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AN AFRICAN DIMENSION TO THE CLEAN DEVELOPMENT MECHANISM: FINDING A PATH TO SUSTAINABLE DEVELOPMENT IN THE ENERGY SECTOR

Patricia Nelson

I. INTRODUCTION

The concept of "sustainable development" is probably suffering from its success as a buzzword. So frequently adopted by so many groups with wildly varying agendas—from the Sierra Club to the coal industry[1]—the term might seem to be well on its way to becoming meaningless.[2] Nevertheless, the debatable political process of imbuing the term with something for everyone has resulted in one of the essential "takes" on sustainable development: The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), which makes a comprehensive effort to link sustainable development with the task of global greenhouse gas (GHG) reduction.[3] The link is made by the Protocol's Clean Development Mechanism (CDM), which encourages the developed world to invest in GHG-reduction projects in developing countries.[4] This particular effort comes with a major problem—one that implicitly suggests its own solution. The African nations, whose development crises might offer the best crucible to refine

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1. *See* RON KNAPP, COAL UNDER SUSTAINABLE DEVELOPMENT CONDITIONS OF THE 21ST CENTURY 1, *at* http://www.wci-coal.com/uploads/IMA2001.doc (2001) (on file with author). Ron Knapp, in his role as Chief Executive of the World Coal Institute, London, presented this paper at the 2001 Indonesian Mining Conference and Exhibition in Jakarta. For the Sierra Club's conflicting viewpoint, which seeks to de-emphasize fossil fuels, *see* SIERRA CLUB, GLOBAL WARMING & ENERGY, RISKY BUSINESS: TRADING AWAY OUR RESPONSIBILITIES, *at* http://www.sierraclub.org/globalwarming/articles/jifact.asp (last visited Mar. 26, 2004) (on file with author).

2. Helio International, *Energy and Ecodevelopment: An Assessment of the Impact of Energy Policies on Planet Earth*, *in* GLOBAL REPORT FOR RIO + 10 (Sustainable Energy Watch 2002), *at* http://www.helio-international.org/Helio/Reports/2002/English/global-report.html (last visited Mar. 28, 2004) (on file with author). Helio International is an organization that monitors the performance of the energy industry vis-a-vis the international environmental Conventions. This report incorporates a series of analyses of various facets of the environmental situation ten years after the 1992 Rio Summit.

3. The United Nations Conference on Environment and Development: Framework Convention on Climate Change, May 9, 1992, S. TREATY DOC. No. 102-38, *reprinted in* 31 I.L.M. 849, *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf (last visited Mar. 29, 2004); Kyoto Protocol to the United Nations Framework Convention on Climate Change, 37 I.L.M. 22 (1998), *available at* http://www.jus.uio.no/lm/un.climate.change.kyoto.protocol.1997/doc.html (last visited Mar. 29, 2004).

4. Kyoto Protocol, *supra* note 3, at art. 12.

the concept of sustainable development in practice, are poorly served by the Protocol and its CDM.[5]

This poor fit does not derive from a lack of relevance or urgency—or even a lack of agreement as to the basic problem. Although there is a small, vociferous group of dissenters, the Kyoto Protocol reflects a broad scientific consensus that rising concentrations of industrial gases in the atmosphere will intensify a natural greenhouse effect.[6] This effect, whose most significant cause is carbon dioxide (CO_2) emissions from fossil-fuel combustion,[7] is projected to lead, in turn, to rising sea levels, changes in crop patterns, more frequent droughts, and increasingly extreme swings in weather conditions.[8] Scientists anticipate that a disproportionate share of these side effects of industrialization will be felt in the less developed areas that benefit least from industrialization and are least equipped to deal with its impacts.[9]

This scenario of impending disproportionate climate impacts is profoundly bad news for Africa, which already suffers disproportionately from drought, flooding, and famine.[10] Even now, widespread displacement of Africans due to natural and manmade disasters is a common occurrence; the global warming effect

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5. *See* UNEP COLLABORATING CENTRE ON ENERGY AND ENVIRONMENT, AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *at* http://unepriso.org/CDM/Accra/AccraPapers.pdf (Aug. 1999) (on file with author). This document is a series of papers presented at a regional workshop, New Partnerships for Regional Development: The Clean Development Mechanism under the Kyoto Protocol, in Accra, Ghana (Sep. 21-24, 1998) and collected by UNEP's Riso National Laboratory, Roskilde.

6. The consensus exists not as to the short-term, micro effects, but as to the underlying physical processes that create the greenhouse effect and the long-term changes that will occur at global level. *See, e.g.*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP I, SUMMARY FOR POLICYMAKERS 7-10, *at* http://www.gcrio.org/OnLnDoc/pdf/wg1spm.pdf (approved Jan. 2001) (on file with author). *See also* Richard Wolfson & Stephen H. Schneider, *Understanding Climate Science, in* CLIMATE CHANGE POLICY: A SURVEY 3, 41 *et seq.* (Stephen H. Schneider et al. eds., Island Press 2002); Stephen H. Schneider & Kristin Kuntz-Duriseti, *Uncertainty and Climate Change Policy, in* CLIMATE CHANGE POLICY: A SURVEY 53, 53-87. There is a dissenting view that the effects, and even the existence, of a greenhouse effect have not been scientifically established. The fossil-fuel industry is a major proponent of this viewpoint. *See, e.g.*, Dr. Robert C. Balling, Jr., Dr. Craig D. Idso & Dr. Robert E. Davis, *A Critical Review of EPA' "State and Local Climate Change Outreach Kit, at* http://www.greeningearthsociety.org/Articles/2000/browner2.htm (July 2000) (report prepared for The Greening Earth Society, a climate-change skeptics group) (on file with author). *See also* THE HEAT IS ONLINE, THE DISINFORMATION CAMPAIGNS OF BIG COAL, *at* http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?id=4380&method=full (n.d., last visited Mar. 26, 2004) (discussing the industry stance from an environmentalist perspective) (on file with author) and Alexander Ewen, *Consensus Denied: Holy War over Global Warming*, GLOBAL WARMING AND CLIMATE CHANGE 3 (2000), *at* http://www.ienearth.com/climate_3.html#holy_war (on file with author).

7. Cheng Zheng-Kang, *Equity, Special Considerations, and the Third World*, 1 COLO. J. INT'L ENVTL. L. & POL'Y 57, 59 (1990).

8. Schneider & Kuntz-Duriseti, *supra* note 6, at 53-87.

9. Wolfson & Schneider, *supra* note 6, at 35-41.

10. *See, e.g.*, UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA, ECONOMIC REPORT ON AFRICA 2003: ACCELERATING THE PACE OF DEVELOPMENT 25, http://www.uneca.org/era2003/ (2003) (on file with author).

will add massive waves of "climate change refugees."[11] Africa's capacity to adapt to climate change is also disproportionately low because Africa has limited technological and economic resources,[12] African scientists have taken the initiative to pinpoint the probable impacts of climate change in their various sub-regions.[13] Given the existence of many more pressing African problems,[14] the African countries' significant commitment of their limited scientific resources to climate change studies, their speedy ratification of the Framework Convention on Climate Change, and their efforts to craft regional climate-change and CDM policies indicate their recognition of the seriousness of the problem and the opportunity presented by the CDM.[15]

The Kyoto Protocol's agenda is difficult to apply to Africa in part because Africa's development problem is so large and various,[16] and in part because the Protocol spotlights difficult North-South development issues: the deployment of finite energy resources, environmental degradation, and uneven distribution of wealth.[17] A seemingly comprehensive way out of these problems is sustainable energy development.[18] However, some Africans are skeptical of a CDM strategy dominated by the energy sector because, in their experience, the agenda of energy companies is "rarely compatible" with the urgent needs of other economic sectors.[19]

The lopsided state of global development also makes African energy development more difficult. The developed countries account for three-quarters of the fossil fuel combustion that has served as the historical path to prosperity.[20] Comparable industrial development of the rest of the world would place a tremendous strain on finite and dwindling fossil fuel resources.[21] A more

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11. Nsongurua J. Udombana, *How Should We Then Live? Globalization and Africa's Development*, 20 B.U. INT'L L.J. 293, 302-04 (2002); Clare Breidinich, Daniel Magraw, Anne Rowley & James W Rubin, *Current Developments: The Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 92 AM. J. INT'L L. 315, 316 (1998).

