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The Climate Change Convention and Evolving Legal Models of Sustainable Development

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The tension between expanding economic production and maintaining environmental amenities has always defined society's love/hate relationship with environmental law. A generation ago moral outrage over burning rivers, polluted air and species extinction led to the enactment of stringent domestic environmental laws that sought to protect public health and the environment with little or no regard for the cost of compliance.¹ Today, the pendulum has swung to the point where vocal property rights advocates propose dismantling environmental statutes that protect endangered species

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1. See, e.g., Clean Air Act § 109(b)(1), 42 U.S.C. 7409(b)(1) (1984). "National primary ambient air quality standards . . . shall, . . . allowing an adequate margin of safety, [be] requisite to the public health." *Id.* EPA v. Nat'l Crushed Stone Assoc., 449 U.S. 64 (1980) (holding that under the Clean Water Act, effluent limitation could be valid even if the cost of compliance might push some firms into bankruptcy); *Tenn. Valley Auth. v. Hill*, 437 U.S. 153 (1978) (holding that under the Endangered Species Act, the value of endangered species is "incalculable," and therefore courts are prohibited from balancing the utility of an endangered species against the economic loss from enjoining a federal project that jeopardizes the continued existence of the species, even if the project is a nearly completed hydroelectric dam).

and wetland ecosystems,² and impairing the government's ability to regulate under existing environmental laws. Yet, despite the pro-development complaints of the business community about the allegedly stifling costs of environmental compliance, over the last two decades our country has enjoyed remarkable economic development. Nevertheless, in the United States, the history of major environmental laws and regulations has been an account of industry challenges to proposals for enhanced protection. Those challenges have been consistently founded on the untrue but persistent assumption that environmental protection must be inversely proportional to economic output;³ i.e., jobs versus the environment. The response from environmentalists is that environmental and economic goals need not be mutually exclusive. They argue that sustainable development must accommodate human economic needs and environmental protection, because assuming our environmental laws were complied with, this increasing economic activity, coupled with steady population growth,⁴ breeds widespread ecosys-

2. See David Helvarg, *The War Against the Greens* (1994).

3. ROBERT PERCIVAL, ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE AND POLICY 165 (1992).

Experience with environmental regulation has demonstrated that industry estimates of prospective compliance costs prove to be far too pessimistic. EPA Assistant Administrator William G. Rosenberg notes: 'Historically, actual costs are generally much lower than projections because of improved technology. For example, in 1971 the oil industry estimated that lead phase-out would cost . . . \$7 billion a year. In 1990, with 99% of the lead phase-out accomplished, actual costs are only \$150 million to \$500 million a year, 95% less than earlier estimates.'

Id. at 167. See also W. Rosenberg, *Clean Air Amendments*, 251 SCIENCE 1546, 1547 (1991).

4. As our population and economic activities grow, environmental rules must become more comprehensive merely to maintain existing ecological and public health conditions, let alone improve deteriorating air, watersheds and ecosystems. For example, statistics for New York City show how population growth affects pollutant load. From 1880 to 1980, the metropolitan region's population grew by a factor of five, from roughly 3 million to 15.2 million people. Estimated waterborne discharges of organic carbon, nitrogen and phosphorous from human waste rose in direct proportion to population growth. WORLD RESOURCES INSTITUTE, *World Resources 1994-95*, 34 (1994). The United States population, currently slightly over 250,000,000 persons, grows annually at the

tem deterioration even in the United States,⁵ which has one of the world's most advanced environmental law systems.

First conceived in the 1972 Stockholm Declaration, sustainable development has been the clarion for many as the answer to the jobs versus environment dilemma. Twenty years later, Agenda 21⁶ and the Rio Declaration⁷ of the United Nations Conference on Environment and Development tried to place the concept of sustainable development at the center of international policy so that in the coming decades, economic development would proceed in a fashion compatible with environmental protection. Many argue, however, that sustainable development is too "slippery" a concept to have meaning,⁸ and therefore has been a failure.⁹ For instance, the construction of a factory in a developing country could be deemed a sustainable development project because it would provide jobs that improve economic well-being, despite the absence of pollution controls which allows the factory to pollute both air and water with toxic waste. Arguably, the present value of the jobs outweighs the potential of future health and environmental concerns from the contamination (at least in the minds of the newly hired workers, who

rate of 1.03%, which means each year the needs of approximately 2,600,000 additional people must be met. *Id.* at 269.

5. For instance, the longleaf pine, once the dominant vegetation in the southeast United States, has declined by 98% since the time of the first colonial settlers. William K. Stevens, *Latest Endangered Species: Natural Habitats of America*, N.Y. TIMES, Feb. 14, 1995, at A1, C4.

6. Adopted by the U.N. Conference on Environment and Development (UNCED) at Rio de Janeiro, June 13, 1992, I, II, III, U.N. Doc. A/CONF.151/26 (1992). See generally THE COMM'N ON ENVTL. LAW OF THE WORLD CONSERVATION UNION & THE INT'L UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES, AGENDA 21 AND THE UNCED PROCEEDINGS (Nicholas A. Robinson et al. eds., 1992) for a comprehensive review of the draft and final Agenda 21 and how they fit into the UNCED proceedings.

