hurdles								
Evolving technology								
Intermittent energy availability								
Unfavorable pricing rules		■						
Lack of access to credit								
Government monopolies								
Uncertainty in incentives								
Interconnection requirements								
Conventional energy subsidies		■						
Higher initial capital costs								
High perception of risk								
Insurance gaps								
Preference to short payback periods								

Note: shading indicates key investment barriers that IIA core concepts might help overcome.

In addition to these opportunities under generic IIAs, energy specific investment agreements (such as the Energy Charter) could also be used as a platform for encouraging investment in renewable energy. Since many of the investment barriers in Table 4 above stem from the special characteristics of the electricity sector in general and renewable energy technologies in particular, they are most directly addressed through sector specific policies, rather than the more general provisions of most investment IIAs. Table 5 below shows the links between the major types of policies being used at the national level to promote investments in renewable energy and the major barriers to investment. In theory at least, any of these policies could be included in international agreements specifically designed to expand the markets for renewable energy.

Adopting such renewable energy specific policies in an international investment agreement, however, would be a major change from the traditional approach to IIAs.

First, the core concepts of IIAs are mostly negative in nature – prohibiting certain actions by governments – as part of an effort to protect foreign investors against discrimination and other unfair treatment. The key policies to promote renewable energy, however, are mostly positive in nature – reflecting a commitment by governments affirmatively to do something, whether that be restructuring their power sectors, changing their taxation systems, spending their tax revenues in new ways or making new types of information available. Such affirmative commitments are much harder for governments to make in international agreements given their political sensitivity in general and the concerns over loss of sovereignty that any such agreements raise. Second, most IIAs are just that – agreements to protect "investments," no matter what sector any particular investment is in. Such protections are of great use to investors in renewable energy projects, but by their very nature, do not address the more specific barriers facing investments in the renewable energy sector. As such, efforts to use international investment law to promote investments in renewable energy projects should be placed in a wider context, embracing traditional IIAs (where some areas for work do remain), sectoral energy and environmental agreements, initiatives by multilateral development agencies, as well as efforts to inform and coordinate national policies. Some suggestions for areas of further work in these areas are discussed in the next section.

Table 5 Key Barriers to Investment in Renewable Energy and Links with Major Policy Tools Being Used to Promote Renewable Energy

Core Concepts	Government Regulation	Government Taxation	Government Spending	Government Information
Barriers				
Inertia of existing electricity system	■			
Lack of information on renewable options				■
High transaction costs		■	■	■
Limited technology development	■	■	■	
Inadequate infrastructure	■	■	■	
Negative externalities not internalized	■			
Siting hurdles	■	■	■	■
Evolving technology			■	■
Intermittent energy availability	■			
Unfavorable pricing rules	■	■	■	
Lack of access to credit			■	
Government monopolies	■		■	
Uncertainty in incentives	■	■	■	
Interconnection requirements	■			
Conventional energy subsidies	■	■	■	
Higher initial capital costs		■	■	■
High perception of risk		■	■	
Insurance gaps	■	■	■	
Preference to short payback periods		■	■	

Note: shading indicates key barriers that major policy tools might help overcome.

6.0 CONCLUSIONS AND SUGGESTED NEXT STEPS FOR USING INTERNATIONAL INVESTMENT LAW TO PROMOTE INVESTMENTS IN RENEWABLE ENERGY

Encouraging more private investment in renewable energy is a key policy goal for a growing number of countries. International investment law – broadly defined – has a major role to play in helping to create the predictable and profitable market conditions needed to attract such investment. Based on the review and analysis in the preceding sections, areas for further work include the following.

6.1 Using Traditional IIAs

While traditional IIAs are the primary focus of this Chapter and remain a critical element of efforts going forward, there are a number of reasons why work in this area seems less pressing than that in the other areas described below.

First, there seems little reason to expect a new Multilateral Investment Agreement any time soon. The OECD discussions around the proposed MAI are finished. The WTO discussions around a new agreement on investments appear to be stalled. Even at the regional level, negotiations on proposed agreements such as the Free Trade Agreement of the Americas are moving slowly at best.

Second, model Bilateral Investment Agreements are increasingly including provisions that address many of the concerns raised by environmental advocates. Environmental provisions have helped to clarify governments' continuing right to regulate to protect public health and the environment. New procedures for dispute resolution have helped increase the transparency of such proceedings. While more work can certainly be done to capture the potential environmental benefits of BITs (see the IISD Model Agreement for example), progress is being made.

Third, overcoming the major barriers to investments in renewable energy will require governments affirmatively to commit to doing something (regulate, tax, spend, inform), not just to commit to avoid discriminating against foreign investors. Such affirmative, sector-specific commitments do not fit the traditional model of IIAs. As such, they appear to be best pursued through other international agreements and activities (as described below).

Finally, even the best IIAs cannot overcome major shortcomings in the investment frameworks in particular countries. Legal tools do not work in countries which do not respect the law. Investors care most about the laws in effect where the project is to be built. Private investors will invest in the most attractive projects in the most attractive countries. As such, efforts need to continue to help countries build markets that are attractive to the types of investors they seek – including those in renewable energy. International policy activities can best support these efforts at the host country level by making information, public funds and frameworks for internalizing the global costs of non-renewable energy available (as discussed below).

If a decision was taken to pursue a new MIT or BIT in a manner that best promotes investment in renewable energy, however, the parties should consider the following recommendations:

- Identify clearly the benefits of the potential investment agreement to businesses (increase predictability of host state action and investor responses thereto), host states (affirm right to regulate within traditional boundaries, attract more private investment), and civil society organizations (more investment in cleaner energy solutions) so that the negotiations have broad and strong support.
- Be as transparent as possible in and around the negotiations, including outreach to a wide range of stakeholders in both business and civil society.
- Include clear definitions of "investment," "investor," and "expropriation" so that parties to the agreement can understand the balance being created between private and public interests.
- Include a broad enough definition of "investment" to ensure that investments in "hybrid property" such as TRECs and greenhouse gas emission allowances are protected.
- Clearly support the host states' "right to regulate" in a non-discriminatory (at least with respect to foreign investors) manner on matters relating to climate protection and cleaner energy.
- Expressly provide that energy from renewable sources is not "like" energy from non-renewable sources for purposes of government support.

6.2 Using other International Investment Activities to Promote Investments in Renewable Energy

Many other international efforts are underway to increase private investment in general or in cleaner energy in particular. All of them are potential platforms for further efforts to use law to encourage investments in renewable energy. Some of the major areas for further work include the following:

Supporting efforts to articulate general investment principles to reflect in any IIA, other international agreement, national or regional policy regime.

A number of different groups are working to improve frameworks for private investments in general and renewable energy in particular. For example:

- UNCTAD advises developing countries on how to attract more FDI (UNCTAD, *n.d.*e);
- The World Business Council for Sustainable Development has published summaries of the key issues affecting country level attractiveness for private investment (IUCN, 2002);
- Ernst and Young publishes its annual Renewable Energy Country Attractiveness Indices based on its assessment of the factors considered by investors in clean energy (Ernst & Young, *n.d.*); and
- The Renewable Energy and Energy Efficiency Project and others offer guidance on reforming different countries' market frameworks for renewable energy (REEP, *n.d.*b).

As the focus increasingly turns to how to put policies in place that best help

overcome the barriers faced by potential investors in renewable energy projects, it may make sense to step back from any particular treaty or country and try to articulate some starting point principles for the features that will make such policies of most use to investors. While such policies need to be "loud, long and legal," a slightly longer list – reflecting the analysis in this Chapter as well as the learning from the initiatives listed above – might well be helpful to guide work on any individual policy effort in this area.

Continuing to encourage policy makers to incorporate clean energy into their infrastructure investment planning efforts

Many governments are facing a looming crisis in infrastructure financing. For example, the OECD has embarked upon an initiative, the OECD Futures Project on Global Infrastructure Needs: Prospects and Implications for Public and Private Actors. The main purpose of the project "is to bring together experts from the public and private sectors to take stock of the long-term opportunities and challenges facing infrastructures, and propose a set of policy recommendations for OECD Governments." (OECD, *n.d.*e). Electricity is one of the major foci of this effort.

It is critical that such broad reviews of energy infrastructure include serious consideration of renewable energy options. While many governments are taking this on, non-renewable energy sources continue to dominate the construction of new power plants in many countries. Only by continuing to press for a greater role for renewable energy will that tide be shifted further toward cleaner energy options.

An increased focus on regional energy sector agreements may help in this area. Transmission grids are increasingly regional. Key features of investment frameworks are often, but not always, shared among many neighboring countries. Continuing development of the Energy Charter or even the electricity portions of NAFTA to reflect the lessons learned about promoting investments in renewable energy may offer opportunities for moving ahead.

Pursuing the opportunities offered by the post-Kyoto discussions

What happens after the Kyoto Protocol expires at the end of 2012 is a major topic of discussion in many policy circles. Most of those discussions are focused on the need for major new investments in cleaner energy and the policy tools for attracting that investment. Ensuring that the learning to date on the barriers to investment and the possible tools for overcoming those barriers are reflected in these discussions is a key area for further work.

At its most fundamental, however, the key focus of the post-2012 work should be on putting a price on carbon over the longer term. Doing so will help spur investments in less carbon-intensive power sources and fits the role of global policy addressing a global externalized cost issue. Tax and "cap and trade" based systems often receive the most attention in this regard as they set either a price or a ceiling for greenhouse gas emissions. In addition, some commentators[28] have suggested that an RPS type standard be considered for greenhouse gas emissions as well. Under this approach, a floor would be established requiring that a set amount of electricity be

[28] Such as Aldyn Donnelly, GEMCo (http://www.gemco.org/), personal communication March 24, 2006.

purchased from "cleaner" sources (such as renewables) with the expectation that that floor will be increased over time.

Discussions of the future of greenhouse gas (GHG) credits should also consider their relation to TRECs and other similar, but separate compliance obligations. From a private investor's perspective, the goal here is to maximize the number of different revenue streams from renewable energy projects thereby increasing their attractiveness.

Continuing to build the infrastructure for linking private investors into such policy discussions

While governments need to understand what private investors are looking for, real private investors are often too busy doing deals to have time for lengthy conversations with government officials about future policy changes. A wide variety of efforts are underway to both gather information from private investors in renewable energy for transmission to government, as well as to create concentrated opportunities for policymakers and investors to exchange information. For example, the UK's Carbon Trust and the Clean Energy Group in the US are sponsoring a Trans-Atlantic Dialogue on Cleaner Energy and the various trade associations (such as the American Council for Renewable Energy in the US) are hosting workshops bringing together public and private investors.

These efforts need to be encouraged and focused on how best to attract more investment so that the lessons learned can be reflected in new policies adopted at whatever level. Given that investors care most about the policy frameworks in place at the location of their project, it will be important to build this infrastructure at the sub-national, national, regional and global levels.

Continuing to build the infrastructure for linking public and private pots of money dedicated to cleaner energy

Neither public nor private capital acting alone will meet the investment needs in the renewable energy sector. Increasingly effective ways to link the public and private capital that have been committed to clean energy need to be found. For example, REEEP is developing a matchmaker service to bring Asian developers together with potential financiers both public and private to help spur projects in Asian countries. Law-related initiatives to support such efforts include:

- Reviews and descriptions of existing national investment frameworks for renewable energy;
- Support for efforts to design and implement more attractive national investment frameworks (such as the model law developed for India (REEEP, *n.d.*c));
- Input on efforts to determine the optimized roles for public and private funds in different kinds of, as well as in particular, transactions (grants, insurance, debt, equity, etc.); and

Negotiation of the contractual agreements necessary to make any particular renewable energy project a reality.

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The Effectiveness and Impact of International Energy Treaties

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I. INTRODUCTION

Over the last fifty years international law has become a dynamic instrumentalist social force addressing a wide range of socioeconomic, sociopolitical and biophysical challenges through bilateral, regional, and global treaties. International law now includes a formidable corpus of treaties dealing, for example, with labor, human rights, health, intellectual property, taxation, the environment and energy. Many of these treaties establish articulated and implied goals and objectives and some of them create new institutions.

At present there are hundreds of international treaties that seek to advance sustainable energy technologies and policies. Moreover, in addition to international treaties, recent years have given rise to dozens of partnership agreements involving countries and private sector entities, scores of pledges found in political resolutions, and numerous other non-binding instruments. These instruments express commitments, of varying degrees and in different ways, supporting the development of sustainable energy technologies. While the extent and form of such commitments and pledges has received some attention, an increasingly important, though unanswered question, relates to how effectively they have been implemented, and the degree to which they actually achieve progress by impacting behavior and moving toward sustainable energy goals.

This paper briefly describes and discusses a two-part project (the International Project on Energy Commitments and Compliance) that seeks to advance sustainable energy solutions to the energy crisis confronting the world. The underlying goal in offering this discussion is to illuminate what we see as important informational and analytical deficits with respect to understanding the effectiveness (or lack thereof) of

international sustainable energy agreements. The operational premise here is that to the extent that we—meaning the international community of scholars, decision-makers, researchers, concerned individuals and so on—are able to understand what is and is not working in the realm of international sustainable energy agreements, we will be better positioned to discern how to improve the effectiveness of these agreements in achieving their underlying objectives—and, at a more macroscopic level, their effectiveness in ameliorating the concerns presented by global energy security and climate change. Based on preliminary conclusions derived from the research described in this paper, we also offer some heuristic and tentative recommendations for improving the effectiveness of international sustainable energy agreements.

The proximate goals of the exercise embodied in the International Project on Energy Commitments and Compliance are very functional and not theoretical. They are to identify all energy treaties in force and to analyze them with a view to reaching some conclusions about the kind of treaties that most effectively and efficiently promote sustainable energy. In addition to in-force international energy agreements, the project also endeavors to evaluate the implementation and impact of the various sustainable energy commitments embodied in such non-legal instruments as partnerships, declarations, pledges and other decisions in the international domain.

Part II of this paper sets forth the underlying rationale for the International Project on Energy Commitments and Compliance by briefly canvassing relevant environmental, geopolitical, and resource-based issues, as well as the inadequacy of current international responses to the present global energy-environmental crisis. Part III delineates the existing backdrop of major international agreements relevant to sustainable energy. In Part IV we describe the current status of international legal research with respect to evaluating the effectiveness of international treaties, note the paucity of comprehensive empirical assessments, and offer an analytical rubric for rehabilitating this deficit. This part also introduces and reviews the International Project on Energy Commitments and Compliance—as well as its analytical predecessor and counterpart, the International Sustainable Energy Assessment. In Part V we offer some tentative conclusions regarding improving the effectiveness of existing and future international sustainable energy-related agreements.

II. THE COLOSSAL CHALLENGE OF ACHIEVING A SUSTAINABLE ENERGY FUTURE

The manner and extent to which increasing global energy demand can be met within the framework of sustainable development presents the greatest global environmental challenge of the 21st century. The world is rapidly approaching the end of the age of oil, and yet we are woefully unprepared for the environmental, socioeconomic, and geopolitical consequences of this transition. As set forth in this paper, the case for new international energy agreements that will facilitate this transition—and assist in addressing the extraordinary environmental challenge posed by global energy demand—is premised upon five widely recognized phenomena.

First, the undeniable energy context is that today's current primary global power consumption of about 12 terawatts (TW) will reach around 30 TW by 2040.[1] Other forecasts indicate that total global energy consumption will expand by 71 percent between 2003 and 2030.[2] A significant and troubling part of this projected increase in energy demand will occur in developing countries that rely primarily upon the combustion of hydrocarbons such as coal to produce the electricity necessary to meet their energy needs.[3]

We note that as a result of the increasing reliance of developing countries on fossil fuels—particularly coal, the most carbon-intensive of fossil fuels—despite lower projected energy consumption levels than that of the industrialized nations, CO_2 emissions from developing countries are projected to exceed those of the industrialized nations soon after 2010.[4] According to the most recent projections by the International Energy Agency, China is expected to overtake the U.S. as the largest emitter of CO_2 *before* 2010.[5]

Second, the environmental consequences of using fossil fuels or hydrocarbons to produce energy are formidable and fearsome. Apart from the fact that hydrocarbons are greenhouse gases that cause anthropogenic global warming, the entire hydrocarbon energy cycle of production, mining, transportation, refinement, use, and emissions are fraught with daunting environmental and public health problems. The environmental and public health effects and impacts of acid rain, heavy metals, urban smog—created by the mining and burning of fossil fuels—can be very damaging to both developing and developed countries.

Third, oil and gas are finite and non-renewable natural resources. Oil and gas are not as abundantly available as coal. Moreover, because the demand for oil and gas far exceeds the supply of those countries that rely most heavily upon them, these countries are compelled to import oil and gas from politically volatile parts of the world. This phenomenon exposes many developed countries to shortages of vital energy sources. However, despite the looming specter of global warming and increasingly tight energy markets,[6] virtually all projections indicate that under current policies and trends fossil fuels will remain the dominant source of energy throughout the foreseeable future. The IEA forecasts that between 2004 and 2030, fossil fuels will account for 83 percent of the overall increase in global energy demand.[7]

Fourth, even appreciating the 1974 Agreement on an International Energy Program (IEP), the 1992 United Nations Framework Convention on Climate Change (UNFCCC), and perhaps the Energy Charter Treaty of 1994 (ECT), all three of which are referred to in the next section, the global response to the energy crisis has been unsatisfactory. In this context, the Kyoto Protocol of 1997 responds to the danger of global warming caused by anthropogenic actions and requires reductions of carbon dioxide emissions. Unfortunately, Kyoto almost totally disregards the need to find alternative sources of energy that can supply the burgeoning energy needs of the world.

Fifth, the search for smart energy that is plentiful, efficient, and accessible to replace or supplement our present environmentally damaging fossil fuel sources will involve new technological developments and creative assumptive frameworks dealing, inter alia, with energy production, distribution, delivery, storage, conversion, end

[1] Future energy scenarios are the product of developmental assumptions for complex demographic, socioeconomic and technological factors and may thus vary significantly. *See* Martin I. Hoffert et al., *Advanced Technology Paths to Global Climate Change: Energy for a Greenhouse Planet*, 298 SCIENCE 981 (2002); Martin I. Hoffert et al., *Energy Implications of Future Stabilization of Atmospheric CO_2*, 395 NATURE 881, 883 (1998); INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT ON EMISSION SCENARIOS, 95–96, 221 (2000). One terawatt (TW) equals one thousand gigawatts or one million megawatts.

[2] The U.S. Department of Energy Information Administration's (EIA) "reference case" projects that total world energy consumption will increase from 421 quadrillion British Thermal Units (BTU) in 2003 to 722 quadrillion BTU in 2030—a 71 percent total increase. EIA, INTERNATIONAL ENERGY OUTLOOK 2006 7 (2006) (hereinafter IEA 2006).

[3] Non-OECD countries are projected to have the strongest energy consumption growth rate, accounting for 57 percent of the entire projected increase in world energy consumption through 2030. *Id*. at 7. For Non-OECD countries, EIA predicts that CO_2 emissions will increase from 11.6 billion metric tons carbon equivalent in 2003 to 26.2 billion metric tons in 2030—a total increase of 125%. *Id*. at 73. During this same period of time, total U.S. CO_2 emissions from energy use are projected to increase from about 5.9 to 8.0 million metric tons carbon equivalent—a total increase of 35%. EIA, ANNUAL ENERGY OUTLOOK 2007, Table 18: Carbon

uses, and environmental protection. These technologies and assumptive frameworks need to be assessed and expressed in a manner which facilitates and secures global, national, and multinational corporate responses. There are no showstoppers waiting in the wings. Development and deployment of sustainable energy technologies on an unprecedented scale is needed.[8]

III. THE LEGAL FOUNDATIONS

The task of facilitating the design and negotiation of new international energy instruments needs to be integrated with prior international endeavors. Two are of particular importance: the IEP and the UNFCCC. The United States is a party to both these agreements.

The IEP was a response to the energy crisis of 1973–74 when the Arab oil embargo sent oil prices spiraling upward and left the major industrialized countries feeling very vulnerable. The rich industrial countries of the world, who were members of the Organization for Economic Cooperation and Development (OECD), responded with the IEP: a new international treaty aimed primarily at ensuring the adequate supplies of oil at affordable prices. The IEP created a new international organization, the International Energy Agency (IEA), as its implementing agency.

Ensuring the stability and security of oil supplies remains the primary objective of the IEA. The objective of stabilizing oil supplies is supplemented by a number of environmentally significant long term objectives pertaining to the conservation of energy, development of alternative sources of energy, and research and development of renewable energy. These environmental objectives have assumed much greater practical importance and led the IEA to create a number of Standing Groups and Working Parties dealing with different aspects of the energy environmental interface. The IEA has also facilitated a host of Implementing Agreements on a variety of renewable energy frontiers including advanced fuel cells, photovoltaic power systems, hydrogen, and wind turbine systems.

Internationally, the IEA has become the primary functional engine for facilitating renewable energy research. However, the operational significance attached by the IEA to renewable energy does not arise from legally binding obligations created by the IEP. The renewable energy aims of IEP are hortatory not mandatory, and remain secondary to its primary objectives of securing reliable oil supplies. The IEP does not contain any legally binding obligations requiring the creation, transmission and deployment of renewable energy to address today's energy and environmental insecurity. Moreover, it is essentially an organization of rich developed nations. Its membership does not include developing countries like China or India. While the IEA has sought to include some developing countries in its Implementing Agreements, such developing countries remain invitees not peers, and lack parity of status with IEP members. Consequently, new international instruments in which developing countries are primary parties and stakeholders offer better vehicles for fulfilling the work begun by the IEA. Such new instruments could more sharply clarify and define the

Dioxide Emissions by Sector and Source (2007). These figures and projections should, of course, be viewed in a historical context that takes into account cumulative emissions. For instance, by some estimates the cumulative CO_2 emission from the U.S. accounts for 29 percent of the world total, while cumulative emissions from China accounts for only 7.6 percent of the world total. Similarly, cumulative emissions from the EU-25 accounts for about 26.5 percent of the world total, while cumulative emissions from India accounts for a mere 2.2%. HERZOG ET AL., NAVIGATING THE NUMBERS: GREENHOUSE GAS DATA AND INTERNATIONAL CLIMATE POLICY 31–32 (2005).

[4] IEA, World Energy Outlook 2006 5 (2006).

[5] *Id.* at 5.

[6] While in 2003 developing nations consumed about 50 percent as much oil as OECD nations, by 2030 they are expected to consume about 77 percent as much oil as OECD nations. EIA 2006, *supra* note 2, at Figure 27: World Oil Consumption by Region and Country Group, 2003 and 2030.

[7] IEA *supra* note 4, at 2.

[8] Pascala and Socolow claim that a 500 ppm stabilization pathway can be attained using existing technology—via implementation of 15 "technology wedges," each of which could be scaled up by 2055 to reduce GHG emissions by 1GtC/yr Pascala and Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCIENCE 968–72 (2004). Pascala

rather vague and amorphous renewable energy mandates of the IEP, and render them more specific and enforceable.

The ECT was agreed to in 1994 with a view to establishing a legal framework to promote long term co-operation in the energy field. It came into force in 1998, and seeks to provide a non-discriminatory legal foundation for international energy cooperation and deals with investment protection, trade in energy, freedom of energy transit, and improvements in energy efficiency. It has been ratified by fifty-one countries primarily in old and new Europe, and the now independent countries of the ex-Soviet Union. It is mainly focused on trade and investment and provides for protection of foreign investment thus ensuring a stable basis for cross border investments among countries with differing social, cultural, economic and legal backgrounds. Under its umbrella the Parties have negotiated a Protocol on Energy Efficiency and Related Environmental Aspects (PEERA) in 1998. PEERA provides a platform for the cooperation in developing energy efficiency.

While the ECT has taken a step toward global energy cooperation, it does not specifically address how to develop primary sources of renewable energy, and the parties have been unable to agree on a Protocol dealing with renewable energy or the re-engineering of infrastructure. Moreover, the United States, China, India, Japan, and Australia are not parties to the ECT. It is important to carry the momentum of the IEP and ECT toward international agreements that include developing countries like China and India that will become the largest users of hydrocarbons.

The UNFCCC is a response to global climate change, and contains a cluster of amorphous legal obligations. It has the unique distinction of having been ratified by all the countries in the world. Three interlocking mandates are of special importance: (1) stabilization of GHGs; (2) common but differentiated responsibility (CBDR); and (3) the right to sustainable development. First, UNFCCC requires all parties to stabilize GHG concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system"[9] within a time frame consistent with sustainable development. The implications of this obligation are extensive. Coal, oil, and to a lesser extent natural gas, are the primary GHGs implicated in climate change, and the obligation to stabilize GHGs requires the Parties to create or find alternative or substitute sources of energy to replace potentially dangerous hydrocarbons and facilitate sustainable development.

This obligation is accentuated by the principles of "equity" and CBDR[10] for protecting the climate system. Equity and CBDR require developed countries to shoulder the primary responsibility and take the lead in combating climate change. Developed countries have, therefore, accepted a duty to create and share new technologies that use and enable non-climate changing sources of primary energy.

The first two sets of obligations interlock with a third institutionalizing the right to sustainable development.[11] The assertion that the "Parties have a right to . . . promote sustainable development [and] . . . that economic development is essential for adopting measures to address climate change"[12] was an affirmation of the primary theme of the 1992 United Nations Conference on Environment and Development. The primacy of sustainable and economic development was resoundingly re-asserted at the recently concluded 2002 World Summit on Sustainable Development.

and Socolow's assessment, however, fails to take into account the stabilization wedges *already* built into their underlying baseline scenario, meaning that to achieve the 500 ppm stabilization pathway anywhere from 21 to 49 wedges capable of being scaled up to 1GtC/yr will be needed by 2055—rather than 15 wedges. *See* Tom Wigley, *Saving the Planet: Emissions Scenarios, Stabilization, and Uncertainties*, NCAR Summer Colloquium, July 2006.

[9] UNFCCC, art. 2.

[10] *Id*. at art. 3(1).

[11] As set forth in the seminal Brundtland Report, sustainable development is described as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." REPORT OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT (WCED), OUR COMMON FUTURE 54 (1987). The report further notes that "[i]n essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations." *Id*. at 57.

[12] UNFCCC, art. 3(4).

These three legal obligations require developed countries, independent of their own energy predicament, to strive for a more diversified energy portfolio and places a duty on them to promote sustainable development in the developing world. A commitment to sustainable development requires the developed world to undertake fundamental R&D on new technologies for producing better forms of primary energy and transfer such technologies to developing countries.[13] The creation of new technologies will remove the threat of energy insecurity in developed countries, while their transfer to developing countries will promote sustainable economic and energy growth.

The major issues arising in this context pertain to the existence, availability and practicability of future sources of primary energy, and the candidate technologies that offer feasible solutions to the energy and environmental crisis, and importantly, the manner and mode in which the technology will be deployed. The canvassing of promising new directions in innovative technologies able to exploit a variety of energy sources will form a vital element of the proposed knowledge base and also help to traverse the cobbled passage from invention to commercial deployment.

IV. EXAMINING THE EFFECTIVENESS AND IMPACT INTERNATIONAL ENERGY TREATIES

A. Overview and Introduction

The growing challenges presented by energy and environmental problems necessitate new treaty arrangements that change the way in which nations behave. Good new energy treaties that command future compliance must be based on an understanding of the extent to which nations comply with existing treaties, and why they do so.[14] This paper builds upon and further develops a seam of international teaching and writing on compliance, effectiveness and impact of energy and environmental treaties.[15]

In general, even the limited inquiry about compliance with international law dealing with biophysical issues like the environment or energy has been theoretical. It has been confined to two questions: One, has international law been *implemented* by being incorporated into domestic law through legislative, judicial or executive action. Two, to what extent have countries *complied* with a treaty by adhering to its provisions and the implementing machinery established by it.[16] The *effectiveness* of a treaty goes beyond mere adherence to legal obligations.[17] This paper defines effectiveness as the extent to which the goals of a treaty have been achieved. But shallow commitments[18] could lead to effective compliance because states would have done so anyway, or could do so without much *impact* on the underlying issue.[19] It is important, therefore, to understand a treaty not only in terms of its *effectiveness* in achieving stated goals, but also of its *impact* as a satisfactory response to the challenge addressed, and the degree to which it changes state behavior.

[13] In addition to other relevant provisions of the UNFCCC, Article 4(5) commits developed country Parties to "take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention."

[14] Jose E. Alvarez, *Why Nations Behave*, 19 MICH. J. INT'L L. 303, 305 (1998).

[15] EDITH BROWN WEISS AND HAROLD JACOBSON, ENGAGING COUNTRIES: STRENGTHENING COMPLIANCE WITH ENVIRONMENTAL ACCORDS (1998); DINAH SHELTON, COMMITMENT AND COMPLIANCE (2000); Kal Raustiala, *Compliance & Effectiveness in International Regulatory Cooperation*, 32 CASE W. RES. J. INT'L L. 387, 393–94 (2000); ABRAN CHAYES AND ANTONIA HANDLER CHAYES, THE NEW SOVEREIGNTY (1995); THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS (1995); Oran R. Young et al., *Regime Effectiveness: Taking Stock, in* THE EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL REGIMEs 249 (Oran R. Young ed., 1999); Harold Hongju Koh, *Why Do Nations Obey International Law?* 106 YALE L.J. 2599, 2603 (1997).

[16] WEISS AND JACOBSON, *supra* note 15; SHELTON, supra note 15.

[17] M.A. Fitzmaurice and C. Redgwell, Environmental Non-Compliance Procedures and International Law, 31 NETH. Y.B. INT'L L. 35 (2000).

International institutions of differing types, created by treaties to serve their goals, as well as international organizations in general,[20] have been the subject of research and teaching. By contrast, methods for ensuring compliance, although listed or catalogued, have not been analyzed and examined from the point of view of their comparative utility, effectiveness or impacts. This has happened despite the fact that compliance may depend on those methods. Such methods include processes, implementive devices, and differing types of techniques employing distributive and resource transferring, grievance remediation (enforcement), private arrangements, and regulatory frameworks. Of the few that have been examined[21] there has only been modest investigation and analysis of the utility of various *compliance methods*[22] and *compliance devices* used by these international instruments to achieve their goals. It is perfectly possible for an expensive method to achieve a modest goal when it could have been done by another at less cost. Overall, it is important to assess and evaluate the extent to which these varying methods have succeeded in achieving their treaty goals because future instrumentalist treaties will need to avoid failures and embrace the successes of existing treaties.

When moving from methods into the field of effectiveness and impacts it is important to identify the goals of a treaty and to compare such goals with the results produced. It is also necessary to inquire about the depth of these goals and the extent to which they did or did not remedy the problem being addressed. Where the results, garnered from empirical data and evidence do not match goals, or point to the inadequacy of those goals, attention turns to the reasons for such shortfalls. It is possible for shallow commitments and modest goals to reflect what countries are already doing rather than what is needed to address the problem at hand. Such an inquiry must traverse institutions, compliance methods, enforcement, as well as the socioeconomic, political or cultural context that might explain the gaps between the goals of a treaty and the inability to meet them, or the meagerness of the goals and the ease with which they were met.

While there is a substantial body of literature on "effectiveness,"[23] these otherwise theoretically illuminating contributions do not include any authoritative conclusions based on comprehensive empirical examination of compliance, effectiveness or impacts of energy and environmental agreements.[24] The impressive study by Brown and Jacobson was based on five treaties.[25] This is primarily because of the absence of comprehensive and organized empirical evidence or data.

It is time to examine the accuracy of the hoary old chestnut that most nations conform to international law most of the time.[26] While this impressionistic claim has been repeated in recent times,[27] and may be correct, the evidence for so believing today simply does not exist in the energy and environmental areas. The importance of empirical evidence backing any such claims cannot be overemphasized.

Ian Brownlie, who considers evidence of effectiveness to be extra-legal, nonetheless asserts that "the utility and effectiveness of a legal order must be determined ultimately by extra-legal criteria."[28] Benedict Kingsbury points out that we do not have systematic studies to verify the accuracy of Henkin's venerable assertion that most of the time nations conform to international. Moreover, he states

[18] George W. Downs et al., Is *the Good News about Compliance Good News about Cooperation?* 50 INT'L ORG. 379, 383 (1996).

[19] Raustiala, *supra* note 125, at 393–94 (while Raustiala conflates the two concepts, this article draws a distinction between effectiveness and impact).

[20] JOSE ALVAREZ, INTERNATIONAL ORGANIZATIONS AS LAW MAKERS (2005).

[21] According to Victor, *Enforcing International Law Implications for an Effective Global Warming Regime*, 10 DUKE ENVT'L. L. & POL'Y 147 (1999), of the more than 140 multilateral environmental agreements covering a broad spectrum of issues, scholars have examined closely only a fraction of these agreements and issue-areas.

[22] ROBERT SUMMERS, INSTRUMENTALISM AND AMERICAN LEGAL THEORY, 193–208 (1982). "Method" as used in this paper corresponds to the"Implementive Machinery" described by Summers.

[23] *See* CHAYES AND CHAYES, *supra* note 15; FRANCK, *supra* note 15; Young, *supra* note 1; Koh, *supra* note 15.

[24] THE IMPLEMENTATION AND EFFECTIVENESS OF INTERNATIONAL ENVIRONMENTAL COMMITMENTS: THEORY AND PRACTICE ix (David G. Victor et al. eds., 1998).

[25] *See* BROWN AND JACOBSON, *supra* note 15.

[26] LOUIS HENKIN, HOW NATIONS BEHAVE (2d ed. 1969).

that the dearth of good empirical studies of the correspondence between state behavior and international rules is a serious obstacle to understanding and evaluating the international legal system.[29] This lack of serious empirical research pertains to compliance methods as well as to effectiveness and impacts. While the effectiveness of international regimes is an established field of study, the empirical evidence relied upon in the environmental and energy areas is sparse at best and dubious at worst.[30]

The existence of an empirically based research and teaching lacunae relating to methods, effectiveness and impacts has created a serious problem because the rationale behind functional and instrumental legal treaties is to *change* behavior. The relative absence of writing and teaching on the extent to which they have succeeded in doing so is an omission that calls to be remedied.

This paper briefly describes and discusses a two-part project that is seeking to advance sustainable energy solutions to the energy crisis confronting the world. The goals of the exercise are very functional not theoretical. They are to identify all energy treaties in force and to analyze them with a view to reaching some conclusions about the kind of treaties that most effectively and efficiently promote sustainable energy. It is doing so by examining all international energy agreements now in force, along with other non-legal instruments ranging from partnerships, declarations, commitments, pledges and other decisions in the international domain that deal with energy. The first phase of this project (ISEA), which is studying compliance, effectiveness and the impacts of these energy treaties, has identified some 1,800 energy treaties dealing with different aspects of energy and incorporating a variety of goals and methods. The second phase of this project (IPECC) will track the implementation, compliance, effectiveness and impact of these treaties—as well as identify and monitor compliance, effectiveness and impacts vis-à-vis such non-legal instruments as partnerships, declarations, commitments, and pledges. When completed this project will erase the data deficit relating to energy treaties, situate our understanding of these treaties within a broader instrumentalist framework, and may offer some salient insights about the compliance methods, effectiveness and impacts of treaties.

B. ISEA/IPECC: AN EMPIRICAL INTERNATIONAL ENERGY LAW RESEARCH PROJECT[31]

ISEA / IPECC is a preliminary attempt to begin construction of a knowledge base and analytical compass that together will facilitate the development and drafting of international energy instruments. This initiative is designed to address the energy and environmental insecurity confronting the world.

1. The International Sustainable Energy Assessment (ISEA)

There is widespread international recognition of the insecurities created by the current hydrocarbon economy, as well as the need to develop more secure forms of energy. Traditionally, national security has been associated with armed aggression and the ability to thwart military invasions or subversion. More contemporary

[27] Victor, *supra* note 21, at 151.

[28] IAN BROWNLIE, THE RULE OF LAW IN INTERNATIONAL AFFAIRS 11 (1999).

[29] Benedict Kingsbury, *The Concept of Compliance as a Function of Competing Conceptions of International Law, in* INTERNATIONAL COMPLIANCE WITH NON-BINDING ACCORDS 50 (Brown Weiss, ed. 1997).

[30] H. Andresen and E. Hey, *The Effectiveness and Legitimacy of International Environmental Institutions*, 5 INTERNATIONAL ENVIRONMENTAL AGREEMENTS 211 (2005).