12. Wolfson & Schneider, *supra* note 6, at 36.

13. Under the auspices of the African Centre of Meteorological Applications for Development, in Niger, the scientists have conducted several studies and predicted accelerated desertification in North Africa, more widespread drought in the Saharan and Sahelian areas, more intense and frequent flooding and drought in North-East Africa, increased dry periods in East and Central Africa, increased flooding in humid areas of West Africa and regular droughts in dry areas of West Africa, and more intense recurrences of the recent devastating droughts in Southern Africa. Moussa Cisse, Yuoba Sokona & Jean-Philippe Thomas, ENDA Energy Programme, INFORMATION NOTE ON THE IMPLEMENTATION IN AFRICA OF THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC) § I.4, *at* http://www.enda.sn/energie/rapports/ccd97ouaga/notegb.htm (Mar. 1997) [hereinafter NOTE ON IMPLEMENTATION] (on file with author). ENDA is a Third World development group based in Senegal.

14. *See id.* at § I.3.

15. *Id.*, Davidson & Sokona, *supra* note 5, at 11.

16. *See, e.g.*, AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5.

17. *See, e.g.*, Paul Baer, *Equity, Greenhouse Gas Emissions, and Global Common Resources*, in CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 393-408.

18. NOTE ON IMPLEMENTATION, *supra* note 13, at § I.2.

19. *Id.* § II.4.

20. Cheng, *supra* note 7, at 59.

21. *See, e.g.*, John J. Berger, *Renewable Energy Sources as Response to Global Climate*

fundamental, if less obvious, issue is the developed countries' consumption of more than their share of the atmosphere's limited capacity to absorb the waste gases of industrialization.[22] The developed countries' disproportionate use of the atmosphere's capacity to assimilate greenhouse gases might have foreclosed the opportunity for the rest of the world to use the traditional fossil-fuel path of economic development—at least if environmental goals are taken seriously.[23]

When the climate-change problem is conceived—as an imperative to force a more equitable sharing of limited atmospheric and energy resources, instruments such as the Kyoto Protocol present an implicit challenge to developed-world lifestyles. Thus, it is not surprising that several key features of the Kyoto Protocol are controversial in the developed world. Perhaps the most controversial feature is the declining cap on greenhouse gas (GHG) emissions, which will become binding on parties when and if a sufficient number of countries ratify the Protocol.[24] The Protocol requires the developed countries to collectively reduce their emissions of greenhouse gases to a level 5-6% below 1990 levels in the first compliance period while developing countries have no comparable emission-reduction obligations.[25] This "asymmetrical" division of responsibilities embodies a philosophy of "joint but differentiated responsibility" in which a country's historical contribution to the climate change problem and its capacity to contribute to the solution determine its obligations.[26]

To make the emissions cap more palatable to the developed countries, the Protocol provides various "flexible mechanisms" to facilitate cost-effective compliance.[27] The flexible mechanisms include a system of emissions trading and joint implementation projects.[28] The flexible mechanisms seek to direct investment, on a global basis, to the least-cost options for GHG reduction.[29] This combination of flexible mechanisms and the emissions cap is commonly viewed as the Protocol's "carrot and stick."[30]

Concerns, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 413-414.

22. Anil Agarwal, *A Southern Perspective on Climate Change*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 377-78 [hereinafter *A Southern Perspective*].

23. *See, e.g.*, *id.*

24. Article 2 of the Protocol provides that the UNFCCC Annex I (developed country) parties "shall" implement policies to reduce their GHG emissions. The emissions cap is set forth in Article 3 and Annex B of the Kyoto Protocol. For discussion of the projected effects of uncontrolled GHG emissions from various perspectives, *see* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6.

25. The initial compliance period is 2008-2012. Kyoto Protocol, *supra* note 3, at art. 3(1).

26. Kyoto Protocol, *supra* note 3, at art. 12. *See* Jacob Werksman, *The Clean Development Mechanism: Unwrapping the "Kyoto Surprise*, 7 REV. OF EUR. COM. & INT'L ENVT'L L. 147, 147 (1998).

27. Nathalie Eddy and Glenn Wiser, *Public Participation in the Clean Development Mechanism of the Kyoto Protocol*, *in* THE NEW "PUBLIC": THE GLOBALIZATION OF PUBLIC PARTICIPATION 203, 203, (Carl Bruch ed., Environmental Law Institute 2002), http://www.ciel.org/Publications/CDM_PubPartic.pdf (2002) [hereinafter Eddy & Wiser] (on file with author).

28. Kyoto Protocol, *supra* note 3, at art. 6 authorizes joint implementation among developed countries and former Soviet bloc "countries in transition. Article 17 authorizes emissions trading among developed countries and countries in transition.

29. Schneider et al., CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at xv-xvi.

30. *See, e.g.*, Glenn Wiser, *Kyoto Protocol Packs Powerful Compliance Punch*, 25 BNA

The Clean Development Mechanism is the flexible mechanism most significant to two key players, the global energy industry and the developing countries. The CDM counts on private investment as part of its implementation strategy, and was designed to foster sustainable development in the developing countries as well as the overarching treaty goal of climate change mitigation.[31] The CDM permits investors from the developed countries to earn credits toward their emission-reduction obligations[32] by investing in GHG-reduction projects in developing countries, thereby promoting sustainable industrialization in those countries.[33] In view of the central role of energy development in the underdeveloped countries, the CDM offers significant international investment opportunities for energy companies that develop climate-friendly energy technologies.[34] Moreover, the CDM is the only flexible mechanism that envisions the participation of developing countries.[35]

This article discusses the opportunities and pitfalls that the Clean Development Mechanism poses for developing countries in Africa and the reciprocal African challenges that present an opportunity to improve the CDM. Part II outlines the CDM and its links to sustainable development. Part III describes the African context for energy development under the CDM. Part IV describes some of the defects in the CDM from an African perspective, and proposed African solutions. Part V sketches the contours of a wider debate between the developed and developing countries about the impact of the Kyoto Protocol and the CDM on equitable global development. Part VI discusses the potentially problematic role of multinational corporations in sustainable energy development. Part VII is a conclusion that summarizes the most essential features of African CDM prospects and proposes a small role for the public in developed countries, particularly the United States. My underlying premise is that the African countries, which are among the most vulnerable to the effects of climate change and the most handicapped in obtaining foreign investment, pose an acid test for the ideals underlying the CDM. Although there are of a number of principal players, this article will focus on the global coal industry and the African governments.

INTERNATIONAL ENVIRONMENT REPORTER 86 (January 16, 2002), *available at* http://www.ciel.org/Publications/INER_Compliance.pdf (last visited Mar. 27, 2004).

31. Kyoto Protocol, *supra* note 3, at art. 12(9) (participation of private actors) and 12(2) (purpose of CDM).

32. *Id.* at art. 12(3)(b).

33. *Id.* at art. 12(2).

34. *See, e.g.*, William L. Thomas, Daniel Basurto & Gray Taylor, *Creating Favorable Climate for CDM Investment in North America*, 15 NAT. RESOURCES & ENV'T 172 (2001) [hereinafter Thomas et al.], describing the investment of major energy companies in sustainable energy technologies; Orie L. Loucks, *Business Capitalizing on Energy Transition Opportunities*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 495-507.

35. ENERGY & ENVIRONMENT GROUP, UNITED NATIONS DEVELOPMENT PROGRAMME, THE CLEAN DEVELOPMENT MECHANISM: A USER'S GUIDE 11, http://www.undp.org/seed/eap/html/docs/cdmchapter1.pdf (2003) (on file with author).