7. *Rio Declaration on Environment and Development*, Adopted by the U.N. Conference on Environment and Development (UNCED) at Rio de Janeiro, June 13, 1992, I U.N. Doc. A/CONF.151/26 (1992), 31 I.L.M. 874 (1992).

8. See, e.g., Helen Endre-Stacy, *Sustaining ESD in Australia*, 69 CHI.-KENT L. REV. 935 (1994); Christopher D. Stone, *Deciphering Sustainable Development*, 69 CHI.-KENT L. REV. 977 (1994).

9. See, e.g., Rebecca A. Hoelting, Note, *After Rio: The Sustainable Development Concept Following the United Nations Conference on Environment and Development*, 24 GA. J. INT'L & COMP. L. 117 (1994).

would most likely apply a relatively high discount rate to the value of future damages), and this extra present value could be invested to improve the country's future.

Others assert that the focus in Rio on the Climate Change Convention¹⁰ and the Biodiversity Treaty¹¹ detracted from more important sustainable development issues, such as indoor air pollution in rural Africa, clean drinking water and sanitation in developing nations.¹²

I propose the contrary is true. Without these treaties, and perhaps others,¹³ sustainable development will become a catch phrase justifying any development project, no matter what the environmental consequences. To understand how these two treaties can give "sustainable development" meaning, we must first trace the evolution of sustainable development in more detail, then consider its critics and the treaties' critics to see whether sustainable development can have legal meaning.

In 1972, the United Nations Conference on the Human Environment (Stockholm),

having considered the need for a common outlook and for common principles to inspire and guide the peoples of the world in the preservation and enhancement of the human environment, [proclaimed the] imperative goal [for human-kind] to defend and improve the human environment for present and future generations . . . in harmony with . . . the

10. *Framework Convention on Climate Change*, U.N. Conference on Environment and Development, U.N. Doc. A/CONF.151/26, reprinted in 31 I.L.M. 849 (1992).

11. *United Nations Conference on Environment and Development: Convention on Biological Diversity*, June 5, 1992, 31 I.L.M. 818 (entered into force Dec. 29, 1993).

12. See, e.g., Gregg Easterbrook, *Forget PCB's, Radon, Alar, The World's Greatest Environmental Dangers are Dung Smoke and Dirty Water*, N.Y. TIMES MAG., Sept. 11, 1994, at 60 [hereinafter Easterbrook].

13. See, e.g., *United Nations Environment Programme Conference of Plenipotentiaries on the Global Convention on the Control of Transboundary Movements of Hazardous Wastes; Final Act and Text of Basel Convention*, Mar. 22, 1989, 28 I.L.M. 649, 657 (entered into force May 5, 1992).

established and fundamental goals of peace and worldwide economic and social development.¹⁴

The conference declared, as a matter of "common conviction," that "man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations."¹⁵ The conference continued by declaring the now famous Principle 21:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign *right* to exploit their own resources pursuant to their own environmental policies, and the *responsibility* to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.¹⁶

However, Principles 1 and 21, not implemented by any enforceable international legal regime, did not solve the environmental and human development problems the Stockholm Conference faced in 1972. A decade later, the United Nations (UN), fearing that degradation of the world's ecosystems would lead to "the breakdown of the economic, social and political framework of civilization,"¹⁷ proposed that all ecosystems and resources of the world used by humans "be managed to achieve and maintain optimum sustainable productivity,"¹⁸ that "planning and implementation of social and economic development activities [take] due account" of the "conservation of nature,"¹⁹ and that, "taking fully into account the sovereignty of States over their natural resources,

14. *United Nations Conference on the Human Environment, Declaration of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev. at 1-3, 11 I.L.M. 1416 (1972).

15. *Id.* Principle 1.

16. *Id.* Principle 21 (emphasis added).

17. *World Charter for Nature*, G.A. Res. 37/7, U.N. GAOR, 37th Sess., U.N. Doc. A/37/51 (1982), reprinted 22 I.L.M. 455 (1983).

18. *Id.* ¶ 4.

19. *Id.* ¶ 7.

each State shall give effect to the provisions of the [World Charter for Nature].”²⁰ Unfortunately, the Stockholm Declaration and the World Charter for Nature did nothing more than elevate the notion of sustainable development to a proposed world “ethic” that urges nations to simultaneously pursue the perceived competing moral principles of economic/social justice and environmental responsibility.²¹ In response, after much discussion, the UN created the World Commission on Environment and Development (Brundtland Commission) in the fall of 1983 to flesh out the factual and policy issues that comprise the abstraction of sustainable development.²²

The Brundtland Commission’s mandate was monumental: a) re-examine the critical issues of environment and development and formulate innovative, concrete and realistic action proposals to deal with them; b) strengthen existing and propose new forms of international cooperation on environment and development; and c) raise world-wide levels of understanding and commitment to action.²³ Finally, after years of work by thousands of people, and public hearings around the globe,²⁴ the Commission issued its 1987 report, *OUR COMMON FUTURE*, which predicted “ever increasing environmental decay, poverty and hardship in an ever more polluted world” with decreasing resources²⁵ unless the world moves to achieve a “new era of economic growth . . . based on policies that sustain and expand the environmental resource base.”²⁶

20. *Id.* ¶ 22.