[31] For more information on ISEA/IPECC, please visit the web page of the Energy and Environmental Security Initiative (EESI) at www.colorado.edu/law/eesi. The ISEA database of international energy agreements can be accessed at http://lawweb.colorado.edu/eesi/. Information on IPECC, as well as other EESI projects, can be found at www.colorado.edu/law/eesi/projects.htm.

concepts of security include critical threats to vital national and international support systems such as the economy, energy and the environment. In this context, the increasing reliance on hydrocarbons has created energy, environmental and economic insecurity

However, the magnitude of the challenges arising in moving to a more sustainable global energy regime cannot be solved by any one nation and must entail international engagement and cooperation. ISEA is designed to facilitate such cooperation and engagement by enhancing international understanding of optimal ways to utilize and configure international energy agreements to facilitate the development of renewable energy technologies and technologies and practices relevant to energy efficiency and energy conservation.

ISEA has created a unique database containing the full-text and analysis of approximately 1,700 international energy treaties (1440 bilateral; 261 multilateral) from all 192 countries in the world (see figures 1 and 2 below).

Figure 1 Top Eleven Countries Represented in ISEA (numbers correspond to the number of treaties the 11 represented countries are associated with as parties)

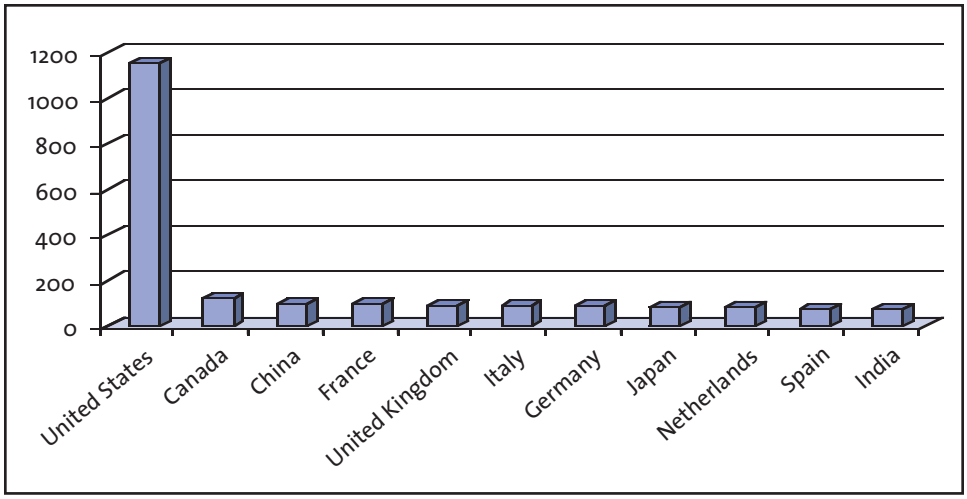
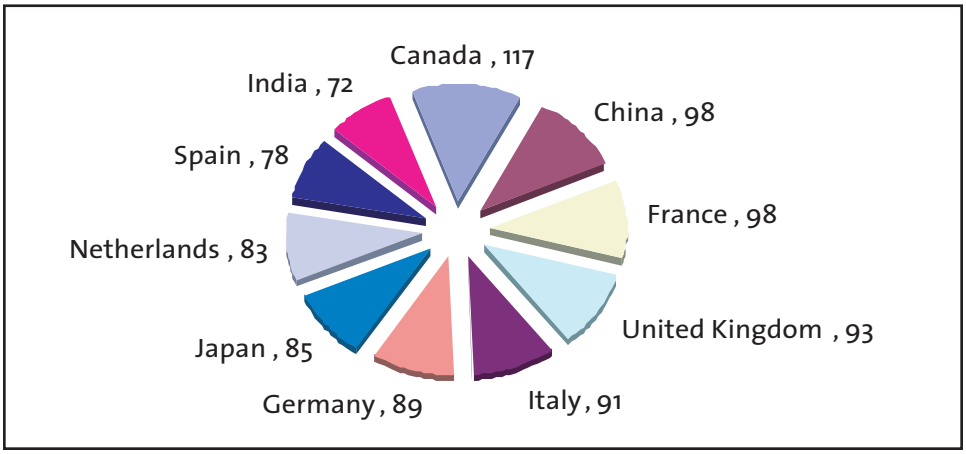


Figure 2 Top Ten Countries Represented in ISEA Not Including the U.S. (numbers correspond to the number of treaties the 10 represented countries are associated with as parties)



The ISEA database covers a wide array of energy subjects ranging from energy markets, electricity infrastructure, renewable energy, energy efficiency, hydrogen, and so on. By providing a detailed empirical survey and analysis of in-force energy treaties, ISEA constitutes the first critical step towards remedying the empirical research and teaching lacunae relating to the compliance, effectiveness and impacts of international energy instruments.[32]

ISEA builds upon research frameworks already delineated,[33] which are fostering the development of low GHG global energy systems primarily by facilitating technology research. The ultimate normative goal of ISEA/IPECC is to advance the negotiation of a comprehensive framework treaty on energy that can galvanize all nations and peoples, including developing countries like China, India and Brazil, to commit to renewable and sustainable energy targets. Such a treaty would be analogous to the Kyoto Protocol that placed numerical quantitative restrictions on carbon emissions.

While a comprehensive treaty remains the ultimate goal, the immediate focus of the ISEA phase was to create an empirical database.[34] Of course, providing such data does not allow ISEA to presume to legislate the scope, structure, specific subject matter, final terms or norms of proposed new energy instruments. Instead, ISEA is intended as a starting point from which to begin the arduous interdisciplinary and collaborative work necessary to negotiate a spectrum of instrumental treaties ranging from bilateral or regional science and technology agreements and trade and investment treaties to more ambitious regional treaties and overarching global conventions or protocols.

Throughout the ISEA phase of this project, researchers were charged with the task of identifying and analyzing every international energy agreement in the world currently in force – including both bilateral and multilateral treaties.[35] This obviously daunting task required the creation of a uniform analytical structure that would

[32] The references to "instruments" are to a genus that includes a variety of multilateral and bilateral agreements, pacts, treaties, protocols and conventions dealing inter alia with science and technology, trade and investment, research and development, technology transfer and sustainable development (as discussed below, the definitional scope of "instruments" is expanded in phase two of this project to include non-legal pledges, commitments, partnerships and decisions).

[33] See Franklin M. Orr, Jr., White Paper: Global Climate and Energy Challenge.

[34] Of course, with respect to this normative goal, it is perfectly conceivable that targeted pragmatism may prevail over comprehensive idealism. Consequently, an ambitious protocol encompassing all sources of sustainable energy may prove too complex. Instead, consensus may form around more narrowly tailored agreements that, for example, focus only on carbon capture and sequestration or fission-fusion hybrid technologies. Importantly, the empirical exercise embodied in ISEA/IPECC is intended to facilitate the development of new—and enhancement of existing—instruments of sustainable energy cooperation regardless of their scope.

[35] ISEA consists of two sequential research tracks, each of which was funded by the Renewable Energy and Energy Efficiency Partnership. The first research track culminated in the creation of

render the process of inputting information into the system straightforward and efficient, ensure that essential information is captured (and conversely, that the lack of such information is also captured), and facilitate and structure the comparative analysis of information within the system. To that end, an analytical structure consisting of 29 fields was devised. All 1,700 agreements currently within the ISEA system were analyzed pursuant to this uniform structure. The analytical structure is bifurcated into two primary divisions: (1) key coordinates—containing such information as parties to the treaty, date entered into force, and subject matter focus; and (2) substantive obligations, such as fundamental obligations, financial commitments, and accountability mechanisms, including information on and analysis of implementation, compliance, effectiveness and impact (with much of the information in these latter four categories to come from the IPECC phase of the project).

the ISEA database of international energy agreements. This phase is "complete" only in the sense that it has yielded the first major iteration of the database. In strict terms, however, this phase is an ongoing and continuous process of updating, refining, and analyzing the information in the ISEA database, and expanding the database to include additional relevant information. The second research track—known as ISEA: Implementation and Impact Phase—is currently underway. During this phase, which is being conducted simultaneously (and is conceptually considered a part of) the IPECC phase discussed below, researchers are expanding the original ISEA database and also evaluating the manner and extent to which countries have implemented commitments embodied in sustainable energy treaties, and the political, social and economic impacts of this implementation.

a. ISEA Analytical Structure / Taxonomy of Obligations

ISEA key coordinates fields include: (1) treaty name; (2) external reference ID; (3) date signed; (4) date entered into force; (5) signatories; (6) parties to the treaty; (7) legal type—a distinction internal to U.S. law; (8) termination or renewal clause; (9) bilateral or multilateral; (10) subject matter; (11) amendments; (12) extensions; (13) related agreements; (14) parent agreement; (15) subsidiary agreements; (16); international bodies involved; (17) official contacts; and (18) the full text of the treaty.

The structure or taxonomy devised for substantive obligations identifies the types or kinds of obligations that call for both implementation and compliance. The fields that constitute this structure are as follows: (1) goals and objectives; (2) fundamental principles; (3) financial obligations; (4) institution-related obligations; (5) project-related obligations; (6) interdependent obligations; (7) dispute resolution mechanisms; (8) implementing agency and methods; (9) accountability and reporting mechanism; (10) implementation and compliance; and (11) effectiveness and impact.

In addition to the two-dimensional view of the field structure denoted above, there are numerous fields within this structure that contain subcategories of analysis and information and dynamic interrelations—thus lending the system a degree of further analytical depth and internal coherence. For instance, with respect to "subject matter focus" the system currently contains treaties covering approximately 45-energy related subject areas. Six of these subject areas are deemed primary or top-level categories (see figures 3. The category "Sustainable Energy" contains six top-level subcategories, one of which is "Renewable Energy." This subcategory in turn consists of seven subgroups (see figure 4).

Figure 3 Top-Level ISEA Subject Categories (numbers correspond to the percentage of agreements contained in the ISEA database that are associated with each category)

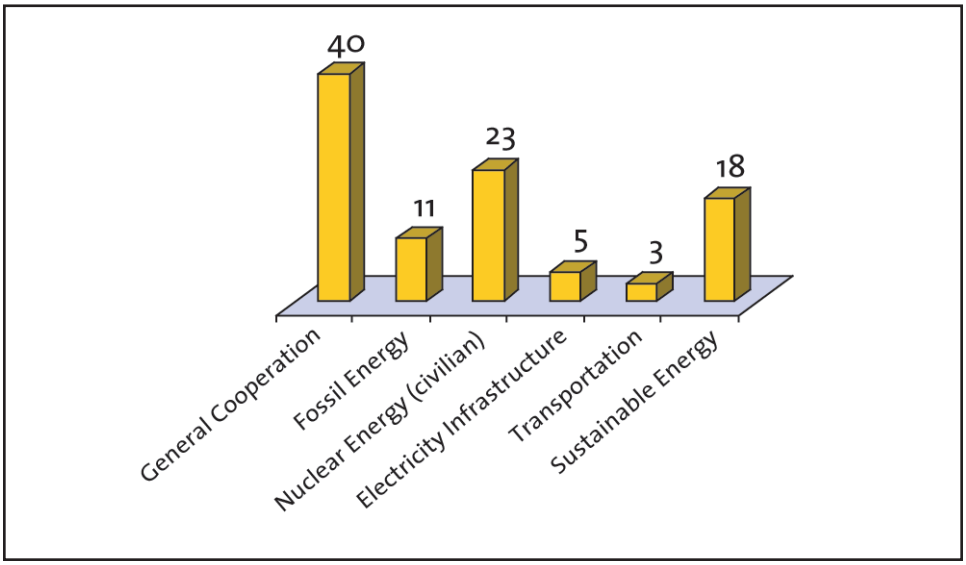
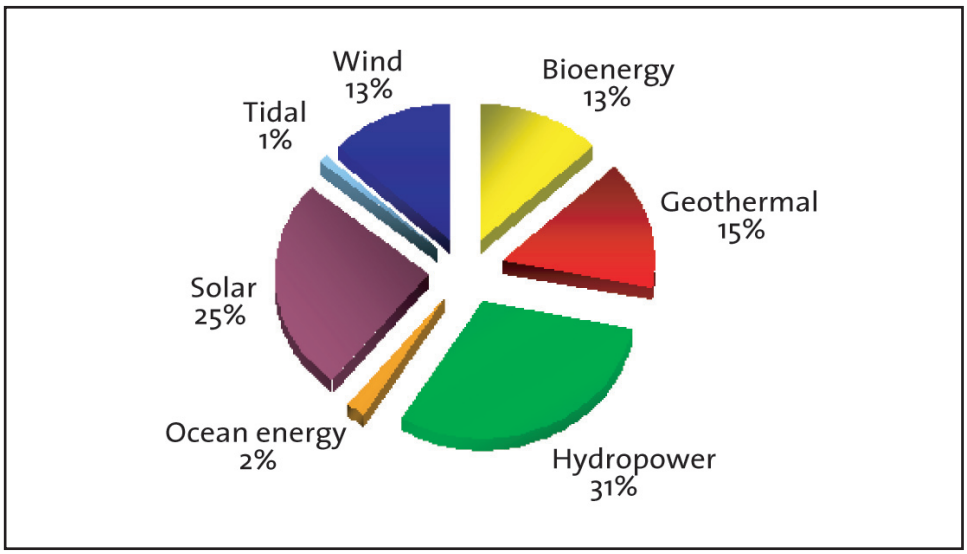


Figure 4 ISEA Renewable Energy Subcategories (numbers correspond to the percentage of agreements contained in the ISEA database that are associated with each renewable energy subgroups)



b. Brief Sampling of 100 ISEA Renewable Energy Agreements

The following discussion is intended to provide a very cursory analysis regarding the type and nature of "renewable energy" agreements contained in the ISEA database. This analysis is based on a random sampling of 100 in-force renewable energy agreements.[36]

[36] The ISEA database contains approximately 170 agreements associated with the category of "renewable energy."

(1) Generalization Regarding Overall Function of 100 Sampled Treaties

The one hundred renewable energy agreements contained within this ISEA sampling, as might be expected, have varying purposes. An overwhelming majority are general cooperation agreements through which the parties have agreed to future cooperation in the advancement of a specified mutual interest. While memorializing the cooperative intent of the parties, these agreements are generally non-binding and devoid of any substantive obligations.

In this particular sampling, 89 of the 100 sampled ISEA agreements are classified as general cooperation agreements. Most of these agreements have the primary purpose of establishing formal mechanisms for collaboration between the parties. For example, one of these agreements, which is generally representative of the class as a whole, is intended "to establish cooperation in the field of small hydropower, wind power and other areas of renewable energy through joint research and development activities, exchange of technical expertise and information networking."[37]

In addition to general cooperation agreements, this sampling includes a small percentage of renewable energy agreements which contain concrete and binding obligations. In this particular sampling, these 11 agreements are characterized, among other things, by binding financial provisions which include specific dollar amounts, dispute resolution mechanisms, and a general level of specificity far greater than that of the aforementioned cooperation agreements. Included in these agreements are agreements which facilitate the completion of specific projects, such as the construction or repair of dams, canal systems, and power plants, as well as agreements establishing detailed commodity trading schemes.

Moreover, some—but overall, very few—of these agreements include language indicating that they were designed to address specific underlying problems. One such agreement, which was created to address the problem of desertification in Africa, contains the following language:

> *Acknowledging* that desertification and drought are problems of global dimension in that they affect all regions of the world and that joint action of the international community is needed to combat desertification and/or mitigate the effects of drought

Another agreement of this type states:

> WHEREAS, the Snowy Mountains Hydroelectric Power Act of 1949 (No. 25 of 1949) of the Commonwealth provides for the construction and operation of works for the generation of hydroelectric power in the Snowy Mountains Area because the Commonwealth has determined that additional supplies of electricity are required for the purposes of defence works and the establishment of further defence undertakings will require additional supplies of electricity; that provision should be made now to enable increased supplies of electricity to be immediately available in time of war; that the consumption of electricity in the Australian Capital Territory and, in particular, at the Seat of Government within that Territory, is increasing and

[37] Memorandum of Understanding for Enhanced Cooperation in the field of Renewable Energy between the Ministry of Non-Conventional Energy Sources, Government of the Republic of India and the Ministry of Water Resources, Government of People's Republic of China (Ext. Ref. 2658). Intermediary agreements such as this one can serve as the precursor to more concrete and binding agreements.

> is likely to continue to increase; that the generation of additional supplies of electricity should be undertaken in such an area and in such a manner as to be least likely to suffer interruption in time of war; and that provision should be made now for the generation of electricity by means of hydroelectric works in the Snowy Mountains Area;[38]

The inclusion of language which articulates an underlying problem is one of several factors distinguishing these eleven agreements from the other eighty nine general cooperation agreements.

[38] Agreement Relating to Training and Other Technical Services to be Furnished by the Bureau of Reclamation, Department of the Interior, in Connection with Proposed Projects of the Australian Snowy Mountains Hydroelectric Authority (Ext. Ref. 1109).

(2) Summary of the Financial Obligations Contained Within Sampling

As most of the sampled agreements are general cooperation agreements, only twelve of the one hundred ISEA treaties sampled contain financial obligations. These twelve agreements contain financial obligations which range from general agreements to provide financial assistance to highly specific provisions detailing the exact dollar amounts, interest, and repayment terms. In reviewing the financial obligations in these twelve agreements three subcategories are apparent: (1) general agreements to provide financial assistance; (2) agreements facilitating an exchange of monies between the parties; and (3) agreements establishing financial terms upon which the parties to the agreement must operate.

Two of the twelve agreements containing financial obligations were general agreements to provide financial assistance. These two agreements contained language such as, "the Government of India shall pay reasonable compensation for such lands acquired or requisitioned"[39] and "[t]he Government of India agrees to provide funds for the financing of the project."[40] While clearly financial obligations, these two agreements do not articulate specific dollar amounts, interest rates, repayment terms, or disbursement dates.

[39] Agreement Between His Majesty's Government of Nepal and the Government of India on the Gangdak Irrigation & Power Project (Ext. Ref. 2680).

In addition to general financial obligations, nine of the twelve agreements have financial obligations that are designed to facilitate the exchange of monies between the parties. Five of these nine financial obligations facilitate the exchange of monies on a unilateral basis, where one party agrees to transfer money to the other. The following is an example of the specific language employed in these unilateral financial obligations:

[40] Agreement Between the Government of India and the Royal Government of Bhutan Regarding the Chukha Hydro-Electric Project (Ext. Ref. 2675).

> To assist the Cooperating Country to meet the costs of carrying out the Project, A.I.D., pursuant to the Foreign Assistance Act of 1961, as amended, agrees to grant the Cooperating Country under the terms of this agreement not to exceed One Million Five Hundred Fifty Thousand ($ 1,550,000.00) United States ("U.S.") dollars ("Grant") and to lend the Cooperating Country under the terms of this agreement not to exceed Seven Million One Hundred Thousand U.S. dollars ($7,100,000.00) ("Loan").[41]

[41] Project Loan and Grant Agreement Between the Republic of the Philippines and the United States of America for Non-Conventional Energy Development (Ext. Ref. 1335).

The remaining four agreements which facilitate the exchange of monies between the parties do so on a bilateral or multilateral basis, where all the parties agree to contribute a certain amount of funding to a project. The language employed in the following agreement is representative of this specific type of financial obligation:

> Each of the Governments specified below hereby undertakes, subject to such parliamentary or congressional action as may be necessary, and subject to the terms and conditions hereinafter set forth, to contribute to the Fund the amount specified opposite its name below:[42]

Canada	Can $	5,000,000
France	FF	150,000,000
Italy	It L	25,000,000,000
United Kingdom	£ Stg	10,000,000
United States	US $	50,000,000

[42] Tarbela Development Fund Agreement, 1968 (Ext. Ref. 1880).

Finally, one of the twelve agreements containing financial obligations establishes specific financial terms which the parties agree to abide by. The financial provisions in this agreement set prices for certain agricultural commodities which will be traded between the parties.[43]

[43] See Agreement Between the Government of the United States of America and the Government of the Republic of the Philippines for Sales of Agricultural Commodities (Ext. Ref. 1263).

(3) Summary of Accountability & Reporting Mechanisms Contained Within Sampling

Forty-eight of the one hundred ISEA treaties sampled include provisions establishing accountability and reporting mechanism. These forty-eight provisions can be further classified into one of four subcategories. These include: (1) provisions mandating reporting to an independent organization; (2) provisions establishing an individual or joint committee who is responsible for facilitating the exchange of information between the parties; (3) reporting provisions obligating only one party to report to the other; and (4) provisions designating coordinators from each party who will facilitate the mutual exchange of information.

Three of the forty-eight agreements establishing accountability and reporting mechanisms mandate reporting to an independent organization. In two of the agreements the independent organization is established pursuant to the agreement, while the other requires reporting to certain members of pre-existing independent organization (i.e. the National Economic and Development Authority). All three of these agreements impose reporting requirements equally on each party to the agreement.

Next, twenty-three of the forty eight agreements designate an individual or joint committee to facilitate the exchange of information between the parties. The overwhelming majority of agreements falling into this subcategory establish a joint committee, comprised of representatives from each party, which will perform these tasks. While the title of this committee varies from provision to provision, the overall function of each committee is identical. Below is a representative example of one of these provisions:

> The Parties agree to establish a Joint Committee, whose tasks are:
>
> (a) to ensure the smooth working and proper application of this Agreement and of the dialogue between the Parties;

(b) to make suitable recommendations for promoting the objectives of this Agreement;

(c) to establish priorities for potential operations in pursuit of this Agreement's objectives.

The Joint Committee shall be composed of representatives of sufficient seniority of both Parties. It shall normally meet every other year, alternately in Vientiane and in Brussels, on a date fixed by mutual agreement. Extraordinary meetings may also be convened by agreement between the Parties.[44]

[44] Cooperation Agreement between the European Community and the Lao People's Democratic Republic (Ext. Ref. 2728).

In two of these agreements a single administrator is responsible for performing these functions. For example, one agreement stipulates that the "Administrator shall . . . send to each Party to this Agreement and to each other Party to the 1960 Agreement a report containing appropriate information with respect to the receipts and disbursements of, and balances in, the Indus Basin Development Fund and the Fund, the progress of the Project, and other matters relating to the Fund, the Project and this Agreement."[45]

[45] Tarbela Development Fund Agreement, 1968 (Ext. Ref. 1880).

The third type of accountability and reporting mechanisms in these agreements are the ones which require one of the parties unilaterally to provide information to the other. The two agreements which fall into this subcategory are agreements where one party requires, as a condition of providing assistance to the other party, access to certain types of information. In both instances, the United States is providing funding for projects benefiting developing countries.[46]

[46] See Basic Agreement Governing Grants by the United States of America to the United Nations (United Nations Trust Fund for Africa) (Ext. Ref. 1004); Strategic Objective Grant Agreement Between the United States of America and the People's Republic of Bangladesh for Improved Performance in the Energy Sector (Ext. Ref. 1578).

The remaining twenty reporting provisions require each party to make certain information related to the agreement available to the other parties. Nineteen of these require the parties to designate an internal coordinator "who shall be responsible for the program, schedule, coordination and reports."[47] Often, these provisions require the coordinators to meet on an annual basis to facilitate this objective.

[47] Renewable Energy Business Development Annex IV Cooperative Activities between the Department of Energy of the United States of America and the State Economic and Trade Commission of the People's Republic of China (Ext. Ref. 2500).

2. The International Project on Energy Commitments and Compliance (IPECC)[48]

ISEA is the first phase of a larger research initiative. This larger research program—IPECC—involves the construction of a comprehensive knowledge base and analytical compass that will monitor compliance with *both* legal and non-legal instruments, and other international decisions of multinational corporations. Such independent global monitoring will be conducted through an innovative and unique online compliance monitoring system. The system will be similar to Wikipedia, the well-known online encyclopedia, in that it will enlist and enable the participation a distributed group of dedicated individuals. Unlike Wikipedia, however, this will not be an open-access system, but rather will engage the participation of approved entities and individuals throughout the world. The system will offer publicly and freely available data facilitating the development and drafting of new and better international energy instruments and decision-making.

[48] A graphical overview of IPECC is available at http://www.colorado.edu/law/eesi/ipecc.pdf.

As the sister project of ISEA, IPECC is designed to improve and enhance the efforts of governments, non-governmental actors—such as corporations, NGOs, trade

unions, and churches—and key decision-makers throughout the world in two ways: First, by evaluating the extent to which their existing commitments and pledges are actually working; and second, by facilitating new and better clean and affordable energy solutions. IPECC premised on two interwoven assumptions. First, we need to find out what has already been done so as not to re-invent the wheel. Second, having found out what has been done we require a system that evaluates this information so as to avoid failed ventures and promote successful ones. Consequently, the IPECC is designed to track and monitor the implementation of sustainable energy commitments undertaken by governments, corporations and other entities, and to provide detailed information on the extent to which they are being complied with.

Thus, with respect to international instruments dealing with energy—including treaties, political commitments, government and private partnerships, and major private contracts—IPECC will provide relevant information and analysis facilitating: (1) A "bottom-up" sociopolitical mechanism for ensuring the successful implementation of, and compliance with, energy instruments by creating a global network of individual monitors committed to a sustainable energy future; (2) transparency and accountability with respect to actions (or lack thereof) taken pursuant to such instruments by governments, corporations and other entities; (3) identification of what has and has not worked with respect to the implementation of such instruments; (4) better decision-making based on reliable information, directed at replicating key successes while avoiding past failures in the development and deployment of sustainable energy technologies; and (5) efficiency improvements in current sustainable energy-related instruments.

Through the use of the innovative collaborative online monitoring system, ISEA/IPECC will create a global network of expert participants dedicated to monitoring and improving actions taken pursuant to international energy commitments. Project information, analysis and recommendations will also be made freely available through a public website and disseminated through annual reports.

The concept of using a controlled, collaborative online system to monitor, evaluate and influence actions taken pursuant to instruments of law and policy is without real precedent. Indeed, the use of collaborative technology platforms that enable users to easily add and manipulate centrally located data is in general fairly new. The well-known Wikipedia—a free online, collaboratively authored encyclopedia—was only launched in 2002. While projects such as Wikipedia harness the power of collaborative authoring in a way that is truly groundbreaking, they have also received extensive criticism regarding the quality and accuracy of the information they present. These projects are truly "open" in the sense that they allow literally anyone to contribute and edit data with few or no restrictions. IPECC differs from the "open" model in that only approved contributors or writers will be allowed to submit information into the system. Additionally, these submissions will enter into the public website only after they are reviewed and accepted by project editors.

ISEA and IPECC seek to provide the information needed to improve the effectiveness of existing commitments and encourage new commitments where necessary. Collectively, these projects are designed to track and monitor the

implementation of sustainable energy commitments undertaken by governments, corporations and other entities, and to provide detailed information on the extent to which they are being complied with. In doing so they will serve as a watchdog over what is and should be happening with respect to these instruments and the commitments they embody.

IV. RECOMMENDATIONS AND CONCLUSION

In the absence of truly massive amounts of clean and affordable energy, the ideal of sustainable development and the energy demands of a growing global population are incompatible. The challenge of sustainable development requires an unprecedented global deployment of new and existing clean energy technologies. If our society is to prove equal to this extraordinary challenge, laws and policies at all geopolitical levels will need to play a vital role in the rapid development of sustainable energy solutions. The International Project on Energy Commitments and Compliance—and its companion endeavor, the International Sustainable Energy Assessment—are designed to (and offered with ambition of) being an instrumental part of the global response to this challenge.

With respect to international sustainable energy agreements, the preliminary findings of these projects suggest to us the following recommendations for improving the effectiveness of such instruments—both regarding their own internal objectives (to the limited extent that they are made explicit) and our imposed, exogenous objective of addressing global energy security and climate change. International sustainable energy agreements *should*:[49]

1. Contain an express statement of the underlying issue or problem that the treaty is designed to address;
2. Endeavor to address the question of how to supply—through technology development and transfer—the legitimate demand of the developing world for affordable, plentiful and environmentally benign sources of energy;
3. Acknowledge and address the extent to which sustainable energy services have the potential to profoundly impact such key issues as poverty, health, education, environmental sustainability, gender equality, and so forth.
4. Provide methods for ensuring transparency and accountability with respect to what has (or has not) been done to achieve the agreement's objectives and address the concerns underlying its creation; and
5. Serve as coordinate parts of a cohesive, coherent and meaningful international response to the twin issues of global energy security and climate change.

There will always be the question of *why* countries abide by—and enter into—such commitments as those expressed in international treaties. For instance, are they doing so because of the effect of the treaty, or is the treaty merely an expression of preexisting will—making it an epiphenomenal expression devoid of real or

[49] As others throughout the ages have noted, the "should" does not alone ever compel an "is." Thus, while we offer these as general, preliminary normative recommendations (i.e., the "should"), the reality of context specific dynamics will ultimately dictate the extent to which these "shoulds" are—if at all—translated into the legal formality of an "is."

meaningful power? The approach adopted in the above projects—and the philosophical position on which these projects rest—assumes that the *why* is not as important as the *what*. The critical issue, as we see it, is not *why* countries act, but whether *what* they are doing is adequate to answering the issues and problems that precipitated their creation. With respect to international agreements that explicitly and substantially deal with sustainable energy, we find—as an impressionistic matter—that these agreements are not adequate to the task of addressing climate change or global energy security. Certainly, though, they were not designed with this ambition in mind. However, these treaties do express a burgeoning commitment by countries, developed and developing alike, to address a multitude of concerns via sustainable energy technologies and services. We contend that these formal commitments should be enhanced and woven into a larger collaborative fabric that is intended to serve as a coordinated response to global energy security.

The Clean Development Mechanism: Special Considerations for Renewable Energy Projects

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EXECUTIVE SUMMARY

This paper discusses the barriers and opportunities for renewable energy projects under the Kyoto Protocol's Clean Development Mechanism ("CDM"). An executive summary of the issues explored in the paper is provided below.

PART I: INTRODUCTION TO THE CDM

The CDM is intended to be, *inter alia*, a vehicle for investment and technology transfer (including the transfer of renewable energy technologies) into developing countries. Such investment would assist those countries to achieve "sustainable development" by enabling necessary economic growth whilst also reducing greenhouse gas emissions on a global level.

PART II: BARRIERS TO RENEWABLES IN THE CDM

The first year after the Kyoto Protocol's entry into force has revealed some hurdles in the operation of the CDM which renewable projects must overcome if the CDM is to be a meaningful driver for significant market growth of the renewable energy industry to meet the growing energy demand of developing countries in a sustainable manner.

The key barriers identified in this paper are discussed below.

- Due to the differentiated global warming potentials of greenhouse gases (carbon dioxide, which is displaced by renewable energy, being the least "potent" in terms of its global warming effect), the volume of emission reductions from renewable energy projects is much smaller per unit of output than the volumes created by projects which abate other greenhouse gases such as nitrous oxide, HFC or methane.
- Conversely, the equipment cost of most renewable energy projects is significantly higher per emission reduction than the cost of other types of potential CDM projects, such as agricultural methane flaring projects. The overall contribution of the revenue stream from Certified Emission Reductions (*CERs*) is therefore comparatively smaller for renewable energy projects than for other types of potential CDM projects. As the CDM is essentially a market, CDM project equity investors will tend to go to where "manufacturing costs" are cheapest and purchasers will tend to seek out a plentiful supply of CERs for minimum transaction costs. Renewable energy projects are therefore at a comparative disadvantage in the CDM compared to projects which reduce other types of greenhouse gases.
- In addition, renewable energy projects such as wind farms have a long operation life which (for projects being constructed today) will extend far beyond the Kyoto Protocol's first commitment period. Until very recently, there was a significant amount of uncertainty as to whether the Kyoto Protocol would be continued beyond its first commitment period (i.e. 2012). CER purchasers have therefore been reluctant to make binding commitments to purchase CERs post-2012, such that the financial incentive created by CERs has in many cases been insufficient to support renewable energy projects for their entire operational life.
- As a result, many renewable energy projects which may be eligible under the CDM have had difficulty attracting project finance to support the projects. CER purchasers have tended to restrict their involvement in CDM projects to a commitment to pay for CERs upon delivery, rather than provide financial support for the underlying project. Registration as a CDM project does not necessarily mean that a renewable energy project will achieve project finance and become operational. Issues such as perceived regulatory and political risk in developing countries and the higher level of technology risk involved in renewable energy projects (as opposed, for example, to traditional fossil fuel projects) have meant that those renewable energy projects which have achieved external finance have tended to be smaller scale projects, rather than projects to create the optimum number of CERs. In addition, local host country regulations (such as grid connection, distribution or electricity tariff arrangements)

may not provide renewable energy projects with the priority or support needed to make them feasible in the existing electricity market.

- Therefore, the transaction costs of developing these smaller scale projects as CDM projects (including the costs of external auditors, registration fees, consultants' fees and legal fees for the negotiation of CER purchase agreements and power purchase agreements) may be prohibitively high compared to the volume of CERs expected to be generated by the projects.
- Finally, there have been a number of "bottlenecks" and inefficiencies during the CDM project approval process, which have affected renewable energy projects amongst others. The CDM Executive Board (a number of part-time, unpaid government officials) has been stretched to capacity, and resources at the UNFCCC Secretariat have been insufficient to deal efficiently with the volume of CDM projects proposed. Because many renewable energy project developers cannot attract project finance until their project has achieved registration as a CDM project, delays at the Executive Board level have also delayed the rate at which renewable energy projects are actually commissioned.

PART III: STEPS ALREADY TAKEN TO ADDRESS THE BARRIERS

A number of important steps have already been taken which should mitigate some of the barriers discussed above. For example:

- The parties to the Kyoto Protocol agreed in Montreal in December 2005 to continue the Kyoto Protocol for a second commitment period, and to negotiate binding emission reduction targets for developed country parties. This should significantly reduce the uncertainty for CER purchasers and investors in potential CDM projects on whether CERs will have some value after 2012.
- A number of developing countries (such as China and Malaysia), when approving CDM projects, have given formal priority to projects which have a definite contribution to sustainable development in the country, including renewable energy projects. In addition, some CER purchasers, such as the Dutch and Austrian governments, have excluded projects without direct sustainable development benefits (such as HFC23 projects) from their portfolio criteria, or are prepared to pay a premium CER price for CERs from renewable energy projects. Such measures give renewable energy projects a comparative advantage against other types of CDM projects which may be able to create larger volumes of CERs for less investment.
- Many developing countries have realized that to attract the levels of investment in renewables required to achieve sustainable development, a

local regulatory framework in *addition* to the CDM that encourages the implementation of renewable energy projects (such as through renewable energy targets or preferential feed-in tariffs) is essential. For example, China and India have implemented local regulations providing preferential treatment to renewable energy projects. The CDM Executive Board has recognized that such regulations should not affect a project's eligibility under the CDM (i.e. that developing countries should not be "penalized" in terms of CDM investment because they implement laws and regulations designed to reduce emissions).

- The CDM rules now explicitly allow the "bundling" of projects to reduce transaction costs, including even the bundling of a number of large scale renewable energy projects. In addition, the parties to the Kyoto Protocol have agreed that renewable energy projects which are implemented as part of a government policy or "programme of activities" (e.g. the installation of solar lighting in a community or the financing of a number of biomass plants in rural areas) are eligible under the CDM. This additional flexibility in the CDM rules should both reduce transaction costs for renewable energy projects, and also enable some smaller scale projects which would not otherwise be feasible to be recognized under the CDM.
- Finally, the COP/MOP at Montreal approved a number of measures that should go some way towards addressing the resources and capacity difficulties experienced in the early years of the CDM.

PART IV: FURTHER OPPORTUNITIES TO IMPROVE THE PERFORMANCE OF RENEWABLE ENERGY PROJECTS UNDER THE CDM

However, notwithstanding the positive recent developments and alterations to the CDM rules discussed above, there are a number of opportunities to further improve the performance of renewable energy projects under the CDM by utilizing the existing rules. The opportunities discussed by this paper are:

- the development of a number of pilot renewable energy projects under the "programmatic CDM" guidance and the development of bundled renewable energy projects;
- how domestic CDM policies that implement CDM architecture and processes in host countries can be further enhanced to give priority to renewable energy projects;
- ensuring national regulations to promote renewables are complementary to the purpose of the CDM and that the necessary information to determine CDM project baselines (which, according to CDM Executive Board guidance must be a hypothetical scenario *without* the regulations) is publicly available for future project developers; and

- developing further opportunities for renewable energy project finance, both from CER purchasers (for example, through upfront payments, debt provision or equity investment) and also from external sources (such as China's Clean Development Fund or from traditional financiers such as the World Bank, the Asian and African Development Banks and from local financial institutions).

Finally, countries should consider how the CDM rules themselves could be amended to give special consideration to renewable energy projects and allow them to compete on a more level playing field for CDM investment.