II. THE CDM AND SUSTAINABLE DEVELOPMENT

Dubbed the "surprise of Kyoto, the Clean Development Mechanism was introduced by the Brazilian delegation, with U.S. support, near the close of negotiations for the Kyoto Protocol.[36] In essence, the CDM allows developed countries to meet a portion of their own obligations to reduce emissions by reducing emissions in developing countries.[37] The investor in such projects, either a government agency or a private corporation,[38] earns certified emission reductions (CERs), a form of credit that the investor can either sell or use to meet a portion of its emission-reduction obligations under the Kyoto Protocol.[39] The flow of investment dollars and CERs will be guided in large part by the market forces of risk and profit potential.[40]

The CDM is a compromise mechanism designed to promote cooperation among the developed and developing countries.[41] It reflects in part the developed countries' wish for ways to reduce their compliance costs.[42] The CDM provides two benefits to developed countries. It creates an alternative mode of compliance for countries that are unable to fully meet their emission-reduction targets by regulating their domestic industries.[43] It also allows the investor to reduce the cost of compliance; emission reductions can often be achieved at a lower marginal cost in the developing country [44]

The CDM also reflects the developing countries' high-priority goal of no-cost or low-cost transfers of funds and technology [45] Such transfers are intended to

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36. Farhana Yamin, *The Kyoto Protocol: Origins, Assessment and Future Changes*, 7 REV. OF EUR. COM. & INT'L ENVT'L L. 113, 122 (1998).

37 Kyoto Protocol, *supra* note 3, at art. 12; Eddy & Wiser, *supra* note 27, at 203.

38. Kyoto Protocol, *supra* note 3, at art. 12(9).

39. Sean S. Clark, Mark C. Trexler & Laura H. Kosloff, *Installment Six of the Climate Treaty Debate: A Report on COP-6*, 15 NAT. RESOURCES & ENV'T 180, 181 (2001) [hereinafter Clark et al.]. Emission-reduction requirements are imposed directly on state parties through the Kyoto emissions cap and indirectly on private corporations in developed countries through regulations imposed by the state party attempting to comply with the Kyoto cap.

40. YOUBA SOKONA, STEPHEN HUMPHREYS, JEAN-PHILIPPE THOMAS, THE CLEAN DEVELOPMENT MECHANISM: WHAT PROSPECTS FOR AFRICA? § 2, *at* http://www.enda.sn/energie/cdm2.htm#4.2 (n.d., last visited Mar. 26, 2004) [hereinafter WHAT PROSPECTS FOR AFRICA?] (on file with author).

41. *Id.* WHAT PROSPECTS FOR AFRICA? summarizes, in rank order, the competing priorities of the developed and developing countries in the negotiations leading up to the Protocol. These are, for the developed countries, emissions reduction, an emissions credit and trading program, developing country participation in emission-reduction requirements, some form of joint implementation, inclusion of carbon sinks in the calculation of emission reductions, and compliance and verification. Developing country priorities were sustainable development, equity, common but differentiated responsibilities, technology transfer, financial assistance, and consideration of special circumstances. For both sides, the CDM was an afterthought and something of a question mark. *Id.* at § 2.1.

42. Gray E. Taylor, *Global Climate Change Agreements—Do the Storm Clouds Have a Silver Lining?*, 45 ROCKY MT. MIN. L. INST. 2.03[2] (1999).

43. Glenn Wiser & Donald Goldberg, *The Compliance Fund: A New Tool for Achieving Compliance Under the Kyoto Protocol* 3-4, http://www.ciel.org/Publications/ComplianceFund.pdf (June 1999). This is a publication of the Center for International Environmental Law.

44. Eddy & Wiser, *supra* note 27, at 203.

45. WHAT PROSPECTS FOR AFRICA?, *supra* note 40, at 2.

mitigate the impacts of an impending acceleration of industrialization in the developing countries by enabling developing countries to build up a "national capacity to reduce greenhouse gas emissions."[46] This aspect of the CDM echoes what the developing countries have been saying for years: They have as yet received few of the benefits of industrialization and have contributed relatively little to the industrial emissions problem, yet the developed countries (which caused most of the problem) expect them to bear a full share of the burdens of solving the problem and to make contributions that far exceed their financial and technical capacities.[47] The developing countries suggest that those who have caused three-quarters of the problem and have superior capabilities to take corrective action should assume the lion's share of the financial responsibility [48]

The developing Southern countries note that the Northern developed countries achieved their industrialization by exploiting fossil fuels and externalizing the attendant environmental costs.[49] There is an added cost to taking a different, more environmentally sound path to development in the South—one that the developed countries should subsidize, in the view of the developing countries. [50] The CDM, which holds the prospect of wealth and technology transfer, is one vehicle for implementing this agenda of wealth transfer.[51] The Southern countries' premise is that such payments should not be viewed as a gift but as a form of compensation for using a disproportionate share of the atmosphere's assimilative capacity [52]

Developing countries support their agenda with a cost-efficiency and mutual-benefit argument. They emphasize that inefficient industrial processes emit more carbon dioxide per unit (of energy and other products) manufactured in the developing world[53] and propose technology transfer as a cost-effective and fair solution, arguing that low-cost or no-cost access to advanced energy technologies would enable them to produce more energy and less CO_2 with the same natural resources.[54] Developing countries would then be able to industrialize and "improve their standard of living without contributing as much as they might otherwise to the problem of global warming."[55] Part of the moral rationale for such transfers rests on the distinction between the developing countries' survival emissions and the developed countries luxury emissions: "Unlike their more-

46. Clark et al., *supra* note 39, at 180.

47. Cheng, *supra* note 7, at 57, 59.

48. *Id.* at 62.

49. Mark A. Drumbl, *Poverty, Wealth, and Obligation in International Environmental Law*, 76 TUL. L. REV. 843, 849 (2002).

50. *A Southern Perspective*, *supra* note 22, at 377-78.

51. Drumbl, *supra* note 49, at 854-57. Drumbl notes the developing countries' emerging negotiation tactic of requiring wealth and technology transfer in exchange for their participation in global environmental treaties and conditioning the performance of the developing countries upon the developed countries' compliance with their obligations to transfer wealth and technology. This approach appears in the Montreal Protocol, the U.N. Framework Convention on Climate Change, and the Convention on Biological Diversity.

52. *A Southern Perspective*, *supra* note 22, at 377-78.

53. Cheng, *supra* note 7, at 66-67.

54. *Id.* at 67

55. *Id.* at 64.

developed counterparts, developing nations lose energy to inefficiency and poor management rather than to overconsumption. Corrective actions can be taken without large investments of capital."[56] This anticipated globally beneficial effect will not occur in the absence of some change in the developed world's policy, because developing countries cannot afford the current high transfer fees for technology.[57]

The CDM seeks to preserve some degree of national sovereignty in setting environmental and development priorities.[58] Its evolving design is meant to be flexible enough to accommodate different national and international agendas.[59] The CDM appears promising to many African (and other) developing countries because it is incorporates their number-one priority in the climate change debate: sustainable development.[60] Because the potential flow of funding would be larger than is currently available from the Global Environmental Facility the CDM is potentially well suited to meet one of Africa's primary needs, the creation of regional infrastructure to deliver environmentally sound energy, transportation, and technical and organizational expertise.[61]

By defining the "purpose" of CDM as assisting the developing countries to achieve sustainable development, and by requiring an independent certification of the project, the concept of sustainable development theoretically sets the limit on the investments that are eligible to earn CERs under the CDM.[62] However, there is less here than meets the eye because there is no firm, binding definition of "sustainable development."[63]

The most frequently cited definition of "sustainable development" is the one developed by the Brundtland Commission: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[64] A World Bank definition emphasizes the ways in which development is embedded in a country's particular web of social factors—the "comprehensive nature of development."[65] This definition, highly influential in

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56. *Id.* at 67.