21. See J. Ronald Engel, *Introduction to ETHICS OF ENVIRONMENT AND DEVELOPMENT* 1, 2 (J. Ronald Engel and Joan Gibb Engel eds., 1990).

22. *Process of Preparation of the Environmental Prospective to the Year 2000 and Beyond*, G.A. Res.38/161, U.N. GAOR 2d Comm., 38th Sess., U.N. Doc. A/38/702/ADD.7 (1983).

23. THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* 363 (1987) [hereinafter *OUR COMMON FUTURE*].

24. *Id.* at 359-87.

25. *Id.* at 1.

26. *Id.*

According to OUR COMMON FUTURE, the world must simultaneously grapple with four related crises:²⁷ 1) rapid population growth which will increase existing impoverishment—90% of the growth will be in the poorest countries, and 90% of that growth in already overburdened cities; 2) economic growth, which consumes natural resources, creates pollution burdens, and, because of international economic relationships, creates enormous pressure to minimize environmental management in developing countries; 3) ecological problems arising from soil erosion, water pollution and availability, atmospheric pollution and climate modifications, and deforestation and biodiversity diminishment; and 4) the borrowing of environmental capital from future generations with no intention or prospect of repayment. Sustainable development (the process of meeting the needs of the present without compromising the ability of future generations to meet their needs)²⁸ was proposed as the conceptual framework to address these competing elements of population growth, economic growth and environmental quality. Although OUR COMMON FUTURE moved sustainable development from an ethical idea to a conceptual framework for policy analysis, it could not go beyond identifying categories of concern: international economic relationships and institutions; management of the global commons; attainment of peace and security; the international adoption of legal structures that deal with environmental effects; and institutions that enforce environmental obligations together with mechanisms for investing in our future.²⁹ These all need to be created, adopted and implemented to make sustainable development a reality.

Recognizing that the concept of sustainable development was appealing, yet meaningless, the UN scheduled an international conference for 1992, twenty years after Stockholm, for the purpose of giving sustainable development concrete

27. OUR COMMON FUTURE, *supra* note 23, at 8.

28. *Id.* at 8.

29. *Id.* at 308-47; see also R.D. Munro & J.G. Lammers, EXPERTS GROUP ON ENVIRONMENTAL LAW OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT: LEGAL PRINCIPLES AND RECOMMENDATIONS (1987).

meaning. Known as UNCED, the United Nations Conference on Environment and Development met in June 1992 in Brazil to declare how Stockholm's principles might be translated into international law.³⁰ More particularly, UNCED was convened to "elaborate strategies and measures to halt and reverse the effects of environmental degradation" and "to promote sustainable and environmentally sound development"³¹ by, *inter alia*, promoting the "development of international law."³²

UNCED's initial agenda was enormous, covering almost all the world's major environmental problems and almost all facets of the human condition:

- a) protection of the atmosphere by combatting climate change, depletion of the ozone layer and transboundary air pollution;
- b) protection of the quality and supply of freshwater resources;
- c) protection of the oceans and seas, including enclosed and semi-enclosed seas, and of coastal areas and the protection, rational use and development of their living resources;
- d) protection and management of land resources by, *inter alia*, combatting deforestation, desertification and drought;
- e) conservation of biological diversity;
- f) environmentally sound management of biotechnology;
- g) environmentally sound management of wastes; particularly hazardous wastes, and toxic chemicals, as well as protection from illegal international traffic in toxic and dangerous products and wastes;
- h) improvement of the living and working environment of the poor in urban slums and rural areas through eradicating poverty, *inter alia*, as well as taking other appropriate measures at all levels necessary to stem the degradation of the environment; and

30. See Thacher, *Background to Institutional Option for Management of the Global Environment and Commons*, at 54, 77 (1991) (unpublished paper for the World Federation of United Nations Association's Project on "Global Security and Risk Management").

31. G.A. Res. 44/228, U.N. GAOR, 4th Sess., Agenda Item 82(f) ¶ I.3 (1990).

32. *Id.* ¶ I.15(d).

- i) protection of human health condition and improvement of the quality of life.³³

Not unexpectedly, the focus of the conference was, of necessity, much narrower. But even with this narrowing, UNCED was remarkably ambitious in seeking to produce six categories of outcomes:³⁴

- 1) a mutually agreeable statement of environmental and developmental principles governing the conduct of nations and people to be called the "Earth Charter,"³⁵
- 2) a programme of work (Agenda 21) addressing major environmental and developmental priorities into the 21st century;
- 3) an agreement concerning financial resources for implementing the programme;
- 4) an agreement on access to environmentally sound technologies for developing countries;
- 5) an agreement on measures to strengthen and supplement existing international institutions and institutional processing; and
- 6) legal instruments on climate change and biodiversity.

Thus, the problem facing UNCED and the world was, and remains, how to link environmental values with economic development. While it may be possible to achieve framework agreements on climate change and biodiversity issues, which might even include specific greenhouse gas emission reduction targets, the more fundamental question of how law can link environmental values with economic development must inevitably be addressed. When international agreements address problems on an ad hoc basis, they create a patchwork of legal solutions that is merely reactive to envi-

33. *Id.* ¶ 12.