PART V: CONCLUSIONS

Last year, the first year of the Kyoto Protocol's entry into force, saw a marked increase in the number of renewable energy projects registered under the CDM and also the identification of a number of inadequacies and inefficiencies in the CDM rules and market practice. Many of these inadequacies and inefficiencies are being addressed through amendments to the CDM rules, national regulations or market practice.

However, this year and next will determine the extent to which the modifications to such rules, regulations and market practice result in a significant increase in the number of commissioned renewable energy projects in developing countries. If there is such an increase, this will assist not only to enable developed countries to meet their Kyoto Protocol targets and reduce global greenhouse emissions, but will also contribute towards sustainable development in key developing country economies.

PART I: INTRODUCTION TO THE CDM

The Clean Development Mechanism (*CDM*) under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (*UNFCCC*) has the potential to be an effective tool in international law to encourage investment in renewable energy projects in developing countries.

The international legal framework for the CDM consists of the UNFCCC Article 12 of the Kyoto Protocol (*KP*) and the Marrakech Accords (*MA*). These international legal instruments, along with any rules developed by the CDM Executive Board (*EB*), decisions of successive Conferences of the Parties[1] and domestic host country requirements, provide the legal regime within which CDM projects are developed.[2]

Under the broader framework of the Kyoto Protocol, industrialized country parties to the Kyoto Protocol (*Annex I Parties*) agreed to binding emission reduction targets to be achieved during the first Kyoto Protocol commitment period (from 2008-2012). Developing countries have not undertaken binding emission reduction targets. However, as the climate change mitigation benefit of an emission reduction

[1] For example, the Land-Use, Land-Use Change and Forestry guidance issued at COP9.

[2] These rules can be accessed from the UNFCC web site at http://unfccc.int.

project is equal no matter where in the world that project is undertaken, it makes sense to allow emission reduction activities in developing countries to be counted towards achieving the overall Kyoto Protocol targets, thereby both:

- encouraging sustainable development and technology transfer in developing countries, some of which (e.g. China and India) are rapidly becoming major global economies; and
- allowing Annex I Parties to achieve their mitigation targets at least overall cost.

These ambitions constitute the primary purpose of the CDM.

The current form of the CDM, based on Article 12 of the Kyoto Protocol to the UNFCCC, emerged late in the negotiations at the third Conference of Parties to the UNFCCC from the proposal by Brazil for a "Clean Development Fund," whereby contributions from Annex I Parties would be utilized towards financing emission reduction projects in developing countries. Through the subsequent four years of negotiations, this concept metamorphosed into the current CDM, which allows projects in developing countries to create credits (*Certified Emission Reductions* or *CERs*) which can be purchased and utilized by Annex I Parties to meet their Kyoto Protocol emission reduction obligations.

The original vision of the CDM involved Annex I Parties or private entities from those countries actually financing and investing in emission reduction projects in developing countries in return for CERs from those projects. However, in practice, Annex I Parties and private entities have tended to avoid actually providing debt or equity to CDM projects – preferring instead simply to purchase CERs from such projects on delivery and leaving it to the local project developers to actually source project finance.[3] The difficulties that this trend has caused for renewable energy projects are discussed further in Part II.

[3] See, for example, UNEP Finance Initiative CEO Briefing January 2005: "Finance for Carbon Solutions", available at http://www.unepfi.org

One of the primary aims of CDM is to encourage sustainable development in non-industrialised countries. For such countries virtually without exception, providing their populations with access to electricity is a primary development objective. In order to have any chance of avoiding the predicted dangerous effects of human-induced climate change, it is essential that a large part of the demand for electricity in developing countries is met with renewable energy supply.

Renewable energy should therefore be a key component of any global climate change strategy, and should be an important focus of the CDM.

PART II: BARRIERS FOR RENEWABLES UNDER THE CDM

This part identifies a number of hurdles to the operation of the CDM, which renewable energy projects must overcome if the CDM is to assist significant market penetration of renewables in the global energy mix.

Relatively High Equipment Cost and Low CER return

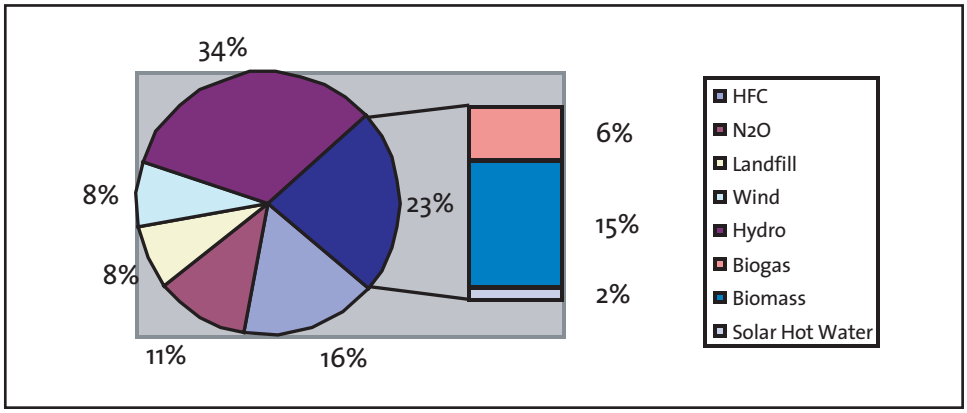
During the Kyoto Protocol negotiations, a range of NGOs and stakeholders suggested that eligibility under the CDM should be restricted to an exclusive positive list of renewables and demand-side energy efficiency technologies.[4] Their argument was that such projects should be "deemed" to comply with the CDM eligibility criteria (i.e. additionality), or at least that such criteria should be less strict in respect of such projects. Ultimately, the "positive list" approach was not adopted by the Kyoto Protocol parties. Rather, any project which reduces emissions can be eligible under the CDM, provided that it meets certain criteria.

This has meant that renewable energy projects have needed to "compete" for CDM investment with projects that create much larger volumes of emission reductions (and therefore CERs), for a smaller project investment.[5] For example, a 50MW wind farm in India (a large scale wind farm, compared to the size of most wind farms which have been successful in attracting project finance, due to perceived technology risk) is estimated to cost around US$58 million to develop and create around 112,500 CERs per year.[6] On the other hand, two HCFC22 plants in China, from which the World Bank's Umbrella Carbon Fund purchased HFC23-based CERs in December 2005, is expected to generate *19 million* CERs per year.[7] HFC23 destruction technology is generally much less cost-intensive than wind farm turbines.

As indicated by the graph below (which is based on the information publicly available on the CDM web site), a number of renewable energy projects have successfully navigated the CDM project cycle to achieve registration. In fact, in January 2006, the majority of registered CDM projects were projects involving the generation of renewable energy.

However, as a result of the relatively "small" global warming potential of carbon dioxide compared to other greenhouse gases and the high equipment cost of renewables, the increase in IRR from the sale of CERs from a CO_2-based renewable energy project (estimated at around 1%, assuming a US$6 CER price)[8] is significantly less than the increase in IRR from a project involving other greenhouse gases (such as landfill methane capture).

Figure 1 Registered CDM Project Type: January 2006



[4] See, for example, the Climate Action Network's CAN Climate Negotiations Newsletter Eco 4 – June 12, 2000: http://www.climatenetwork.org/eco/sb/sb12/eco4_0600.html

[5] See, for example, Hanh, Michealowa and de Jong, "From GHGs Abatement Potential to Viable CDM Projects", Hamburg Institute of Economics, HWA Report 259, 2006

[6] Senergy Global Pvt Ltd. "Unilateral CDM Project: Project Developer's perspective and Financial Structuring", presentation by Chintan Shah see http:www/carbonfinance. org, "A big step for Chinese emissions trading"

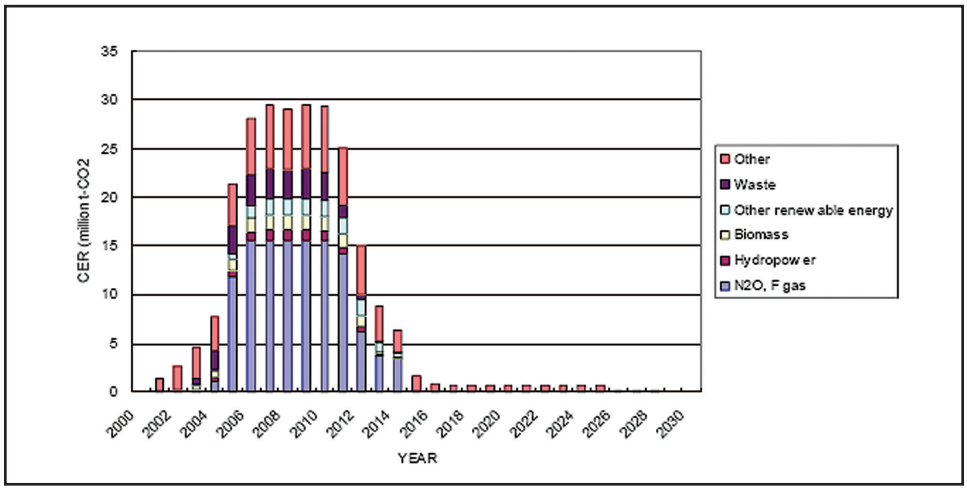
[7] see http:www/carbon finance.org, "A big step for Chinese emissions trading"

[8] "CDM in the Post Kyoto Regime: Incentive Mechanisms for developing countries to promote energy conservation and renewable energies" Workshop Issue Paper March 22 and 23, 2005, Taishi Sigiyama, Kenichiro Yamaguchi and Hiroshi Yamagata.

The significant majority of CERs from registered projects (estimated on the basis of public project design documents) will in fact come from the smaller number of HFC and N2O projects.

[9] Ibid note 5 – original source, Mitsubishi Research Institute

Figure 2 Forecast CERs accrued from submitted CDM Project (by Project Type)[9]



As the CDM is at its essence a market, the high volumes of CERs which can be created by industrial chemical projects (such as HFC23 and N_2O reduction projects) will directly impact the market price of CERs. There is no legal distinction between CERs created from renewable energy projects or from industrial chemical projects, so renewable energy projects are at a comparative disadvantage to other types of potential large-scale CDM projects.

The international community has specifically refrained from differentiating renewable energy projects from other types of emission reduction projects under the CDM rules. Therefore, it will be CDM host countries which will bear the responsibility of addressing this comparative disadvantage, through, for example, the CDM approval process and through implementing local regulations to encourage renewables.

Insufficient Regulatory Certainty to Guarantee CER Revenue Stream for the Operational Life of Renewable Energy Products

Renewable energy projects such as hydropower and wind projects often have a significant economic lifespan (between 20 and 30 years).[10] The first commitment period of the Kyoto Protocol (which is the purpose for which CERs are currently being purchased by developed countries and companies) expires in 2012.

[10] See, for example, "Hydroelectric Power in Hawaii, a Reconnaissance Survey" 1981 available at http://www.state.hi.us/dbedt/ert/hydropower-81.html

Therefore, a renewable energy project which has just achieved CDM registration and is currently being constructed (expected to be commissioned in 2007) will have an economic life of up to 25 years longer than the period for which CER purchasers are currently purchasing. Most CER purchasers are reluctant to commit to binding obligations post-2012. However, if a renewable energy project has obtained

registration on the basis of an "investment barriers" analysis,[11] then this may mean that the small IRR increase from the sale of CERs (e.g. 1%) is the only element which makes the project financially feasible and pushes the project over the investment criteria threshold.

If it seemed likely that this additional 1% CER revenue would only be available for the first five years of the project's life, project developers may consider that this is not enough certainty on which to base the significant financial outlay to construct the project.

The issue of the future market value of CERs (and indeed, whether or not a second Kyoto Protocol commitment period is agreed) is largely dependent on international politics, including whether Russia chooses to release its AAUs to the market, and whether Kyoto Protocol parties such as the European Union, Japan and Canada are able to agree on binding emission reduction targets. However, the December 2005 meeting of parties to the Kyoto Protocol provided greater certainty that the CDM will continue beyond 2012, as discussed in the following part.

Local host country regulations (and regulatory uncertainty) will also be crucial to the feasibility of a renewable energy CDM project. If a host country has implemented long term regulations to encourage renewable energy projects, which are expected to continue for the economic life of renewable energy projects being built today, this will have a greater effect on the investment analysis of a project than the international politics surrounding the Kyoto Protocol. Conversely, if local regulations present barriers to renewable energy projects, such as an inability to obtain grid access or environmental approvals, this will essentially prohibit the growth of the renewable energy industry in that region. As discussed further below, domestic regulations encouraging renewable energy projects do not, under the international rules, impact on the additionality analysis of a CDM project. Therefore, domestic regulations to encourage the CDM may in fact enable renewable energy projects to overcome many of the barriers identified in this paper, by providing a comparative advantage to renewable energy projects in certain countries or regions without affecting their eligibility to access credits under the CDM.

Difficulty Attracting Project Finance

Although the initial concept of the CDM envisioned developed countries providing technology transfer to developing countries (and therefore taking some type of debt or equity investment), until recently CER purchasers, even where those purchasers are financial institutions, have largely tended to limit their involvement in the project to being an offtaker of CERs, with payment to be made upon delivery, rather than providing project finance or becoming an equity participant in the project. This has been due to a number of reasons, including the concern that the Kyoto Protocol may not enter into force and the issue of political and regulatory risk in the CDM host country. In addition, with renewable energy projects in particular, some types of renewables carry a perceived technological risk, which may make investors cautious to support these projects compared to more "basic" CDM projects such as gas flaring.

As a result, it has largely been up to local project developers to initially finance their projects off the books or to seek traditional project finance from local banks and

[11] One of the means of proving additionality, according to the Executive Board's "Tool for the Demonstration and Assessment of Additionality" available at http://cdm.unfccc.int/

investors. Many renewable energy projects which have signed CER purchase agreements and/or achieved registration as CDM projects have in fact been unable to achieve financial close.[12]

[12] See, for example, "Financing Renewable Energy in Emerging Markets – Opportunities and Approaches", Frank Joshua, Climate Investment Partnership, presentation to Workshop on Innovative Options for Promotion and Transfer of Technologies, Montreal, December 2004

Traditionally, most renewable energy projects are developed or financed by the private sector. It is only when the private sector has sufficient incentive to invest in renewables that renewable energy technology will achieve the depth of energy market penetration necessary to reverse the global trend of rising emissions.

In countries where access to fossil fuels is cheap and plentiful, the success of encouraging private sector investment to certain types of renewable energy projects (such as solar and wind) is almost entirely dependent on national or regional renewable energy policy and regulation. However, by creating an additional "commodity" for renewable energy projects in terms of CERs (and thereby an additional revenue stream for the project), the CDM creates an additional financial incentive for renewable projects in *any* developing country party to the Kyoto Protocol. The value of CERs is not contingent on the location of the relevant CDM project, so therefore the comparative advantage of CDM projects in different countries is based on local regulations and political and regulatory risk considerations.

As an instrument of international law, the Kyoto Protocol operates only to create legal obligations for nation states (and not for individuals or private entities). However, to achieve sufficient volumes of abatement without significant government subsidies requires substantial involvement of the private sector.

The CDM therefore explicitly allows Kyoto Protocol parties to approve participation of public and/or private sector entities in CDM projects. In fact, the majority of registered CDM projects to date have been largely private sector-driven. Almost all developing countries have encouraged the involvement of the private sector in CDM projects, with only a few countries (e.g. China) placing limits on the identity and nature of entities eligible to create and sell CERs. However, unless there is sufficient local regulatory support for renewable energy projects to support private sector financing of such projects, the CDM alone is unlikely to create a significant and robust renewable energy market.

High Transaction Costs

Obtaining registration as a CDM project and verification of CERs can involve significant transaction costs, including the commissioning of consultants and lawyers, the payment of auditors (*Designated Operational Entities*) and the payment to the Executive Board of a fee upon registration and issuance of CERs.

Although some effort has been made by the parties to the Kyoto Protocol to reduce costs for small scale projects, economies of scale generally mean that costs (other than Executive Board fees) do not significantly increase as the volume of CERs increases, so renewable energy projects expected to generate a relatively small number of CERs may find the CDM transaction costs prohibitive.

For example, EcoSecurities has estimated that the consultancy costs for project assessment and completion of the project documentation necessary to register a large

scale (i.e. >15 MW) renewable energy project range between £23,000 and £122,000,[13] plus additional fees for the Designated Operational Entity's validation and verification. The Executive Board will also require payment of US$21,000 upon registration of such a project to cover administrative expenses, plus US$0.20 per CER issued (with a discount of US$0.10 for the first 15,000 CERs issued each year). For a 50MW renewable energy plant expected to produce around 112,500 CERs per year, the transaction costs can eat away much of the first year's expected CER revenues from the project.

[13] See UK Climate Change Projects Office Guide "Carbon Transaction Costs and Carbon Project Viability"

Bottlenecks and Inefficiencies in the CDM Project Cycle

The first year of CDM operation saw the Executive Board and the UNFCCC secretariat stretched beyond capacity, endeavouring to deal with an ever-growing number of proposed projects and methodologies on an extremely limited budget.

Some market participants have claimed that bottlenecks and administrative inefficiencies have arisen in the following contexts:

- irregularity of EB meetings;
- delays in, and inconsistency surrounding, approval of methodologies;
- registration of projects and a disproportionate number of requests for review;
- the Executive Board's stringent interpretation of "additionality," requiring project developers to prove that they had always intended to implement the project as a CDM project;
- failing to streamline the approval processes for small-scale projects;
- delays in the establishment of the International Transaction Log (which will enable emissions trading of CERs).[14]

[14] See, for example, "Strengthening the CDM", IETA position paper for COP/MOP1, available at http://www.ieta.org/ieta/www/pages/getfile.php?docID=1132

Whilst it is beyond the scope of this paper to deal with any of these issues in great detail, it is worth noting that any emerging market experiences "growing pains" in its first few years of operation, and that many of the perceived inefficiencies or difficulties with the operation of the CDM are likely to be mitigated as all stakeholders gain greater experience in the project cycle, and precedents are developed to look to when difficulties arise.

PART III: STEPS ALREADY TAKEN TO ADDRESS THE BARRIERS

A number of important measures have already been taken by the international community, CER purchasers and CDM host countries, to address and mitigate the barriers described in the previous part. These are discussed below.

Continuation of the Kyoto Protocol

The parties to the Kyoto Protocol agreed in Montreal in December 2005 to continue the Kyoto Protocol for a second commitment period, and to negotiate binding

emission reduction targets for developed country parties during such period. This should provide some much needed certainty for CER purchasers and investors in potential CDM projects that CERs will have some value after 2012.

Preferential Treatment of Renewable Energy Projects in the CDM Approval Process and the Purchase of CERS

As discussed previously, the CDM is essentially a compliance market, and in the absence of government intervention or buyer preference, capital investment will tend to focus around projects where CER creation is cheapest and most plentiful (being industrial gas projects such as HFC and N2O projects).

However, host country governments have sole discretion to influence the conditions on which they will approve certain types of CDM projects, as it is a prerequisite to registration of a CDM project that the project has been approved by the host country as contributing towards "sustainable development." As discussed below, most host countries have identified renewable energy as a key contributor towards sustainable development. On the other hand, industrial gas projects such as HFC23 abatement projects, provide limited or no local environmental or social benefits in the host country.

A number of developing countries (such as China and Malaysia), when approving CDM projects, have given formal priority to projects which have a definite contribution to sustainable development in the country, including renewable energy projects.

In addition, some CER purchasers, such as the Dutch and Austrian governments, have excluded projects without direct sustainable development benefits (such as HFC23 projects) from their portfolio criteria, or are prepared to pay a premium CER price for CERs from renewable energy projects.

Such measures attempt to put renewable energy on a more level playing field with other types of CDM projects which may be able to create larger volumes of CERs for less investment.

Local Regulation Supporting Renewable Energy Products

The CDM is designed to encourage the dual goals of global reduction in emissions and sustainable development for developing countries. Renewable energy could be one of the major contributors to sustainable development, reducing developing country reliance on (often expensive and imported) fossil fuels such as coal, oil and diesel, whilst also assisting to meet the growing energy demand.

The Kyoto Protocol recognises the importance of renewable energy as a contributor to the mitigation of climate change, providing in Article 10 that:

> all Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances . . . shall . . . formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change . . . [including] the energy, transport and industry sectors . . .

Although renewable energy is not specifically mentioned in the CDM, many developing countries have made it a cornerstone of their national and regional development priorities. China and India, two developing economies expected to grow exponentially over the next decade, have developed a range of policies and procedures to integrate renewable energy into the mainstream energy mix.

For example, Chinese President Hu Jintao stated late last year:

> China attaches great importance to the utilization and development of renewable energy and considers it as one of the most important instruments to promote socio-economic development.[15]

China's Vice-Premier Zeng Peiyan elaborated:

> Chinese government has attached great importance to the development and utilization of renewable energy, listing it as an important task to fasten the development of renewable energy including wind, solar, biomass and others during the period of the Eleventh Five-Year Plan. Therefore, we will take series of measures to develop and utilize renewable energy vigorously. First of all, specific development goals will be set. By 2020, the renewable energy is planned to take 15% of the total energy supply.[16]

[15] Letter from President Hu Jintao to the Beijing International Renewable Energy Conference 2005, dated 6 November 2005.

[16] Keynote address to the Beijing International Renewable Energy Conference 2005, 7 November 2005

India has also recognized the importance of renewable energy in achieving sustainable development. In his 2005 Independence Day address to the nation, India's President stated:

> Energy is the lifeline of modern societies. But today, India has 17% of the world's population, and just 0.8% of the world's known oil and natural gas resources. We might expand the use of our coal reserves for some time and that too at a cost and with environmental challenges. The climate of the globe as a whole is changing. Our water resources are also diminishing at a faster rate. As it is said, energy and water demand will soon surely be a defining characteristic of our people's life in the 21st Century . . .
>
> . . . It would be evident that for true Energy Independence, a major shift in the structure of energy sources from fossil to renewable energy sources is mandated.

Many other developing countries, as well as China and India, have recognized that the CDM alone is insufficient to create enough incentive for the volumes of renewable energy projects required to significantly change the energy mix in the manner necessary to avoid unsustainable long-term reliance on fossil fuels. National and regional renewable energy regulation is also a necessary part of the policy mix.

Many developing countries have begun to develop renewable energy policies to encourage renewable energy projects, including:

- feed-in tariffs;
- market-based renewable energy instruments;

- renewable energy targets;
- tax incentives;
- government financial support.

A comparative analysis of various national renewables regulations is beyond the scope of this paper.[17] However, it is important to develop procedures and international regulations to ensure that developing countries which implement national regulations to support renewables and encourage sustainable development are not disadvantaging their prospects of attracting CDM investment by negating the "additionality" of renewable energy projects. National renewables policies and regulation should be complementary to, not inconsistent with, the CDM.

[17] However, we note that the CCLaw Assist project, sponsored by the UK Foreign and Commonwealth Office and conducted by Baker & McKenzie and Institute of Development Studies is in the process of creating a guidebook which will compare and contrast the national regulations in the five key CDM jurisdictions of Brazil, China, India, Mexico and South Africa.

Aligning National Regulations with the CDM Additionality Requirements

One of the key criteria under the international rules for eligibility under the CDM is "additionality." Before a CDM project can be registered as eligible to create CERs, it must first prove that the project will reduce emissions below the projected emissions in the most likely scenario without the project (the *Baseline*). A CDM project activity must generate emission reductions that are "additional" to those which would have occurred in the absence of the project activity (the *Additionality* requirement).

Only once the Executive Board has accepted the Baseline for the project and is satisfied that the project fulfils the Additionality criteria will the project be eligible to generate CERs, which are measured and verified by independent auditors in accordance with agreed standards and criteria under the international rules. Each CER represents one tonne of carbon dioxide equivalent abated by a project activity below the approved Baseline.

The requirement to prove Additionality, and the procedure for doing so, has been a contentious aspect of the CDM.[18] The "additionality tool" created by the CDM Executive Board, specifically requires project developers to prove that registration of a project (including a renewables project) under the CDM would allow the project to overcome barriers which would otherwise prevented the project, such as:

[18] Ibid note 12.

- financial barriers to investment (i.e. the CER revenues will allow the project to attract investment, based on expected rate of return)
- technological barriers (i.e. limited local skills or knowledge on the operation of the technology, reluctance of banks to provide debt funding to perceived "risky" technologies
- barriers due to prevailing practice (i.e. the project is the "first of its kind" in the host country)[19]

[19] See Annex 8 to the Executive Board's 22nd meeting in Montreal, December 2005 http://cdm.unfccc.int/EB/Meetings/022/eb22_repan8.pdf

On the basis of this assessment (considered in further detail below), the CDM will allow renewable energy projects to occur which are "additional" to those which would have occurred in developing countries in a business-as-usual scenario. That is, the effect of the CDM should be to increase investment in renewables over and above the investment which would have otherwise occurred.

However, there was initially some hesitation by developing countries when considering whether to implement regulation or policy designed to encourage renewables could in fact "jeopardize" the ability of renewable projects in those countries to become CDM projects. For example, the argument was made that, if China implemented a preferential feed-in tariff for renewable energy projects (as is envisioned by China's Renewable Energy Law), then this would mean that renewable energy projects would become comparatively more financially attractive, and therefore may have difficulty passing the "additionality" test established by the CDM Executive Board.

There was a concern that this could create a perverse incentive for developing countries, in that they may be reluctant to pass laws or policies encouraging emission reductions for the fear that such laws may negate the additionality of future projects, and thereby reduce foreign investment and technology transfer into the country.[20]

Such a result would obviously be politically undesirable. The CDM Executive Board has recognized this potential disincentive and addressed it at its 16th meeting, in a decision titled "*Clarifications on the treatment of national and/or sectoral policies and regulations (paragraph 45(e) of the CDM Modalities and Procedures") in determining a baseline scenario.*"[21] It subsequently provided further guidance at its 22nd meeting in Montreal, Canada.[22]

The Executive Board has provided that, as a general principle, national and/or sectoral policies and circumstances are to be taken into account on the establishment of a baseline scenario, without creating perverse incentives that may impact host countries' contributions to the ultimate objective of the climate change convention.

The Executive Board agreed to differentiate ways to address the following two types of national and/or sectoral policies in determining a baseline scenario[23] (i.e. assessing the eligibility of a project and its "additionality" under the CDM rules:

- Existing national and/or sectoral policies or regulations that create policy driven market distortions which give comparative advantages to *more* emissions-intensive technologies or fuels over less emissions-intensive technologies or fuels (e.g. national fossil fuel subsidies) (type "E+").
- National and/or sectoral policies or regulations that give positive comparative advantages to *less* emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs) ("type "E-").

The Board determined that only type E+ policies (i.e. policies which encourage more emissions-intensive technologies) implemented *before* the adoption of the Kyoto Protocol shall be taken into account when developing a baseline scenario. If these policies were implemented since the adoption of the Kyoto Protocol in 1997, the baseline scenario should refer to a hypothetical situation without the relevant national and/or sectoral policies or regulations being in place.

For type E- policies (i.e. policies which encourage *less* emissions-intensive technologies), any such policies which have been implemented since the adoption of

[20] For example, see the presentation by Berliner Energieagentur GmbH to the Conference on Financing Renewable Energy in China, May 2005 http://www.erec-renewables.org/documents/China/presentationsBrussels/MB_SYNERGY_EU_China_partnership_project.pdf

[21] http://cdm.unfccc.int/EB/Meetings/016/eb16repan3.pdf

[22] http://cdm.unfccc.int/EB/Meetings/022/eb22_repan3.pdf

[23] "National and/or sectoral policies" are defined as: (1) Policies and regulations decided and published by local and/or national authorities of the host Party(ies), or (2) Policy driven market distortions resulting from decisions taken by local or national public authorities of the host Party(ies).

the Marrakech Accords (November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place).

The renewable energy laws and policies being implemented by the Chinese and Indian governments would be considered "Type E-" for the purpose of the Executive Board's decision, so would not need to be taken into account when developing a baseline.

As discussed above, the dissemination of renewables in developing countries (one of the key desired outcomes of the Renewable Energy and International Law Project) is likely to require local laws and policies in developing countries to support renewables over and above the incentives provided by the CDM. It is important, therefore, that such local laws and policies do not negate the ability of a project to qualify under the CDM. The CDM Executive Board has provided that this should not be the case.

Use of CDM Projects to Support Sustainable Development Goals

Under the Marrakech Accords, the goal of sustainable development is mandatory for CDM projects. However, it is left up to individual DNAs to determine the sustainable development criteria and to approve or deny projects based on those criteria. This has been challenging as some of the easiest projects to implement with the largest volumes of CERs, such as HFC-23 projects, arguably offer few local development benefits to host countries. In addition, the low cost and high yield of HFC-23 projects renders them relatively more attractive to CDM investors than renewable energy projects, placing the latter at a comparative disadvantage in terms of attracting investment. This outcome is clearly undesirable from a sustainable development perspective.

One innovative way to approach this problem is to create a domestic regulatory environment in which the sale of CERs from projects with lower development benefits are taxed at a higher rate than those with larger benefits. The revenue created can then be invested in a fund that would be used to advance sustainable development goals.

A system like this is currently in place in China, where the proceeds from CER sales from HFC-23 projects are taxed at 65%, N_2O are taxed at 30% and priority projects (including renewables) and others are taxed at 2%. In addition to creating revenue for sustainable development, this tax structure displaces the comparative disadvantage of renewable energy projects, which are in themselves preferable to HFC-23 projects in terms of meeting the host country's sustainable development goals.

Given that renewable energy is high on China's list of sustainable development priorities, and that two HFC23 projects in China *alone* created US$930 million of CER revenues (i.e. US$604.5 million in taxes),[24] the amount generated into this fund is expected to be significant. To put the level of this fund in perspective, *global* investment in renewable energy in 2004 was estimated at a record level of US$30 billion.[25] If the Chinese government invested the CDM tax on the two HFC23 projects in renewable energy projects, this would constitute around 2% of the global annual investment for renewable energy. There is therefore a tremendous opportunity for

[24] See "Big Chinese Step in Carbon Emissions Trading": HFC23 project combines major carbon emission reductions and sustainable development benefits: World Bank press release 2006/224/ESSD

[25] See "Renewables 2005 Status Report" published by the Renewable Energy Policy Network for the 21st Century (REN21) and available at www.ren21.net.

China to provide financial support to renewable energy projects through its sustainable development/CDM fund, and potentially for the global renewable energy industry to influence the investment priorities of the fund, which is currently being established.

Bundling of Projects and Programmatic CDM

The decisions taken at COP/MOP1 Montreal formally recognized that

> a local, regional, national policy or standard cannot be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity.[26]

[26] Further Guidance Relating to the CDM, paragraph 20.

The inclusion of "programmatic CDM" activities creates a valuable opportunity for a whole range of renewable energy projects, including those smaller scale and micro-projects (such as the installation of PV solar panels in residential housing) which would not otherwise generate the volume of CERs necessary to make the CDM transaction costs worthwhile.

In addition, the programmatic CDM provides important incentive for developing countries to pursue local, regional or national policies and measures in the renewable energy field.[27]

[27] See "Policies and Programs under the CDM", presented by Christiana Figueres at COP/MOP1.

A CDM program is one in which emission reductions are achieved by multiple activities executed over time as a result of a government measure or private sector initiative. Generally, a CDM program would have the following characteristics:

- it occurs as the result of a deliberate public sector measure (voluntary or mandatory) or a private sector initiative; and
- it results in a multitude of dispersed activities (potentially over a number of time periods and locations) that would not occur but for the implementation of the program.

The CDM rules would require the program of activities to be submitted as a single project activity (e.g. conversion of local diesel generators in remote communities in Eastern China to biomass generators), through the submission of a single project design document.

As of the date of this paper, there are a number of "programmatic CDM" activities that have achieved registration. For example, the World Bank's Community Development Carbon Fund has purchased CERs from a registered CDM project in Moldova which involved the implementation of renewable energy projects and fossil fuel switching to biomass in 120 public, residential and commercial buildings in Moldova.[28] The project involved three separate Baseline methodologies for the different types of activities being implemented under the program. The project is expected to create 17,888 CERs per annum.

[28] See http://cdm.unfccc.int/Projects/DNV-CUK113398 5755.59/view.html

In addition to programmatic CDM, the CDM rules also allow the "bundling" of similar projects in the one registration process, to minimize transaction costs. Even large scale projects can be bundled. Bundling can create an opportunity for renew-

able energy project developers with a portfolio of projects in the same country to minimize the CER transaction costs involved in developing each project individually as a CDM project.

Addressing Resources Issues of the CDM Executive Board and Secretariat

A number of important steps were taken in Montreal to assist in remedying the difficulties experienced in the CDM project cycle due to the sparse resources allocated to the Executive Board and UNFCCC secretariat.

Specifically, Executive Board members will receive per diem remuneration for their services provided and the UNFCCC secretariat will be significantly bolstered to provide administrative support to the Executive Board, with the Executive Board taking on more of an "executive" oversight role. Annex I country financial support is expected to be forthcoming to assist the streamlining of the CDM project cycle. In addition, the COP/MOP approved a share of proceeds for administration of the CDM, being US$0.20 per CER issued, with the first years' payment in advance.[29] As more CERs are issued, this should assist to ease the pressure on resources at the secretariat and Executive Board level, and hopefully remedy some of the "bottlenecks" that have arisen in the CDM project cycle.

[29] with a discount of US$0.10 for the first 15,000 CERs issued each year.

PART IV: FURTHER OPPORTUNITIES TO IMPROVE THE PERFORMANCE OF RENEWABLE ENERGY PROJECTS UNDER THE CDM

As discussed in the previous part, significant progress has been made over the past year in terms of addressing barriers and creating opportunities for renewables under the CDM. However, there is room for further improvement and action which will further increase the capacity of renewables to contribute to the CDM. Some of the primary opportunities are discussed below. However, during the course of this year, as some of the modifications to the CDM rules and national regulation to support renewables are implemented in practice, it is likely that further opportunities will be identified.

Further Development of Programmatic CDM Projects

As discussed above, the CDM rules have been clarified to expressly allow programmatic CDM projects. This creates an important opportunity for renewable energy policies and programs to be recognized under the CDM. In particular, programmatic CDM may create opportunities for micro-renewables (such as community PV projects) to generate CERs and attract carbon finance. However, the development of such projects would require significant coordination in terms of tracking the implementation of the program and the number of emission reductions achieved. In addition, the Baseline for a programmatic CDM project may involve a number of project methodologies.

Organisations with the capacity to effectively implement programmatic CDM, such as local governments, may not be aware of the opportunities created for them

under the CDM, nor may they have the technical capacity to develop effective Baselines without consulting with experts. There is therefore an opportunity to build the capacity of local and regional governments (for example, the local and regional governments in China charged with developing renewable energy policies under China's National Renewable Energy Law) to recognize the opportunities for programmatic CDM to assist them to generate additional revenue, which could be used to finance the costs of the project.

Use of Domestic Policy and Regulation to Prioritise Renewable Energy Projects

Domestic policy and regulation that makes up the CDM architecture of a host country government can be crucial in determining investment priorities for CDM projects. Initiatives may be either market-based or legal; restrictive ("pull") or incentive-based ("push"). For example, countries may implement mandatory targets which oblige a certain percentage of approved CDM projects to be renewable energy related. Alternatively, host countries may offer grants, subsidies or tax incentives to renewable energy projects to encourage their implementation in the place of other projects with low development benefits. China's original tax-based approach to this issue was discussed above, but several other domestic programs and incentives could be effective.

Gathering Public Information on Baselines without "E+" Regulations

As discussed above, the CDM Executive Board has provided that national or regional regulations with the effect of favouring projects which reduce emissions (including, for example, China's Renewable Energy Law), should *not* be taken into account when developing a project Baseline (i.e. they should not impact Additionality). It is perhaps, however, easier said than done to calculate a project baseline in a "hypothetical scenario" without certain laws or policies ever having entered into effect.

The current CDM rules require each Baseline to be "project-specific." Developing a renewable energy project Baseline will require a range of factors, such as the emissions intensity of power generation in the most likely scenario without the project. If the national renewable energy policy regulations are successful, they may result in a decrease in the emissions-intensity of electricity generation in the country. Theoretically, this decrease should *not* be taken into account when developing baselines for renewable energy projects.

It may be difficult for individual project developers to develop the hypothetical baseline emissions for local, regional or national electricity generation projections. Because many developing countries do not yet have in place the types of sophisticated national greenhouse inventories required for the Kyoto Protocol's developed country compliance assessments, there may be a paucity of information available to assist project developers to develop their Baselines in accordance with the Executive Board guidance.