57. *Id.*

58. *See* WHAT PROSPECTS FOR AFRICA?, *supra* note 40, at § 2.

59. *See id.*

60. *Id. See also* R.S. Maya & John Turkson, *CDM Baseline and Additionality in the African Context—The Issues, in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 19 (pointing out the dual objectives of emission reduction and sustainable development).

61. WHAT PROSPECTS FOR AFRICA, *supra* note 40, at § 4.2.

62. Lavanya Rajamini, *Renegotiating Kyoto: A Review of the Sixth Conference of Parties to the Framework Convention on Climate Change*, 2000 COLO. J. INT'L ENVTL. L. & POL'Y YEARBOOK 201, 218 (2000).

63. *See id.* at 218 (applying the concept in the context of the Kyoto Protocol); U.N. WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE 8 (1987) [Brundtland Report].

64. *See, e.g.*, the epigraph on the web page for the United Nations Department of Economic and Social Affairs, Division for Sustainable Development, *at* http://www.un.org/esa/sustdev/.

65. World Bank, The World Bank Working to Make Development Sustainable, *at* http://lnweb18.worldbank.org/ESSD/sdvext.nsf/43ByDocName/SustainableDevelopment (n.d., last visited Mar. 28, 2004)(on file with author). The definition appearing on the World Bank web page

guiding investment, incorporates African priorities such as institutional capacity and the urgent needs of the rural poor.[66] To Africans, however, the inevitable weave of complex local factors suggests a need for a "made-in-Africa prescription" for sustainable African development.[67]

One African definition that attempts to fulfill this role posits five components of sustainable development: financial, economic, environmental, technological and social sustainability.[68] Many Africans would add another crucial, particularly African component: institutional sustainability.[69] A high premium is placed on building institutions to implement African development priorities.[70] Institutional capacity is the bottom line for implementing the CDM in Africa because "without it[,] no policy or strategy can be developed or implemented."[71] Africans hope to build institutions strong and flexible enough to create balanced growth. According to one succinct and elegant definition: "Broadly, sustainable development can be defined as attainment of economic growth and equity given environmental constraints."[72] The mention of "equity" is significant and mirrors the preoccupations of many developing countries.[73]

On a global level, the concept of sustainable development is almost infinitely complex in practice, requiring a skill in balancing many national circumstances and many kinds of equities in additional to the intergenerational one. One possibility pertinent to Africa lies in the roots of the concept: the idea of "ecodevelopment" introduced at the 1972 U.N. Conference on the Environment at Stockholm.[74] Ecodevelopment is a "mode of development in harmony with nature and human needs in a given environment"—which "can be different in

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discussing the role of the Bank's Environmentally and Socially Sustainable Development Network states that sustainable development programs entail a partnership among the public and private sectors, and civil society. Participation, empowerment, strengthened institutions, environmental protection and conservation, and focus on the rural poor are all foundations for sustained and inclusive economic growth. The stated objective is to ensure that "actions taken today to promote development and reduce poverty do not result in environmental degradation or social exclusion tomorrow.

66. *Id.*

67 Udombana, *supra* note 11, at 295.

68. *Id.*

69. Randall Spalding-Fecher, Khorommbi Matibe & Gillian Simmonds, *The Clean Development Mechanism: Energy Projects for Africa*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 63, 69 [hereinafter Spalding-Fecher et al.]. *See also* Richard Wolfson & Stephen H. Schneider, *Understanding Climate Science*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 3, 36 (regarding Africa's limited capacity to adapt to climate change).

70. *See, e.g.*, Spalding-Fecher et al., *supra* note 69, at 67-69.

71. Anil Agarwal, *Boiling Point: The United Nations Framework Convention on Climate Change/Kyoto Protocol*, *in* GREEN POLITICS 15, 55 (Anil Agarwal et al. eds., New Delhi Centre for Science and Environment 1999) [hereinafter *Boiling Point*], *citing* Youba Sokona, of ENDA, an NGO headquartered in Senegal; Spalding-Fecher et al., *supra* note 69, at 67-68.

72. F.D. Yamba, *The Clean Development Mechanism as Tool for Enhancing Sustainable Development*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 53-54.

73. *See, e.g.*, *A Southern Perspective*, *supra* note 22, at 375 *et seq.*

74. This is the position of Helio International regarding the global situation for developing countries in general. *See Energy and Ecodevelopment*, *supra* note 2.

industrialized and land-based [rural] countries without inviting judgment."[75] This concept is particularly pertinent to Africa, with its predominantly rural population whose needs and priorities diverge from the accustomed perspective in the developed countries because of its dependence on biomass energy for the foreseeable future.[76]

There is one recent definitional trend that has a potential to alter the nature and the balance of power surrounding CDM projects: The international coal industry has entered the fray and seized some of the ground usually occupied by environmental groups. According to the industry, "sustainable development" is the assurance of a stable supply of energy in a time of escalating demand.[77] In this context, further development of coal, the fossil fuel that happens to have the highest level of emissions of greenhouse gases and other pollutants,[78] is a "resource bridge" to bring economic development within the reach of as many nations as possible.[79] Given the mix of equities and resources in Africa, this version of sustainable development might (or might not) be in the interest of the various developing countries and is disquieting in view of the amount of power that large multinational companies may wield vis-à-vis small developing countries.

Moreover, despite its definition of sustainable development, the World Bank approach to reform in the energy sectors of developing countries does not seek to minimize the use of coal; rather, it focuses on promoting an internationally competitive coal sector within the developing country and balancing the supply and demand for coal in specific countries.[80] The Bank's energy-sector policy proposes that subsidies be removed from inefficient coal operations.[81] However, it does not propose the removal of subsidies for the development of new technologies for high-emission fuels, although such subsidies in wealthy, exporting countries might effectively limit the choices for energy investments worldwide and might run counter to local development priorities in developing countries. An ample role for foreign coal technology is implied in the Bank's more specific goals of identifying and closing the higher-cost mines, eliminating government subsidies for local industries, and promoting competition in the industry.[82]

III. THE AFRICAN CONTEXT FOR ENERGY DEVELOPMENT UNDER THE CDM

North-South development inequities are particularly glaring in Africa. Africa,

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75. *Id.*

76. Spalding-Fecher et al., *supra* note 69, at 64.

77 Ron Knapp, *supra* note 1, at 1.

78. STEPHEN BERNOW, MICHAEL LAZARUS & SIVAN KARTHA, COAL. AMERICA'S PAST, AMERICA'S FUTURE? 2-4, *at* http://www.worldwildlife.org/climate/coal_crossroads.pdf (Tellus Institute May 2001) [hereinafter COAL. AMERICA'S PAST] (study prepared for World Wildlife Fund).

79. Ron Knapp, *supra* note 1, at 1.

80. THE WORLD BANK GROUP, MINING: COAL SECTOR RESTRUCTURING, *at*http://www.worldbank.org/ogmc/mining_coal.htm (n.d., last visited Mar. 29, 2004) (on file with author).

81. *Id.*

82. Spalding-Fecher et al., *supra* note 69, at 70.

which has abundant reserves of fossil fuels, currently accounts for only 2.5 percent of the world's economic activity[83] and is unmatched in the "diversity and complexity" of its environmental and economic problems.[84] The U.N. Secretary General's list of obstacles to African development is daunting even without the prospect of global warming: it includes "external debt problems, declining external resource flows, declining terms of trade, barriers to market access for their products, high population growth, inadequate social development, lack of infrastructure and environmental constraints, including water shortages."[85] All of these market-based and social problems are of course exacerbated by AIDS and Africa's high poverty rate and low standard of living.[86]

Given all of these pressing problems and Africa's minimal contribution to the global warming problem, reducing greenhouse gas emissions is not high on Africans' development agenda.[87] Africans' primary development priorities are the more urgent ones of food and energy security for the majority of the population that lives in poverty.[88]

Perhaps energy development is the heart of the issue. Africa's very low levels of energy consumption are both "cause and consequence" of underdevelopment, according to African NGOs.[89] Africans must consume more energy in order to "climb out" of both their economic and environmental problems.[90] However, bringing energy to the African people, sustainable or not, will be exceedingly difficult, given the reality that Africa has the lowest rate of foreign direct investment (FDI) in the world[91] and a dysfunctional energy sector.