34. See Report of Maurice F. Strong, Sec. Gen. of the Conference, to the Second Session of the UNCED Preparatory Committee, A/CONF.151/PC/14, ¶¶ 49-58.

35. The document that was ultimately issued was called the Rio Declaration and its language was the subject of heated debate. For a detailed analysis of the tensions reflected in the Declaration, see David A. Wirth, *The Rio Declaration on Environment and Development: Two Steps Forward and One Step Back, or Vice Versa?*, 29 GA. L. REV. 599 (1995).

ronmental crises. Although economic concerns are always a variable in these agreements, international law has not created a systematic framework within which environmentally sound sustainable development decisions can be made in the daily activity of the world. This paper suggests that the conceptual approaches to environmental law and international law do not lead to a workable international law of sustainable development.

Instead, the law must be reformulated to reflect the laws of ecology, biology, physics and chemistry on one hand, and economic principles on the other. The declaratory principles that each state has a sovereign right to exploit resources and act within its borders, yet must be responsible for effects caused outside its borders set forth the model the law must implement. The economics side of the balance is already fully implemented in international law in the doctrine of sovereignty, which allows each state to maximize its own welfare as an actor in the world's markets. However, as to each country's daily activities, current law lacks any comprehensive means to account for the effects on others created by activities within a state's borders. An international law of sustainable development must provide a framework that balances the privilege of sovereign action with the responsibility for that action. To do this, the law must internalize adverse environmental effects into economic development decisions.

For instance, the earth's atmosphere is a global commons into which the world's population emits the gaseous by-products of its activities on the erroneous assumption that the atmosphere has limitless capacity to absorb invisible gaseous wastes without changing its characteristics, and that air-pollution is cost-free waste disposal. However, these emissions affect changes in the world's ecosystems, and some of the emissions may radically alter the world's climate.³⁶ The same is true of local and regional air pollution, water pollution, hazardous waste disposal, national resource utilization, forestry practices, the preservation of species diversity and

36. *Second Assessment Report*, Intergovernmental Panel on Climate Change, Adopted at Rome, Dec. 12, 1995.

the capacity of the world's ecosystems to supplement life. Theoretically, if the environmental cost of the use or consumption of each resource were included in its price, then the market would encourage resource use that increased the efficient use of each resource and reduced total environmental costs, resulting in lower costs of each activity to society.³⁷ Because the market inherently fails to internalize these costs into private decision-making, the legal system must fill the gap so that decisions about local actions reflect global or regional effects. Presently, the cost of emissions and ecosystem consequences are not at all included in decisions.³⁸ To achieve sustainable development, the failure of the market to externalize environmental costs must be corrected. This is the task for the law, which can modify conduct and mold institutions. It is also the vehicle society uses to require external costs to be internalized.

The balance of this article will explore whether the UNCED process, and its results — the Rio Declaration, Agenda 21, the Climate Change Convention and the Biodiversity Convention — advanced or set back the cause of sustainable development in international law. The analysis begins with Gregg Easterbrook's provocative argument that it was a mistake for the world to devote time at UNCED to finalizing the Climate Change Convention and the Biodiversity Convention instead of devoting the world's attention to improving drinking water, sewage treatment, and air quality in the poor, underdeveloped countries of the world.³⁹ Specifically, he was highly critical of public interest environmental organizations,

37. See RICHARD L. OTTINGER, ET AL., ENVIRONMENTAL COSTS OF ELECTRICITY 127, 137 (1990).

38. "A decision not to consider external costs in itself quantifies them by setting their value at zero." F. Paul Bland, *Problems of Price and Transportation: Two Proposals to Encourage Competition from Alternative Energy Resources*, 10 HARV. ENVTL. L. REV. 345, 386 (1986). The question of how a particular environmental damage should be valued and what that value should be is beyond the scope of this article. However, considerable energy is going into answering this question. RICHARD L. OTTINGER, ET AL., ENVIRONMENTAL COSTS OF ELECTRICITY (1990); EXTERNAL ENVIRONMENTAL COSTS OF ELECTRIC POWER (Olav Hohmeyer & Richard L. Ottinger eds., 1994); and SOCIAL COSTS OF ENERGY (Olav Hohmeyer & Richard L. Ottinger eds., 1991).

39. Easterbrook, *supra* note 12.

which he disparagingly refers to as “enviros,”⁴⁰ for selecting global climate change and biodiversity as the central issues to be addressed at UNCED, instead of pressing public health issues such as drinking water and urban air pollution.⁴¹ Thus, the idea of sustainable development must now not only resolve the tensions between the cost of environmental protection and economic development, but also grapple with perceived tensions of choosing among important goals: public health needs versus ecological health.

However, UNCED was to link ecological concerns with human development needs, not separate them. Unfortunately, the perceptual divide suggested by Easterbrook results in the rapid evaporation of meaning from sustainable development because any project that promotes economic growth can be viewed as sustainable simply because it results in short-run employment opportunities, the present value of which, if a high financial discount rate is used, may overwhelm long term gains. Under this rationale, sustainability is in the eye of the beholder. Easterbrook is correct that water and indoor air pollution in huts of rural Africa are public health matters of great concern. Nevertheless, focusing on those problems does not justify removing the Climate Change Convention from the agenda of UNCED. On the contrary, as we will see, the Climate Change Convention will probably be more powerful in improving indoor and outdoor air quality in developing countries than all the complaining about funding priorities ever could be.