Further Opportunities for Project Finance

Finally, as discussed above, difficulties obtaining project finance (as opposed to mere CER offtake arrangements) has been one of the key barriers to the commissioning of renewable energy CDM projects.

The ability to obtain project finance will depend on a large number of factors, including:

- host country regulation and perceived regulatory and political risks;
- market price for electricity and CERs (and the impact this has on the investment analysis of a project); and
- the familiarity and level of comfort of local and international banking institutions with the CDM as an additional revenue aspect of renewable energy projects.

Although there is no published market price for CERs, it is generally accepted that the market price has increased significantly over the past year since the entry into force of the Kyoto Protocol and the European Union's Emissions Trading Scheme (which recognises CERs as a compliance tool). On the other hand, CER purchasers have commented that there is a scarcity of feasible CDM projects, meaning that demand currently outstrips supply.

The current state of the CDM market has meant that CER purchasers have begun to move away from the traditional "pay on delivery" arrangements that were common in the pre-Kyoto market to packages more attractive to CDM project developers, including:

- upfront payments for some or all of the CER market value;
- the provision of a loan to the project, with repayments of principal plus interest to be set off against payments owing for delivered CERs; and
- buyers working together with banks (e.g. Japan Carbon Finance Ltd. and Japan Bank of International Cooperation) to offer bundled CER offtake and project finance.

Whilst this is a positive step for CDM projects, given that renewable energy projects have longer commissioning periods and generate relatively smaller numbers of CERs than, for example, methane capture and combustion projects, such arrangements may not be as forthcoming for renewable energy projects.

In addition, there is often a lack of familiarity amongst traditional financiers (including local banks in the host country) with the risks of renewable energy technology and the workings of the CDM. Given the undoubted social and environmental benefits of renewable energy, there is therefore an opportunity to build the capacity of such financiers to understand the opportunities offered by renewable energy projects under the CDM. In addition, there may be an opportunity for larger multilateral lenders, such as the World Bank or the Asian Development

Bank, to assist local banks to finance renewable energy projects, by "buying out" the difference between the local banks' acceptable risk/return margin, and the margin presented by renewable energy CDM projects.

Finally, countries should consider how the CDM rules themselves could be amended to give special consideration to renewable energy projects and allow them to compete on a more level playing field for CDM investment.

PART V: CONCLUSIONS

The CDM can be an effective tool to complement other national and regional regulatory frameworks to encourage the market for renewable energy.

Last year, the first year of the Kyoto Protocol's entry into force, saw a marked increase in the number of renewable energy projects registered under the CDM and also the identification of a number of inadequacies and inefficiencies in the CDM rules and market practice. Many of these inadequacies and inefficiencies are being addressed through amendments to the CDM rules, national regulations or market practice. This year and next will determine the extent to which the modifications to such rules, regulations and market practice result in a significant increase in the number of commissioned renewable energy projects in developing countries.

This paper has also identified a number of further opportunities to increase market penetration of renewable energy projects under the CDM. Such an increase will assist not only to enable developed countries to meet their Kyoto Protocol targets and reduce global greenhouse emissions, but will also contribute towards sustainable development in key developing country economies.

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WTO Disciplines and Biofuels: Opportunities and Constraints in the Creation of a Global Marketplace

BY IPC AND RENEWABLE ENERGY AND INTERNATIONAL LAW (REIL)*

*This paper is a summary of the October 2006 International Food & Agriculture Trade Policy Council (IPC) Discussion Paper, "WTO Disciplines and Biofuels: Opportunities and Constraints in the Creation of a Global Marketplace." The summary was written by Jennifer Haverkamp of Renewable Energy and International Law (REIL), with support from the United Nations Foundation.

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EXECUTIVE SUMMARY*

This paper is an abridged version of "WTO Disciplines and Biofuels: Opportunities and Constraints in the Creation of a Global Marketplace," issued by the International Food & Agricultural Trade Policy Council (IPC) and Renewable Energy and International Law (REIL) in October, 2006. That paper provides an in depth legal examination of how the rules of the World Trade Organization (WTO) might apply to the biofuels sector, and sets forth a range of WTO issues that could usefully be clarified.

We emphasize "might" apply, because this is a topic that has not yet been addressed in great detail and our examination should therefore be viewed as an exploratory one. The fact that biofuels are not classified in a uniform fashion, plus their unusual make-up – a fuel produced through the transformation of agricultural feedstocks – makes examining biofuels and trade regulations a rather complex undertaking. As often happens when existing rules have to be applied to technologies that did not figure prominently when the rules were written, a debate needs to occur on how the rules apply to this technology and how or whether the rules need to be clarified or even changed.

This abridged version distills the key analyses, findings, and conclusions for an audience less concerned with the details of WTO trade law. Those seeking additional background, further examples, or substantiation for the legal arguments are encouraged to refer back to the original paper.[1]

Overview and Background on Biofuels and International Trade

Enthusiasm for biofuels as an alternative to fossil fuel has emerged from many corners. Governments and interest groups, with causes as varied as national security, the environment, rural development, and poverty alleviation, have looked to this alternative energy source to address their concerns. However, biofuels' contribution to the world energy supply today is miniscule; in order for this alternative technology to address the above issues, production would have to scale up considerably and favorable conditions for robust international trade in biofuels would be needed.

Producing fuel from agricultural crops has already raised questions about the impacts on the supply of food and land. What has received less attention is the shift that would result in the location of feedstock and fuel production. Energy demand and land productivity are somewhat asymmetrical. OECD countries, which import most of their fossil fuel, consume more than 49 million barrels of oil a day. While their demand for biofuels is therefore rising, the same industrialized countries do not have sufficient land availability to entirely meet that demand with domestic production; even if they could, this would not necessarily constitute the most cost-efficient or environmentally sustainable approach. The most ideal land for sugarcane and oil palm trees, currently the most energy efficient biofuels feedstocks, is primarily located in developing countries, and mostly in tropical and sub-tropical climates. In addition to having land more suitable to efficient biofuels feedstocks, these countries also have longer growing seasons and lower labor costs than OECD countries.

Many developing countries are showing interest – or are already establishing programs – to develop local feedstocks and local production of biofuels, and the technology has been pointed to as a possible development tool for poor countries. Domestic production and use can – as in developed countries - lead to increased markets for agricultural commodities and aid rural development efforts and incur savings through reduced expenditures on imported fossil fuel, which make up a significant part of developing countries' budgetary

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outlays. Most developing countries are, however, not in a position to provide anywhere near the government support that the industry enjoys in developed countries and will need to rely heavily on private investment to foster the establishment of a biofuels industry. A transparent and global trading regime can serve to attract stable financing and investment capital.

Even though some developing countries may have a comparative advantage in the production of biofuels or biofuel feedstock, potential trade may be stifled by the OECD countries' overly exclusive focus on domestic production, prompted by their desire to provide additional outlets for their agricultural producers. Under these circumstances, biofuels will continue to be produced from feedstocks that may not necessarily be cost-effective, and/or fare relatively poorly on a net-energy or sustainability basis. There is currently a strong vested interest in annual broadcrops, such as corn and rapeseed, particularly in the U.S. and EU, despite the fact that the energy cost of production of the feedstock crop per hectare/per annum is significantly higher with annual crops than with perennial plantations of feedstock crops such as palm oil or jatropha. International trade in biofuels would enhance efficiency by directing production to the most cost-effective locations, and use of the highest yielding and lowest cost feedstocks.

Additionally, so-called "next generation biofuels" produced from cellulosic materials are held out as the most promising in terms of net energy balance and environmental sustainability. To the extent that the biofuels industry will require and receive continuing government support measures, it is vital that they incur the least distortion of market signals and choices and thus allow the most cost efficient and environmentally sound biofuels to thrive in the market place.

To date, the asymmetry between energy demand and land productivity has not mattered greatly, as the consumption of biofuels has been insignificant compared to fossil fuels. Most countries have been able to supply their markets with domestically produced biofuels; importing biofuels for transportation use has been minimal. However, as demand increases and as developing countries identify a market in which they may have a comparative advantage, international trade in biofuels may become more commonplace. While developing countries thus arguably have a comparative advantage, there are also concerns that increased production of feedstocks and biofuels in these countries might contribute to increased food insecurity and prove environmentally disruptive, e.g., because the cultivation of biofuel feedstocks might lead to deforestation. Toward this end, sustainability criteria are being considered by some governments and nongovernmental organizations. To work, such sustainability criteria would need broad international support and to be designed so as not to create unfair trade barriers.

Governmental support for the biofuels sector has come in many forms, ranging from the voluntary directives of the supra-national European Union, through the national and sub-national level. WTO obligations are relevant for many of these; some examples include:

- Fuel excise tax exemptions and rebates, full or partial;
- Mandates for the production of specified levels of biofuels;
- Mandates for compulsory blending with fossil fuels to a certain percentage by federal and subnational entities;
- Government-procurement preferences and purchase mandates;
- Local, state/provincial and federal fleet requirements specifying some level of required or sub sidized usage of biofuels in the relevant government fleets.
- Environmental legislation mandating certain specific types of fuel additives (typically for fuel oxygenation) related to reducing vehicle exhausts. This has resulted in higher demand for ethanol either as a blending agent or for manufacture into ETBE as a substitute for the more environmentally hazardous MTBE;

- Subsidies not normally associated directly with biofuels, such as agricultural farm supports in the U.S., EU and elsewhere; and
- Government supported R&D for biofuels ranging from basic research to technology demonstration plants.

As is clear from the above discussion, for myriad reasons, a look at how WTO rules might apply to the biofuels sector is to be recommended, both for countries that are providing significant amounts of support to their bio-fuel industries and countries that would be interested in exporting bio-fuels. Even if such trade does not materialize soon, such an examination of WTO rules is timely, given uncertainties about subsidy notification requirements and the increase in biofuels byproducts. In the pages that follow, this paper sets forth a range of WTO issues that could usefully be clarified in a debate on how international trade rules apply to the biofuels sector as such. These include:

- How should bio-fuels be classified for tariff treatment and other purposes – are they agricultural, industrial or environmental goods, and what are the implications of each for WTO members' obligations? What are the options for reaching a more uniform classification and for possible trade liberalization?

- How should subsidies to promote the production or consumption of biofuels be considered from the perspective of existing or any planned WTO rules? How should possible "cross-subsidization" (the increase in by-products as a result of subsidies to biofuel production or consumption) be evaluated?

- What is the consistency of domestic regulations and standards—for example, mandates requiring the use of biofuels, fuel content requirements, or environmental sustainability import criteria —with WTO rules on regulations and technical barriers to trade? How do WTO government procurement rules apply to biofuels preferences and mandates in public procurement?

Rules of the World Trade Organization Relevant to the Biofuels Industry

Classification of Goods and WTO Law

Background on Tariff Classifications

A major function of the WTO is to provide a framework for its Members to negotiate reductions of tariffs on goods. Members express their commitments through a schedule of "bound" tariff rates, by which they are legally bound not to impose higher tariffs for any other WTO Member. Tariffs are set by categories of products, since not every single product could possibly be listed in a Member's schedule, and the rates can vary widely from one category to another. Therefore, which category a product falls within can significantly affect its tariff treatment.

The WTO leaves to its Members' discretion how to categorize their products. However, since the vast majority of WTO Members are also Members of the World Customs Organization (WCO), through which they are bound by treaty to use a system of classifications known as the Harmonized Commodity Description and Coding System, or "HS" for short, WTO negotiations employ the HS tariff classification system.[2] The HS system classifies products at a fairly general level, known as the "six digit" level.

WTO Members are free to develop more detailed product subcategories below the six digit level, and to set different "applied" tariffs for them, provided that 1) those tariff rates remain lower than the bound rate at the six digit level; 2) the lower rates are offered on an unconditional "most favored nation" (MFN) basis to all other WTO Members; and 3) the same lower rates are offered to "like products". Whether two products are "like" is a matter of often very complicated legal analysis.

Classification and Tariff Treatment of Biofuels

Biofuels and their feedstocks present the following tariff classification issues, among others, in the WTO:

- How to classify the fuels themselves, and whether to classify them and their feedstocks as agricultural goods or industrial goods. E.g., should feedstock materials (such as maize or palm oil) be given different tariff classifications, and thus potentially different tariff treatment, based on whether they are intended for use in biofuels or in the food industry?

- Whether to treat biofuels as environmental goods, for purposes of the WTO Doha Round's mandate to liberalize trade in environmental goods and services.

The current system for classifying biofuels is unclear and allows for inconsistent treatment of similar, sometimes interchangeable biofuels products, yet addressing these problems presents several challenges.

Generally speaking, biofuels have been classified according to whether they are considered agricultural or chemical products and not according to their use as fuels. An exception is biodiesel, which now has its own HS classification. A more typical example is ethanol, which is classified in the HS according to whether it is undenatured (HS 220710) or denatured (HS 220720), with no separate classification or subclassification for fuel ethanol.

Since HS classifications are, as noted above, the basis for tariff bindings in WTO Members' schedules, the lack of HS classifications more precisely targeted at a substance's fuel use not only makes it difficult to get precise biofuel trade flow statistics, but may also impede efforts to liberalize tariffs on biofuels. WTO Members may have environmental and energy security reasons for wanting to reduce tariffs on these substances when used as fuels but not when they are destined for other uses in competition with domestic products.

HS classifications also importantly determine whether or not a product is an agricultural product under WTO rules, a distinction with significant implications regarding tariff rules and the treatment of subsidies (discussed below). The WTO Agreement on Agriculture (AoA) applies to HS Chapters 1 to 24 (except for fish products) as well as to a specified list of products with other HS headings. While ethanol, in HS Chapter 22, is considered an agricultural good, biodiesel falls under Chapter 38 and is thus considered an industrial good.

Further complicating the classification issue is the possibility (to the extent that the Doha Development Round may be revived) that some biofuels could be deemed as "environmental goods" and subject to special negotiations under the Doha mandate to reduce or eliminate tariffs and trade barriers for "Environmental Goods and Services" (EGS).[3] In the parties' still unresolved debates over the definition of "environmental goods", Brazil and India have suggested negotiations on EGS should include biofuels; the EC's position is similar. Some WTO Members, including the US, on the other hand, have argued that only products subject to non-agricultural market access (NAMA) negotiations could be included in the EGS negotiations, thus excluding agricultural products. (But note that the US has also omitted from its proposal biodiesel, although it is not an agricultural product under the HS.)

Concerns are sometimes raised about the difficulty customs officers would face in administering a biofuels classification system that is in part end-use based (i.e., whether intended for use for fuel or not), since in some instances there would be no obvious way to distinguish through physical inspection between covered and non-covered substances. However, most states already impose myriad requirements on imported goods—technical, health and safety, environmental, etc.—for which compliance cannot be determined by a simple physical inspection of goods coming across the border. In most instances, officials must rely on certification either by the exporter or importer themselves or by some independent testing and certification institution in the country of export or some third country, backed up by random sampling, spot checks, post-entry surveillance and similar techniques.

Potential Policy Responses to Classification Issues

There are a number of possible multilateral, plurilateral and unilateral policy responses to the biofuels classification issues.

Amendment of the Harmonized System of Tariffs

The most obvious or straightforward approach would be to introduce distinctive HS headings for biofuels, i.e. headings based both on the chemical and biological composition of the substance and on its use as fuel. In this respect, the WCO's HS classification of biodiesel provides an obvious precedent, containing a chemical description ("mixture of mono-akyl esters…"), a process characteristic ("derived from vegetable oils or animal fats") and an end-use criterion ("…fuel for diesel engines").[4]

Amendment of the Harmonized System is, however, a complex process which could take many years, since the WCO's Council generally considers amendments in four-year cycles, with amendments under the next review cycle not scheduled to be implemented until 2012.[5]

Once the WCO arrived at particular HS classifications for biofuels (whether under agricultural or non agricultural HS headings), it would still be up to WTO Members to decide, as a policy matter, whether all or some of these fuels should be considered to fall within the scope of the WTO Agreement on Agriculture and to amend Annex 1 of the Agreement on Agriculture to reflect the preferred solution.[6]

Negotiated Agreement in the WTO

In theory, WTO Members could negotiate the liberalization of tariffs on biofuels in a way that circumvented the HS classification problems. A precedent is the 1996 WTO Information Technology Agreement, where Members committed to liberalize tariffs for two lists of products: an "A" list, based on HS classifications, and a "B" list, describing specific products, regardless of how those products might fit within existing HS classifications. Similarly, WTO Members or some subset of them could agree to limit tariffs on biofuels or allow them entry tariff free regardless of the existing HS classification and existing domestic nomenclature. Such an agreement would not need to be negotiated within the existing Doha negotiating committees for NAMA, agricultural goods, or EGS; with enough political will a sui generis negotiation could be launched by a decision of the WTO Ministerial Council.

Environmental aspects of biofuels. It would probably be a mistake to link multilateral biofuel trade liberalization to a specific set of environmental goals, in light of the controversy over the definition of "environmental good" in the EGS negotiations and the divisions among environmentalists themselves on whether particular

biofuels are an overall positive for the environment,[7] The WTO is not a desirable forum for resolving such complexities. Instead, individual WTO Members, or indeed any sub-set of WTO Members (for example, pursuant to obligations under environmental treaties) are free to impose sustainability requirements on domestic and imported biofuels, provided they did so in a non-discriminatory manner. (See discussion of domestic regulations below.)

Unilateral Options

An individual WTO Member could unilaterally lower tariffs on biofuels, as a matter of its own energy and environmental policy, as long as it provided MFN treatment to "like products." Doing so would encourage domestic consumption of biofuels, while protecting domestic non-fuel products by retaining the higher tariffs on non-fuel products subject to the same HS classification as the biofuels. The WTO Member could do this through introducing a further sub-classification in its domestic nomenclature.

WTO jurisprudence suggests that biofuels and physically similar products with non-fuel uses should not be considered "like" products, as they are not competing in the same consumer marketplace. Whether a WTO Member could make tariff distinctions among biofuels products based on their environmental impacts (e.g., over the product's lifecycle), is less clear.

Treatment of Biofuels under Tariff Preference Programs

Yet another option for addressing biofuels tariff treatment is through certain preferential trading arrangements, under which a developed country admits products from developing countries at rates lower than its bound rate for those products. These exceptions to MFN treatment are authorized by the WTO through a system of waivers (for specific subsets of developing countries) or as part of the Generalized System of Preferences (GSP). EC preferences extended to the group of African, Caribbean and Pacific (ACP) countries, for example, provide duty free treatment of biofuels imports, as do the US preferences under its Caribbean Basin Initiative (CBI). At present, under the US GSP biofuels do not qualify for preferential treatment (ethanol was explicitly withdrawn from the US GSP in the 1980s) but the preferences are granted to biofuels under the enhanced EC GSP scheme, as well as the EC's "Everything but Arms" scheme.

WTO jurisprudence suggests that, under certain circumstances, a developed country could treat different developing countries differently as part of a GSP scheme, so long as the differences in treatment addressed in a positive manner the development needs of the countries in question, and were based on objective and transparent criteria applied with due process.

Subsidies and WTO Law

Government subsidization has been crucial to the economic viability of the biofuels industry since its inception. Determining these instruments' consistency with international trade rules often requires a complex and fact-specific analysis.

Background on Biofuels Subsidization

Due to the immature states of the technologies involved, and the often high cost of the relevant feedstocks, the biofuels industry throughout the world has had to rely on subsidies and other public support to grow. Brazil's ethanol industry enjoyed significant government subsidies during its first twenty years, commencing in 1975 after the inception of the first oil crisis. The Brazilian National Ethanol Program (Proalcool) included the

building of a national distribution infrastructure for ethanol, low-interest loans to sugar companies for distillery construction, a mandatory blend of 20%[8] ethanol with all gasoline sold and subsidies at the fuel pump to ensure that ethanol blended fuels – and later all ethanol fuels – remained competitive with, or cheaper than, 100% gasoline at the retail pump. An industry shakeout followed the government's discontinuation in the 1990s of the traditional subsidy programs (aside from subsidized prices at the fuel pump), but the ethanol industry managed to survive. In the United States, federal government support for ethanol became established during the time of the second oil shock in the late 1970s, when price and energy security concerns were high[9], first with provisions in the Energy Security Act of 1978 providing for a $.40/gallon exemption on the federal motor fuels tax (currently $.51/gallon through 2010) and followed by the Energy Tax Act of 1980, which offered insured loans to small (under 1,000,000/gallon/annum) producers of ethanol (the original measures in these acts and others were extended in the decades since).[10] Over time other measures have been added, such as federal DOE funding for research in renewable fuels, usage mandates etc. In the EU, several member states have put mandatory targets into place and provide for tax incentives; a further example of support for biofuels is the energy crop premium the EU provides to its farmers in addition to their single farm payments.[11]

Subsidization can have multiple purposes and these purposes may vary in their consistency with the underlying norms of world trade law. A government may, for environmental or energy security reasons, subsidize consumers so as to provide them with an incentive to switch from conventional fuel to biofuel (in whole or part) by compensating, or more than compensating, for the added cost. Or it may attempt to achieve the same objective by subsidizing research and development that can lead to more efficient technologies for the production of biofuels. Neither of these kinds of subsidies need affect the relative competitive position of domestic and foreign producers (assuming the knowledge generated by subsidized R & D is not largely proprietary to domestic firms and leads to generalized innovation that foreign producers can also exploit — an assumption that is difficult to substantiate). On the other hand, a government may subsidize the domestic production of biofuels; this may not be a cost-efficient way of providing an incentive for consumers to switch from fossil fuels to biofuels, since the lowest-cost, most efficient producers of the biofuels in question may be foreign producers. Such subsidies are sometimes justified, as a policy matter, on "infant industry" grounds.

WTO Law Regarding Subsidies

Several components of the WTO Agreements address subsidies, including the GATT itself, the Agreement on Subsidies and Countervailing Measures (the SCM Agreement) and the Agreement on Agriculture (the AoA). As with tariff classifications (see Section A above), the way in which a biofuel is classified importantly determines whether one or both sets of WTO disciplines on domestic subsidies are applicable.

The General Agreement on Tariffs and Trade (GATT)

Under the GATT, subsidies and taxes are, like other domestic measures, subject to such disciplines as National Treatment, requiring comparable treatment of domestic and foreign producers.

More specifically, the GATT itself exempts from the National Treatment obligations the "payment of subsidies exclusively to domestic producers". Note that payments to users or consumers, however, would still be subject to National Treatment.

The SCM Agreement

The Subsidies and Countervailing Measures (SCM) Agreement prohibits outright two kinds of subsidies: export subsidies and subsidies contingent upon the use of domestic products over imported products. Biofuels subsidies are generally not tied to export performance and therefore would not fall into this first category of

prohibited subsidies. However, production subsidies contingent upon the use of domestic products, such as locally produced feedstock crops, are an issue in the biofuels area.

The SCM Agreement authorizes a WTO Member adversely affected by other kinds of subsidies either to bring a WTO dispute settlement challenge or to unilaterally impose "countervailing measures," provided certain criteria are met. These criteria include:

- that the subsidy entail a "financial contribution" by the subsidizing government and a "benefit" to the recipient, where the "benefit" confers a competitive advantage on the recipient;
- that the subsidy be "specific" to particular industries or firms; and
- that the subsidy causes certain "adverse effects" on competitors.

In other words, a WTO member government wishing to provide WTO-consistent biofuels subsidies should avoid those that would meet the "actionability" criteria.

The SCM Agreement and WTO case law provide further guidance on these criteria. "Financial contribution" explicitly includes a range of situations other than direct cash payments, such as provision of goods and services or tax breaks where the government foregoes revenue "otherwise due".

Determining whether a subsidy confers a competitive advantage "benefit" calls for comparison to a benchmark of market conditions that would exist in the absence of the government intervention (i.e., the subsidy). Correctly identifying a "benefit" and whether it exists can be a complex matter in situations where the market conditions themselves have been so influenced by government intervention as to render a meaningful "market" benchmark for "benefit" elusive. This may well be the case with biofuels, where a variety of government interventions in all the major producer nations have pervasively shaped the market.

For a subsidy to be "specific", it must be targeted to some specific or limited class of users. A subsidy that does not single out certain industries or firms can, however, still be "specific" if a limited subset of industries or firms is the predominant or disproportionate user of the subsidy.

"Adverse effects" include injury to the importing country's domestic producers of a like product in competition with the imported subsidized product; nullification or impairment of GATT benefits (in particular, tariff concessions); or serious prejudice to the interests of another Member. "Serious prejudice" is defined to include such effects as displacing imports of a "like" product into the market of the subsidizing Member or displacing exports of the complaining Member to a third country market; significantly suppressing or undercutting prices in the same market with respect to like products; or increasing the world market share of the subsidizing Member in a particular subsidized primary product or commodity.

An additional issue that may be important in the biofuels context is that of upstream and downstream subsidies. One firm or industry may receive the financial contribution but it is the benefit that flows to an upstream or downstream industry that is the source of concern. For example, a subsidy paid to domestic feedstock producers might be challenged by foreign producers of biofuels on the grounds that the subsidy results in a lower price of feedstock to domestic producers of biofuels.

The Agreement on Agriculture

WTO rules for agricultural subsidies are of particular relevance to biofuels and their feedstocks. If a given

biofuel or feedstock falls within the HS classifications listed in Annex 1 of the Agreement on Agriculture, the rules of that Agreement will apply in addition to those of the SCM Agreement.

The Agreement on Agriculture addresses agricultural subsidies by committing WTO members to adhere to limits on their overall annual trade distorting support for agriculture, and to reduce their support by a set percentage from a baseline amount that varies by WTO Member. (These are called "amber box" subsidies.) Not counted against those limits are certain kinds of non- or minimally trade distorting subsidies for public policy purposes, such as for research and development, or for environmental programs (the "green box" subsidies, discussed further below).

Amber Box Subsidies. There is considerable uncertainty as to whether individual WTO Members are actually operating their agricultural support programs within these aggregate amber box ceilings. In the case of biofuels there is particular uncertainty: Many biofuels programs are structured as support to the biofuels industry, rather than as support for individual agricultural products that fall under the AoA. However, given that these latter programs nevertheless, at least in part,[12] confer support to such agricultural products, they may still belong in the amber box. The stakes are considerable, for if a large number of these measures were considered to be "amber box," the aggregate ceilings to which Members have agreed to might well be exceeded in certain cases, included the ceilings of the US and the EC.

Green Box Subsidies. It is worth examining the extent to which biofuels subsidies qualify – or could be structured to qualify – for the "green box".

To qualify for the green box, a support program must meet the following fundamental requirements: the program must be publicly funded, not involve transfers from consumers, and not have the effect of providing price support to producers. In addition, the program must meet specific policy criteria listed in Annex 2 of the AoA, including, among others, subsidies for research and development and general services and infrastructure, as well as environmental subsidies. A program that fails to meet both the fundamental requirements and the policy criteria must be reported to the WTO as amber box.[13]

The Annex 2 list of policy criteria for green box subsidies includes certain limitations or exceptions. For example, support for research and other general services or infrastructure cannot take the form of direct payments to producers or processors. For environmental subsidies to qualify for green box treatment, "[t]he amount of the payment shall be limited to the extra costs or loss of income involved in complying with the government programme." Annex 2's "Payments under environmental programmes" does envisage that environmental subsidies based on fulfillment "of conditions related to production methods and inputs" would qualify for the green box.

Illustrative WTO Legal Analysis of Biofuels Subsidy Programs

In order to provide a more concrete sense of the WTO legal issues that arise for biofuels subsidies, what follows is an examination of some different kinds of subsidy programs through the lens of the SCM actionability criteria – i.e., whether they constitute a "financial contribution", confer a "benefit", are sufficiently "specific", etc. The purpose of working through the examples is not to make a judgment as to whether any existing government program is WTO-illegal, which would require a comprehensive analysis of the facts specific to that one program, but rather to illustrate the different kinds of legal issues raised by different kinds of biofuel subsidies.

Subsidies on Production of Biofuels

Production subsidies can include recurring payments based on the quantity of production (for example, 50 cents per each gallon of fuel produced) or non-recurring subsidizing of capital costs (physical plant, etc.). Whether a production subsidy is delivered as a tax credit or a cash payment, there is clearly a "financial contribution" within the meaning of the SCM Agreement's criteria for actionability. In the case of taxation-based measures, the key question is whether the government has "foregone revenue otherwise due." A tax credit by its very structure would seem to meet this criterion and thus raise concerns.

However, it may be possible to restructure a biofuels tax program to be more WTO-consistent, given that the SCM Agreement allows each WTO Member autonomy to establish the general principles and policies underlying its taxation system. If, for instance, a subsidizing government replaced its biofuels tax credit with an environmental tax on all fuels, the amount of which was based on the environmental characteristics of each particular fuel, but was applied in accordance with a general principle of internalizing the environmental externalities from fuel consumption,[14] there might no longer be a "financial contribution" within the meaning of the SCM Agreement, despite the more favorable tax treatment that ethanol producers would receive compared to producers of dirtier fuels.

The second question for WTO actionability would be whether such subsidies confer a "benefit" in the sense of a competitive advantage that would not exist in a normal, or undistorted market. This is not an easy question: demand, supply and price of biofuels in global markets have been pervasively influenced by government interventions of many kinds. (In fact, this is true of fuel energy markets generally.)

Here it may be worthwhile to make a more general point: precisely because of the pervasiveness of biofuels market interventions, resort to dispute settlement in relation to such subsidies may not be a realistic option. In a situation where everyone is subsidizing, bringing a claim against one country's subsidies may well trigger a counter-claim against one's own or a challenge to other measures that support the industry in question in the country bringing the original complaint, leading to spiraling trade tensions. In such a situation, rather than "settling" the dispute by coming into compliance, WTO members may well prefer to incur retaliation.

Subsidies on Consumption of Biofuels

A good example of subsidies to consumption are the various exemptions from gasoline tax that EU Member states have granted to purchasers of biofuels, pursuant to the 2003 EU biofuels directive. By the terms of the directive, these exemptions are to be no greater than required to offset the additional cost of using biofuels rather than gasoline.

Here there is obviously a "financial contribution" within the meaning of the SCM Agreement as the government is forgoing "revenue otherwise due" under gasoline taxation policies. There are serious questions, however, about whether the subsidy confers a "benefit" and whether it is "specific." This kind of subsidy is available throughout the economy, i.e. to any user of fuel and in fact is used throughout the economy. Therefore it is almost by definition not specific as long as we regard the beneficiaries of the subsidy as the consumers of fuel.

This brings us to the question of "benefit": it is unclear that the direct users of the subsidy receive any benefit in the sense of competitive advantage as the subsidy merely reduces the price of alternative fuel to the price of gasoline, and so does not provide the user with any possibility of lowering its fuel costs per se.

If, however, we were to view the subsidy as an upstream subsidy to the biofuels industry, it might be possible to characterize it as specific, depending on how diverse we regard the biofuels sector and the number of firms participating. The question would be then whether any "benefit" is conferred on EC biofuels producers, in the sense of a competitive advantage. To the extent that the tax exemption does not require that the biofuel being purchased be produced within the EC, it is difficult to see how it would afford a competitive advantage to EC producers of biofuels over producers in other WTO Members.

Subsidies on Feedstocks for Use as Biofuels Inputs

It is important to distinguish between subsidies that governments provide to feedstocks as part of general programs of agricultural support and those that they target to that part of the production intended for biofuels use. In both the US and EU, inputs to biofuels are often subsidized in the former context. Such general support subsidies must conform to both the rules in the SCM Agreement and the disciplines of the AoA, such as the aggregate support ceilings. From the perspective of understanding trade in biofuels, the interesting questions are whether, under the SCM Agreement, general support for feedstocks could be regarded as downstream subsidies to biofuels producers, and whether, under the AoA, they could be considered "green box" subsidies.

On the first question, that of downstream subsidies, one would have to ask whether, given the nature of the downstream users, the subsidy is "specific" and whether those users actually receive a "benefit" in the sense of a competitive advantage. For instance, it would be hard to view as "specific" corn subsidies that are part of general agricultural support programs, since they potentially benefit a wide and very diverse variety of industries that use corn as inputs, including the processed food industry, the alcoholic beverages industry, and the animal feed industry. As regards "benefit," such subsidies are typically not restricted on their face to production that is destined for exclusively domestic downstream users and so it is unclear that it creates a competitive advantage for domestic downstream industries over foreign industries producing like products. In practical terms, however, transportation costs and logistics may mean that only domestic downstream industries can use the subsidy and in such a case it might be possible to show that they receive a competitive advantage. Whether there is a benefit upstream or downstream should not be assumed; it has to be proven based on a careful analysis considering all the facts in the case at hand.

The answer to the second question — whether a subsidy on production of feedstocks destined for biofuel use could qualify as "green box" based on environmental benefits – is likely negative: the AoA appears to limit such "green box" environmental subsidies to those that are intended to compensate a producer for the costs of complying with government environmental programs.

A different example of a subsidy on feedstocks is illustrated by the trend in both the EU and the US to allow farmers to produce biomass inputs for biofuels on "set-aside land" — land which farmers have been paid to remove from agricultural crop production. The question is whether the production of biofuel inputs falls outside of the AoA's meaning of "marketable agricultural production" for purposes of amber box support ceilings. On the one hand, clearly, the products are not destined for use as food or animal feed and are not marketed as agricultural products. On the other hand, because these products have multiple uses, including food and feedstuff uses, such programs will at the margin affect the supply and price of the commodities in question in general, and thus at the margin have an impact on competition in the food and feedstuff markets for those crops.

The case of farmers being permitted to grow switchgrass for production of ethanol on set-aside land is very likely to be consistent with the AoA, as switchgrass is not generally regarded as a "marketable agricultural product" itself.

Another kind of difficult-to-categorize measure is represented by the EC energy crop payment, introduced with the 2003 Common Agricultural Policy (CAP) reform. This is an additional payment to farmers based on the amount of land used to produce energy crops, and is thus arguably not decoupled from production.

Subsidies to Byproducts Created in the Manufacturing of Biofuels

Another question worth examining is whether biofuels subsidies can in some situations be passed through to commercially valuable byproducts of the production process so as to provide a "benefit" actionable under the SCM Agreement. The production of biodiesel, for example, yields significant quantities of glycerol, raising the question of whether subsidies paid on the production of the fuel could be regarded as "passing through" to producers of glycerol. The meaning of "benefit" under WTO subsidies law is a competitive advantage and not merely a financial advantage. Since any competitive advantage in glycerol would flow from the inherent fact of producing ethanol (whether subsidized or not); there is a good argument for viewing the subsidy as fully "consumed" by the ethanol production itself and thus not actionable.

Subsidies that increase production of biofuels also lead to an increased production and possibly surplus of by-products, for example, rapeseed meal from rapeseed oil biodiesel in the EU, and distillers dried grain and distillers dried solubles from ethanol biofuels production in the United States. While the expansion of the biofuels industry in both the EU and US is unlikely to be able to meet domestic biofuel demand, the increases in by-products may overtake domestic demand for such products, lowering prices. Such surpluses of what could arguably be considered "cross-subsidized" by-products could lead to increased exports and the displacing of other meal and grain product providers. These "adverse effects" on competitors, another criterion for actionability, could possibly lead to queries about the biofuels subsidies' WTO compatibility.

Domestic Regulations/Standards and WTO Law

The third set of WTO issues that arise in the biofuels sector pertains to domestic regulations and standards, of which there are many.

The internal, or domestic, policies of governments (technical regulations, subsidies, government procurement practices, etc.) that restrict market access or alter the competitive relationship between domestic and imported products in favor of the former can undermine negotiated tariff reductions and disciplines on other "border" measures (such as quotas or bans on the import and export of particular products). Such policies usually serve legitimate governmental objectives. On the other hand, they may be more trade-restrictive than necessary to achieve those objectives, and in some cases are intentionally designed to advantage domestic interests, raising WTO-compatibility concerns.

Many of the WTO's disciplines are designed to make difficult distinctions between internal policies that are legitimate exercises of domestic regulatory autonomy (even if they have some trade-restrictive effects) and those that can be considered a form of protectionism or "cheating" on the WTO bargain, in that they undermine the market access reasonably expected from Members' commitments to liberalize trade. These WTO disciplines are set forth in, among others, the General Agreement on Tariffs and Trade (the GATT) itself and its general exceptions; the Technical Barriers to Trade (TBT) Agreement (requirements for national standards and regulations concerning goods); the Sanitary and Phytosanitary Measures (SPS) Agreement (requirements for national measures directed at health, safety, and pest introduction from imported goods, mostly food and agricultural products); and the Government Procurement Agreement (GPA). Each is examined more fully below.