In this energy sector, consumption of electricity for commercial purposes, already at the lowest per-capita rate in the world, is falling.[92] Household access to electricity is even lower due to the limited, creaking energy infrastructure and rampant poverty[93] Energy intensity, the amount of energy that is burned relative

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83. YOUBA SOKONA, *Energy in Sub Saharan Africa*, RIO + 5 REPORT (AFRICA) 1 (1997), *at* http://helio.interserver.net/Helio/anglais/reports/africa.html#characteristics (publication of Helio International, discussed at note 2, *supra*) (on file with author). *See also* CLAUDE MANDIL, INTERNATIONAL ENERGY AGENCY, THE INTERNATIONAL ENERGY AGENCY AND AFRICA, *at* http://www.iea.org/dbtw-wpd/textbase/papers/2003/african_energy.pdf (n.d., last visited Mar. 29, 2004) (on file with author).

84. Moussa Cisse, Yuoba Sokona & Jean-Philippe Thomas, *Introduction* to NOTE ON IMPLEMENTATION, *supra* note 13.

85. *Report of the Secretary-General on the Work of the Organization*, U.N. GAOR, 56th Sess. Supp. No. 1, Para. 140, U.N. Doc. A/56/1 (2001), *cited in* Udombana, *supra* note 11, at 308.

86. *Id.*

87. NOTE ON IMPLEMENTATION, *supra* note 13, at § I.3.

88. *Id.* § I.2.

89. *Id.*

90. *Id.*

91. Udombana, *supra* note 11, at 308. *See also* Reimund Schwartze, *Activities Implemented Jointly*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 293-304.

92. *Energy in Sub Saharan Africa*, *supra* note 83, at 4; NOTE ON IMPLEMENTATION, *supra* note 13, at § I.2.

93. *Energy in Sub Saharan Africa*, *supra* note 83, at 5.

to economic output, is extraordinarily high, three times higher than in Europe.[94] Power outages and interruptions in fuel supplies are frequent.[95] The Sub-Saharan region's power-generating capacity is one-twentieth that of Europe.[96] The regional model for a working energy grid is South Africa, which relies heavily on coal-burning power plants.[97]

For people inside this dysfunctional system, efficient fossil-fuel technology is a major step up. Indeed, improved access to fossil fuels and cleaner fossil-fuel technology are high on the list of African development goals.[98] However, the fossil-fuel model is not the whole solution, in part because it would be expensive and time consuming. To extend a traditional electrical grid to the entire population, Africans would have to build an enormous transportation and energy-distribution infrastructure virtually from scratch.[99]

Furthermore, another model must be found for the 95% of the rural population that does not have access to electricity and cannot be connected to an electrical grid cost-effectively.[100] This population, which relies primarily on biomass fuel and devotes an ever-increasing amount of labor to fuel gathering,[101] forms the basis of another set of African energy-development priorities. These include a "greater range of technological choice, financing mechanisms and technology support for rural and decentralized energy systems" and "improved forest management, cook stoves, and charcoal conversion methods to ensure sustainable and environmentally sound use of traditional fuels."[102] The rural population is the theoretical customer base for small-scale renewable-energy technologies that are popular with developed-world advocates of climate change mitigation.[103]

Although people living in poor rural villages are more vulnerable to the impacts of pollution than other populations and therefore might benefit most from low-emitting energy technologies, all strategies to develop energy for rural customers have major economic benefits insofar as they bring industry and jobs to

94. *Id.* 6; Spalding-Fecher et al., *supra* note 69, at 64.

95. Spalding-Fecher et al., *supra* note 69, at 64.

96. *Id.*

97. *See id.*

98. Spalding-Fecher et al., *supra* note 69, at 64.

99. *See* YOUBA SOKONA, STEPHEN HUMPHREYS & JEAN-PHILIPPE THOMAS, SUSTAINABLE DEVELOPMENT: A CENTERPIECE OF THE KYOTO PROTOCOL §§ 1, 2, 3.1, *at* http://www.enda.sn/energie/susdevkp.htm (n.d., last visited Mar. 28, 2004) [hereinafter A CENTERPIECE OF THE KYOTO PROTOCOL] (on file with author). This is report for the ENDA Tiers Monde, Energy Programme.

100. *Id.* § 2.2.

101. A. MARKANDYA, ECONOMICS OF GREENHOUSE GASES: THE INDIRECT COSTS AND BENEFITS OF GREENHOUSE GAS LIMITATIONS 6.1.2 (UNEP COLLABORATING CENTER ON ENERGY AND THE ENVIRONMENT 1998), *at* http://www.uccee.org/EconomicsGHG/IndirectCosts.pdf (last visited Mar. 29, 2004).

102. This is one factor in a list of African development priorities formulated at Energy and Development Research Centre of the University of Capetown. Spalding-Fecher et al., *supra* note 69, at 64.

103. *See* A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 2.2.

rural areas.[104] Any energy system that creates reliable lighting and pumping capacities improves several conditions associated with poverty, including a lack of educational opportunities and poor access to water and health and sanitation services.[105] Promising clean coal technologies, for example, include integrated combined-cycle generation,[106] carbon sequestration,[107] fluidized-bed combustion, and coal liquefaction and gasification.[108]

Cost is the big drawback to the more advanced fossil fuel technologies. The price tag for a coal gasification plant ranges from $1.2 to $1.6 million per megawatt of power.[109] Even a conventional coal-fired power plant costs $1 million per megawatt.[110] Constructing a natural gas plant costs approximately $550,000 per megawatt and entails a continuing, potentially crippling cost of importing a fuel that is subject to large price swings—especially in a time of escalating demand due to environmental concerns.[111] Such large-scale fossil-fuel investments seem inconsistent with one important African development concern—that energy investments should be proportionate to a country's GDP and should not place an undue burden on other sectors.[112] In light of the large upfront costs, the low profit potential of most of the African markets, and the relatively weak bargaining

104. ENERGY AND ATMOSPHERE PROGRAM, UNITED NATIONS DEVELOPMENT PROGRAMME, ET AL., ENERGY AFTER RIO: PROSPECTS AND CHALLENGES § 4.2.1, *at* http://www.undp.org/seed/energy/chapter4.html [hereinafter ENERGY AFTER RIO] (on file with author).

105. *Id.* In addition, such projects reduce the hours devoted to gathering fuelwood and water, freeing up labor for other purposes and indirectly promoting the welfare of women. It is primarily women who devote increasingly long hours to fuel and water gathering, and women are particularly vulnerable to health problems caused by inefficient biogas stoves. A. MARKANDYA, ECONOMICS OF GREENHOUSE GASES: THE INDIRECT COSTS AND BENEFITS OF GREENHOUSE GAS LIMITATIONS, *supra* note 101, at § 6.1.2., ENERGY AFTER RIO, *supra* note 104, at § 4.2.3 (both addressing the situation of developing countries in general).

106. CARE, ADVANCED TECHNOLOGY, *at* http://www.careenergy.com/technology/utility.asp (n.d., last visited Mar. 23, 2004) (on file with author).

107. CSI, CARBON SEQUESTRATION INITIATIVE: TECHNOLOGY OVERVIEW, *at* http://sequestration.mit.edu/technology_overview/index.html (n.d., last visited Mar. 28, 2004) (Massachusetts Institute of Technology project) (on file with author).