In thinking about what sustainable development means, we should not be myopically focused on whether the water in a particular location is overly polluted. Instead we should

40. *Id.* at 63.

41. *Id.*

To make Rio a fashionably negative event about Western guilt-tripping and America-bashing, the prospect of global warming was put above the urgent loss of lives in the third world from water and air pollution. Rio concluded with Western leaders' agreeing to devote billions of dollars to controlling global warming, while not lifting a finger for the 7.8 million poor children who die each year mainly from what they drink and breathe.

Id. at 61.

look at how to create a legal model that will cause routine financial and business decisions to internalize environmental and public health consequences. Over time, as our capital is recycled, new infrastructure investments will reflect low-cost, efficient avoidance of adverse effects. As an overarching legal framework that will eventually require efficient use of fossil fuels and renewable energy, the Climate Change Convention has the potential to move huge amounts of public and private investment capital from the north to the south. Decisions about what, where or whether a new economic development project is built should be driven by some internalizing process that harnesses the efficiency of the market without sacrificing environmental quality. The Climate Change Convention provides a powerful vehicle to reach this end, especially when combined with the internalizing power of domestic environmental regulation enacted to implement Climate Change Convention requirements.

But how will the Climate Change Convention fit into this model of sustainable development? This question can be answered by examining the potential response of electric utilities to America's goal under the Convention. For the United States to meet its expressed goal of 1990 emission levels by the year 2000, the electric utilities in the United States will be required to reduce substantially the amount of carbon dioxide they emit when they burn coal and other fossil fuels to generate electricity. Since the locations of carbon dioxide emissions within each country are immaterial, as long as global emissions are reduced, the task of making the reductions is amenable to market-based mechanisms such as offsets and emission allowance trading.

In response to international developments, a number of states have indicated that they will allow utilities to meet emission reduction requirements by engaging in offset projects, such as demand-side management or carbon sequestration. Massachusetts has been most explicit in defining the qualitative parameters for offsets.⁴² For a greenhouse gas

42. See *Mass. Elec. Co. v. Dep't of Pub. Util.*, 643 N.E.2d 1029 (Mass. 1994); FINAL ORDER, INVESTIGATION BY THE DEPARTMENT OF PUBLIC UTILITIES ON ITS

offset to apply, it must be a real reduction: durable, measurable, and enforceable. At the national level, in section 1605(b) of the Energy Policy Act of 1992, the U.S. Department of Energy (DOE) was authorized to establish a set of criteria for measuring whether an entity has engaged in an emissions reduction project and for recording on the government's records the amount, of emissions that were reduced. Under the Act, no company is required to reduce emissions. Those that voluntarily do so, and whose projects meet the DOE criteria, will have those reductions formally recorded, with the hope that these certified reductions will be usable in the future to meet any mandatory reduction requirements or to sell to companies that need reductions.

Thus, section 1605(b) is creating a preliminary structure within which a market for greenhouse gas emission reductions can develop. DOE has issued general and industry specific guidelines that attempt to define what an emission reduction really is, particularly in the context of a developing nation which must increase its energy use simply to provide for the basic needs of society.⁴³ At about the same time, the U.S. Department of State issued groundrules for pilot projects for the joint implementation of the United States' obligations under the Climate Change Convention.⁴⁴

The purpose of the State Department pilot program is,

. . . to encourage the rapid development and implementation of cooperative, voluntary and cost-effective projects between domestic and foreign partners aimed at reducing or sequestering emissions of greenhouse gases, particularly projects promoting technology in developing countries and countries in transition to market economies Projects in our domestic pilot program will enable us to test and

OWN MOTION AS TO ENVIRONMENTAL EXTERNALITY VALUES TO BE USED IN RESOURCE COST EFFECTIVENESS TESTS BY ELECTRIC UTILITIES SUBJECT TO THE DEPARTMENT'S JURISDICTION, DPU 91-131 (Mass., Nov. 10, 1992).

43. U.S. Dep't of Energy, *Voluntary Reporting of Greenhouse Gases under Section 1605(b) of the Energy Policy Act of 1992: General Guidelines* (Public Review Draft May 31, 1994).

44. Dep't of State, *Announcement of Groundrules for U.S. Initiative on Joint Implementation*, Bureau of Oceans and Int'l Env'tl. and Sci. Affairs 59 Fed. Reg. 28,442 (1994) [hereinafter USIJI Guidelines].

evaluate methodologies for measuring, tracking and verifying costs and benefits, and, we believe, help establish an empirical basis to contribute to the formulation of international criteria for joint implementation.⁴⁵

Under this pilot program, any U.S. person, including private and governmental entities, can enter into a U.S. Initiative on Joint Implementation (USIJI) project with any country, person or entity in a country that has signed, ratified, or acceded to the UN Framework Convention on Climate Change.⁴⁶ To be a USIJI pilot project, the proposal must be approved by a panel that will insure that the project is acceptable to the host country. The evaluation involves: "specific measures to reduce or sequester greenhouse gas emissions;" provides data and measurement methodology to establish a baseline of current and future greenhouse gas emissions in the host country with and without the project; reduces or sequesters greenhouse gas emissions beyond the baseline without the project; provides adequate independent project data verification; identifies non-greenhouse gas environmental impacts and benefits; and provides "adequate assurance that the greenhouse gas emissions reduced or sequestered over time will not be lost or reversed."⁴⁷ Analogous, but not identical, rules have been established by the DOE in its section 1605(b) guidelines.