The General Agreement on Tariffs and Trade (GATT)

The cornerstone of the WTO approach to domestic policies is the principle of non-discrimination. Enshrined in the GATT are requirements that Member governments are to accord the goods and services of fellow members 1) National Treatment (i.e., give them the same treatment as domestic goods and services); and 2) Most Favored Nation Treatment (MFN) (i.e., give the same treatment to goods and services of all other Members, rather than favoring some over others based on their country of origin). The GATT does, however, provide a variety of exceptions to these obligations for measures that are directed to certain public policy objectives, provided the measures meet certain requirements (discussed more below).

Internal Taxation Measures

The GATT's National Treatment and MFN obligations apply to both fiscal measures, such as taxes, and nonfiscal measures, such as domestic regulations. Article III:2 of GATT governs the internal taxation of products by WTO Members; as interpreted judicially, it contains two distinct obligations: 1) the obligation to tax identically "like" imported and domestic products; and 2) the obligation that taxation on "directly competitive or substitutable products" not be "dissimilar" in such a way as "to afford protection to domestic production."[15] The assessment of whether two products are "like" or "directly competitive or substitutable" is a matter of case-by-case examination of the facts, weighing all relevant evidence regarding physical characteristics, end uses, and consumer habits.

Explicitly or facially discriminatory tax measures are almost certain to violate the national treatment obligation. For instance, a tax concession with respect to biofuels — either in general or for a particular fuel or fuels – would violate the GATT's National Treatment obligation if the concession depended upon purchasing domestically-produced fuel.

Less well defined, and controversial in WTO law and policy, are the circumstances under which de facto, or disparate impact, discrimination is GATT-illegal. Consider for example, mandates or differential taxation that do not explicitly favor domestic producers but rather particular biofuels or feedstocks in which domestic producers have a comparative advantage. An example is the US excise tax credit for fuel ethanol, which applies to both domestic and imported ethanol. Foreign producers of biofuels other than ethanol might argue that their own products are "like" or "directly competitive or substitutable" and should thus qualify for the tax credit. However, there are significant differences in physical characteristics and uses and performance that distinguish ethanol from biodiesel, for example, making it improbable that the products in question would be found to be "like" or directly competitive or substitutable.

Non-Fiscal Internal Measures

Article III:4 of the GATT sets out the National Treatment obligation with respect to internal laws, regulations and requirements other than tax measures. The determination of whether a non-fiscal measure violates National Treatment entails two distinct steps: first, ascertaining whether the imported product and the domestic product are "like," by weighing and evaluating the same kinds of factors as is the case for fiscal measures—including physical characteristics, end uses, and consumer habits; and second, if "likeness" is found, determining whether the regulatory distinction between the two products results in less favorable treatment of imports. In other words, governments are not forbidden from making regulatory distinctions between like products; they just cannot provide less favorable treatment for imports.

A wide range of internal regulations concerning biofuels could have an impact on trade:

- mandates to use particular percentages or quantities of biofuel either in fuel blends or for spe cific purposes (such as bus or taxi fleets);
- restrictions or limits on the amount or kind of biofuel that can be contained in a blend with conventional fuel;
- specifications of the properties or performance characteristics of particular biofuels or the ma terials they must be derived from;
- labeling for consumer protection and information purposes;
- health and safety regulations concerning the handling and transportation of particular bio fuels or inputs required for the processing of biofuels, and related specifications for processing plants;
- broad environmental performance requirements related to the entire life-cycle of the product, including the sustainability of the agriculture used to produce the feedstock from which the bio fuel is processed.

There is little question but that mandates that explicitly or facially discriminate in favor of domestic products over imports, for instance through requiring that the mandate be fulfilled in whole or in part using domestically-sourced biofuels, would violate the GATT's National Treatment obligation. Similarly, mandates (or tax concessions) linked to the feedstock used in the production of biofuels being produced domestically would also violate National Treatment. In this latter case, the discrimination would exist both against foreign producers of biofuels (who may be forced to use either costly feedstock from the importing country for the fuel to qualify for the mandate or concession with the likely result that they cannot economically sell fuel into that market) as well as against foreign producers of feedstock itself.

Environmental Sustainability Standards

Mandatory or tax concession-linked conditions concerning the environmental performance of particular biofuels pose a complex set of issues. To illustrate, consider three stylized or hypothetical examples of possible environmental performance conditions that an importing WTO Member might impose:

- conditions that address the environmental impact of biofuels in the country of import (e.g., volatility, or toxicity of additives);

- conditions that seek to maximize the contribution of biofuels to reducing carbon emissions and thus look to the net effects of a particular fuel on carbon emissions throughout its entire life- cycle, including carbon emissions in the production or processing of the fuel and the feed stock inputs;

- conditions that go beyond carbon emissions to promoting sustainable agriculture in the country producing the feedstock for the biofuel. This could range from labor and social effects to deforestation, fertilizer use and habitat protection.

The first kind of environmental measure is unlikely to violate the GATT National Treatment obligation, assuming that it is not drafted or structured in such as way as to be more burdensome on foreign than on domestic producers. The difference in environmental impacts in the importing country would normally be traceable to some physical difference in the products in question, could well affect end-uses, and may also be a concern to consumers. Thus, the product complying with conditions that relate to post-import environmental impacts may well be found "unlike" a non-compliant imported product.

The WTO-legality of the second kind of measure, to the extent that it concerns itself with environmental impacts from the process of production in the WTO Member producing exports or some third country WTO Member producing inputs, is less clear cut. It raises the controversial issue of the so-called product-process distinction; namely, whether the GATT permits an importing country to treat products differently based on their method of production as opposed to their properties as products for consumption.16 The infamous unadopted Tuna/Dolphin GATT panel rulings of the early 1990s would say it does not. Current jurisprudence, however, on how to determine "likeness" and "directly competitive and substitutable", does not appear to predetermine a conclusion one way or another concerning methods of production; moreover, it emphasizes the need for the adjudicator to examine all relevant factors in a given case and context, and to consider all the evidence pointing either in the direction of a finding of "likeness" or otherwise. Carbon emissions, given their greenhouse gas effects, are clearly a global environmental problem and to the extent that a WTO Member is addressing this global problem in its environmental regulations on biofuels it would be illogical not to take into account the overall impact of a particular fuel throughout its lifecycle on global carbon emissions.

The third type of environmental performance measure, which would impose conditions related to the sustainability of the production of the feedstock from which the biofuel is produced, also presents product-process issues.

Mandatory sustainability criteria are under active policy discussion in many jurisdictions, particularly in the EU.[17] In the Netherlands a Ministry of Housing and Environment project group has developed possible criteria for sustainable biomass production.[18] Next door in Germany, there is, at the time of writing, active discussion as to the means by which various tropical oils are produced (especially palm oil) with particular concern expressed about de-forestation and carbon issues. It is clear from these examples that the hypothetical issues examined here are rapidly transitioning to the domain of public debate and input into the policy process.

The degree of international consensus behind a domestic measure is a factor in its WTO compatibility. Where an importing country bases differences in treatment among biofuels on sustainability norms, criteria and methods which are widely accepted in the international community and which have been developed through broad consultation among diverse states, taking into account the variety of conditions in different countries, it should be difficult for a complaining WTO Member to establish that there is an overall bias against imports as a group.

It may be worth giving serious consideration to the recommendation of a WorldWatch study that international sustainability criteria be developed,[19] although given the many views on what such criteria should encompass, consensus would likely be difficult to reach. At the same time, an international consensus on core criteria need not preclude individual countries imposing additional criteria, provided those are based upon established methodologies (such as life cycle product analysis) and on concerns that are supported by international norms (such as those on sustainable development reflected in various international legal and policy instruments).

Exceptions from GATT Obligations

The GATT provides a variety of exceptions to MFN, National Treatment, and its other obligations. Article XX sets forth exceptions that "save" otherwise GATT-illegal measures, provided that the measures are directed to certain public policy objectives (e.g., public morals, human health and safety, the conservation of exhaustible natural resources) and that they are not applied in a manner that is arbitrary, unjustifiable, or a disguised restriction on trade.

Two of particular relevance to biofuels requirements are GATT Article XX(b), which provides an exception for measures "necessary to protect human, animal or plant life or health", and GATT Article XX(g), which permits otherwise GATT-inconsistent measures that are "relating to the conservation of exhaustible natural resources."

A specific condition of Article XX(g) is that the trade measures in question must be taken in tandem with comparable measures restricting domestic production or consumption (even-handedness).

The possible relevance to biofuels of these two GATT exceptions can be seen through their application to a hypothetical mandate that explicitly favors domestic producers of fuel and/or feedstocks over foreign producers.

It could perhaps be argued that ensuring an adequate domestic supply of biofuels is directly related to the conservation of exhaustible natural resources (e.g., fossil fuels, or clean air), or necessary to the goal of protecting human life and health, especially where such a supply is not securely available from non-domestic sources. It would certainly be more debatable, however, whether discriminatory measures of this kind, as opposed to subsidies and non-discriminatory mandates, are really needed to create a viable domestic industry and even more debatable whether they could be justified once one is no longer dealing with an infant industry. These exceptions might also be invoked to justify sustainability criteria that discriminated against certain biofuels imports. However, a government designing such a measure should take into account the different conditions in the territory of exporting states, in order to avoid running afoul of Article XX's requirement that a measure not be applied so as to create arbitrary or unjustifiable discrimination.

Two other potentially relevant exceptions are GATT Article XX(j), which provides an exception for measures "essential to the acquisition or distribution of products in general or local short supply," and the National Security Exception in Article XXI of the GATT. The National Security Exception provides, in part, that "Nothing in this Agreement shall be construed…to prevent any contracting party from taking any action which it considers necessary for the protection of its essential security interests … taken in time of war or other emergency in international relations." It is not implausible to characterize the current global situation as one of a "time of war or other emergency in international relations," and it is widely acknowledged that energy security is a vital dimension of national security generally.

The WTO Technical Barriers to Trade Agreement (TBT)

The TBT Agreement applies to mandatory measures that specify the characteristics of products and their "related processes and production methods (Annex 1:1)." The TBT Agreement also contains a code of good practice urging WTO Members and the non-governmental standard-setting bodies within their jurisdiction to use international standards as the basis for their voluntary standards.

The TBT Agreement's main requirements are:

- that international standards be used, where possible, as a basis for technical regulations (Art. 2.4), and

- that technical regulations not constitute an "unnecessary obstacle to trade" (Art. 2.2); in other words, that the measure must not be more trade restrictive than is required to meet a Member's legitimate objective (there is a non-exhaustive list of "legitimate objectives" that includes, inter alia, "protection of human health or safety, animal or plant life or health, or the environment").

Generally speaking, international standards have not yet been developed for biofuels, although components of standards promulgated by domestic or European standards bodies or authorities may reference international standards, such as ISO standards in relation to testing of certain characteristics of substances. In the absence of such international standards, certain non-discriminatory domestic regulations (i.e. consistent with MFN and

National Treatment obligations of the GATT) may still be challengeable under TBT for creating unnecessary obstacles to trade in biofuels. For example, internal regulations that limit the percentage of biofuel in blends "often based on not entirely justifiable environmental reasons" may have trade restrictive effects.[20]

The EU biodiesel standard, which provides specifications for 100% biodiesel used as fuel in transport sector,[21] may have trade implications. Since the specifications and test methods for biodiesel production are based on rapeseed oil's properties, producers need to either use rapeseed oil or invest in R&D to create a biodiesel that would still qualify for the norm. [22] To avoid curtailing imports, the EU may need to rethink both the standard and the blending percentage, while ensuring that concerns over automotive engines are addressed.

The WTO Sanitary and Phytosanitary Standards Agreement (SPS)

The SPS Agreement applies to internal regulations that address certain risks arising from trade in food and agricultural products (e.g., noxious weeds or insect pests that accompany shipments of grain or other biomass). In what is, effectively, an exception to the MFN obligation, the agreement allows WTO Members to place restrictions on imports from particular other WTO members, provided that such measures be based on scientific principles and evidence and be supported by risk assessment. It, like the TBT Agreement, favors measures based on international standards and requires domestic regulations to be no more trade restrictive than necessary to achieve the legitimate risk management objectives for which they were designed.

Regulations concerning biofuels and their feedstocks that deal with environmental, health and safety considerations may well address SPS risks. For instance, the SPS Agreement applies to "risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms" and "risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs." (Annex A) Some of these risks could clearly arise from the international trade and transportation of feedstocks for biofuels, including biomass or biowaste. As a matter of internal regulation, some jurisdictions apply food safety regulations to the transportation of certain biofuels because the substances, despite their use as fuel, correspond to definitions of foodstuffs in domestic law. Biomass may fall within legal definitions of waste and therefore be regulated in those terms without regard to the different risk management issues that arise from the fact that the material is not entering the jurisdiction to be disposed of as waste but to be transformed into or used for fuel.

As a general matter, a measure will be governed by either SPS or TBT but not both. However, in recent jurisprudence relevant to biofuels regulation, the WTO indicated that if an internal regulatory scheme addressed itself both to SPS related risks and to other public policy goals, the measure could be considered under both agreements.

Government Procurement

The WTO Government Procurement Agreement (GPA), which sets rules for its Member governments' purchasing decisions and granting of contracts, can also have a bearing on biofuels policies. At various levels of government and in a number of different countries, government procurement regulations and policies exist that either mandate or permit government purchasing decision-makers to give preference to biofuels and biofuel-powered vehicles. In the United States, for example, the U.S. Postal Service, the U.S. military, and many state governments are requiring their bus and truck fleets to incorporate biodiesel fuels as part of their fuel base.[23] Many jurisdictions, including the US and the EC, also have general requirements that decision-makers, in their purchasing decisions, take into account environmental effects, energy efficiency or whether an energy source is renewable.[24]

The GPA's obligations include nondiscrimination (national treatment and MFN) in the awarding of government contracts; more specifically, that the products, services and suppliers of other GPA members be given "treatment no less favorable" than "that accorded to domestic products, services and suppliers." The GPA also requires that procurement specifications be based on international standards where available and, if not, on national technical regulations, and that the specifications not constitute an unnecessary obstacle to trade. GPA members are also expected to favor performance-based specifications over product characteristics.

The GPA's relevance to biofuels policies and programs is, however, somewhat circumscribed. First, membership in the GPA is voluntary, with only some WTO Members having elected to adhere to it. Notably for biofuels, to date the US, the EU and its member states, Japan, and Canada are members; Brazil, Australia, and the developing countries are not. [25] Second, the GPA's coverage is not comprehensive: its members can specify which of their government agencies and which level of government (federal, state/provincial, local) are included, and can specify various exceptions such as for small and medium-sized enterprises or for particular kinds of procurement, such as the procurement of research and development services. For example, only a select sub-set of the state governments in the US are covered by the GPA. Particularly relevant to the biofuels context is, for example, the EC's exclusion "for the purchase of water and for the supply of energy or of fuels for the production of energy" by a range of procurement entities, as well as the exclusion of "procurement of agricultural products made in furtherance of agricultural support programs and human feeding programs" and procurements by some procurement entities in connection with activities in the fields of drinking water, energy, transport or telecommunications.

One area of some uncertainty in GPA law relevant to biofuels is governments' ability to specify non-economic (by which is often meant environmental and social) criteria for suppliers as conditions for the award of procurement contracts. The relevant provision of the GPA stipulates that "any conditions for participation in tendering procedures shall be limited to those which are essential to ensure the firm's capability to fulfill the contract in question." This provision has been interpreted by some commentators to exclude non-economic criteria.[26] However, this particular provision is about the qualifications of suppliers to fulfill a contract for certain goods and services; not about how the goods and services themselves are specified in the contract. Thus, a strong argument can be made that a government could condition the award of the contract on the supplier's overall environmental or energy conservation performance – e.g., with respect to use of biofuels — so long as the evaluation criteria are specific and transparent. For example, a government could limit the bidding on courier services to companies that, in all their global operations, use only vehicles running on biofuels.

Conclusions and Recommendations

It is clear that there has been major growth in interest in biofuels over the last two years of high energy prices. This interest is being converted into concrete action at a rapid pace, as witnessed by:

- large new subsidy and mandate commitments in developed nations, particularly the United States and the European Union;

- steep increases in private investment in biofuel production in the US, EU and other countries, partially due to the considerable government support measures to the sector;

- major commitments to growing biofuels feedstock crops in much of Asia, including large commitments of hectarage for new palm oil plantation. This is particularly true in Indonesia and Ma laysia, and to a lesser extent in Thailand, as well as coconut oil plantations in the Philippines, and jatropha plantations in India;

- the emergence of government supported biofuels programs in the least developed countries, particularly in Africa (but also in Vietnam) for research into biofuels suited to local conditions, production of feedstocks and of biofuels.

High prices for fossil-based transport fuels make biofuels—while still expensive in relation to fossil-fuels—more economically viable, and could lead to a decrease of government subsidies in the US and EU. Already, considerable and possibly further increased mandates, combined with the limited land availability in developed countries, appear to be pointing toward the potential of a growing biofuels trade. Furthermore, large new commitments to plantations to grow feedstocks (in addition to the cumulative effect of a myriad of smaller ones) will bear fruit in the coming years in Brazil, South East Asia and elsewhere. Increased interest in biofuels resulting in enhanced funding for research and development will result in improved methods of production and more easily handled fuels.

However, as this paper suggests, for this potential growth in trade to occur, a clarification of how international trade rules apply to the sector is advisable. Uncertainty over biofuels classification, and the range of government measures to protect domestic biofuel production— from tax incentives, high tariffs and subsidies—risk stunting growth in trade even as the global demand for biofuels is rising. A web of separate technical and environmental standards also risk interfering with the potential for greater trade in biofuels.

Even supposing that trade in biofuels remains limited, this paper recommends a closer look at WTO rules. A greater clarity about subsidy notification requirements and a closer look at potential cross-subsidization of by-products associated with biofuel production is useful, given the uncertainty of whether WTO rules for agricultural or industrial products are applicable. The purpose of this paper is to touch on those issues that could usefully be clarified in the quickly growing biofuels sector, and to facilitate a discussion on the future direction of government measures.

Endnotes

1 Available at www.agritrade.org /Publications/wto_biofuels.html.

2 A clear and accessible explanation of the Harmonized System and the role of the WCO can be found in R. Steenblik, "Liberalising Trade in 'Environmental Goods': Some Practical Considerations," OECD Trade and Environment Working Paper No. 2005-05, particularly annex A1.

3 For a detailed treatment of these negotiations, see R. Howse and P. B. van Bork, Options for the Liberalisation of Trade in Environmental Goods in the Doha Round, International Centre for Trade and Sustainable Development, Geneva, July 2006.

4 The WCO's Explanatory Notes read as follows: "a mixture of mono-akyl esters of long-chain [C16-18] fatty acids derived from vegetable oils or animal fats, which is a domestic renewable fuel for diesel engines and which meets the specifications of ASTM D 6751 [American Society for Testing and Materials "Standard Specification for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels]."

5 R. Steenblik, supra n.1, p. 16.

6 As will be discussed below in the subsidies section of this paper, The Agreement on Agriculture contains disciplines on subsidies that are in addition to those that apply to all products under the WTO Subsidies and Countervailing Measures (SCM) Agreement. For instance, trade-distorting domestic subsidies that fall into the so-called "amber box," i.e. that are not subject to the so-called "green box" carve-out, must be notified to the WTO and must fall within certain quantitative ceilings. Thus, whether a particular product falls within the AoA can have important implications for disciplines on government supports for that product.

7 See the extensive and informative discussion of this issue in Biofuels for Transportation: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century, Final Report, Prepared by the Worldwatch Institute for the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), in cooperation with the Agency for Technical Cooperation (GTZ) and the Agency of Renewable Resources (FNR), Washington, D.C., August 2006.

8 The current blending ratio is Brazil is 25% ethanol/75% gasoline.

9 With the enthusiastic support of the U.S.'s powerful farm-based lobbies, who also strongly supported these measures.

10 Not counting various State level measures these acts were: The Alternative Motor Fuels Act of 1988, the Clean Air Act of 1990, the Energy Policy Act of 1992, the Biomass Research Act of 2002, the Farm Bill 2002 and the Energy Policy Act of 2005.

11 The energy crop premium consists of a payment of 45 Euros per hectare in addition to decoupled payments. Condition for payment is that there must be a contract with a processor, unless the crop is processed on the farm. Hansen, S and van Vaals, M, Biofuels in the EU — Changing Up Gears, November 2005, Rabobank International, Utrecht, The Netherlands, p.24.

12 A program may provide incentives with respect to more than one kind of biofuel; for example, ethanol and biodiesel; the former falls within the AoA and the latter does not, so the question then becomes even more complex. It is necessary to try and isolate the effects of the operation of the program on ethanol alone in order to determine if these incentives attract "amber box" notification requirements.

13 United States Department of Agriculture, "2007 Farm Bill Theme Paper: Energy and Agriculture", Washington D.C., August 2006, p. 18.

14 Thus a subsidy could result in the relative prices of various fuels corresponding more closely to their relative environmental friendliness, providing incentives to choose those fuels that create fewer negative environmental externalities.

15 This second obligation is found by the Appellate Body through combining the language of Article III:2 itself with the language concerning "protection" in the preamble Article III:1, as referenced in an interpretative note to Article III. Such "interpretative notes" form an integral part of the treaty. See Japan-Alcoholic Beverages.

16 See, for a discussion of the possible relevance of the product/process distinction in the Tuna cases in this context, C. Lancaster, "Biofuels assurance schemes and their compatibility with trade law," power point presentation, Piper Rudnick Gray Cary, Brussels, 7 June 2006.

17 See recommendation 2410 in Worldwatch Institute, Biofuels for Transportation, supra n. 6. Also see, from the Dutch Ministry of Housing and the Environment (VROM), "Criteria for duurzame biomassa productie" [Criteria for Sustainable Biomass Production] by the Projectgroep Duurzame productie van biomassa [Project Group for Sustainable Production from Biomass]

August 2006, http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=w690, for an extensive review of current Dutch thinking and proposals for Dutch regulation in this matter. It is also to be noted that as of September 2006 there is an ongoing discussion about the environmental dimension of palm oil (and similar oils) production, the Roundtable on Sustainable Palm Oil. See: http://www.rspo.org.

18 See "Criteria for duurzame biomassa productie", ibid.

19 See Worldwatch Institute, Biofuels for Transportation, supra n. 6.

20 S.T. Coehlo, "Biofuels-Advantages and Trade Barriers," UNCTAD/DITC/TED/2005/1, UNCTAD, Geneva, 2005, p. 4.

21 Biodiesel norm, EN 14214 'Automotive Fuels – Fatty Acid Methyl Esters (FAME) for Diesel Engines – Requirements and Test Methods.

'22 Hansen and van Vaals, Biofuels in the EU; supra n. 10

23 CRS Report for Congress, Agriculture-Based Renewable Energy Production, Updated May 18, 2006, p. crs-17.

24 For a survey, see P. Kunzlik, "National Procurement Regimes and the Scope for the Inclusion of Environmental Factors in Public Procurement," in OECD, The Environmental Performance

of Public Procurement: Issues of Policy Coherence, 2003. See, also, Buying Green: A handbook on environmental public procurement, European Commission, 2004.

25 The WTO Members who are also members of the Government Procurement Agreement include Canada, European Communities (including its 25 member States: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom), Hong Kong China, Iceland, Israel, Japan, Korea, Liechtenstein, Netherlands with respect to Aruba, Norway, Singapore, Switzerland, and the United States.

26 See for instance, H.-J. Priess and C. Pitschas, “Secondary Policy Criteria and Their Compatibility with EC and WTO Procurement Law” (2000), 9 Public Procurement Law Review 171.

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World Trade Law and Renewable Energy: the Case of Non-tariff Measures

*Robert Howse and REIL**

Over the last two decades, trade and environment issues have typically been a source of intense controversy and conflict in the world trading system. Renewable energy, however, represents an area where we believe that freer less-distorted trade and environmental protection have the potential to be mutually reinforcing. Historically, electrical energy itself has not been traded across borders, with some exceptions (Canada and the US and in the EU). However, with the de-monopolisation of electricity in an increasing number of jurisdictions, and the unbundling of functions such as generation, grid operation, transmission, and retailing as well as the development of financial instruments such as futures and options contracts for energy, the structure of the entire market is starting to change, complicating the analysis under WTO law. This article aims to raise questions and suggest areas where domestic and international policymakers may need to consider undertaking further analysis.

I. Introduction

This article, which closely follows a paper that REIL was asked to prepare by the United Nations Conference on Trade and Development (UNCTAD), considers the question of non-tariff barriers and renewable energy primarily from the perspective of the law of the World Trade Organization (WTO). Further work that REIL is engaged in will also consider regional and bilateral trade and investment agreements.

Over the last two decades, trade and environment issues have typically been a source of intense controversy and conflict in the world trading system, reflecting and intensifying cleavages between environmentalists and supporters of free trade, and between developed and developing countries. Renewable energy, however, represents an area where we believe that freer less-distorted trade and environmental protection have the potential to be mutually reinforcing. Within the United States, demonopolisation and restructuring for competition in the electrical utilities sector has led to new opportunities for renewables. The same ought to be true globally. The removal of barriers to trade in renewable energy equipment and technology promises to reduce the cost and increase the feasibility of meeting global environmental obligations. It also helps to unlock the enormous potential of renewable energy in the developing world, where conventional power has not solved the problem of rural electrification – a key to development in a number of countries. In addition, given the rapidly rising energy needs of the fastest growing developing countries, there is an urgent need for alternatives to fossil-fuel generation that are sustainable. As current events illustrate, the widespread expansion of nuclear power raises serious issues of national and international security, which are not present with renewables. Finally, the eventual possibility of global trading schemes in Renewable Energy Certificates would allow developing countries with a comparative advantage in certain kinds of renewables generation-wind or solar power, for instance –

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the opportunity to exploit that comparative advantage by providing users of energy elsewhere a means of satisfying obligations (or voluntary commitments) to use renewable energy in their own jurisdictions. This opportunity exists even in cases where trading the energy itself is not feasible.

The first part of the article (sections II.-VI.), examines whether and to what extent, under the law of the WTO, government policies to promote renewable energy may be disciplined as non-tariff barriers. The second part (section VII.), addresses itself to whether and to what extent WTO law could be used to challenge or discipline policies (regulatory barriers) that disadvantage renewable energy.

Historically, electrical energy itself has not been traded across borders, with some exceptions (Canada and the US and in the EU). However, non-tariff measures that affect the goods and services that are inputs in the production, distribution, transmission and sale of electrical energy (such as oil, biofuel, photovoltaic panels, wind turbines or their components) often arise from the regulatory framework for electricity itself, even though it is trade in the inputs that is of concern, and the electricity itself is not being traded across borders as a 'commodity'. For instance, if the regulatory framework for electricity requires that a certain percentage of electricity fed into the grid be renewable energy, and that only certain sources or generation methods qualify, this will affect competitive opportunities for those goods (technologies, equipment, fuels) and services that are involved in the production, distribution, etc. of renewable energy. With the demonopolisation of electricity in an increasing number of jurisdictions, and the unbundling of functions such as generation, grid operation, transmission, and retailing as well as the development of financial instruments such as futures and options contracts for energy, the structure of the entire market is starting to change, complicating the analysis under WTO law.

This article is far from an exhaustive examination of the issues (for example, we do not at this juncture consider investment or intellectual property rules, on which separate work will be done by REIL). The failure to consider these matters in this particular article should not be interpreted as a judgment that they are peripheral or secondary in importance: rather these omissions are the result of deadline pressures and related limits on the nature of the research and consultation with experts and industry officials within the time frame required. In many areas, the analysis is speculative, aimed at raising questions and suggesting areas where domestic and international policymakers may need to consider undertaking further analysis. Above all, it should be stressed that the paper raises these matters at a very general level. Whether any given governmental measure is consistent with WTO rules is a highly contextual question that may well depend on the exact design features of that particular measure, and its broader context -regulatory, technological and commercial. Thus, nothing in this paper should be considered as a judgment that any actual measure of any particular government violates WTO rules.

All references to WTO cases are to Appellate Body rulings, unless otherwise noted. Abbreviated citations are used for convenience in the body of the article. A list of Panel and Appellate Body reports with full citations is annexed to this article.

II. The GATT (General Agreement on Tariffs and Trade)

Energy inputs are in many obvious cases goods (e.g. biofuels or oil), and traded electrical energy is generally considered a good when bulk energy is traded across the border between vertically integrated power companies: therefore the General Agreement on Tariffs and Trade (GATT) will apply to many measures that relate to renewable energy and its competitive relationship to other kinds of energy.[1]

1. Taxation measures and Article III:2 of the GATT (National Treatment)

Article III:2 of GATT governs the internal taxation of products by WTO Members; as interpreted judicially, Article III:2 contains two distinct obligations: 1) the obligation to tax identically 'like' imported and domestic products; and 2) the obligation that taxation on 'directly competitive or substitutable

1 As will be discussed below in the Services section important issues arise as to the classification of various steps in the supply of energy as trade in goods and/or services in a new regulatory environment where vertically integrated power monopolies have been broken up into various competitive businesses in generation, transmission, grid operation, retailing, etc.

products' not be 'dissimilar' in such a way as 'to afford protection to domestic production'.[2] The assessment of whether two products are 'like' or 'directly competitive or substitutable' has been held judicially to be a matter of case-by-case examination of the facts, weighing all relevant evidence; the WTO Appellate Body has approved a technique of assessing both 'likeness' and whether products are 'directly competitive or substitutable' that consists in examining the factors enumerated in a GATT policy document, the Border Tax Adjustment Working Party, namely physical characteristics, end uses, and consumer habits. In addition, customs classifications may also be probative. While the issue of whether two products are 'directly competitive or substitutable' sounds like a matter of economic analysis, the Appellate Body (Korea-Alcoholic Beverages) has emphasised that this is a jurisprudential question based on the purpose of National Treatment in protecting equal competitive opportunities, and may be based on common-sense considerations of reasonable consumer behavior as well as empirical economic analysis of substitutability. A finding of likeness would normally entail a conclusion of greater affinity or similarity between the products in question than a finding of 'directly competitive or substitutable': this follows from the more stringent obligation imposed (identical rather than merely not 'dissimilar' obligation, as well as the fact that in the case of 'like products' – by contrast, with 'directly competitive or substitutable' products – the relevant is not qualified by its limitation to cases where different tax treatment would afford 'protection' to domestic production).

Not all taxation measures are the subject of Article III:2, which deals with National Treatment in taxation of products. Tax breaks for research and development, for instance, might well constitute subsidies within the meaning of the WTO Subsidies and Countervailing Measures (SCM) Agreement, if these measures are based on the government forgoing revenue that is 'otherwise due'. In addition, as is illustrated by the US-FSC case, income taxation rules may violate National Treatment with respect to the non-fiscal internal measures (Article III:4) of GATT if those rules result in a denial of equal competitive opportunities to imported 'like' products.

In the case of renewable energy fiscal measures that tax 'products', it is useful to distinguish several kinds of measures. The first could be described as an excise tax on inputs in the production of energy that occurs in the taxing jurisdiction. In the EC context, Majocchi and Missaglia note that this 'seems the most convenient system for taxing energy. The early application in the production process combines two advantages: 1) the number of economic agents performing taxable transactions is small and easily checked; and 2) the tax burden is immediately shifted onto all energy consumers, thereby directly affecting their behavior.'[3] However, in a world where such taxes are not harmonised, consumers in the taxing State can avoid the incentive effects of the tax by purchasing imports of energy from another jurisdiction, where inputs into the production of energy are taxed in a different manner, for instance, without any distinction between renewables and fossil fuels. One way of addressing this problem is by border tax adjustment; when the final product comes across the border, i.e. with energy, the importing State levies a tax on the inputs in its production in the foreign jurisdiction equivalent to the tax that would be levied if the energy had been produced domestically. A different way of addressing the problem is taxing energy itself differentially depending on the method of its production.

We now consider how each of these policy options might fare under the rules on internal taxation in Article III:2 of the GATT.

a. Tax on inputs without border tax adjustment

Differential taxation of fossil fuels as inputs in the product of energy is very likely to be consistent with Article III:2. The fuels in question are physically quite different than the technologies and materials involved in the production of renewable energy; consumers may well care about the environmental consequences that flow from these physical differences (see EC-Asbestos), and even though

2 This second obligation is found by the Appellate Body through combining the language of Article III:2 itself with the language concerning 'protection' in the preamble Article III:1 as referenced in an interpretative note to Article III. Such 'interpretative notes' form an integral part of the treaty. See Report of the Appellate Body, 'Japan – Taxes on Alcoholic Beverages', WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R, 4 October 1996.

3 Majocchi/Missaglia 'Environmental Taxes and Border Tax Adjustments: An Economic Analysis', in Milne/Deketelaere/Kreiser, et al. (eds), Critical Issues in Environmental Taxation: International and Comparative Perspectives, Vol. 1, 2003, p. 347 (hereinafter Critical Issues).

it could be argued that the end uses (production of electrical energy) are the same, based upon the existing jurisprudence (EC-Asbestos), it is improbable that such a common end use would overcome the other evidence pointing to unlikeness. A similar analysis would occur with respect to whether the products are 'directly competitive or substitutable'. In any case, unless somehow designed or structured to favor domestic producers, such a tax could not be found to 'afford protection to domestic producers'.

But this last observation leads to an important caveat, the fact that a tax scheme generally treats renewable inputs more favorably than fossil fuel inputs in itself, as we have suggested, will not make this scheme run afoul of Article III:2. However, the legitimacy of favoring renewables through taxation instruments will not save a tax scheme that is discriminatory in other respects, for instance, as between different fossil fuels (e.g. oil versus coal). Similarly, the analysis of 'likeness' or 'directly competitive or substitutable' might have a different flavor were the WTO adjudicator to be faced with a scheme that favors domestic renewables inputs over imports. While issues of intent or motivation are not supposed to influence determinations of 'likeness' or 'directly competitive or substitutable', in practice this is a case-by-case and highly contextual kind of determination, and in weighing the relative importance of the various probative factors (physical characteristics vs. end uses, for example), the adjudicator may well be influenced, at least subconsciously, by the overall purpose of National Treatment, as stated in III:1, which is to avoid 'protection' of domestic products.

b. Excise tax on inputs with border tax adjustment

This issue was the subject of adjudication in the GATT Superfund case, where the EC challenged a tax on certain chemical inputs, which, in the case of imported products, was collected as a tax on the final product at the border. According to the EC, such a tax was impermissible under the GATT because the polluting effects to which the tax was directed occurred not in the taxing country but in the country of production. The GATT panel held that the purpose of the tax was irrelevant to the right of border tax adjustment in GATT practice, and so the United States was permitted to tax inputs based on their polluting effects in the foreign country of production, as long as the amount of the tax did not exceed the amount imposed on like domestic inputs. Thus, a key condition on the WTO legality of border tax adjustment is that the tax be applied in a non-discriminatory manner to both domestic and imported products. It cannot favor domestic sources.

The Superfund ruling makes it clear that a WTO Member would be able to border tax adjust an excise tax on inputs in energy production by imposing the comparable tax when the final product, energy, is traded across the border. Nevertheless, Dröge et al. claim that 'WTO law remains unclear about the eligibility of indirect taxes [taxes on products] for adjustment.'[4] Their conclusion is based on lack of consensus in the 1970 Working Party on Border Tax Adjustment concerning whether particular kinds of taxes should be singled out as eligible for border tax adjustment. However, this lack of consensus is irrelevant, given the affirmation by the adopted panel ruling in Superfund that Article III:2 of GATT allows border tax adjustment as a general rule.

c. Differential taxation of energy based on the source of generation

Another kind of tax measure to promote renewables would entail taxing domestic and imported energy differently, depending on the generation source, whether renewable or non-renewable. In evaluating this kind of measure under GATT III:2, the WTO adjudicator would have to consider whether electrical energy from a non-renewable source is 'like', or 'directly competitive or substitutable' with, electrical energy from a renewable source. Much of the debate about how this analysis might be done revolves around the controversy over the so-called 'product/process distinction', the notion that the GATT does not permit differential treatment of products based on their method of production as opposed to their properties as products for consumption.

Without rehashing this controversy here, to begin with we note the fundamental proposition that renewable energy as a product for consump-

4 Dröge et al., 'National Climate Change Policy – Are the New German Energy Policy Initiatives in Conflict with WTO Law?', German Inst. for Econ. Research, Discussion Paper 374, 2003, p. 28.

tion is not 'like' non-renewable energy. To start with a simple example, putting a solar panel on one's roof is fundamentally a different consumption decision from buying energy off the grid, which is produced by conventional power sources; the power generated by the solar panel has different characteristics (intermittency for example, and lack of vulnerability to grid failures) that makes it unlike conventional power. Where renewable generation is on-grid, the difference is also evident; consider the particular issues involved in connectivity given the intermittent nature of renewable generation and the distant and dispersed nature of the generation activity (e.g. wind farms).