108. *See, e.g.*, American Coal Foundation, *New Technologies for Coal Combustion*, COAL. ANCIENT GIFT SERVING MODERN MAN, *at* http://www.ket.org/Trips/coal/AGSMM/agsmmtech.html (last updated Oct. 1, 2001).

109. Lisa Kosanovic, *Clean Coal? New Technologies Reduce Emissions, But Sharp Criticisms Persist*, E/THE ENVIRONMENTAL MAGAZINE (Jan. 23, 2002), *at* http://www.enn.com/news/enn-stories/2002/01/01232002/s_46190.asp (on file with author).

110. *Id.*

111. *Id.* Fuel-switching from coal to natural gas is one of the most popular alternatives for lowering the environmental impacts of power plants and is often the lowest-cost alternative once an investment has been made in conventional power plant. *See* David Mallery, *Clean Energy and the Kyoto Protocol: Applying Environmental Controls to Grandfathered Power Facilities*, 10 COLO. J. INT'L ENVT'L L. & POL'Y 469, 473 (1999) (noting the lack of incentive to invest in cleaner methods of coal combustion); CARL E. BEHRENS, THE CLEAN COAL TECHNOLOGY PROGRAM: CURRENT PROSPECTS 3, *available at* http://www.cnie.org/nle/crsreports/energy/eng-71.pdf (Apr. 6, 2001) (Congressional Research Service report).

112. F.D. Yamba, *The Clean Development Mechanism as a Tool for Enhancing Sustainable Development*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 53, 55.

position of African countries, a more likely investment scenario might include decidedly low-tech options such as coal-washing and conventional coal-fired steam technology.[113]

In contrast, some of the available, environmentally oriented technologies that are well suited to rural villages include more efficient cookstoves, biogas-driven water pumping systems, household- or village-scale photovoltaic systems, as well as "liquid fuel production from biomass, biomass co-combustion, wind energy technologies, solar-thermal for heat and electricity methane production from solar and liquid residues and wastes, thermal generation from biomass sources, and small hydroelectric plants."[114] Solar and other renewable energy systems are suited to the needs of off-grid villages.[115] They are in scale with the needs of individual villages and would support the African development priorities of "technological choice" and improved access to decentralized energy technologies.[116] However, one risk to be considered is the potential impact on nascent local industries that are using "tried and true" technologies.[117] Destruction of those industries could "place a significant brake on development," according to African NGOs.[118]

Examples of successful projects include a pilot project that installed photovoltaic systems in Ugandan rural villages.[119] The project, designed to counter a trend toward increasing, inefficient use of diesel generators, reduced GHG emissions below a fossil-fuel baseline.[120] The project also reduced the country's national dependence on imported oil, which was consuming an undue share of Uganda's foreign exchange earnings.[121] A government subsidy enhanced development opportunities for otherwise non-competitive local industries producing related products such as batteries, and thereby promoted national development along sustainable lines.[122]

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113. See Section IV(A), *infra*, for discussion of Anil Agarwal's argument that the CDM tends to lock in low-tech fossil fuel technologies.

114. ENERGY AFTER RIO, *supra* note 104, at § 4.2.3; *Odingo's Report: Why CDM Needs Africa*, EQUITY WATCH, October 30, 2002, *at* http://www.cseindia.org/html/cmp/climate/ew/ew_oct30/odingo.htm [hereinafter *Odingo's report*].

115. *See* A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at 2.2; DEPARTMENT OF METEOROLOGY, MINISTRY OF WATER, LANDS, AND ENVIRONMENT, CAPACITY BUILDING IN CLEAN DEVELOPMENT MECHANISM IN UGANDA (FINAL REPORT), Report Section 5 and Annex B, *at* http://www.uccee.org/CDM/CDMCapacityBuildUganda.pdf (June 2001) (on file with author) [hereinafter Uganda Report].

116. This is one factor in list of African development priorities formulated at Energy and Development Research Centre of the University of Capetown. Spalding-Fecher et al., *supra* note 69, at 64.

117. ENDA, FROM JOINT IMPLEMENTATION TO THE CLEAN DEVELOPMENT MECHANISM: SHOULD AFRICAN POSITIONS CHANGE AFTER THE KYOTO PROTOCOL? § 2, *at* http://www.enda.sn/energie/cc/cdm.htm (n.d., last visited Mar. 23, 2004) (on file with author).

118. *Id.*

119. Uganda Report, *supra* note 115, at § 5 and Annex B.

120. *Id* §§ 5.1- 5.2, Annex B.

121. *Id.* § 5.1.

122. *Id.* at Annex B.

Rural villages' current reliance on biomass fuel provides another obvious opportunity to use the CDM to promote energy development along an "ecodevelopment" pathway.[123] The United Nations Development Programme notes that there are "[a]dvanced biomass power technologies now under commercial development" that could use the residues from plantation agriculture to produce electricity for adjacent rural areas.[124] Biomass power projects have frequently failed in the past because of maintenance problems caused by excessive tar formation.[125] However, biogas technology has recently improved in this respect.[126] The modern version can meet rural power demands for water-pumping, for example, at a lower cost than would be achieved by connecting the area to the national power grid.[127]

There might be a further, largely psychological benefit to renewable fuel technologies. There is a historical relation between fossil-fuel consumption and prosperity; the mindset that presumes a necessary relation drives resistance to greenhouse gas reduction. To dislodge the kind of resistance that is based on fears of reduced lifestyles, it is necessary to find a way to "disconnect" increased prosperity from increased consumption of fossil fuels.[128] The renewable-fuel technologies do just that.

Whichever energy-development route they select, however, Africans must consider a web of economic and environmental issues. For example, farming is the predominant livelihood in Africa and the most obvious route to food security for a rising population.[129] However, increasing reliance on agriculture contributes to deforestation and soil exhaustion as more and more land is cleared and traditional practices of fallowing the land are abandoned.[130] The farming population also makes heavy use of wood and other biomass fuels, which contributes further to deforestation and desertification.[131] Excessive reliance on biomass fuels intensifies flooding and erosion and can deter other development projects.[132]

It is not a simple matter of staving off agricultural decline by implementing modern energy projects, particularly the large-scale coal technology programs that some powerful foreign investors will be selling via the CDM or domestic export policies. Much of the African soil is thin and poor, and a battle is already pitched against drought, famine, and desertification.[133] African soils are also "sensitive to

123. *Energy and Ecodevelopment*, *supra* note 2.

124. ENERGY AFTER RIO, *supra* note 104, at § 4.2.2.

125. *Id.* § 3.3.2.6.

126. *Id.*

127. *Id.*

128. *Energy and Ecodevelopment*, *supra* note 2, at 5.

129. *See* Udombana *supra* note 11, at 315 (discussing African countries' dependence on agriculture).

130. NOTE ON IMPLEMENTATION, *supra* note 13, at § I.2; *Energy in Sub-Saharan Africa*, *supra* note 83, at § 1.3.

131. *Id.*

132. *Id.*

133. Udombana, *supra* note 11, at 315 n.136, *citing* ECONOMIC COMMISSION FOR AFRICA,

acidification."[134] Coal-fired power plants would exacerbate damage caused by acidification because they emit more pollutants that contribute to acid rain than do plants powered by other fuels.[135]

It is also not possible to simply defer consideration of global warming to deal with these more pressing problems. Studies by the Intergovernmental Panel on Climate Change suggest that Africa's future under global warming is one of lower grain yields, less rainfall, decreased availability of water, more disease, accelerated desertification, loss of coastal settlements, and intensified droughts and floods.[136] The additional stress due to global warming would further erode the African agricultural sector's capacity to provide food security or export dollars to fund economic development.[137]

Any reduction in agricultural exports will also intensify an already crippling debt crisis that was fueled by the high interest rates of the 1980s and compounded by declining commodity prices and counter-productive Structural Adjustment Programs.[138] Added to the mix of complicating economic factors is the fossil fuel industry's status as a major employer in Africa.[139] Developing countries with a high poverty level naturally wish to protect existing jobs. One viewpoint is that requests for employment-sensitive alternative-energy projects under the CDM might drive up project costs to such an extent that they would deter the investment.[140] However, there is another, more optimistic view that seeking projects such as advanced biomass energy production would create jobs in a manner that is painless to the investor.[141] The theory is that such projects would naturally and cost-effectively generate a fair number of jobs related to the growing and processing of biomass crops,[142] as well as a vastly greater number and variety of jobs related to an across-the-board migration of industry to rural areas with competitive biomass electricity.[143] Successful biomass projects would create an

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ECONOMIC REPORT ON AFRICA 2001: TRACKING PERFORMANCE AND PROGRESS 33 (2002). This note states that as of 2000, "[56%] of Africans—431 million people—depended on agriculture for their livelihoods.