Neither section 1605(b) nor the State Department's USIJI guidelines grant applicants legal emission credits, or any guarantee that if and when an emission credit or trading program is established, that section 1605(b) or USIJI reductions will qualify or receive credit under the Convention or U.S. law. Moreover, the Convention's Conference of the Parties has not yet agreed on any international rules or guidelines for joint implementation under the Climate Change

45. *Id.* at 28,444. United States Statement on Joint Implementation Before the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change, Aug. 29, 1994.

46. USIJI Guidelines, *supra* note 44, at 28,443.

47. *Id.* at 28,444.

Convention.⁴⁸ However, at its meeting in Berlin in April 1995, the Conference of the Parties (COP) did agree to allow joint implementation arrangements, but no credits would be assigned during the pilot phase (through the year 2000).⁴⁹

Both the State Department USIJI pilot program and the DOE's section 1605(b) guidelines, which track domestic and foreign offset projects, are purely voluntary. Neither grant nor promise legally enforceable credits. Neither the COP nor the United States has adopted any enforceable emission targets or caps. Nevertheless, nearly thirty projects have been submitted to the State Department for review in its first round of submissions.⁵⁰

The anticipation of future emission caps, taxes or limitations, combined with the lure of using market mechanisms to achieve low cost emission reductions, has generated substan-

48. William K. Stevens, *Climate Talks Enter Harder Phase of Cutting Back Emissions*, N.Y. TIMES, Apr. 11, 1995, at C4.

49. The NEW YORK TIMES reported that the U.S. Under Secretary of State Timothy Wirth characterized the international consensus to start joint implementation as the meeting's "signature item" even though no credits would be granted to pilot projects. *Id.* Presumably, as was the case with the 1990 Clean Air Act Amendment's sulfur dioxide emission trading allowance scheme (42 U.S.C. §§ 7651-7651(o) (1990)), which granted retroactive credits to utilities in states which had voluntarily invested to reduce their sulfur dioxide emissions prior to the amendments. 42 U.S.C. § 7651(e) (1990). So too, good faith voluntary projects that create real, verifiable, durable greenhouse gas reductions or sequestrations will be given retroactive credit if and when an international joint implementation plan under the Convention is adopted. *See, e.g.,* Re: Advance Plans for Construction of Facilities, 136 P.U.R. 4th 153, 176, 1992 WL 318828 (Wis. P.S.C. 1992) (noting that just as the P.S.C.'s consideration of sulfur emissions years before the 1990 Clean Air Act Amendments had put Wisconsin utilities in an advantageous position when the trading allowance program was adopted, so it would be prudent to similarly anticipate potential climate change regulations). Obviously, the ability to earn credits under the Climate Change Convention will provide "a major incentive for the private sector to engage in economically risky projects in developing countries." *Industry Accuses Administration of Breaking Promise on Berlin Talks*, 1995 WL 2265677 (4/19/95 GLWM (Global Warming Network Online) file quoting John Shlaes, executive director, Global Climate Coalition, an industry lobbying group).

50. Pamela Wexler and David Hodas, 1994 *Annual Report, Special Committee on Global Climate*, in NATURAL RESOURCES, ENERGY AND ENVIRONMENTAL LAW-1994 YEAR IN REVIEW 168 (1995). The report notes that the proposals span a range of industrial sectors and regions, including Central and South America, Asia, Central Europe and Russia.

tial response. A recently reported domestic example is the trade between a New York utility and an Arizona utility of carbon dioxide emission reductions recorded under section 1605(b) for unused sulfur dioxide allowances. The transaction calls for the New York utility to transfer its right to claim 1.75 million tons of carbon dioxide emission reductions⁵¹ recorded with the DOE under section 1605(b) guidelines to the Arizona utility, which plans to expand its coal-fired electricity generation. In exchange, the Arizona utility will transfer 25,000 tons of unused Clean Air Act sulfur dioxide allowances to the New York utility, which will donate them to a public interest environmental group. The public interest group will retire the allowances, thereby reducing sulfur dioxide emissions by 25,000 tons. The tax deduction value to the New York utility of the contribution will be used to institute additional demand-side management measures.⁵² When the transaction was announced, the 25,000 ton sulfur dioxide allowances, with a market value of approximately \$1.50 per ton, were worth about \$3.75 million. Thus, the 1.75 million tons of carbon dioxide reductions recorded under section 1605(b) were worth about \$2.00 per ton.