These are all evident differences that apply if one wants to consider renewable energy as a product for consumption. At the same time, the approach to 'likeness' and 'directly competitive and substitutable' articulated by the Appellate Body does not predetermine a conclusion one way or another concerning methods of production. The AB has emphasised (Japan-Alcohol and EC-Asbestos) that factors other than those in the Border Tax Adjustment Working Party may, in an appropriate case, be dispositive of whether two products are 'like' or 'unlike'. The Appellate Body has also emphasised the need for the adjudicator to examine all relevant factors in a given case and context, and to consider all the evidence pointing either in the direction of a finding of 'likeness' or otherwise. There is simply nothing in the jurisprudence that would justify a per se exclusion of production methods from the analysis of 'likeness' or 'directly competitive or substitutable' nor, on the other hand, is there anything to suggest that production methods could be, on their own, dispositive of a finding of 'unlikeness' or a lack of direct competitiveness or substitutability.

This being said, electrical energy differs from other, or most other, traded commodities. As Howse and Heckman note, 'It cannot be stored; production and consumption of electricity must be simultaneous.'[5] To distinguish between the process of producing energy and some separate commodity that is consumed appears to be at odds with the physical characteristics of electricity itself. Put simply, energy is a process. Thus, in considering 'physical characteristics' in the context of determining whether renewable energy is like or unlike non-renewable energy, the WTO adjudicator would almost necessarily, on the basis of sound science, be required to consider the physical nature of a process. Further, evidence that consumers care about whether energy is renewable or not would be highly probative of 'likeness' or 'direct competitiveness or substitutability'.[6]

Finally, while per se distinguishing in taxation between renewable and non-renewable sources would, as suggested, quite possibly be permissible under Article III:2, some schemes of this character may also contain discrimination against imports, which would run afoul of III:2. An example is the Finnish scheme that was found invalid under the Treaty of Rome rules on free trade by the European Court of Justice.[7] Finland taxed domestic energy under rules that provided for different rates of tax depending on the method of production; however, Finland also applied the highest of these rates to imported energy, regardless of production method, on grounds that it was difficult to verify the sources of imported energy. The Court held that European internal trade law permitted differences in taxation based on production method and raw materials used in the creation of energy, but that the scheme was nevertheless impermissible in that it was not applied even-handedly to domestic and imported energy. Van Calster notes that the court seemed particularly concerned that 'the Finnish legislation did not even give the importer the opportunity of demonstrating that the electricity imported by him had been produced by a particular method in order to qualify for the rate applicable to electricity of domestic origin produced by the same method.'[8]

The feature of the Finnish scheme that was found problematic by the European Court would also likely lead a WTO adjudicator to find a violation of Article III:2, since imported renewable sourced energy is being taxed at a higher rate than domestic renewable sourced energy.

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5 Howse/Heckman, 'The Regulation of Trade in Electricity: A Canadian Perspective', in Daniels (ed.), Ontario Hydro at the Millenium: Has Monopoly's Moment Passed?, 1996, p. 106.

6 For strong evidence that consumers in some jurisdictions have a strong preference for renewables, see Lehr/Guild/Thomas et al., 'Listening to Customers: How Deliberative Polling Helped Build 1,000 MW of New Renewable Energy Projects in Texas', Nat'l Renewable Energy Lab., NREL/TP-620-33177 2003.

7 Case C-213/96 – Outkumpu Oy v Piiritullikamari [1998] ECR 1-1777.

8 Van Calster, 'Topsy-turvy: The European Court of Justice and Border (Energy) Tax Adjustments-Should the World Trade Organization Follow Suit?', in Critical Issues, supra note 3, p. 324.

2. Non-fiscal regulatory measures and Article III:4 of the GATT

Article III:4 of the GATT sets out the National Treatment obligation with respect to non-fiscal laws, regulations and requirements. Such non-fiscal measures must accord no less favorable treatment to imports than to 'like' domestic products. The determination of whether a measure is in violation of Article III:4 entails two distinct steps. The first is to ascertain whether the imported product and the domestic product are 'like'. The analysis of likeness under Article III:4 entails a weighing and evaluation of the same kinds of factors as is the case for fiscal measures – including physical characteristics, end uses, and consumer habits – with the possibility that other factors may, in certain cases, also be probative of likeness (EC-Asbestos). If indeed the domestic and the imported product are determined to be 'like', the adjudicator will proceed to the second step of determining whether the regulatory distinction between the two products results in less favorable treatment of imports (EC-Asbestos; Korea-Beef). As the Appellate Body has emphasised, not all regulatory distinctions between 'like' products are impermissible under Article III:4, but rather only those which result in less favorable treatment for the group of imported products in comparison to the group of like domestic products. Thus, the adjudicator will consider whether the regulatory distinction in question is, overall, disadvantageous to imports. The fact that a facially neutral regulatory distinction results in some one imported product being treated worse than some one domestic product will not be enough to establish 'less favorable treatment'. Instead, there must be in the structure and design of the regulatory scheme some systematic bias or orientation in favor of 'like' domestic products.

Prominent examples of non-fiscal regulatory measures to promote renewable energy are minimum price and quota measures. The characteristics of these policy instruments are summarised by Fouqet et al.: 'The minimum- price system is characterised by a legally determined minimum price and an obligation on the part of the grid operator or utility to purchase „green" electricity. In contrast, the key components of quota schemes are government mandates for specified groups of market participants to purchase or sell a minimum quantity of capacity or amount of electricity from renewable energy. The government allocates certificates in order to ensure compliance with the mandated quantity.'[9]

Although there may be some issue as to whether minimum price schemes are 'subsidies' within the WTO definition (and thus they might be subject to subsidies disciplines), it is likely that, where imposed on both domestic and imported energy, minimum price and quota measures would be considered as internal laws, regulations and requirements within the meaning of Article III:4.[10]

In the Canadian Beer case, a GATT panel addressed a measure that established a minimum price for the sale of beer in government retail monopoly stores. The panel declined to rule that minimum price requirements as such violate Article III:4 of the GATT in providing less favorable treatment to lower cost foreign producers of like products. It did find, however, that Canada violated Article III:4 in the way in which it determined the applicable minimum price, based on the cost structure of domestic beer producers; by the use of a formula linked to domestic producers' costs, the very design and structure of the scheme discriminated against foreign producers.

There are important implications of this ruling for the manner in which minimum prices are set in renewable energy schemes: minimum prices that are determined exclusively or largely based on domestic costs of renewable energy could be suspect under Article III:4. The minimum price should be set in such a way as to allow for equal competitive opportunities between domestic and imported sources of renewable energy. This may prove problematic for minimum price schemes that are intended to address not only environmental goals but also industrial policy goals of promoting a domestic renewable energy industry.[11] It may be in

9 Fouquet et al., 'Reflections on a Possible Unified EU Financial Support Scheme for Renewable Energy Systems (RES): A Comparison of Minimum-price and Quota Systems and an Analysis of Market Conditions', EREF and Worldwatch Institute, Position Paper 2005, p. 12.

10 The argument that minimum price requirements constitute 'subsidies' in WTO law will be addressed later in this paper in the section on Subsidies. Similarly, the argument that quotas may be quantitative restrictions within the meaning of Article XI of the GATT, and thus per se illegal, is addressed below in the discussion of Article XI.

11 In the PreussenElektra case, discussed below in the Subsidies section of this paper, the Advocate General noted before the European Court of Justice that the German minimum price purchase requirement did not permit the sourcing of the required amount of renewable energy from abroad (paragraphs 200-202).

practice however that no foreign renewable energy sources exist that are willing to supply the needs of the regulating State at a lower price than the price required to make the domestic industry viable. This would be a different state of affairs than existed in the case of the Beer dispute, where American competitors of Canadian beer producers were able and willing to supply at prices below the legally imposed minimum.

The case of quota schemes poses a rather different set of issues. In a document produced for the Commission on Environmental Cooperation under the North American Free Trade Agreement, Horlick, Schuchhardt and Mann have argued that US State renewable portfolio standard (RPS) laws, which require retail sellers of electricity to include in their portfolios a certain percentage or amount of electricity from renewable sources, may violate the National Treatment provisions in the GATT.[12] This conclusion is in large part based on the assumption that 'Electricity produced from renewable resources has exactly the same qualities as electricity generated from other (conventional) resources and it is the same whether domestically produced or imported.' On the basis of this assumption Horlick, Schuchhardt and Mann apparently consider it a foregone conclusion that electricity from renewable sources would be found to be a like product to electricity from non-renewable sources.

As has been pointed out in lengthy response to their study by the Union of Concerned Scientists, the legal analysis of Horlick, Schuchhardt and Mann is questionable in some respects. It seems based on the presumption that the WTO adjudicator could never find that two products with similar physical characteristics are nevertheless 'unlike', for example, because the other factors probative of 'likeness', such as consumer habits, point to a finding of 'unlikeness'.[13] As discussed above in the section of this paper on fiscal measures, this presumption is not born out by a close reading of the doctrinal framework established by the Appellate Body in EC-Asbestos and Japan-Alcohol.[14] While in these cases the physical characteristics of the products played a large role in the determination, the Appellate Body also went out of its way to stress that every case is different, and that the analysis of likeness is an inherently contextual undertaking of weighing all the relevant evidence (the Appellate Body also said in EC-Asbestos that where physical characteristics are significantly different there must be considerable evidence on other matters weighing in the other direction to establish 'likeness'; but it did not thereby endorse the reverse proposition that physical similarities establish even a rebuttable presumption of likeness. This reverse proposition would be incompatible in any case with the general burden of proof on the complainant in WTO litigation).

The evidence must necessarily include evidence of consumer preferences and habits, a factor that the Appellate Body has held must be addressed before making a determination of likeness. In this respect, the Union of Concerned Scientists notes: 'The public's demand for renewables, as evidenced by the interest in diversity and the willingness to pay more for the product, demonstrates that the purchase decision has more dimensions than merely physical ones.' If the Appellate Body were of the view that physical similarities alone could always be an adequate basis for a finding of likeness, regardless of other kinds of evidence pointing towards 'unlikeness', its requirement that all the evidence be weighed and all the factors considered in every case would make no sense: it would make a farce of judicial economy to require an adjudicator to go on to look at other factors and evidence, if indeed, physical characteristics, where sufficiently similar, could be simply dispositive of likeness.

Even if renewable sourced energy were deemed to be a 'like' product to non-renewable sourced energy, a finding of Article III:4 violation would require the additional step of a determination of 'less favorable treatment' of imports. Horlick et al. conclude that 'the generating methods included in the renew-

12 Horlick/Schuchhardt/Mann, 'NAFTA Provisions and the Electricity Sector', North American Commission for Environmental Cooperation, Article 13 Initiative, Background Paper, Electricity and the Environment 2001 (hereinafter CEC Background Paper).

13 Hempling/Rader, 'Comments of the Union of Concerned Scientists to the Commission for Environmental Cooperation in response to its „NAFTA Provisions and the Electricity Sector"', Background Paper to its 22 October 2001 Working Paper Entitled 'Environmental Challenges and Opportunities of the Evolving North American Electricity Market', 2002.

14 See CEC Background Paper, supra note 12, p. 9. Horlick/Schuchhardt/Mann admit there is no textual basis in the GATT treaty for their proposition: 'There are no specific provisions in the text of the GATT 1994 itself which plainly discipline countries from making a distinction between traded like products based on criteria or factors which are not physically embodied in the product.' As a scientific matter, it may well be misleading in any case to think of the process of producing energy as somehow not physically embodied in the energy itself. As noted earlier in this paper, energy is inherently dynamic – it is a process of transformation. The product is the process.

able portfolios tend to disadvantage out-of-State producers, including foreign importers, because of different regulatory, topographic and environmental conditions which influence electricity generation in different regions and countries.'[15] National Treatment, however, cannot possibly be interpreted to require a government in its regulations to neutralise the comparative advantage that some producers have over others due to such locational factors. This would be contrary to objectives of the WTO as stated in the Preamble to the WTO Agreement, including optimal use of the world's resources.

In EC-Asbestos the Appellate Body has suggested that the notion of 'less favorable treatment' must be read in light of the purpose of avoiding 'protection' stated in Article III:1. It will not be appropriate to find 'less favorable treatment' where the disadvantage to imported products stems entirely from foreigners' locational disadvantages in producing a product that meets a regulatory condition rationally designed to achieve a non-protective purpose. However, Horlick et al. point to definitional features of some States' portfolio standards that include within eligible renewable sources some kinds of renewable energy and exclude others, in such a manner as to favor systemically domestic producers. From the perspective of the environmental and energy security goals that underpin favoring renewables as such over non-renewables, these definitional features are not rational or justified, according to Horlick et al. If this is indeed true – and this is a matter strongly contested by the Union of Concerned Scientists – a finding of 'less favorable treatment' of the group of imported products under III:4 might well be correct.

Along similar lines, the meaning of 'like' product under III:4 is able to address the concerns of Horlick et al., without resorting to their forced reading that renewable sourced energy is a like product to non-renewable sourced energy on account of physical similarities alone. Distinctions in renewable portfolio standard regimes that distinguished between different sources of renewable energy would be analysed under Article III:4 by first of all determining whether domestic energy from renewable source A (included in the portfolio standard) is a like product to imported energy from renewable source B (not included in the portfolio standard). A WTO adjudicator might conclude that as a general matter renewable sourced energy is an 'unlike' product to non-renewable sourced energy, but, conversely, when comparing energy from two different renewable sources, find that the products are indeed 'like'. There is thus no need to force the reading of III:4 to treat all physically similar energy as 'like' in order to avoid the kind of arbitrary discrimination between different renewable sources that Horlick et al. may be quite legitimately worried about.

Article XI of the GATT and renewable energy quotas

As already noted, some renewable energy measures specify numerical targets that grid operators, retailers or other economic actors must meet. Article XI of GATT, which has the heading 'Quantitative Restrictions', bans 'prohibitions and restrictions' on imports and exports. There is a theoretical possibility that quantitative renewable energy measures could be considered as 'prohibitions' or 'restrictions' on imports, on the notion that these measures impose a quantitative limit on the amount of non-renewable energy that can be sold into the market in question, including imported energy. In the India-Autos case, the panel took a very broad view of the measures covered by Article XI, which included de facto prohibitions and restrictions that did not formally restrict imports. However, in all of the cases where a broad view of the measures covered by Article XI was articulated, even if the measures in question did not have the form of a prohibition or restriction but some other kind of regulatory or administrative action nevertheless the action was targeted at imports or exports. In other words, even on the expansive view of Article XI, quantitative measures that apply to both domestic and imported product should be examined under Article III:4 of GATT, not Article XI. The essential distinction is articulated by Prof. Joost Pauwelyn: 'The prohibition in Article XI was only intended to prevent quantitative restrictions imposed solely on imports (such as a ban or quota on shoe imports to protect domestic shoemakers). To apply the Article XI prohibition to all measures, including domestic regulation, on the sole ground that they restrict imports would fly in the face of GATT's presumption in favor of regulatory autonomy and nullify

15 Ibid., p. 10.

the rights of WTO Members under Article III of GATT.'[16]

3. Article XX of the GATT: general exceptions

Assuming that either fiscal or non-fiscal measures on renewable energy were found to violate one or more of the provisions of the GATT discussed above, they might nevertheless be justified under one or more of the exceptions in Article XX. Of particular relevance are the XX(b) exception for measures necessary for the protection of human or animal life or health and XX(g) measures in relation to the conservation of exhaustible natural resources. Under XX(b) it would be necessary to demonstrate that there is a real health risk from non-renewable energy and that measures to promote renewables are either an indispensable means of addressing the risk or 1) that there is a close connection between the renewables measures and solving the health risk and 2) the trade restrictive impact is not disproportionate to the contribution of the measure to addressing the risk (EC-Asbestos, Korea-Beef). A range of documents from international organisations, and those that have emerged from intergovernmental conferences such as Bonn 2004, attest to the role of renewables in addressing the risks from conventional energy, and are evidence of wide and growing recognition of this role by the international community.

A condition of maintaining measures based on an Article XX justification is that they might be applied so as to constitute unjustifiable or arbitrary discrimination between countries where the same conditions prevail or a disguised restriction on international trade (this is based on the 'chapeau' or preambular paragraph of Article XX). This condition, it must be emphasised, deals only with application through administrative or judicial action, not the scheme as such (US-Shrimp, US-Shrimp 21.5). Unjustifiable discrimination may result from the application of a scheme which is rigid and unresponsive to different conditions in different countries. Arbitrary discrimination may occur if there is a lack of due process and transparency in the manner in which the criteria of the scheme are administered, if there are discriminatory effects on foreign interests (US-Shrimp). There is lack of clear judicial guidance so far on the meaning of 'disguised restriction on international trade' (US-Reformulated Gasoline).

Article XX(g) permits otherwise GATT inconsistent measures that are 'in relation to the conservation of exhaustible natural resources.' A specific condition of Article XX(g) is that the trade measures to be justified must be taken in tandem with comparable measures on production or consumption that apply to the domestic market (even-handedness). The air is an exhaustible natural resource according to GATT/WTO jurisprudence. As a general matter, the meaning of 'exhaustible natural resources' is to be guided by emerging legal and policy norms on sustainable development and biodiversity (US-Shrimp). Unlike with XX(b) where the connection between the measure and its aim is expressed by the term 'necessary' leading to the requirement that the measure either be indispensable or have a close connection to its aim and a not disproportionate trade impact, the language 'exhaustible natural resources' expresses the concept of a rational nexus between the measure and its aim, a 'real' connection (US-Shrimp). Additionally, the measure must not be disproportionately wide in reach or scope (US-Shrimp).

A longstanding issue is whether, under Article XX, a WTO Member can justify measures aimed not only at dealing with local, i.e. domestic environmental externalities, but also with global environmental commons challenges and, further, whether such measures can include measures aimed at inducing other States to adopt appropriate policies to protect the commons. In US-Shrimp, the AB made it clear that in principle Article XX was available to address other States' policies (Paragraph 121). At the same time the AB did not resolve the question of whether some kind of territorial nexus between the country taking the measure and the environmental problem is needed. Given the long term effects of the use of non-renewable energy sources are universal, and given the many immediate transboundary effects, if such a nexus were indeed required, it would not be hard to show in the case of renewables measures. Notably, in US-Shrimp, the AB suggested that, even supposing a

16 Pauwelyn, 'Rien ne va plus? Distinguishing Domestic Regulation from Market Access in GATT and GATS', unpublished manuscript, Duke Univ. Law Sch. 2004. As Pauweyln notes, the Working Party Report on The Haitian Tobacco Monopoly refused to consider quantitative measures that were not targeted at imports to be a violation of Art. XI.

territorial nexus were to be required it was satisfied by the mere fact that some members of the endangered species of sea turtles were to be found in US waters some of the time. This means that even if the AB or some members of the AB had been leaning towards a 'nexus' requirement, what was being considered was a kind of 'minimal contacts' test.

III. The WTO Technical Barriers to Trade (TBT) Agreement

In addition to the National Treatment obligation in GATT Article III:4, most mandatory domestic requirements on traded products will also come under the disciplines of the WTO TBT Agreement, because they will fall within the definition of 'technical regulations'. The main disciplines that are distinctive in the TBT Agreement are the requirement that international standards be used as a basis for technical regulations (2.4), and the requirement that technical regulations not constitute an unnecessary obstacle to trade (2.2). This means that the measure must not be more trade restrictive than is required to meet a Member's legitimate objective (there is a non-exhaustive list of 'legitimate objectives' that includes, inter alia, 'protection of human health or safety, animal or plant life or health, or the environment.'

Further, where the measure is 'in accordance with' relevant international standards, and is 'prepared, adopted or applied' for one of the listed legitimate objectives, it is rebuttably presumed not to create an unnecessary obstacle to trade, within the meaning of 2.2.

There is no definition of 'international standards' in the TBT Agreement. There is however a requirement that international standard setting bodies be open to participation by the relevant standard-setting bodies in all WTO Member States.

It will be immediately observed that international standard setting will have a very significant impact on the WTO-compatibility of renewables measures. This includes any international standards that define what is a renewable energy source, and norms of reliability, safety etc. for renewable energy technologies and operations.

'Technical Regulations' include reporting and verification requirements to ensure that the energy is from a renewable source. Such requirements must, then, not pose an unnecessary obstacle to trade by imposing an undue burden on traded energy. Similarly, mandatory labeling schemes are likely to fall within the meaning of 'technical regulations';[17] these schemes also must be operated such that the requirements of labeling and the conditions that must be satisfied to use a 'Green' label do not result in an unnecessary obstacle to trade. In these areas, too, agreed international norms can do much to facilitate trade and ensure that domestic measures are not susceptible to challenge under the TBT Agreement.[18]

The Effects of tradeable renewable energy certificates on the compliance of renewables measures with the GATT and TBT Agreements

Trading of government-imposed obligations to purchase renewable energy, as opposed to trading in energy itself, is trade in services not trade in goods, and will be considered as such in the discussion on Services later in this paper. However, as the Appellate Body held in Canada-Periodicals measures on services may also affect trade in goods and therefore be subject to the WTO disciplines that pertain to trade in goods.[19] Any system of tradeable certificates presupposes the willingness of the government that is imposing an obligation with respect to renewable energy to accept the certificate in lieu of the certificate owner herself fulfilling the obligation. The terms and conditions that the obligation-imposing government sets for acceptance of certificates in lieu of specific fulfillment of the obligation may in some instances have effects on trade in goods. An obvious example would be where the energy purchases attested to by the certificate must be purchases of domestic renewable energy. The government may have a legitimate reason for such

17 Dröge et al., supra note 4, p. 17.

18 It should be noted that the TBT Agreement also imposes on governments a requirement that they take measures to ensure that 'voluntary' standards, including those that are emitted by non-governmental bodies, observe the principles underlying disciplines on mandatory governmental regulations. In this way, TBT norms may also apply for instance to industry-developed standards or to decisions of a private enterprise that acts as a market operator in a demonopolised electricity system (although the market operator as discussed elsewhere in this paper might also be subject to discipline under the 'State Trading Enterprises' provision of the GATT, where the market operator is acting pursuant to a statutory right or privilege.)

19 See also Werksman/Lefevere, 'WTO Issues Raised by the Design of an EC Emissions Trading System', FIELD, Scoping Paper No. 3, 1999.

a restriction, where its policy goal in encouraging renewables is to reduce local environmental externalities from fossil fuel or nuclear generation activities. A certificate attesting to the purchase of renewable energy by some other party in some other jurisdiction by definition does not indicate a reduction in the actual use of non-renewable energy within the obligation-imposing jurisdiction, and a corresponding reduction in local environmental externalities. By contrast in a domestically-limited certificate trading system, one can always be sure that some counterparty is in fact consuming renewable energy in lieu of non-renewable energy that is being produced, with attendant environmental externalities, on the territory of the obligation-imposing country. At the same time, the exclusion of foreign energy from the trading scheme would appear to be discriminatory under the GATT National Treatment standard. The limitation might be justified under Article XX of the GATT: however, given that emissions from fossil fuel generation are recognised in many international instruments as a global environmental problem, it is an open question whether under Article XX a WTO Member could justify discrimination based on the idea that its view of the problem is one that is limited to local externalities.

When we turn to internationally traded certificates, the analysis is very different. Such certificates greatly expand the opportunities of out-of-jurisdiction producers of renewable energy; the existence of such a trading program allows out-of-jurisdiction producers, indirectly, to fulfill the demand for renewable energy created by the government obligation, even if it would be infeasible or uneconomical for those out-of-jurisdiction producers to wheel the energy itself across the border into the obligation-imposing jurisdiction. The creation of these indirect opportunities for out-of-jurisdiction producers to supply the government-created demand for renewable energy in the obligation-imposing jurisdiction serves to counter arguments that the obligations in question inherently favor domestic producers of energy, renewable or non-renewable, because of technical or other barriers to foreign renewable producers selling energy itself across the border into the obligation-imposing jurisdiction.

At the same time, the obligation-imposing government will necessarily dictate the terms and conditions on which it will recognise renewable energy that is certified from out of jurisdiction sources as counting for the satisfaction of the certificate-holder's obligation. These terms and conditions will affect the economic opportunities of renewable energy producers in other WTO Member States. But they will not necessarily affect the competitive opportunities of traded products, unless the terms and conditions apply to energy itself that is traded across the border. Where they apply to energy that is being generated in a foreign jurisdiction by renewable sources and being sold (as energy) in that jurisdiction, then the only trade is in the certificates, not the energy, and the terms and conditions in question would be disciplined by the GATS including the provisions on financial services.

IV. Subsidies

Export subsidies and subsidies tied to domestic content requirements are prohibited by WTO law (GATT Article XVI; Subsidies and Countervailing Measures (SCM Agreement). However, non-prohibited subsidies nevertheless may be 'actionable' under WTO law[20] if they have certain kinds of adverse trade effects. Actionability means either that a complaint can be made against the measure in question by a WTO Member government in WTO dispute settlement, or that the subsidy may be addressed through unilateral countervailing duties imposed by the government of an affected country in compliance with the procedures set out in the SCM Agreement and pursuant to domestic law. Countervailing duties may only be imposed where it can be shown that the subsidy has caused injury to the domestic industry in the country imposing the duties through the import of competing 'like' subsidised products. Where the domestic industry is not injured or threatened with injury from subsidised imports, countervailing duties are an impermissible measure under WTO law.

In the analysis which follows we shall focus on the criteria for a subsidy to be actionable in the sense of the subsidy measure giving rise to a valid complaint in WTO dispute settlement.

20 The text of the SCM Agreement also refers to some particular subsidies that are deemed 'non-actionable' including, notably some R & D and environmental subsidies (Article 8.2 (a) and (c)). However, this safe harbour for these classes of subsidies expired some years ago by virtue of Article 31, which envisaged negotiations that would review and perhaps modify these classes of 'non-actionable' subsidies. These negotiations have not been brought to a successful conclusion.

First of all, in order to be actionable, the measure must conform to the definition of a subsidy in the SCM Agreement. Two essential components of this definition are that there is a financial contribution by government and a benefit received by the recipient.

'Financial contribution' is a defined term itself in the SCM Agreement, and explicitly includes a range of situations other than direct cash payments, such as provision of goods and services or tax breaks where the government foregoes revenue 'otherwise due'.

'Benefit' denotes the requirement that the subsidy must confer a competitive advantage on the recipient; the notion of advantage is understood by reference to the conditions the recipient would otherwise have to face in a competitive marketplace, absent the government intervention in question (Canada-Aircraft; Canada-Lumber). The benchmarking in question is assisted by Article XIV of the SCM Agreement, which provides a non-exhaustive list of 'market' benchmarks: for example, in the case of equity capital infusions by government, the infusion 'shall not be considered as conferring a benefit unless the investment decision can be regarded as inconsistent with the usual investment practice (including for the provision of risk capital) of private investors in the territory of that Member.' (14(a)). In the case of provision of goods or services or purchase of goods and services, a benefit only exists if the provision is made 'for less than adequate remuneration' or the purchase is made 'for more than adequate remuneration', with regard to 'prevailing market conditions for the good or service in question in the country of provision or purchase (including price, quality, availability, marketability, transportation and other conditions of purchase and sale).'

As a general matter, the WTO Appellate Body has acknowledged that correctly identifying a „benefit" and whether it exists can be a complex matter in situations where the market conditions themselves have been pervasively influenced by government intervention, and therefore a meaningful 'market' benchmark for 'benefit' is elusive (see Canada-Lumber, US-Privatization CVDs). This consideration may be of no little importance in the case of financial support measures for renewable energy, for the 'market' against which the competitive advantage conferred by the financial support measure is supposed to be defined (the 'benefit'), is often a market that historically has been shaped in terms of investment conditions, prices, supply and other relevant market factors by pervasive government action (usually in favor of non-renewable energy). For example, does a government loan or guarantee for investment in renewable energy constitute a 'benefit' or competitive advantage, under market conditions where private providers of capital almost never fully capitalise a major energy project without some kind of government support or guarantee? The practices of the marketplace themselves, in other words, may assume and internalise government support measures.

In addition to meeting the requirements of 'financial contribution' and 'benefit', in order to be actionable a subsidy must also be specific. That is, the terms of the government support program must target the subsidy to some specific or limited class of users, either particular industries or firms; a subsidy may be de facto specific, however, even if not by its terms targeting certain industries or firms, where a limited sub-set of industries or firms are the predominant or disproportionate users of the subsidy. It must be appreciated that the determination of specificity is a matter of locating a point along a spectrum. On one end there are obviously specific subsidies such as the bailout of a single enterprise. At the other end there are obviously non-specific subsidies, such as government provision of universal health care, which are 'used' throughout the entire economy. (See the Report of the Panel, United States-Softwood Lumber (Final Countervailing Duty Determination)).

In addition to meeting the requirements of 'financial contribution' and 'benefit' and being specific, a subsidy must cause certain 'adverse effects' in order to be successfully challenged as 'actionable' in the WTO. These adverse effects are listed in Article 5 of the SCM Agreement, and include injury to domestic producers of a like product in competition with the imported subsidised product (injury in this sense must exist if countervailing duties are to be imposed); nullification or impairment of benefits accruing 'directly or indirectly' under the GATT, in particular tariff concessions; or serious prejudice to the interests of another Member. 'Serious prejudice' is further defined in Article 6.3. To show 'serious prejudice' the complaining WTO Member must show that the effect of the subsidy is to displace imports of a 'like' product into the market of the subsidising Member or to displace

exports of the complaining Member to a third country market; or significant price suppression or price undercutting in the same market with respect to like products; or finally 'the effect of the subsidy is an increase in the world market share of the subsidising Member in a particular subsidised primary product or commodity [footnote omitted] as compared to the average share it had during the previous period of three years and this increase follows as a consistent trend over a period when subsidies have been granted.'

It will be immediately observed that there are many hurdles that a complainant must overcome to successfully challenge an 'actionable' (non-prohibited, non-export subsidy) in WTO dispute settlement. Outside the context of agriculture (discussed below) where domestic support has been a matter of considerable tension and controversy and where the Agreement on Agriculture has its own complex rules which interact with the SCM rules, there has so far not been much litigation interest in the WTO with respect to 'actionable' subsidies. There are, however, numerous cases where the United States has imposed countervailing duties on such subsidies.

Subsidies are a persuasive form of government intervention to support renewable energy.[21] In this paper, we can only very selectively examine how the features of some of these programs might be considered under the various criteria discussed above.

One issue that has already arisen in the context of the European internal competition law is whether minimum price requirements could be considered subsidies due to their effect of guaranteeing revenues in excess of what would exist without government intervention. In the PreussenElektra case, the European Court held that minimum price purchase requirements under German law could not be considered „State aid" in European law because of the absence of any direct or indirect transfer of State resources.[22] In the WTO SCM Agreement, by contrast, a 'financial contribution' includes a situation where 'a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in [SCM Agreement Article 1.1(a)(1)] (i) to (iii) which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by government.' Since (iii) includes 'purchasing goods', the argument is that a situation where the government directs a private actor to purchase goods at a higher than market price is included within the meaning of 'financial contribution' even if the government does not incur any cost itself. In the Canada-Aircraft case (paragraph 160), the Appellate Body observed that 'financial contribution' could include those situations where a private body has been directed by the government to engage in one of the actions defined in the SCM Agreement Article 1.1(a)(1)(i)-(iii), even if government does not bear the cost of such delegated action.

This being said, one should not jump to the conclusion that the German minimum price purchase requirements would fully meet the relevant definition of 'financial contribution', i.e. the definition that applies where the government entrusts or directs a private body. The relevant provision also requires that the function entrusted or delegated to the private body be one that is normally performed by government. The German minimum price purchase requirements do not represent a delegation of a governmental function to any private body; rather they represent a regulation of the electricity market, and their directive character goes to regulating market behavior and transactions, not imposing a governmental function on a private body. Here, the observations of the panel in US Export Restraints are relevant: '. . . [I]t does not follow . . . , that every government intervention that might in economic theory be deemed a subsidy with the potential to distort trade is a subsidy within the meaning of the SCM Agreement. Such an approach would mean that the „financial contribution" requirement would effectively be replaced by a requirement that the government action in question be commonly understood to be a subsidy that distorts trade.' (paragraph 8.62). The requirement that a private body be performing a normally governmental function guards against the possibility that all 'command-and-control' regulation, which

21 The range of typical measures is summarised in Sawin, 'National Policy Instruments: Policy Lessons for the Advancement and Diffusion of Renewable Energy Technologies Around the World', Int'l Conference for Renewable Energies, Thematic Background Paper Series 2004, pp. 18-20. See also Beck/Martinot, 'Renewable Energy Policies and Barriers', in Encyclopedia of Energy, Cleveland ed. 2004, pp. 372-376.

22 Case C-379/98 – PreussenElektra AG v.Schleswag AG [2001] ECR I-2099.

directs private bodies and which always has some distributive effect as between different private economic actors, could be deemed a subsidy.

We have already alluded to some of the complexities of ascertaining whether the subsidy has conferred a 'benefit' on the recipient, i.e. a competitive advantage over and against general 'market' conditions. Some programs for renewable energy may not confer a 'benefit' in this sense. Measures that merely defray the cost of businesses acquiring renewable energy systems or which compensate enterprises for providing renewable energy in remote locations, do not necessarily, for instance, confer a 'benefit' on the recipient enterprise. They simply reimburse or compensate the enterprise for taking some action that it would otherwise not take, and the enterprise has not acquired any competitive advantage over other enterprises, which do not take the subsidy but do not have to perform these actions either.

With respect to the requirement of specificity, subsidies that are provided to users of renewable energy may well not be specific if they are available generally to enterprises in the economy.

This brings us to the consideration of 'adverse effects'. Often subsidies for renewable energy and renewable energy technologies reflect the absence of alternative sources of supply for renewable energy and/or the technologies. In such cases, there may be no competing producers from other WTO Members who can claim to be injured, or suffer other adverse effects, from the subsidies in question. Where subsidies are paid to users of renewable energy or renewable energy technology, and where those users can benefit from the subsidy regardless of whether they acquire the energy or the technology from domestic or foreign sources, again here there may not be any 'adverse effects' on competing foreign producers.

Finally, we should mention the possibility that renewable energy subsidies could be challenged based on their 'adverse effects' not on competing renewables imports but on foreign non-renewable energy products. Here we note that, generally speaking,[23] the 'adverse effect' in question must be on a like product from another WTO Member. The meaning of likeness for purposes of the SCM Agreement has been addressed only once so far in the jurisprudence, in the Indonesia-Autos case. In that case, the panel did not delineate very clearly the concept of 'like products', instead evoking a very broad notion that entails considering the kinds of factors that are at issue under Article III of the GATT as well perhaps as others, such as the way the industry had segmented itself. In Indonesia-Autos, the panel emphasised physical characteristic s in its likeness analysis, but largely because, as it said, physical characteristics, in the case of automobiles, were closely linked to consumer relevant criteria such as brand loyalty, brand image/reputation and resale value (paragraphs 14.173-14.174.).

Where the harm alleged is 'serious prejudice' within the meaning of Article 6 of the SCM Agreement, the requirement to identify a 'like product' exists explicitly with respect to serious prejudice due to price undercutting, but not with respect to the other kinds of effects identified in 6.3.c, notably significant price suppression, price depression or lost sales. In the US-Cotton case, at footnote 453, the Appellate Body held that it did not have to decide the interpretative issue of whether a comparison with 'like' products should be nevertheless inferred in the case of significant price suppression, price depression or lost sales.

Related issues would arise if a WTO Member were to challenge renewables subsidies, claiming adverse effects on producers of non-renewable inputs such as fossil fuels. The complex set of considerations that determines price and supply of fossil fuels in domestic and world markets (including futures and derivatives trading, political events, and in the case of petroleum, cartel-like behavior), could make it very difficult to attribute the kinds of 'adverse effects' contemplated in Article 5 of the SCM Agreement to renewables subsidies. With respect to 'serious prejudice', the Appellate Body has held in US-Cotton 'it is necessary to ensure that the effects of other factors on prices are not improperly attributed to the challenged subsidies [footnote omitted]'(paragraph 437). The Appellate Body further observed: 'we underline the responsibility of panels in gathering and analysing relevant factual data and information in assessing claims under Article 6.3(c) in order to arrive at reasoned conclusions'(paragraph 458).