134. Gareth Porter, *Pollution Standards and Trade: The "Environmental Assimilative Capacity Argument*, 4 GEO. PUBLIC POL'Y REV. 49, 54 (1998).

135. *See, e.g.*, COAL. AMERICA'S PAST, *supra* note 78, at 2.

136. Richard Wolfson, Stephen H. Schneider, *Understanding Climate Science*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 36, *citing* the Technical Summary of IPCC 2001b.

137. *See id.*

138. Commodity prices began to rebound in 2002, particularly for petroleum-exporting countries. *See* U.N.E.C.A. ECONOMIC REPORT ON AFRICA 28, *supra* note 10. For concise description of the negative impacts of Structural Adjustment Programs implemented by international financial institutions, see Udombana, *supra* note 11, at 313-17.

139. Spalding-Fecher et al., *supra* note 69, at 70. As modern methods of mechanized coal mining are introduced in developing countries, this status is likely to change. *See* AMERICAN COAL FOUNDATION, HOW COAL IS PRODUCED, *at* http://www.ket.org/Trips/Coal/AGSMM/agsmmproduced.html (on file with author).

140. *See* Spalding-Fecher et al., *supra* note 69, at 70 (noting the employment benefits of the fossil fuel industry in general).

141. ENERGY AFTER RIO, *supra* note 104, at § 4.2.2.

142. *Id.*

143. *Id.*

expanded rural tax base capable of financing local infrastructure projects and stemming the flood of migration to the cities.[144]

Nevertheless, at least a part of Africa's energy development path will consist of investment in large-scale, conventional power plants because a regional electricity grid has been identified as "one of the most important tools for improving access to commercial energy while reducing environmental impact [from existing, crude methods of biomass combustion]."[145] A regional energy infrastructure also would create economies of scale that would reduce the transaction costs and increase the economic competitiveness of small countries.[146] One debatable assumption is that a regional grid and institutional capacity to oversee power trading and distribution would create free intra-regional trade in energy, in turn allowing southern African countries to substitute hydropower for the environmentally "dirty" coal-fired electricity from South Africa.[147]

Viable African institutions are necessary to build energy capacity and energy trading systems and to achieve regional cooperation on energy standards and technology development.[148] Some form of regional organization is necessary to carry out the goal of building a regional electricity grid.[149] The lack of African infrastructure also drives up transaction costs and drives investors away from the region.[150] Moreover, many CDM projects involve experimental technology, which requires a high degree of institutional capacity and subject matter expertise to oversee the project's implementation.[151] Without a decision-making infrastructure of its own, the country might be saddled with an intrusive level of oversight from outside agencies.[152]

Institution building is in part a matter of national pride and sovereignty. Thus far, the lack of a bureaucratic and financial infrastructure has hampered even the development of an African" position and the promotion of African interests

144. *Id.*

145. Spalding-Fecher et al., *supra* note 69, at 66.

146. European Commission, Communication from the Commission to the Council and the European Parliament—Energy Cooperation with the Developing Countries, COM(2002)0408 final, *available at* http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=COMfinal&an_doc=2002&nu_doc=408 (discussing strategies for introducing clean coal technology from the EU to the African countries).

147 Spalding-Fecher et al., *supra* note 69, at 66. It has not worked out that way in the United States, where the market share of coal-fired power from the oldest dirtiest plants has increased because it tends to be cheaper, particularly in a deregulated market and context of low environmental regulation. JOHN COEQUYT, ENVIRONMENTAL WORKING GROUP & REBECCA STANFIELD, U.S. PUBLIC INTEREST RESEARCH GROUP, UP IN SMOKE: CONGRESS' FAILURE TO CONTROL EMISSIONS FROM COAL POWER PLANTS 9 (July 1999) [hereinafter UP IN SMOKE], *at* http://www.ewg.org/pub/home/reports/upinsmoke/pr.html (on file with author).

148. Spalding-Fecher et al., *supra* note 69, at 64.

149. *Id.* at 66.

150. *Id. See also* Reimund Schwartze, *Activities Implemented Jointly, in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 293-304.

151. *Boiling Point, supra* note 71, at 79.

152. *Id.*

during the climate change negotiations.[153] The lack of African influence on the Kyoto Protocol agenda might reflect its minimal presence and resources in the negotiation process.[154]

The concepts of African economic unity and institutional development have been inseparable since the Organization of African Unity was formed in 1963 to assume control over African development in the aftermath of colonization.[155] An African vision of economic unity has evolved through a 1991 Treaty Establishing the African Economic Community (AEC).[156] This treaty created a new African entity, the African Union, modeled on the European Union.[157] The constitutive act for the African Union, which entered into force in 2001, provides for a new institutional infrastructure for African economic cooperation and regional energy development.[158]

IV DEFECTS IN THE CDM AND PROPOSED SOLUTIONS FROM THE AFRICAN PERSPECTIVE

Among the most problematic features of the CDM are its additionality criteria, which require project developers to demonstrate that they will go beyond the business-as-usual development scenario. The primary additionality criterion is "environmental additionality": the project must reduce GHG emissions below the baseline level.[159] This requirement is made explicit in Kyoto Protocol Article 12.[160] A "financial additionality" criterion, widely understood to be implicit in Article 12, requires that project developers tap supplemental sources of funding; the CDM project may not divert Official Development Aid or other government aid from other types of development projects.[161] A proposed criterion of

153. Dr. Albert Mumma, *The Poverty of Africa's Position at the Climate Change Convention Negotiations*, 19 UCLA J. ENVTL. L. & POL'Y 181, 202-03 (2000/2001).

154. Whereas the developed countries could support their negotiating requests at the various Conferences of the Parties (COPs) with extensive research from private and public think tanks as well as side events, booths, and daily newsletters, the African countries typically had between two and four delegates due to financial constraints and were not asked to speak at panels or side events organized by others *Id.*

155. Corinne A. Packer & Donald Rukare, *Current Developments: The New African Union and Its Constitutive Act*, 96 AM. J. INT'L L. 365, 366-67 (2002).

156. *Id.* at 369-70.

157. *Id.*

158. Constitutive Act of the African Union, July 11, 2000, *at* http://www.oau-oau.org/LOME2000/introductory_notenote.htm (last visited Mar. 28, 2004); Organization of African Unity, Press Release 52/2001, The Constitutive Act of the African Union Attains the Legal Requirement for Entering into Force (Apr. 27, 2001), *at* http://www.oau-oau.org (last visited Mar. 18, 2004) The Act establishes number of committees, including one that integrates several subjects relevant to developing an African policy for the CDM: the Committee on Industry, Science and Technology, Energy, Natural Resources and Environment. *See* Packer & Rukare, *supra* note 128, at 375-76.

159 Kyle W. Danish and Jonathan C. Rotter, *Drafting Contracts for Greenhouse Gas Offset Projects in Developing Countries*, 15 NAT. RESOURCES & ENV'T 168, 170 (2001).