Since the COP agreed in Berlin to negotiate by 1997 an agreement on specific emission reductions after 2000, the need for low-cost emission reduction and sequestration strategies will soon become critical. Just to cap the world's carbon dioxide emissions at 1990 levels by 2000, given current increases since 1990 and projected trends, will require the Organization of Economic Cooperation and Development (OECD) countries to reduce their emissions and growth in emissions by about 800 million tons per year.⁵³ In addition, 1.5 billion tons per year of reductions or sequestration to accommodate anticipated growth in the developing countries of

51. Peter Passell, *For Utilities, New Clean-Air Plan*, N.Y. TIMES, Nov. 18, 1994, at D1. These reductions were the product of the utility's energy efficiency projects in its service area. *Id.*

52. *Id.*

53. Stevens, *supra* note 48, at C4. Data taken from the graphs in the article "Projecting Carbon Emissions," source: Department of Energy, and "Comparing Emissions," source: Intergovernmental Panel on Climate Change, United Nations.

the world will be necessary to provide some equitable adjustment in present and historical per capita emissions.⁵⁴ Thus, the OECD nations will need to find about 2.3 billion tons of reductions or sequestration per year through 2010 just to maintain emissions at 1990 levels.

However, a 1990 emission level cap will still result in increased carbon dioxide concentrations in the atmosphere. This is why the COP agreed to negotiate further specific emission reductions to begin after 2000. For instance, a target of limiting emissions to 80% of 1990 levels (6 billion tons per year) after 2000 would require an additional worldwide reduction or sequestration of 1.2 billion tons per year. To meet this, or even less ambitious goals, will require an enormous investment in energy efficiency in OECD countries. Perhaps more importantly, investments in developing countries in state-of-the-art energy efficiency and renewable energy technology will also be required so they can achieve economic growth without increasing fossil fuel use. To achieve this goal, developing countries should not be allowed to use our inefficient cast-off technology. Rather we must enable these nations to jump directly to the most efficient demand-side and renewable energy technologies.

The need to achieve this goal at low cost is imperative. Certainly, if voluntary reductions without legal credit significance are trading at \$2 per ton before any binding caps or reductions are agreed to or imposed, it is reasonable to expect that reduction and sequestration credits necessary to meet mandated emission limits could be as high as \$50 per ton, especially when reductions must be verified, actual, durable and enforceable.⁵⁵ At \$50 per ton for 2 billion tons of reduction or sequestration per year, the world's investment would be about \$100 billion per year for several decades. This is equivalent to the estimated capital requirement for electric power growth over the next two decades.⁵⁶ It would be tragic

54. *Id.*

55. See RICHARD L. OTTINGER, ET AL., ENVIRONMENTAL COSTS OF ELECTRICITY 184-85 (1990).

56. Richard L. Ottinger, *Energy and Environmental Challenges For Developed and Developing Countries*, 9 PACE ENVTL. L. REV. 55, 62-63 (1991).

if this investment did not maximize a shift to sustainable economic growth.⁵⁷

Joint implementation provides a powerful mechanism to achieve low-cost emission reductions while promoting sustainable development. Some early pilot projects demonstrate this potential. The oldest is the Applied Energy Service (AES) forestry project in Guatemala to sequester carbon in trees and reduce emissions from deforestation to offset the carbon dioxide emissions from an AES coal-fired electric power plant to be built in the United States. Although the project is subject to some criticism, and might not meet the USJI criteria for pilot projects,⁵⁸ if successful, it will reduce atmospheric carbon dioxide by 15.5 million tons at a cost of less than \$2 per ton. More importantly, it has provided critical field testing for forestry offset projects and has spurred

The capital requirements of electric power growth (projected at 5 to 7.5% per year on a current trends basis) has been estimated to be \$1.4 to \$4 trillion over the next two decades. Unfortunately, the World Bank currently lends less than \$4 billion per year to the energy sector, while commercial lending stands at about \$16 billion per year and has been declining rapidly.

Id.

57. *Id.* Ottinger provides a vivid example of the tragedy of missed opportunity when precious capital investment is not focused at state-of-the-art efficiency:

In 1980, China decided to distribute refrigerators throughout the capital city of Beijing. It did so with resounding success, supplying refrigerators to over 60% of the Beijing households by 1990, where only 6% had them in 1980. The reconditioned refrigerators from Japanese factories were thought to be cheap. They were not cheap however, when the costs of the electric power supply necessary to run these very inefficient machines became apparent. In fact, the purchase and supply of inefficient equipment cost more than three times what would have been the cost of supplying the most efficient refrigerators on the world market today.

Id. at 59. Even the limited funds made available in China for energy efficiency investments (10% of energy investments in 1981 and 1982) resulted in China saving "an estimated 27 million standard tons of coal per year, which is equivalent to 6.3% of China's total industrial energy consumption for the year 1985. China's average costs for improving energy efficiency were lower than the cost of new coal supply and substantially lower than the unsubsidized costs of new coal supply in other countries."

Id. at 60.