Some renewables subsidies (e.g. biofuels subsidies) may raise issues concerning the application and interpretation of the provisions of the WTO Agreement on Agriculture, which contains inde-

23 But see the discussion of 'serious prejudice' in the following paragraph.

pendent disciplines on domestic support measures for agriculture. The Agreement on Agriculture explicitly exempts certain environmental and conservation subsidies from the requirement to reduce domestic support (Annex II, Paragraph 12); if a measure falls within these provisions, the Agreement on Agriculture permits its retention at current levels.[24] At the same time the Agreement on Agriculture Article 13b (the 'peace clause') provides immunity from suit under the SCM Agreement for such subsidies, but only during the 'implementation' period, i.e. before January 1, 2004. The 'peace clause' has now expired and no agreement has been reached between WTO Members on its revival.

V. The General Agreement on Trade in Services (GATS)

As already noted, the conventional view is that, when traded across borders, electrical energy is a 'good'. This view arose when trade in electricity consisted in bulk power contracts between integrated national monopolies. With demonopolisation and regulatory reform occurring in the electrical energy sector in many countries, and the functions of former integrated monopolies now being performed by discrete generation, distribution, grid management and retailing enterprises, the nature and structure of electricity trade is changing; it is plausible to view these various discrete entities as providers of services of various kinds such that what are being traded across borders are these services, rather than electricity as a good. Where renewable energy obligations are being imposed on grid operators or retailers, for example, it may be appropriate to consider these obligations under the GATS rather than the GATT. Adding to the uncertainty, the Appellate Body has found overlap between the two treaties such that the same measure could be disciplined in different aspects by both GATT and GATS (EC-Bananas).

The scope and structure of GATS obligations is significantly different than in the case of the GATT. The Agreement applies to measures affecting trade in services, defined as the supply of services by the service suppliers of one WTO Member to the consumers of another WTO Member, through any of four 'modes' of delivery. Mode 1 refers to a situation where neither the supplier nor the buyer of the service crosses the border in order to effect the transaction: supply of electricity across the border, to the extent that this is a service (see above), falls within mode 1 in many cases. Mode 2 entails the consumer going to the jurisdiction of the supplier in order to consume the services (e.g. tourism). Mode 3 involves the supplier establishing a commercial presence in the jurisdiction where the consumers of the service reside (and this mode may have important implications for the energy sector as well as mode 1). Mode 4 involves the entry of personnel of the service supplier into the jurisdiction where the consumers reside in order to deliver the service.

There are some general obligations in the GATS that apply to all services supplied from one WTO Member's providers to consumers of another Member in any of these modes of delivery, including Most Favored Nation treatment and transparency. However, many of the most important obligations apply only in respect of sectors where individual WTO Members have made commitments in their 'schedules', and this includes National Treatment (Article XVII) and the GATS equivalent (roughly speaking) of GATT Article XI (Quantitative Restrictions), namely GATS Article XVI (Market Access) and Article. VI (Domestic Regulation – very roughly equivalent to the TBT in respect of goods). Further complicating the structure of obligations in GATS is the possibility for WTO Members to use their 'schedules' to limit or qualify obligations such as National Treatment in scheduled sectors, and these limitations may apply across the board, or to only one particular mode of delivery for a particular service sector.

It will be appreciated that when the GATS was being negotiated in the late 80s and early 90s, demonopolisation of electricity utilities and unbundling of functions had barely begun. In the circumstances, it is understandable that there were few specific commitments that bear upon the services entailed in the provision of electricity.[25] Moreover, as Zarilli notes, there is no clear and precise classification that would facilitate the scheduling of specific commitments on energy services in GATS:

24 The treatment of US biofuels subsidies under the WTO Agreement on Agriculture is the subject of an excellent in-depth analysis by Dana, 'WTO Legal Impacts on Commodity Subsidies: Green Box Opportunities in the Farm Bill for Farm Income Through the Conservation and Clean Energy Development Programs', Envtl. Law & Pol'y Ctr. 2004.

25 'Chapter Eleven: Energy Services', in WTO Secretariat, Guide to the GATS: An Overview of Issues for Further Liberalization of Trade in Services, 2001, pp. 259-294.

'The WTO „Services Sectoral Classfication List" (document MTN-GNS/W/120) does not include a separate comprehensive entry for energy services. The United Nations Provisional Central Product Classification (UNCPC) also does not list energy services as a separate category.'[26] As she goes on to observe, Annex 1 in the CPC does provide a list of energy related services that might fall under various classifications, ranging from consulting to construction to transportation services, and there are a few energy related sub-classifications in the WTO scheduling document. Interpreting whether an activity that is not explicitly scheduled is nevertheless included within a classification or sub-classification in a Member's schedule is a complex exercise, which may include resort to materials such as negotiating history; see the US-Gambling Appellate Body report.

Trade in financial services

Where instead of actual energy or services ancillary to the production and distribution of energy, it is renewable energy certificates that are being traded, the WTO instruments on trade in financial services arguably apply. Of course, this is a less than surgical distinction because while these instruments can be traded as an economic activity unrelated to the actual purchase and sale of energy itself, they are often a means by which sellers and buyers of energy and their intermediaries manage trade in energy itself. What seems fairly clear is that trade in renewable energy certificates would fall within the ambit of the WTO instruments on financial services. These certificates do not entail an entitlement to energy, but rather an entitlement to be relieved of an obligation to purchase renewable energy that would otherwise fall on the bearer of the certificate, because the issuer of the certificate, who may be in another jurisdiction, is prepared to bear that burden. It should be noted that the characterisation of renewable energy certificates as a service does not depend in any way on whether the energy itself is regarded as a good or a service. (Thus, commodity futures (pork bellies, for example) are a financial service, despite the fact that the underlying transaction is a goods not a services transaction.)

WTO Members have made financial services commitments in the Uruguay Round negotiations and in subsequent negotiations dedicated to financial services which concluded in 1997/1998, and in a number of cases these commitments have been made in the context of adhesion to the Understanding on Commitments in Financial Services. This understanding includes a National Treatment obligation, a requirement of market access through cross-border trade and commercial presence, and various related provisions on entry of personnel, and various exceptions or limitations. There is a best efforts commitment also to eliminate non-discriminatory regulations that have significant adverse impacts on the trade of other WTO Members.

An important question is whether tradable renewable energy certificates fall under any of the existing classifications under which WTO Members have made commitments in the financial services negotiations or whether they constitute within the meaning of the Understanding a 'new financial service'. (Article 7 of the Understanding requires that 'A Member shall permit financial service suppliers of any other Member established in its territory to offer in its territory any new financial service.') Possibly relevant classifications include 'derivative products incl., but not limited to, futures and options' and '- other negotiable instruments and financial assets, incl. bullion.'

The nature of its financial services commitments may well affect a State's ability to confine a tradeable certificate program to within its national borders. Since the unconditional MFN obligation in GATS applies to financial service measures (unless within four months of the entry into force of GATS a WTO Member has lodged an MFN reservation with respect to the particular measure in question – GATS Second Financial Services Annex), questions could arise where a WTO Member's authorities recognise certificates issued by some other WTO Members' nationals and not those of other WTO Members, or where a Member seeks to operate an international certificate trading scheme based on reciprocal or mutual recognition. However, based on the GATT jurisprudence, it is likely that distinctions of this kind could be drawn where they are based on genuine origin-neutral criteria such as the

26 Zarilli, 'International Trade in Energy Services and the Developing Countries', in UNCTAD, Energy and Environmental Services: Negotiating Objectives and Development Priorities, 2003, p. 46.

authenticity of the certificate, the environmental practices of the issuer, the method of generation and so forth (Canada-Autos, report of the panel).

It is possible that certain subsidies to renewable energy generation in a particular jurisdiction could, in certain instances, result in a lower cost to providers of renewable energy certificates in that jurisdiction, in as much as the cost of generating the renewable energy attested to by the certificate is lower for the certificate issuer than it would be in a market where renewables generation is not subsidised. In this respect, it is crucial to note that there are no existing disciplines on subsidisation of services in the WTO; future disciplines are the subject of current negotiations pursuant to GATS Article XV).

VI. The Government Procurement Agreement (GPA)

The WTO Government Procurement Agreement (GPA) is a plurilateral agreement to which only a sub-set of WTO Members (27 in all) have bound themselves. The United States is a signatory, and the Agreement applies to sub-national procurement in the case of 37 US States; the Administration has sought to persuade other States that it should include their procurement in bindings under the WTO GPA (as well as regional agreements). Unlike most multilateral WTO Agreements the GPA has a provision for individual States taking reservations from the general obligations of the GPA, whereby various Member States have specified limitations on their commitments under the Agreement.

The GPA includes a National Treatment obligation with respect to goods and services, as well as service suppliers (contractors). The differences between renewable and non-renewable energy that make these 'unlike' products, which were discussed in the case of the National Treatment obligation in GATT apply also with respect to procurement. Contrary to some readings, the GPA does not require that a government award contracts to the lowest bidder for performing a given function (here the provision of energy) without regard to considerations such as environmental, national security or other public goods. The GPA does contain an obligation that 'any conditions for participation in tendering procedures shall be limited to those which are essential to ensure the firm's capability to fulfill the contract in question.' (Article VIII(b)). This is however largely a due process and transparency requirement; once a government has set out the conditions of the contract itself, it must open the bidding process to all suppliers who have capability to fulfill those conditions. The provision says nothing about what factors may enter into defining the conditions of the contract in the first place. In sum, the GPA provides governments at both the federal level and below ample room to give preference to renewable generation in their energy purchases, even if such energy must be purchased at a higher price than from conventional generating sources. In any case, there are exceptions in the GPA that relate to, inter alia, measures necessary 'to protect human, animal and plant life or health' and measures necessary for certain types of national interests (albeit defined rather narrowly so as to mostly apply to defense related procurement activities). The former exception with respect to 'human, animal and plant life or health' would certainly cover environmentally-motivated preferences for renewables, given the environmental harms and risks associated with conventional methods of generation. The kind of evidence or proof that would be required to show that measures are 'necessary' under similar exceptions in Article XX of the GATT (discussed above) would likely apply here as well.

The GPA also contains an obligation that procurement technical specifications not constitute unnecessary obstacles to trade, tracking closely the language in the TBT Agreement, discussed above. According to at least one NGO, this language means 'Translated from the trade jargon, this provisions means that specifications based on how a good is made (for instance, requiring recycled content in paper or other goods to be procured) or how a service is provided (for instance, requiring a portion of energy be purchased from renewable sources) are prohibited.' (Public Citizen, Global Trade Watch, November 1, 2004). This interpretation of the GPA does not appear to be justified; technical specifications are permissible where 'necessary', i.e. to achieve the policy goals of the government in respect of the contract. It is only in cases where the goals can be fully achieved with less trade restrictive impact than that of a given regulation, that the regulation may run afoul of these provisions of the GPA.

VII. Opportunities to challenge barriers to renewable energy under WTO law

1. Access to the grid and distribution and transmission networks

To the extent that electrical energy is a good, the terms under which imported energy is afforded access to the national grid and distribution and transmission networks is governed by the TBT Agreement as well various provisions of the GATT, including in some instances Article XVII, 'State Trading Enterprises'. These terms could be unfavorable to either foreign producers of renewable energy and/or producers of renewable energy technology. As already discussed, the TBT Agreement requires that technical regulations not constitute an unnecessary obstacle to trade. Even where privatisation and restructuring have occurred, many electricity market operators and or 'wires' companies may fall within the definition of State trading enterprises, because they are granted 'exclusive or special privileges'. Such enterprises are required under Article XVII of the GATT to make purchases and sales in accordance with commercial considerations, and this obviously includes pricing; pricing or other purchasing practices of the market operator that, for example, take into account 'stranded assets' of domestic fossil fuel or nuclear generating operations might be subject to challenge under this provision of Article XVII. Moreover, a State trading enterprise is required to afford the enterprises of other Members, in accordance with customary business practice, 'adequate opportunity' to compete for purchases and sales.

Clearly, some technical regulations that create obstacles to trade in renewable energy or renewable technologies are necessary for legitimate objectives. For example, limits on the siting of wind turbines may well be motivated by legitimate concerns about the risks to wildlife, especially birds and bats. Other regulations may be designed intentionally or may be inadvertently based on the traditional predominance of fossil fuel or nuclear generation, and the dominance of industry representatives from those sectors in the regulation and standard-setting process. Imbalance penalties that do not take into account that the intermittency of renewable energy may be offset by other distinctive contributions to the stability of the overall system are an example.

2. Biofuels: Regulations on transport and vehicle standards and specifications

There may be instances where biofuels or substances that compose biofuels receive regulatory treatment based upon assumptions that they are being traded as waste or for use in functions other than the production of renewable energy that may make the substances more hazardous. The TBT Agreement in addition to the requirement that technical regulations not be 'unnecessary obstacles' to trade contains a provision that requires that 'Wherever appropriate, Members shall specify technical regulations based on product requirements in terms of performance rather than design or descriptive characteristics.' (TBT 2.8).This provision implies that technical regulations should not treat materials (such as for example sawmill by products, a potential issue in the EU) based upon the notion that such materials will be used in such a way as to cause a given environmental or other social harm, when their actual use, i.e. as fuels or components in renewables generation, does not give rise to the harms in question.

3. Subsidies

Subsidies for oil, coal gas and nuclear power are often cited as a very significant barrier to renewable energy.[27] Many of these subsidies could fall into the „actionable" category, depending on their exact characteristics, which would have to be analysed on the basis the framework in the WTO SCM Agreement sketched above. As a general matter, one may question whether WTO litigation will be a realistic option to challenge such subsidies – governments might be reluctant to deploy legal arguments that could result in challenges to their own support programs. Nevertheless, at least with respect to export subsidies, this consideration did not, for example, inhibit Canada from initiating a chain of WTO cases where Canada and Brazil challenged each others measures on civil aircraft.

27 Pershing/Mackenzie, 'Removing Subsidies: Leveling the Playing Field for Renewable Energy Technologies', Int'l Conference for Renewable Energies, Thematic Background Paper Series 2004.

Perhaps inspired to some extent by initiatives on fisheries subsidies, a more promising approach would be to attempt to have negotiations within the WTO with a view to Members agreeing to cap and reduce subsidies that are environmentally-unfriendly in the energy sector. Such negotiations might also address themselves to the task of identifying a set of 'green box' renewable energy subsidies that Members agree to refrain from challenging, on account of consensus as to their positive environmental effects. A broader and much more speculative question is whether such negotiations could be linked to the fulfillment of commitments under international environmental regimes.

4. Services

To the extent that services provision is at issue and not just trade in goods, barriers to access to the grid, and transmission and distribution networks could be challenged where these affect the trading opportunities of service providers from other WTO Members. Assuming that the WTO Member being challenged has made commitments on the relevant energy services (and it will be recalled that few such commitments have been made to date), depending on the nature of the barrier either the National Treatment or Market Access provisions of GATS or both may be applicable. The explicit language of the National Treatment obligation in GATS indicates that it covers de facto as well as de jure discrimination (and see EC-Bananas). In addition the disciplines on domestic regulation in Article VI of the GATS may be applicable: these disciplines envisage negotiations concerning regulatory barriers not caught by other GATS provisions on a sector-by-sector basis; in the interim, domestic regulations in sectors that are the subject of specific commitments must be based on objective and transparent criteria, not more burdensome than necessary to ensure the quality of the service; and in the case of licensing procedures, not in themselves a restriction on the supply of the service.

Given the lack of explicit commitments on energy services in the Uruguay Round, and the changes in the structure of electricity systems and technological developments negotiations on energy services in the current Doha Round may present an opportunity to ensure that the commitments made reduce barriers to renewable energy. The same goes for financial services negotiations in the current round, in respect of the status and treatment of tradeable renewable energy certificates in the future.

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Policy Profile: The Application of Waste Legislation to Bio-Energy

The Renewable Energy and International Law (REIL) Project[1]
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ABSTRACT
This article examines the EU Waste Directive and the implications of recent European case law for its implementation at national level. In particular, we consider how the directive has been implemented in the United Kingdom and the potential effects this may have on the use of forestry by-products as a bio-energy source. The analysis reveals that it is still unclear whether bio-energy materials derived from sawmill operations are 'waste' according to EU and consequently UK law. This uncertainty may pose a barrier to the uptake of biomass of renewable energy. However, a new Framework Directive on Waste has now been proposed, which, if adopted, will resolve much of this uncertainty. Most importantly, the proposed directive provides for automatic classification of certain materials as 'by-products', rather than waste, a reform that is likely to lead to exemption of woodchips, sawdust, bark and other forestry products from waste-related obligations. © Crown copyright 2006. Reproduced with the permission of Her Majesty's Stationery Office. Published by John Wiley & Sons, Ltd.

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Introduction

GREATER USE OF BIOMASS PRODUCTS AS A RENEWABLE SOURCE OF ENERGY WOULD HELP TO MEET several objectives. Replacing fossil fuels will reduce net CO_2 emissions, and the development of new markets for biomass products will encourage more active woodland management, promote rural development, increase income to woodland and farm owners and, in some instances, help to alleviate energy poverty. However, concerns have been raised over the potential for international and domestic waste legislation to create a disincentive to the development of the embryonic bio-energy industry. Classification of the products of timber processing such as woodchips, sawdust

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and bark as 'waste' may have consequences for both the forestry and energy industries in terms of compliance obligations and costs, and could therefore limit the uptake of biomass as a renewable energy source.

EU Definition of Waste

The legal definition of waste is set out by EU Council Directive 75/442/EEC on waste (the 'Framework Directive'), as amended by Council Directive 91/156/EEC, Art.1(a). This definition states

> 'Waste' shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard. The Commission has drawn up a list of wastes belonging to the categories listed in Annex I.

Annex I sets out the 'Categories of Waste', from which a 'List of Wastes'[2] was created by the European Environment Agency. The List of Wastes provides numerical references to clearly identify different types of waste. Included in the List of Wastes are

- general production waste including waste from forestry exploitation and
- wastes from wood processing and the production of paper, cardboard, pulp, panels and furniture, including waste bark and cork, sawdust, shavings, cuttings, spoiled timber and wastes not otherwise specified.

But in this context what is a 'waste'? The concept of 'discarding' is central to the determination of a product as waste. Unfortunately, the Framework Directive does not define 'discarding'. Some commentators have regarded it reasonable to assume that Annex II of the Directive can offer indirect aid to the interpretation of 'discard'. Annex II contains two lists of operations (Annex IIA and IIB) that are to be subject to Article 4 obligations of the Directive (waste to be recovered or disposed of without threat to human health and the environment).

Annex IIA comprises a list of disposal operations and, given the significant overlap between the words 'discard' and 'dispose', it has been suggested that these are operations by which substances may be 'discarded' for the purposes of the Directive. However, it does not appear that the operations listed in Annex IIA apply to the use of the wood chips, sawdust and bark derived from sawmilling activities.

The situation with Annex IIB, Recovery Operations, is more complicated. It is unclear whether residues resulting from industrial processes that are reused (either with or without a recovery procedure) as part of a normal practice should be brought within the waste regulatory scheme. Although they are residues as listed in Annex I, they are not technically waste until discarded or there is an intention or requirement to discard. If they are not discarded, the fact that they are subject to an operation described in Annex IIB may not itself qualify sawmill conversion products as waste unless it is assumed that the operation automatically constitutes an act of discarding. Annex IIB includes the 'use principally as a fuel or other means to generate energy'. It is possible, therefore, that any sawmill conversion products used as an alternative to fossil fuels to produce steam for timber drying kilns would be classified as waste as they fall within an operation described in Annex IIB. However, the situation is not completely clear, as these conversion products have not been 'discarded' in the ordinary English meaning

[2] Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC hazardous wastes.

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of the word. A recent study into the definition of waste recovery and disposal operations suggested that the lists contained in Annex II of the Framework Directive should be revised.[3]

Case Law on the Definitions of 'Waste' and 'Discarding'

The definitions of 'waste' and related waste management terminology, such as 'recovery' and 'disposal', are essential elements for the implementation of the European waste management policy.[4] As discussed above, the question of which actions constitute 'discarding' is crucial to the EU definition of waste but the legislation is relatively unclear on this issue. The European Court of Justice has taken a fairly cautious approach to the definition of 'discarding'. The approach has been influenced by a deliberate desire to interpret 'waste' widely so as to limit its inherent risks and pollution.

Earlier case law relied heavily on the use of Annex II of the Framework Directive in interpreting the term 'discarding'.

- In *Tombesi* (C-224/95 Criminal Proceedings against Euro Tombesi *et al.* [1997] ECR I-3561), the court stated that it was not worth trying to interpret the term 'discard' according to its normal meaning and that the term 'waste' and the disposal and recovery operations listed in Annex II should be read together. The term 'discard' should therefore be accorded a special meaning defined by reference to these and analogous operations.
- In *ARCO* (C-419/97 ARCO Chemie Nederland Ltd *et al.* v. Minister van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer *et al.* [2000] ECR I-4475), the court stated that although it was possible to infer discarding from the carrying out of an Annex II operation, not every substance that underwent a recovery operation would thereby be classified as waste. In support of this view, the court pointed out that certain recovery operations could equally apply to the use of raw materials and that discarding might take place in circumstances not specified in Annex II. The court suggested that discarding might be inferred from the fact that the substance was treated by a common method of waste recovery or that the substance was commonly regarded as waste. The court also suggested that there might be evidence of discarding if the substance constituted a residue or by-product for which no use other than disposal could be envisaged or if its composition was not suitable for the use made of it.
- In *Palin Granit* (C-9/00 Palin Granit Oy v Vehmassalon kanserterveystyon kuntahtyman hallitus [2002]) and *AvestaPolarit* (C-114/01 AvestaPolarit Chrome Oy, formerly Outokumpu Chrome Oy), the court held that stone left over from stone quarrying, which was stored for an indefinite length of time to await possible use, was to be regarded as production residue rather than as a by-product and was therefore 'waste' within the meaning of the Waste Framework Directive. A substance produced other than as the primary aim of the process could be regarded as a by-product, which the undertaking wished not to 'discard' but to exploit or market without further processing prior to re-use, in which case it was not waste. The court held that a substance was only a by-product if its re-use was not a mere possibility but a certainty, without any further processing prior to re-use and as an integral part of the production process. The place of storage of leftover stone, its composition, and the fact, even if proved, that it did not pose any real risk to human health or the environment, were not relevant criteria for determining whether the stone was to be regarded as waste.
- In the *Petroleum Coke* case (C-235/02: Mario Antonio Saetti and Andrea Frediani), the court held that petroleum coke that is produced intentionally or in the course of producing other petroleum fuels in

[3] Report prepared by Okopol GmbH for Contract No. T34-3040/2002/341550/MAR/AZ dated March 2004.
[4] Implementation of Community Waste Legislation – Period 1998–2000 (Com (03)250), p. 138.

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an oil refinery and is certain to be used as fuel to meet the energy needs of the refinery and those of other industries does not constitute waste within the meaning of the directive.

- In *Niselli* (C-457/02: criminal proceedings against Antonio Niselli), the court in November 2004 held that Annexes IIA and IIB are not exhaustive, and that the definition of 'waste' in the Framework Directive cannot be construed as covering exclusively those substances or objects intended for, or subjected to, the disposal or recovery operations mentioned in Annexes IIA or IIB. Furthermore, the definition of 'waste' should not exclude production and consumption residues that can be reused in a cycle of production, even if they do not require prior treatment or cause harm to the environment.
- Finally, in *European Commission v Kingdom of Spain* (C-416/02), the court in September 2005 further clarified the circumstances in which residue from an extraction or manufacturing process would be regarded as a by-product, rather than 'waste' within the meaning of the directive. Where a process results in the production of a residue, which the producer does not seek to discard but rather to exploit or market without any further processing, such residue will properly not be regarded as waste. The key factors leading to this conclusion are that the residue has an economic value without further processing, and that its re-use by or sale to an economic operator other than the producer is not a 'mere possibility', but a certainty.

These cases confirm that the question of whether products such as sawdust, woodchips and bark constitute 'waste' is currently dealt with under EU law on a case by case basis. They also suggest that the outcome will depend to a large extent on the level of certainty that these products will be directly used in some other commercial arrangement.

The UK Biomass Industry

The UK Government is a signatory to the Kyoto Protocol. Although increasing energy efficiency and decreasing demand are the government's main means to reduce emissions, a third policy element is to generate a rising proportion of power from renewable resources. The principal mechanism is the Renewables Obligation, which applies in England and Wales, the Renewables Obligation Scotland and more recently in the Renewables Obligation Northern Ireland. Suppliers are required to source increasing proportions of their electricity from renewable sources. Within the obligations, there is no differentiation among technologies, with the result that the early focus has been on wind projects. However, additional support has been provided by the UK Government for biomass projects in recognition of the value of having a broad based renewable sector. Since renewable policy is devolved, further support is available via the four separate administrations – England, Northern Ireland, Scotland and Wales.

The use of home-grown biomass represents a major opportunity for the forestry sector in the UK. Support for greater use of biomass as a renewable source of energy is clearly stated in the forestry strategies of England, Scotland and Wales. Although there are no targets for heat generation at a UK level, there is recognition, particularly in Scotland and Wales, that small to medium scale heat-only projects offer additional potential benefits – rural employment, greater conversion efficiency and therefore greater paying capacity to the grower, a means of addressing energy poverty and a reduced energy loss during transportation assuming more local end uses.

Wood can be sourced directly from the forests (from small stem portions – small round wood; side branches and/or the very tips of the stems – brash; stems that have been shaded out or died of disease – deadwood) or indirectly from sawmills from the conversion of large stems to sawn timber – conversion products. Other potential sources of woody biomass include arboricultural arisings and short rotation coppice. At present, the main potential sources are branches, arboricultural arisings and poor quality

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stems having taken account of biological and environmental site constraints and also current markets for small round wood and conversion products; it is estimated that 1.3 million oven dried tones may be available, dependent on price and access. In future, as a result of the large scale conifer planting programme between 1950 and 1990, the total timber ready for harvesting is expected to double up to 2020, with a concomitant increase in potential woodfuel. Since much of the increased production will be harvested at large stem sizes, the majority of potential woodfuel is likely to become available in the form of sawmill conversion products rather than branches or poor quality stems. Developments with major resource requirements must therefore be confident of the conversion product element of their future supply chain.

In Britain, there is uncertainty about the classification by the regulators of various categories of potential woodfuel as waste. Environmental regulation is the responsibility of the Environment Agency in England and Wales and the Scottish Environmental Protection Agency in Scotland. Although this uncertainty is not the major barrier to the realization of many planned projects, it is a cause of concern to the embryonic woodfuel industry in Britain. The classification of sawmill conversion product as a waste leads to additional bureaucracy, financial cost and time for the suppliers – trucks transporting wood chips, sawdust and bark have been stopped by SEPA officials requesting evidence of licences for the transportation of waste. Furthermore, public perceptions about proposed developments, especially local and community projects, are likely to be much more negative if the resource is classified as a waste; this might also have a negative impact on the forestry sector image. Lastly, it is common practice for sawmills to use a proportion of the wood chips or sawdust as an alternative to fossil fuels to produce steam for timber drying kilns. This has been considered by a SEPA official to be combustion of fuel composed of solid waste, which changes the baseline for carbon monoxide emission levels applicable to the sawmills and would significantly increase operating costs.

The UK Forest Products Association (UKFPA) holds that 'sawmill conversion products' have defined markets, are produced to a specification and remain in the commercial chain of utility, and that production of these products is essential to the economic sustainability of the sawmill industry. For these reasons, the UKFPA is firmly of the opinion that these products should not be classified as waste. While the UKFPA has obtained confirmation from SEPA that 'generally the sawmill products are not waste', SEPA also emphasized that each case needed to be considered on its individual circumstances. The response of the Environment Agency is generally similar, though local officials may give different assessments.

We therefore investigated whether the products of timber processing other than sawn timber (wood chips, sawdust and bark) are categorized as 'waste' according to EU law and, if so, whether this poses a potential or real legal barrier to the development of biomass as a form of renewable energy in Britain.

UK Definition of Waste and Waste Management Licensing System

The Framework Directive is currently implemented in the UK through the *Waste Management Licensing Regulations* 1994 (the 'Licensing Regulations') that underpin the *Environmental Protection Act* 1990. This Act and the Licensing Regulations are aimed at preventing pollution of the environment or harm to public health through regulation of the treatment, storage and disposal of 'controlled waste'.

With the adoption of the Framework Directive, any reference to 'controlled waste' and 'waste' under the Act and Licensing Regulations is taken to be a reference to 'waste' as defined by the EU Framework Directive.

Under sections 33(1)(a) and (b) of the *Environmental Protection Act* 1990, it is an offence to deposit controlled waste in or on any land, or to treat, keep or dispose of controlled waste in or on any land, or by means of any mobile plant, unless under and in accordance with a waste management licence.

Lower risk waste management activities such as reclamation and reuse are usually not seen as a threat to the environment or human health, and are therefore exempted from the requirement to obtain a waste management licence. Schedule 3 of the Licensing Regulations (as amended by the *Waste Management Licensing Amendment (Scotland) Regulations* 2003 in Scotland and the *Waste Management Licensing (England and Wales) (Amendment and Related Provisions) Regulations* 2005 in England and Wales) sets out around 45 categories of exempt activities, most of which are subject to specific constraints on waste types, quantities, capacities and duration of storage.

The relevant categories in relation to forestry, agricultural and municipal waste include

(i) burning as a fuel any straw, poultry litter or wood, waste oil or solid fuel that has been manufactured from waste by a process involving the application of heat,
(ii) the secure storage on any premises of the above wastes, which are intended to be burned as a fuel,
(iii) the beneficial use of waste if it is put to that use without further treatment, and its use does not involve its disposal, and
(iv) the storage of waste intended for beneficial use, insofar as that storage does not amount to disposal.

The Licensing Regulations adopt the 'Disposal Operations' and 'Recovery Operations' annexes to the Framework Directive. According to these lists, 'Use of waste principally as a fuel or for other means of generating energy' is a recovery operation and not a disposal operation. The 'beneficial use of waste' that does not amount to disposal is likely to include biomass energy generation.

Although the recovery, storage and disposal of biomass products are therefore likely to be exempt activities for the purposes of the License Regulations, such activities are required to be registered with the appropriate registration authority (the Environment Agency in England and Wales, and SEPA in Scotland), as required by regulation 18 of the Licensing Regulations.

The requirement to register the recovery, storage and disposal extends also to the transportation of waste. Under the *Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations* 1991 (England and Wales) (together the 'Registration of Carriers Regulations'), waste carriers are required to be registered to transport controlled waste by road, rail, air, sea or inland waterways. The Environment Agency and SEPA maintain registers of carriers and make them available for public inspection.

It is an offence under the Licence Regulations and the Registration of Carriers Regulations for an establishment or undertaking to carry on an exempt activity without being registered. This means that, despite the exemptions mentioned above, if forestry, agricultural or municipal waste products are classified as 'waste', those that wish to use these products as biofuels will still be required to obtain registration to recover and transport the waste, which imposes additional costs and administrative burdens.

Discussion

Despite the decisions in *Palin Granit* and *AvestaPolarit*, it is still unclear whether wood chips, sawdust and bark, as products of sawmill operations, are 'waste' according to EU law. Strong legal arguments could be made to the effect that when, during the sawmilling process, it is always intended that these products will be collected, transported to a generation site and used as an alternative to fossil fuels as a matter of ordinary business practice, they should not be considered to be waste and would not be considered to be such as a matter of ordinary legal construction. However, not all government entities have drawn this distinction with ease and classification is done on a case by case basis.

The application of waste definitions to products derived directly from the forest, such as small round wood and brash, has not been addressed here but the situation is likely to be even more complicated. For example, thinnings that do not have a profitable market may be left on the forest floor to decom-

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pose but in areas with a vibrant bio-energy market the same trees could be felled for an immediate and identified energy use; in this case it seems unlikely that these could be classified as waste. Exactly the same dimension material could be created from the upper portion of mature trees at final harvest but this could well be classified as waste in the present circumstances because it is seen as a by-product of the snedding and crosscutting to produce the larger dimension logs. Such a classification might be less likely if this upper portion had a definite market at the time of felling, but the categorization as waste might be further strengthened if the brash were left on the ground to dry and shed the needles before it was collected. Thus there is even greater uncertainty about the classification of forestry material because the management system must also be considered.

Until this uncertainty is clearly resolved, it poses a legal barrier to the development of this form of renewable energy. One solution is to agree a set of guidelines for specific circumstances where woodchips, sawdust and bark from sawmilling operations and small round wood and brash from forest operations will *not* be considered waste. For example, where these products are the subject of a supply contract to a biomass generator, they should not be considered waste as they are never discarded or unwanted. Clear and practical guidelines would assist to redress the uncertainty that has been generated by the current state of the law.

Proposed New EU Framework Directive and Related Guidelines

In the EU, new legislation has recently been proposed that may help to clarify these issues for member states (the 'proposed directive'). If adopted, the proposed directive would replace the old directive and may resolve many of these outstanding concerns. The Thematic Strategy on Waste, created as part of a suite of Thematic Strategies for 2005–06 and under which the proposed directive has been developed, identified waste as a priority area for the simplification of Community legislation, and has proposed a variety of reforms, which may remove the barriers to renewable energy associated with waste legislation. The strategy aims to bring waste legislation in line with existing EU legislation promoting biomass renewable energy generation: notably, the Directive on the Promotion of Electricity Produced from Renewable Energy Sources, the Biomass Action Plan and the forthcoming Forestry Action Plan, to be released in 2006.

Specifically, the Commission has foreshadowed the release of guidelines to distinguish between waste and non-waste by-products. The guidelines, though not yet released, will be based on the jurisprudence of the European Court of Justice and are likely to resolve the uncertainty created by the different approaches taken in the case law. These guidelines are likely to have a significant impact on the forestry and agricultural industries, where residues and by-products are conserved for certain use in bio-energy production.

In addition, the proposed directive seeks to maximize energy recovery from waste, including municipal waste, by introducing efficiency thresholds to classify waste treatment in municipal incinerators either as recovery or disposal. A 'recovery' classification would allow the recovered products to be considered as 'goods', making it easier to use them for energy purposes.

Finally, the proposed directive contains a provision by which 'end of waste' status may be accorded to appropriate waste streams under a comitology process. Such a process is likely to lead to the classification of those products intended for biomass energy generation as 'goods', rather than as 'waste', thus alleviating the burden that may otherwise be placed on the renewable energy industry. The Commission will identify eligible waste streams by considering two criteria: first, whether there is a net environmental benefit in re-classifying the waste, and whether there is a market for the secondary material.

Conclusion

In our view, it is not possible to definitely determine, on a general level, whether wood chips, sawdust and bark are categorized as 'waste' under current EU and UK law. Rather, the circumstances surrounding the production and disposal or use of these products will determine whether they constitute waste on a case by case basis. Recent decisions of the European Court of Justice confirm the view that what is 'waste' is a question of circumstances rather than the nature of the product itself.

However, legal arguments could certainly be made to support the view that wood chips, sawdust and bark, at least in specific circumstances where these products are directly destined for a specific use (such as use as a biofuel), do not constitute waste and should not attract the additional legal obligations imposed on entities who create, store and transport waste. The strength of these arguments, and therefore the likelihood of their success, will depend on the details involved and will differ on a case-by-case basis. The proposed directive on waste is likely to create greater certainty in this area, and in light of the concerns raised by the forestry and bio-energy industries, should resolve the issues favourably for the development of wood biomass as a renewable energy source.

THE IMPACT OF WASTE LEGISLATION ON THE USE OF BIOMASS AS A RENEWABLE ENERGY SOURCE

By the Renewable Energy and International Law (REIL) Project[1]

Principal authors: M Wilder, P Curnow and L Fitz-Gerald (Baker & McKenzie)

[1] The Renewable Energy and International Law (REIL) Project is an international partnership in association with the Renewable Energy and Energy Efficiency Partnership, Yale's Center for Environmental Law and Policy, and Baker and McKenzie's Global Clean Energy and Climate Change Practice

EXECUTIVE SUMMARY

Greater use of biomass products as a renewable source of energy would help to meet several objectives. Replacing fossil fuels will reduce net CO_2 emissions, and the development of new markets for biomass products will encourage more active land management, promote rural development, increase income to woodland and farm owners, and in some instances, help to alleviate energy poverty. However, concerns have been raised over the potential for international and domestic waste legislation to create a disincentive to the development of the embryonic bio-energy industry. Classification of the products of timber processing such as woodchips, sawdust and bark as 'waste' may have consequences for both the forestry and energy industries in terms of compliance obligations and costs, and could therefore limit the uptake of biomass as a renewable energy source.