58. OTTINGER, ET AL., *supra* note 55, at 165-69.

others to enter this field.⁵⁹ Norway is financing a project in Mexico to install high efficiency light bulbs that will reduce carbon dioxide emissions at a cost far below the marginal costs in Norway.⁶⁰ In Poland, a joint venture between Philips and the Polish power sector will replace 1.15 million incandescent lamps with compact florescent lamps over two years, saving approximately seventy-three gigawatt-hours per year of electricity and reducing carbon emissions by about 500,000 tons. This pilot project will also build Poland's demand-side-management capacity and support local non-profit organizations.⁶¹

A portfolio of similar projects, including energy efficiency, transportation improvement, wind power, solar power, biomass, fuel cell technology, and boiler and manufacturing improvements, is being developed and funded by the Global Environment Facility.⁶² This will provide an extensive base to support joint implementation investments. The range of these innovative investment opportunities is remarkably broad.⁶³ In fact, there are now U.S. consulting firms devoted to putting together these kinds of projects by developing the project concept, locating funding, helping to negotiate agreements between U.S. companies and foreign governments and entities, as well as dealing with multilateral banks and national foreign aid agencies.⁶⁴

59. See MARK C. TREXLER AND CHRISTINE HAUGEN, KEEPING IT GREEN: TROPICAL FORESTRY OPPORTUNITIES FOR MITIGATING CLIMATE CHANGE (Mar. 1995); Sheryl Sturges & Jeffrey B. Hewitt, *Progress of a Policy Experiment: Climate Challenge Interim Report Card*, 8 THE ELECTRICITY J. 60 (1995).

60. Robert J. Anderson, *Joint Implementation of Climate Change Measures: An Examination of Some Issues* (Jan. 1994); The World Bank, *Facing the Global Environment Challenge: A Progress Report on World Bank Global Environment Operations*, 11 (June - Aug. 1995).

61. The World Bank, *Facing the Global Environment Challenge: A Progress Report on World Bank Global Environment Operations* (Jan. - Feb. 1995), 28-29 (1995).

62. The World Bank, Global Environment Coordination Div., Environment Dep't: *Facing the Global Environment Challenge: A Progress Report on World Bank Environment Operations Work Program App.* (Jan. - Feb. 1995).

63. KEITH KOZLOFF AND OLATOKUMBO SHOBOWALE, RETHINKING DEVELOPMENT ASSISTANCE FOR RENEWABLE ELECTRICITY (1994).

64. See, e.g., Sheryl D. Sturges, *Greenhouse Gas Emission Offsets: A Global Warming Insurance Policy*, 6 THE ELECTRICITY J. 70 (1993).

To the extent an emissions cap is established under the Climate Change Convention, U.S. utilities and industrial companies will be motivated to invest in emission reductions in foreign projects because the costs will inevitably be lower than in the U.S. The DOE's § 1605(b) guidelines now identify criteria for most industrial sectors as well as agriculture, construction, commercial and forestry businesses. There is even exploratory work underway to establish a private investment fund that will try to assemble and consolidate capital as a mutual fund that will invest in these types of projects as long term investments.

This brings us back to the role of the Climate Change Convention within the context of UNCED and sustainable development. According to Easterbrook, indoor air pollution from dung and charcoal burning in rural African huts should have been a priority at UNCED, instead of the Climate Change Convention. Yet, an emissions cap under the Convention would do more to improve indoor air pollution in rural developing countries than anything that UNCED could have produced if it had followed Easterbrook's narrow focus. The emissions cap could motivate investment by U.S. companies in efficient stoves for rural families now cooking inefficiently and with large amounts of smoke:

A \$1 billion annual investment would supply efficient wood stoves to the 400 million rural households in developing countries (based on a cost of \$10 per stove with a four year life span). The fuelwood conserved could generate, in biomass fired stoves, as much electricity as eighty [80] large nuclear power plants costing \$160 billion. On a more advanced level, it has been calculated in Brazil that investments of \$10 billion over the next 15 years in more efficient refrigerators, street lighting, lighting for commercial buildings, motors, industrial motors and variable speed drives could preclude the construction of 22 gigawatts of new electric generating capacity at a cost of \$44 billion.⁶⁵

65. Ottinger, *supra* note 56, at 61.

If a company were to invest in these stoves and train people to distribute them, it could, at a low cost per ton, obtain a credit for emission reductions through the reduced charcoal used and reduced deforestation from wood gathering, and, as a side benefit, would dramatically improve the indoor air quality and the respiratory health of hundreds of millions of persons.⁶⁶

By placing a cap on carbon dioxide emissions, to be achieved by market-based mechanisms such as joint implementation linked to emission reduction credit trading, we can both achieve our climate change prevention goals at the lowest possible cost and help break the link between economic cost and environmental improvement. As the world begins to use its energy more efficiently, capital will be freed to advance economic development and provide services, such as clean air, safe drinking water, effective sewage treatment, and improved education to the developing world. Thus, by fully implementing the Climate Change Convention, we will create the market signals to integrate efficient (and therefore less polluting) use of fossil fuels into routine economic decisions.

Without the pressure of the Convention's implementation, UNCED sustainable development concepts will be little more than a vague set of concepts that could justify any economic project as "sustainable" on the grounds that it will provide some additional jobs, despite possible human health and environmental harms. The Climate Change Convention is therefore intimately and necessarily linked to UNCED goals of sustainable development because it provides the specific parameters around which the concept of sustainable development can have meaning and be concretely implemented.

66. In fiscal 1995, the Global Environment Facility approved a grant in Mali for a household energy project that will address "both the demand for and supply of household energy in a country where people depend heavily on environmentally damaging wood fuels. Consumption of these fuels will be reduced by promoting the use of more efficient stoves and by substituting wood fuels with kerosene and bottled gas . . ." *The World Bank, Mainstreaming the Environment: The World Bank Group and the Environment Since the Rio Earth Summit*, 47 (1995).