Legal definitions of 'waste'

The first issue for consideration is whether or not waste biomass products do in fact constitute 'waste' under relevant domestic laws. The definition of 'waste' set out in these laws varies between jurisdictions. Generally, however, it is defined to include any substance which is discarded or disposed of, or required to be discarded or disposed of according to law.

- In the European Union, 'waste' is defined by EU Council Directive 75/442/EC on Waste, as "any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard". Under this definition, it is unclear whether forestry and agricultural by-products that are intended for bio-energy production, and which are never actually 'discarded' in the ordinary sense, do in fact constitute 'waste' at law. A proposed new Framework Directive on Waste is likely to resolve this uncertainty in 2006.

- In the United States, 'solid waste' is defined in the federal *Resource Recovery and Conservation Act* as "any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities…". The definition of 'disposal' does not encompass incineration for bio-energy production, so it is unlikely that forestry and agricultural by-products would constitute 'waste'. The definition of 'disposal' under New York State law, however, does include "being burned as a fuel for the purposes of recovering usable energy", and thus all forms of waste biomass would constitute 'waste' in that jurisdiction.

- In Australia, waste is regulated on a state-by-state basis. In NSW, for example, 'waste' is defined to include "any discarded, rejected, unwanted, surplus or abandoned substance". As in the European Union, it is not clear whether by-products which are not discarded in the ordinary sense do in fact constitute 'waste' under this definition.

Barriers to the development of the bio-energy industry

The types of barriers that are created also vary between jurisdictions. They may include, for example, the following requirements:

- Licensing for entities transporting or disposing of hazardous and other wastes;
- Packaging, labelling and transporting of hazardous and other wastes that are to be the subject of a transboundary movement in conformity with the generally recognised international standards and rules in the field of packaging, labelling and transport;

- Preparation of a movement document tracking the transboundary movement of all hazardous and other wastes;
- Reporting of information on waste-related activities, including quantities of waste transported, waste fraction, waste type, waste producer and delivery site, with designated national registration authorities;
- Registration of waste management facilities with relevant authorities (to be renewed upon satisfactory regular inspections);
- Pre-application meetings to obtain registration, permits and licences;
- Prohibitions on siting of waste management facilities in various locations (e.g. agricultural land, floodplains etc.);
- Preparation of additional documents prior to registration, including engineering reports, comprehensive recycling analyses, contingency plans and so on;
- Payment of levies by the occupiers of registered waste facilities for each tonne of waste received at the facility or generated in a particular area; and
- Obligations on receivers of wastes to ensure the presentation of consignment authorisations, waste transport certificates and licences by entities delivering wastes.

These imposition of these types of obligations is likely to increase costs for biomass energy producers, putting these entities at a comparative disadvantage when compared to entities using fossil fuels for energy generation. As such, these laws are likely to create barriers to the uptake of waste biomass as a source of renewable energy.

Options for legislative reform

These barriers have yet to be addressed in a comprehensive manner in any jurisdiction. However, a range of solutions have been adopted which may assist in redressing the balance between renewable and non-renewable energy generation. For example:

- Certain non-hazardous waste streams may be exempted from classification as 'waste' altogether (and re-classified as 'by-products'), or may be classified as 'waste' but exempted from related obligations;
- Other hazardous wastes which have a beneficial use (i.e. bio-energy production), may be exempted on a discretionary basis from waste-related obligations, where appropriate; or
- Other mechanisms to compensate the bio-energy industry for the costs of compliance with waste legislation, such as mandatory grid purchases or other financial incentives, may be implemented.

These options would of course need to be balanced with the important environmental, health and safety concerns which underpin waste legislation in each jurisdiction.

1. INTRODUCTION

Greater use of biomass products as a renewable source of energy would help to meet several objectives. Replacing fossil fuels will reduce net CO_2 emissions, and the development of new markets for biomass products will encourage more active land management, promote rural development, increase income to woodland and farm owners, and in some instances, help to alleviate energy poverty. However, concerns have been raised over the potential for international and domestic waste legislation to create a disincentive to the development of the embryonic bio-energy industry. Classification of the products of timber processing such as woodchips, sawdust and bark as 'waste' may have consequences for both the forestry and energy industries in terms of compliance obligations and costs, and could therefore limit the uptake of biomass as a renewable energy source.

This paper will examine the existing international and domestic legislation that deals with waste and biomass, and through a comparative analysis of different regulatory regimes, propose various options for mitigating the effects of regulation on the biomass renewable energy industry. In particular, the paper will examine the reform proposals that are currently before the EU Council in the field of waste legislation, and consider the impact the proposed changes may have on member states and their renewable energy industries.

2. WHAT IS BIOMASS?

Biomass, as a renewable carbon resource, encompasses a wide range of organic and inorganic materials which can be used to generate energy. Included in most definitions are all water- and land-based organisms, vegetation and trees ("virgin biomass"), as well as all dead and waste biomass such as municipal solid waste, biosolids (sewage), animal wastes (manures) and residues, forestry and agricultural residues, and certain types of industrial wastes.[2]

Clearly, it is "non-virgin" or waste biomass which is relevant to an examination of waste legislation; hence, the scope of this paper is restricted to that category. For simplicity, waste biomass, and the legislation which governs it, will be considered under three broad headings: forestry waste, agricultural waste and municipal waste.

The technologies available to use waste biomass for energy generation include a range of thermal and thermochemical processes, including combustion, gasification, liquefaction and the microbial conversion of biomass to obtain gaseous and liquid fuels by fermentative methods.[3] For example, wood wastes may be combusted to form steam, which is passed through a steam turbine to form electricity; and anaerobic processing of municipal solid waste can generate methane, which can be captured and used generate energy.

3. WHAT IS 'WASTE'?

The legal definition of 'waste' varies slightly from jurisdiction to jurisdiction, but certain common characteristics can be identified. Generally, waste is defined as any substance which is discarded or disposed of, or required to be discarded or disposed of according to law. In many jurisdictions, the fact that the waste product is then used for another purpose, such as biomass renewable energy generation, does not exempt it from categorisation as 'waste', even if it is always intended that it be used for that purpose.

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[2] Donald L. Klass, "Biomass for Renewable Energy and Fuels", *Encyclopedia of Energy, Vol. 1* (2004) p 193

[3] Donald L. Klass, "Biomass for Renewable Energy and Fuels", *Encyclopedia of Energy, Vol. 1* (2004) p 204

A legal categorisation of a product as 'waste' can create significant barriers to its use, as will be discussed later in this paper, including increased costs and licensing and other administrative obligations, which may discourage the use of the products so classified for biomass renewable energy generation. In this section, however, we consider the different approaches that have been taken in international and domestic law to the task of defining what constitutes 'waste'.

3.1 International legal definitions of 'waste'

The *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* (the "**Basel Convention**"), adopted 22 March 1989, is the major international agreement dealing with waste. The Convention states that:

> "Wastes" are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law.

The Convention identifies the two types of waste to which it applies – "hazardous wastes" and certain defined "other wastes". "Hazardous wastes" are defined as:

> (a) Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III; or
>
> (b) Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous wastes by the domestic legislation of the Party of export, import or transit.

"Other wastes" are set out in Annex II and include "wastes collected from households".

"Disposal" is defined in the Convention to mean any operation specified in the list set out in Annex IV, "Disposal Operations". Part B of the Annex, which sets out a list of recovery operations, lists "Use as a fuel (other than in direct incineration) or other means to generate energy" as one use which constitutes "disposal" for the purposes of the Convention.

It is unlikely, under this definition, that forestry wastes fall within the scope of operation of the Basel Convention. None of the residues from forestry exploitation, such as woodchips, sawdust and bark, are listed in Annex I, and neither do they possess the toxic characteristics listed in Annex III.

Similarly, most agricultural wastes are not hazardous, and as such are excluded from the scope of the Convention. One notable exception is the category of "agrochemical wastes", which encompasses pesticides, herbicides, certain animal medicines and so on. While the Basel Convention itself does not establish a detailed list of wastes, agrochemical wastes are identified in the European Environment Agency's "List of Wastes", established pursuant to Council Directive 75/442/EC on waste, as the only hazardous waste product generated by primary production.[4]

However, many types of municipal waste will constitute "hazardous wastes" within the scope of the Basel Convention. By way of example, the European Environment Agency's "List of Wastes" includes the following as hazardous categories of "municipal waste":[5]

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[4] Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous wastes.

[5] Category 20 - Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC

- Solvents
- Acids
- Alkalines
- Photochemicals
- Pesticides
- Fluorescent tubes and other mercury-containing waste
- Discarded equipment containing chlorofluorocarbons
- Inedible oils and fats
- Paints, inks, adhesives and resins containing dangerous substances
- Detergents containing dangerous substances
- Cytotoxic and cytostatic medicines
- Certain mixed batteries and accumulators
- Other discarded equipment containing hazardous substances

3.2 Domestic legal definitions of 'waste'

European Union

The legal definition of waste in the European Union is set out by EU Council Directive 75/442/EEC on waste (the "**Framework Directive**"), as amended by Council Directive 91/156/EEC, Art. 1(a). This definition states:

> "**Waste**" shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard. The Commission has drawn up a list of wastes belonging to the categories listed in Annex I."

Annex I sets out the "Categories of Waste", from which a "List of Wastes"[6] was created by the European Environment Agency. The detailed List of Wastes provides numerical references to clearly identify different types of waste. Included in the List of Wastes are:

(i) primary production wastes, including agricultural wastes and waste from forestry exploitation;

(ii) wastes from wood processing, including waste bark and cork, sawdust, shavings, cuttings, wood, particle board and veneer;

(iii) wastes from pulp, paper and cardboard production and processing, including waste bark and wood; and

(iv) a range of municipal wastes, both non-hazardous and hazardous, collected from households, parks and streets, and similar commercial, industrial and institutional wastes.

The central issue in relation to forestry by-products and agricultural waste is whether or not they in fact constitute "waste" under the EU definition. While "primary production wastes" are included in the List of Wastes, it is not clear that timber by-products and agricultural residues that are intended for bio-energy production constitute "waste" in the first place, since they are never actually "discarded" – rather, they are preserved and transported to generation sites

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establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous wastes.

[6] Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous wastes.

where they are used for energy generation. Clearly, the concept of "discarding" is central to the determination of a product as waste, but the Framework Directive does not define what amounts to "discarding".

Some commentators have regarded it reasonable to assume that Annex II of the Directive can offer indirect aid to the interpretation of "discard". Annex II contains two lists of operations (Annex IIA and IIB) that are to be subject to Article 4 obligations of the Directive (waste to be recovered or disposed of without threat to human health and the environment).

Annex IIA comprises a list of Disposal Operations and, given the significant overlap between the words "discard" and "dispose", it has been suggested that these are both operations by which substances may be "discarded" for the purposes of the Directive.[7] However, it does not appear that the operations listed in Annex IIA apply to the use of woodchips, sawdust, bark and agricultural residues and wastes as bio-energy.

The situation with Annex IIB, Recovery Operations, is more complicated. The Annex includes, for example, "use principally as a fuel or other means to generate energy". However, although certain materials may be contained in the List of Wastes and be subject to an operation in Annex IIB, they are still not technically "waste" until discarded or there is an intention or requirement to discard. If they are not discarded, the fact that they are subject to an operation described in Annex IIB may not itself qualify the products as waste – unless it is assumed that the recovery operation automatically constitutes an act of discarding.

As discussed below, however, the European Court of Justice has ruled that "discarding" has a special meaning under the Directive, and that it should be interpreted in light of both the definition of "waste", and also the disposal and recovery operations listed in the Annexes. It is therefore possible that under the Framework Directive, substances listed in Annex I, which are subject to a recovery operation in Annex IIB, would be taken to be "discarded" despite not being so under the ordinary English meaning of that word.[8]

Earlier case law from the European Court of Justice took a fairly cautious approach to the definition of "discarding", relying heavily on Annex II of the Framework Directive for its interpretation. In **Tombesi** (*C-244/95 Criminal Proceedings against Euro Tombesi et al [1997] ECR 1-3561*), the Court stated that it was not worth trying to interpret the term "discard" according to its normal meaning and that the term "waste" and the disposal and recovery operations listed in Annex II should be read together. The term "discard" should therefore be accorded a special meaning defined by reference to those and analogous operations.

In **ARCO** (*C-419/97 ARCO Chemie Nederland Ltd et al v Minister van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer et al [2000] ECR 1-4475*), the Court stated that although it was possible to infer discarding from the carrying out of an Annex II operation, not every substance that underwent a recovery operation would thereby be classified as waste. In support of this view, the Court pointed out that certain recovery operations could equally apply to the use of raw materials and that discarding might take place in circumstances not specified in Annex II. The Court suggested that discarding might be inferred from the fact that the substance was treated by a common method of waste recovery (i.e. use as a fuel) or that the substance was commonly regarded as waste. The Court also suggested that there might be evidence of discarding if the substance constituted a residue or by-product for

[7] Professor Dr Ludwig Kramer, "The distinction between product and waste in Community law" [2003] 1 Env. Liability, p. 6

[8] Professor Dr Ludwig Kramer, "The distinction between product and waste in Community law" [2003] 1 Env. Liability, p. 7

which no other use than disposal could be envisaged, if its composition was not suitable for the use made of it, or if special environmental precautions must be taken when it is used.

In **Palin Granit** (*C-9/00 Palin Granit Oy v Vehmassalon kanserterveystyon kuntahtyman hallitus [2002]*) and **AvestaPolarit** (*C-114/01 AvestaPolarit Chrome Oy, formerly Outokumpu Chrome Oy*), the Court held that stone left over from stone quarrying, which was stored for an indefinite length of time to await possible use, was to be regarded as production residue rather than as a by-product and was therefore "waste" within the meaning of the Framework Directive. A substance produced other than as the primary aim of the process could be regarded as a by-product, which the undertaking wished not to "discard" but to exploit or market without further processing prior to re-use, in which case it was not waste. The Court held that a substance was only a by-product if its re-use was not a mere possibility but a certainty, without any further processing prior to re-use and as an integral part of the production process. The place of storage of leftover stone, its composition, and the fact, even if proved, that it did not pose any real risk to human health or the environment, were not relevant criteria for determining whether the stone was to be regarded as waste.

In the **Petroleum Coke** case, (*C-235/02: Mario Antonio Saetti and Andrea Frediani*), the Court held that petroleum coke which is produced intentionally or in the course of producing other petroleum fuels in an oil refinery and is *certain* to be used as fuel to meet the energy needs of the refinery and those of other industries does not constitute waste within the meaning of the Directive.

Finally, in **Niselli** (*C-457/02: criminal proceedings against Antonio Niselli*), the Court held that Annexes IIA and IIB are not exhaustive, and that the definition of "waste" in the Framework Directive cannot be construed as covering exclusively those substances or objects intended for, or subjected to, the disposal or recovery operations mentioned in Annexes IIA or IIB. Furthermore, the definition of "waste" should not exclude production and consumption residues which can be reused in a cycle of production, even if they do not require prior treatment or cause harm to the environment.

These cases confirm that the question of whether forestry and agricultural residues and by-products which are not “discarded” in the ordinary sense constitute "waste" is currently dealt with under EU law on a case-by-case basis, and depends to a large extent on the level of certainty that these products will be directly used in some other commercial arrangement (such as energy production from biofuels).

Unlike forestry and agricultural wastes, however, there is no doubt that municipal waste has been “discarded” by the holder and therefore constitutes “waste” under EU law. Currently, there is no mechanism by which bio-energy raw materials can be exempted from the obligations that accompany this designation.

United States

Federal

In the United States, waste is regulated at both a federal and a state level. The primary piece of federal legislation concerned with waste is the *Resource Conservation and Recovery Act*, which defines "solid waste" as follows:

> The term “solid waste” means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility *and other discarded material*, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid

> or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended.

The Act does not define what amounts to discarding, but does provide a definition of "disposal", which, as in EU law, may provide some guidance as to the meaning of "discard":

> "The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters."

Use as a fuel to generate energy clearly does not constitute a "disposal" operation under federal law. Thus, forestry and agricultural by-products intended for bio-energy production, which are neither discarded in the ordinary sense nor "disposed of" according to the definition above, are unlikely to constitute "waste" for the purposes of the legislation.

The legislation also defines "resource recovery" as the recovery of materials or energy from solid waste. However, the relevance of resource recovery under the Act is confined to certain provisions relating to government grants for renewable energy research and development and does not exempt materials intended for this procedure from designation as waste.

State

The definitions of "waste" under U.S. state law vary slightly from that contained in the federal Act. In New York State, for example, waste is regulated by Part 360 of the *Environmental Conservation Rules and Regulations (NY)*, enacted pursuant to the *New York State Environmental Conservation Law*, which adopt the same definition of "solid waste" as is set out in the federal *Resource Conservation and Recovery Act*. In contrast to the federal legislation, however, the Act also provides a definition of "discarding":

> A material is discarded if it is abandoned by being:
>
> (i) disposed of;
> (ii) burned or incinerated, including being burned as a fuel for the purpose of recovering usable energy; or
> (iii) accumulated, stored or physically, chemically or biologically treated (other than burned or incinerated) instead of or before being disposed of.

Unlike EU legislation, therefore, the New York regulations specifically provide that burning waste as a fuel is an operation which constitutes an act of "discarding".

However, the regulations also provide for an exemption from a "waste" classification (and the associated obligations, as discussed below), where the New York Department of Environmental Conservation determines that the waste is being "beneficially used" according to section 360-1.15. That section provides for *automatic* exemption from a "waste" classification for certain products, including "unadulterated wood, wood chips, or bark from land clearing, logging operations, utility line clearing and maintenance operations, pulp and paper production, and wood products manufacturing, when these materials are placed in commerce for service as…wood fuel production".

The section also provides for a discretionary exemption for other forms of waste which are beneficially used. The generator or proposed user of the solid waste in question must

petition the Department of Environmental Conservation, in writing, for a determination that the solid waste under review in the petition may be beneficially used in a manufacturing process to make a product or as an effective substitute for a commercial product. The Department will grant, subject to satisfaction of certain criteria, a "beneficial use exemption", which will have effect from the point where the solid waste is used as a fuel to generate energy.

Australia

Responsibility for waste under Australian law is dealt with at the state level. Each Australian state has its own legislation which defines waste and provides for the way in which it is to be managed. The approach differs from state to state, and in some cases, specific exemptions apply to the definition of waste exist where the product is to be reused in a separate process.

In New South Wales, for example, section 4 of the *Waste Avoidance and Resource Recovery Act* 2001 (NSW) provides that “waste” has the same meaning as in the *Protection of the Environment Operations Act* 1997 (NSW). The Dictionary of the *Protection of the Environment Operations Act* 1997 (NSW) provides that “waste”, unless specifically defined, includes:

(a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume;

(b) any discarded, rejected, unwanted, surplus or abandoned substance;

(c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, reprocessing, recovery or purification by a separate operation from that which produced the substance; or

(d) any substance prescribed by the regulations to be waste for the purposes of this Act.

A substance is not precluded from being waste for the purposes of this Act merely because it can be reprocessed, re-used or recycled.

However, a prerequisite to becoming waste appears to be that the product is discharged in a manner so as to affect the environment, or is discarded, rejected, unwanted, surplus or abandoned. Clearly municipal waste and some agricultural waste fits into this category; however, as with the EU legislation, the major question in relation to forestry and most agricultural by-products destined for use as biofuels is whether the products are ever actually discarded.

4. BARRIERS TO RENEWABLE ENERGY UPTAKE

Having analysed the varying approaches to defining 'waste' under international and domestic law, the next section will consider what barriers are posed to bio-energy production as a result of the waste biomass falling within the definition of "waste". The nature of the barriers created by legislation varies between jurisdictions, but certain obligations are common. These include, for example, the requirement that all entities and persons dealing with waste (whether collecting, transporting or using as a raw material) obtain licences to perform these tasks, submit reports on their waste-related activities to designated authorities, or label and package waste in a particular manner.

4.1 Under international law

Basel Convention

According to the Basel Convention, transboundary movements of hazardous and other wastes are only permitted where the exporting State does not have the technical capacity, necessary facilities or suitable disposal sites to dispose of the wastes in an environmentally sound and efficient manner, where the wastes are required as a raw material for recycling or recovery industries in the State of import, or where the Parties otherwise agree (as long as the agreement does not conflict with the objectives of the Convention).[9]

Furthermore, State parties are required to establish a licensing system for persons transporting or disposing of hazardous and other wastes,[10] as well as a system for packaging, labelling, transportation and documentation where the waste is to be subject to a transboundary movement.[11]

In addition, exporting States are required to inform recipient States about a proposed transboundary movement of hazardous and other wastes, including a statement of the effects of the proposed movement on human health and the environment.[12] Additional notification is required for each State which is a transit State in respect of the transboundary movement.[13] Certain additional documentation requirements apply solely in respect of hazardous waste.[14]

In accordance with these provisions, therefore, it is clear that transboundary transportation of wastes is permitted where the purpose of the movement is the supply of biomass as a raw material for renewable energy generation, and/or where the State in which the waste is generated does not itself have adequate biomass renewable energy generation facilities to efficiently use the waste. Even where the waste is destined for biomass generation, however, States must still satisfy the obligations set out above in relation to labelling, packaging, documentation, notification and licensing, if the product in question is designated as 'waste' under national legislation.

Stockholm Convention

The *Stockholm Convention on Persistent Organic Pollutants* proposes that each Party to the Convention shall at a minimum take a range of measures in producing the total releases derived from androgenic sources of chemicals listed in Annex C to the Convention. Annex C specifically notes that a range of Persistent Organic Pollutants, namely polychlorinated dibenzo-p-diozins and dibenzofurans (PCDD/PCDF), hexachlorobenzene (HCB) (CAS No: 118-74-1) and polychlorinated biphenyls (PCB), may be released through firing installations that utilise biomass fuels. The Annex states that priority should be given to the consideration of approaches to prevent the formation and release of these chemicals, including the minimisation of burning of landfill sites. In this regard, the Convention is specifically aiming to reduce the use of biomass fuels where they do in fact produce Persistent Organic Pollutants.

4.2 Under domestic law

European Union

[9] Article 4(9)
[10] Article 4(7)(a)
[11] Article 4(7)(b)
[12] Article 4(2)(f)
[13] Article 6(4)
[14] Article 6(5)

The EU Framework Directive on Waste sets out a number of obligations on member states to ensure the safe and efficient use, disposal and transportation of waste. The obligations on the end users of waste, however, are derived from the provisions of national legislation which implement the Framework Directive. It is interesting to note, however, that the Framework Directive specifically instructs member states to "take appropriate measures to encourage…the use of waste as a source of energy."[15]

United Kingdom

Under section 33(1)(a) and (b) of the *Environmental Protection Act* 1990, it is an offence to deposit controlled waste in or on any land, or to treat, keep or dispose of controlled waste in or on any land, or by means of any mobile plant, unless under and in accordance with a waste management licence.

Lower risk waste management activities such as reclamation and reuse are usually not seen as a threat to the environment or human health, and are therefore exempted from the requirement to obtain a waste management licence. Schedule 3 of the *Waste Management Licensing Regulations* 1994 (the "**Licensing Regulations**") (as amended by the *Waste Management Licensing Amendment (Scotland) Regulations* 2003 in Scotland and the *Waste Management Licensing (England and Wales) (Amendment and Related Provisions) Regulations* 2005 in England and Wales) sets out around 45 categories of exempt activities, most of which are subject to specific constraints on waste types, quantities, capacities and duration of storage.

The relevant categories in relation to forestry, agricultural and municipal waste include:

(i) burning as a fuel any straw, poultry litter or wood, waste oil or solid fuel which was been manufactured from waste by a process involving the application of heat;

(ii) the secure storage on any premises of the above wastes, which are intended to be burned as a fuel;

(iii) the beneficial use of waste if it is put to that use without further treatment, and its use does not involve its disposal; and

(iv) the storage of waste intended for beneficial use, insofar as that storage does not amount to disposal.

The Licensing Regulations adopt the “Disposal Operations” and “Recovery Operations” annexes to the Framework Directive. According to these lists, “Use of waste principally as a fuel or for other means of generating energy” is a recovery operation and not a disposal operation. The “beneficial use of waste” is likely to include biomass energy generation and would not amount to disposal.

Although the recovery, storage and disposal of biomass products are therefore likely to be exempt activities for the purposes of the License Regulations, such activities are required to be registered with the appropriate registration authority (the Environment Agency in England and Wales, and SEPA in Scotland), as required by regulation 18 of the Licensing Regulations.

The requirement to register the recovery, storage and disposal extends also to the transportation of waste. Under the *Controlled Waste (Registration of Carriers and Seizure of*

[15] EU Framework Directive, Article 3(1)(b)(ii)

Vehicles) Regulations 1991 (England and Wales) (together the "**Registration of Carriers Regulations**") waste carriers are required to be registered to transport controlled waste by road, rail, air, sea or inland waterways. The Environment Agency and SEPA maintain registers of carriers and make them available for public inspection.

It is an offence under the Licence Regulations and the Registration of Carriers Regulations for an establishment or undertaking to carry on an exempt activity without being registered. This means that, despite the exemptions mentioned above, if forestry, agricultural or municipal waste products are classified as "waste", those that wish to use these products as biofuels will still be required to obtain registration to recover and transport the waste, which imposes additional costs and administrative burdens.

Denmark

In Denmark, Statutory Order No. 619 of 27 June 2000 on Waste sets out a number of obligations that must be complied with in relation to the use, transportation, recovery and disposal of waste, including in relation to registration and licensing of waste carriers, and notification, registration and reporting on waste.

However, in the Statutory Order No. 638 of 3rd July 1997 on Biomass Waste, many types of biomass waste intended for energy production are specifically excluded from the requirements of Order 619. The Order applies only to "waste from forestry, woodworking industries, agriculture and enterprises processing agricultural products, as well as fuel pellets or fuel briquettes manufactured on the basis of the above waste". The Order provides that:

> "(3)(1) Waste featuring on the list in the annex to the Order [i.e. those wastes listed above] may be incinerated without assignment from the local council, in power or heat generating plants designed for feeding with solid waste, or it may be sold for incineration in such plants.
>
> (3)(2) Furthermore, waste featuring on the list in the annex to the Order may be sold without assignment from the local council to enterprises producing fuel pellets or fuel briquettes destined for incineration in power or heat generating plants."

Agricultural and forestry waste is also exempted from notification requirements under the Order. No equivalent exemptions are made in respect of municipal waste, which remains subject to the costs and obligations set out in Order 619.

Proposed new EU Framework Directive

The EU Commission has recently proposed a new Framework Directive on Waste[16] (the "**Proposed Directive**"), which, if adopted, would replace the old directive and may remove many of the barriers identified by the European renewable energy industry in relation to waste legislation.

The Thematic Strategy on Waste, created as part of a suite of Thematic Strategies for 2005-06 and under which the Proposed Directive has been developed, has identified waste as a priority area for the simplification of Community legislation,[17] and has proposed a variety of reforms which may remove the barriers to renewable energy associated with waste legislation. The Strategy aims to bring waste legislation in line with existing EU legislation promoting biomass renewable energy generation: notably, the Directive on the promotion of

[16] Proposal for a Directive of the European Parliament and the Council on Waste COM (2005) 667
[17] Communication from the Commission of the European Communities to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Taking sustainable use of resources forward: A Thematic Strategy on the prevention and recycling of waste, 21 December 2006

electricity produced from renewable energy sources,[18] the Biomass Action Plan[19] and the forthcoming Forestry Action Plan, to be released in 2006.

Specifically, the Proposed Directive contains a provision by which "end of waste" status may be accorded to appropriate waste streams under a comitology process. Such a process is likely to lead to the classification of those products intended for biomass energy generation as “goods”, rather than as “waste”, thus alleviating the burden that may otherwise be placed on the renewable energy industry. The Commission will identify eligible waste streams by considering two criteria: first, whether there is a net environmental benefit in re-classifying the waste, and whether there is a market for the secondary material. This provision appears to be in line with the "beneficial use exemption" under New York state law, as discussed above.

In addition, the Proposed Directive seeks to maximise energy recovery from waste, including municipal waste, by introducing efficiency thresholds to classify waste treatment in municipal incinerators either as recovery or disposal. A “recovery” classification would allow the recovered products to be considered as “goods”, making it easier to use them for energy purposes.[20]

Finally, the Commission has foreshadowed the release of guidelines to distinguish between waste and non-waste by-products. The guidelines, though not yet released, will be based on the jurisprudence of the European Court of Justice and are likely to resolve the uncertainty created by the different approaches taken in the case law. These guidelines are likely to have a significant impact on the forestry and agricultural industries, where residues and by-products are conserved for certain use in bio-energy production.

Together, these measures are likely to remove many of the barriers that have been created by EU waste legislation to the development of biomass as a renewable energy source.

United States

The obligations under federal law on those dealing with waste products are set out in the *Resource Conservation and Recovery Regulations*, enacted pursuant to the *Resource Conservation and Recovery Act*. The regulations primarily concern the process surrounding household collection of waste, and impose health and safety-related obligations on the proper collection of waste and storage in landfill facilities.

Under state law, the obligations (and resultant costs) are more onerous. In New York State, for example, operators of waste-related facilities must apply for and obtain registration, permits and/or licenses to own and operate facilities, carry out particular activities, and transport waste. The licenses are subject to regular renewal applications and rigorous reporting requirements. For obvious reasons, even stricter requirements are placed on entities dealing with hazardous wastes.[21]

However, federal legislation has long been in place which specifically counteracts the effects of waste legislation on the biomass renewable energy industry. The federal *Public Utility Regulatory Policies Act* ("**PURPA**") defines a class of energy producer called a "qualifying facility" – either small-scale producers of commercial energy who normally self-generate

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18 EU Council Directive on the promotion of electricity produced from renewable energy sources in the internal electricity market (2001/77/EC)

19 Commission of the European Communities, ‘Communication from the Commission: Biomass Action Plan’, 7 December 2005

20 Commission of the European Communities, ‘Communication from the Commission: Biomass Action Plan’, 7 December 2005

21 *Environmental Conservation Rules and Regulations (NY)* Part 360

energy for their own needs but may have occasional or frequent surplus energy, or incidental producers who happen to generate usable electric energy as a by-product of other activities.

Provided the facility meets the Federal Energy Regulatory Commission's requirements for ownership, size and efficiency, utility companies are obliged to purchase energy from these facilities. The rates tend to be highly favourable to the producer, and are intended to encourage more production of this type of energy as a means of reducing emissions and dependence on other sources of energy. The result has been that power producers, including those based at sawmills and pulp and paper mills, that use biomass for fuel can sell power at profitable rates. Thus, far from discouraging this from of bio-energy, US law actively encourages it. The promotion of clean energy was one of the intents of PURPA.

Australia

As noted above, waste legislation is dealt with in Australia on a state-by-state basis. In New South Wales, waste management requirements are provided in the *Protection of the Environment Operations (Waste) Regulation* 2005, which has been enacted as an interim measure, extending the provisions of the now repealed *Protection of the Environment Operations (Waste) Regulation* 1996 while reform proposals are examined.

Under both the existing regulations and the proposed new regulations, those entities using, transporting, recovering and disposing of waste will be required to comply with a range of obligations, including tracking (documentation, reporting and advising authorities), transportation, storage and payment of waste levies. However, the special obligations in relation to waste tracking and record-keeping are limited to entities dealing with a specified list of wastes, including most municipal and hazardous wastes, but excluding forestry and agricultural wastes.[22]

In Queensland, by contrast, under section 13 of the *Environmental Protection Act* 1994 (Qld), specific provision is made for the approval of a waste to be exempted from the Act if it has a beneficial use other than disposal. Biomass renewable energy generation would therefore presumably exempt waste products from the application of the Act.

Summary

Based on the limited comparative analysis undertaken for this paper, it is clear that a range of regulatory obligations can be imposed on entities dealing with waste for bio-energy production, including:

- **Licensing** for entities transporting or disposing of hazardous and other wastes;
- **Packaging**, **labelling** and **transporting** of hazardous and other wastes that are to be the subject of a transboundary movement in conformity with the generally recognised international standards and rules in the field of packaging, labelling and transport;
- Preparation of a **movement document** tracking the transboundary movement of all hazardous and other wastes;
- **Reporting** of information on waste-related activities, including quantities of waste transported, waste fraction, waste type, waste producer and delivery site, with designated national registration authorities;
- **Registration** of waste management facilities with relevant authorities (to be renewed upon satisfactory regular inspections);

[22] *Protection of the Environment Operations (Waste) Regulation* 2005, Part 3 and Schedule 1, Part 1

- **Pre-application meetings** to obtain registration, permits and licences;
- **Prohibitions on siting** of waste management facilities in various locations (e.g. agricultural land, floodplains etc.);
- **Preparation of additional documents** prior to registration, including engineering reports, comprehensive recycling analyses, contingency plans and so on;
- **Payment of levies** by the occupiers of registered waste facilities for each tonne of waste received at the facility or generated in a particular area; and
- **Obligations on receivers of wastes** to ensure the presentation of consignment authorisations, waste transport certificates and licences by entities delivering wastes.

5. KEY ISSUES AND RECOMMENDATIONS

The issue of how biomass waste is classified under relevant international and domestic waste law is an issue which policymakers are increasingly addressing to ensure that the administrative and other costs of unnecessary regulatory obligations can be avoided or minimised. In an environment where renewable energy competes with fossil fuel-based energy production, any additional unnecessary costs imposed on renewable energy producers can act as a competitive disadvantage.

Various jurisdictions have proposed different solutions to the barriers created by the application of waste legislation to the biomass renewable energy industry. It is preferable from the perspective of the industry that the waste raw materials used in bio-energy production be exempted from the onerous requirements discussed above. Broadly speaking, two methods have been adopted for the creation of such exemptions.

One method is to exempt certain products intended for biomass energy generation from a "waste" classification altogether. This has been the approach of policymakers in jurisdictions such as New York state, and is proposed under the new EU "by-product" guidelines.

The other method is involves continuing to classify waste materials intended for biomass energy generation as "waste" under law, but exempting them (where appropriate) from the obligations generally imposed on entities dealing with waste. This approach has been followed in jurisdictions such as the United Kingdom, Queensland and Denmark.

Based on the limited comparative analysis undertaken for this paper, there appear to be at least three strategies for waste legislation to provide greater support to the bio-energy industry:

1. Automatic exemptions (either from a "waste" classification, or from related obligations) for non-hazardous by-products (such as untreated woodchips) and other non-hazardous wastes (New York State);

2. A process for discretionary exemptions (either from a "waste" classification, or from related obligations) for other wastes (New York State's "beneficial use" exemption), or wastes which have been subject to "recovery" (the "end of waste" mechanism in the EU's proposed Framework Directive on Waste); and

3. Additional mechanisms to compensate for the imposition of waste-related obligations where exemption is not feasible (because, for example, the wastes are hazardous), including PURPA-style initiatives and mandatory renewable energy targets (USA and California approach).

Recommendations

In consideration of the approaches that have been taken in various jurisdictions discussed above, there is clearly benefit in adopting a "policy toolbox" approach, which streamlines waste and biomass legislation to incorporate each of the three strategies set out above. Far from being mutually exclusive, the strategies above are in fact complementary, and are the most effective if implemented as a package.

Firstly, automatic exemptions from 'waste' classification are appropriate for certain types of wastes, particularly forestry and organic agricultural wastes, as these are non-hazardous and of low risk in terms of safety. Automatic exemptions are clearly faster and less burdensome from an administrative viewpoint than discretionary exemptions, and thus are preferable where a 'waste' classification is not necessary for reasons of safety.

However, in the case of municipal wastes, particularly hazardous wastes, automatic exemptions are likely to be inappropriate. There are clearly sound environmental, health and safety policy reasons for the classification of hazardous materials as 'waste' and the imposition of regulatory standards on those entities dealing with these types of waste. However, where municipal wastes can have a beneficial use (such as energy production), and a discretionary exemption from some (if not all) waste-related obligations would not unduly endanger public health and safety, this course of action should be considered. The same action should be considered for wastes which have already been used for bio-energy generation and pose no further safety hazard, in order to minimise costs for the transportation of biomass residue away from the incineration facility.

Finally, where health and safety considerations preclude any exemption for particular products from waste-related obligations, compensation in the form of mandatory grid purchases or other financial incentives could be made to biomass energy generators, in order to offset the impact of compliance with waste-related obligations under the law. However, full consideration of these options has been undertaken by other commentators and is beyond the scope of this paper.

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