160. Kyoto Protocol, *supra* note 3, at art. 12(5)(c).

161. *See, e.g.*, CENTRE INTERNATIONAL DE RECHERCHE SUR L'ENVIRONMENT ET LE DEVELOPPEMENT ET AL., POLICIES FOR THE DESIGN AND OPERATION OF THE CLEAN DEVELOPMENT

"investment additionality" would exclude high-profit projects that are likely to occur in the business-as-usual scenario, without the added inducement of CER credits.[162] Also pertinent is "technological additionality, which would require developers to make a new technology transfer to the host country[163] and institutional additionality, a requirement that CDM projects go beyond the host country's ongoing government programs.[164]

A. Counterproductive Environmental Additionality Criterion and Baseline Issues

The criterion of environmental additionality is the problematic one from the perspective of the African countries. This requirement creates an unintended incentive for CDM investors to "bypass" the poorest countries that are most in need of development and most in danger of developing via the cheapest, most pollution-intensive means.[165] The bypass effect results from the market-based nature of the CDM, which prompts private corporations to invest in CDM projects where they see high opportunity and low risk[166]—in other words, "fast and cheap" emission-reduction credits.[167] In practice, this means that CDM projects will be clustered in developing countries, such as China and India, that have already developed along a traditional fossil-fuel pathway· such countries have a substantial emission problem that can be easily improved with technology that is readily available to the developer and would require little or no investment in research and development.[168] Countries where GHG emissions are low because development is still nascent are not rewarded for the opportunity for innovation that they offer; rather, they are effectively locked out of the process.[169] This is particularly true of the African countries other than South Africa, which have minimal fossil fuel infrastructure and customer base, as evidenced by the lowest fossil-fuel

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MECHANISM 2 (2000), *at* http://www.centre-cired.fr/archives/articles/2000/JCH-Toman.PDF (2002) [hereinafter CDM Policy Workshop] (on file with author). This document summarizes discussions that occurred in a multinational workshop on the CDM, September 24-25, 1999.

162. Danish & Rotter, *supra* note 159, at 170.

163. *Id.* This concept has been applied in various ways by host countries determining whether to participate in CDM project. Some have required a transfer of state-of the-art technology. *See* DECON MBH ET AL., CLIMATE PROTECTION PROGRAMME, CDM IN THE FIELD OF RENEWABLE ENERGIES IN MOROCCO 2, *at* http://www.gtz.de/climate/publications/projects/CDM-Marocco-Kurz-engl.pdf (Oct. 2001).

164. S. Brown, et al., *Issues and Challenges for Forest-Based Carbon-Offset Projects: A Case Study of the Noel Kempff Climate Action Project in Bolivia* § 4, 5 MITIGATION AND ADAPTATION STRATEGIES FOR GLOBAL CHANGE 99-121, *at* http://www.winrock.org/GENERAL/Publications/CarbonIssues.pdf (2000). This criterion has also been defined in a less ambitious way, as the transfer of technology that is the "best available, and practicable for a country's environment, environmentally safe and sound technology. *See* F THOMAS, S. ULLRICH, CDM FACT-SHEET FOR DECISIONMAKERS 3, *at* http://www.europarl.eu.int/workshop/Kyoto/docs/ierfactsheetdecmak_en.doc (2002).

165. *A Southern Perspective*, *supra* note 22, at 386.

166. A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 3.1.

167. *A Southern Perspective*, *supra* note 22, at 386.

168. *Id. See also* Youba Sokona & Djimingue Nanasta, *The Clean Development Mechanism: An African Delusion?* 54 CHANGE 8-11 (Oct.-Nov. 2000), http://www.enda.sn/energie/cc/cdm-afric.htm (last visited Mar. 28, 2004).

169. *A Southern Perspective*, *supra* note 22, at 386.

consumption rate in the world, at only 2-3% of the global rate.[170]

This situation is not likely to change under the CDM if a pilot program for Activities Implemented Jointly (AIJ) is any guide.[171] Under this program, the forerunner of the CDM, Africa garnered only twelve out of 156 pilot investment projects.[172] This investment deficit is largely a matter of perceived risk. Africa's abysmal rate of foreign direct investment (FDI), already the lowest in the world due to the low purchasing power of its small markets, has now shifted into a declining mode because of warfare in the region and perceptions of high political risk.[173] Corporations tend to perceive lower investment risk if the host country is a "known quantity" due to ongoing investment relationships.[174] However, Africa does not benefit from this perceptual phenomenon because of its low rate of FDI.

One proposed African solution to the lack of incentive for international corporate investment under existing norms, is to measure environmental additionality in terms of emissions avoided rather than emissions reduced.[175] Whereas the existing model rewards investors for "cleaning up" fossil-fuel power plants, an avoidance approach would reward investments that bypass the fossil fuel mode of development entirely [176] This approach would promote a technological "leapfrog effect" (as yet largely theoretical), in which an undeveloped country is able to adopt clean energy technologies at the outset of development and thereby avoid the environmental and public-health impacts of fossil fuel use and the costs of retrofitting existing facilities as the country's environmental standards mature.[177] The avoided-emissions approach might be the only feasible method of integrating Africa into the Kyoto Protocol, in view of its exceptionally low levels

170. *Id.*

171. Under the Climate Change Convention, the UNFCCC Secretariat launched a trial program for North-South cooperation in GHG reduction, the Activities Implemented Jointly (AIJ) program. This program was launched at the First Conference of the Parties (COP 1), in Decision 5/CP.1 (Apr. 7, 1995), *available at* http://unfccc.int/program/coop/aij/dec5cp.html (last visited Mar. 20, 2004). *See also* Abeeku Brew-Hammond, *Designing Energy Projects in Africa for the Clean Development Mechanism*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 75, 76.

172. See list of AIJ Projects at UNITED NATIONS, ACTIVITIES IMPLEMENTED JOINTLY (Feb. 12, 2002), *at* http://unfccc.int/program/coop/aij/aijproj.html (UNFCCC website, last visited Mar. 24, 2004). *See also* Spalding-Fecher et al., *supra* note 69, at 67, Brew-Hammond, *supra* note 173, at 76, and Suraje Dessai, *Air and Atmosphere: The Fifth Conference of the Parties to the United Nations Framework Convention on Climate Change: An Advancement or Derailment of the Process*, 1999 COLO. J. INT'L ENVT'L L. Y.B. 192, 199 (2000) for descriptions of the problem at an earlier stage of the program.

173. U.N.E.C.A. ECONOMIC REPORT ON AFRICA, *supra* note 10, at 28-29 (2003). To some extent, the high investment risk might be more matter of perception than reality. According to the United Nations Economic Commission for Africa, "African countries have the highest rate of return on investment in the world—four times more than in the G-7 countries, twice more than in Asia, and two-thirds more than in Latin America. *Id.*

174. *A Southern Perspective*, *supra* note 22, at 386.

175. WHAT PROSPECTS FOR AFRICA?, *supra* note 40, at § 2.2.

176. *Id.*

177 Richard L. Ottinger & Rebecca Williams, *Renewable Energy Sources for Development*, 32 ENVIRONMENTAL LAW 331, 354 (2002).

of GHG emissions due to its current state of underdevelopment.[178]

Another proposed solution is to establish quotas for CDM investment, in the hope of equalizing investment opportunities among the developing countries.[179] These quotas might be regional (i.e., one-third for Africa), or economically based (i.e., one-third to the least-developed countries).[180] The problem with the quota system is that if the profit picture is not to their liking, investors can simply invest outside of the CDM.

Under any approach, the project sponsors must establish a baseline, the business-as-usual scenario that serves as the basis for calculating emission avoidance or reduction.[181] Establishing a baseline is particularly difficult if the host country has only a sketchy institutional capacity to measure current emissions, gauge future economic growth, and develop a coherent and credible energy policy that would establish a trajectory for future emissions.[182] Another baseline issue that is specific to the energy section is the treatment of ongoing improvements in power-plant efficiency.[183] Investment in more efficient power generation is a standard economic development strategy· by increasing the amount of power generated per unit of fuel, the developing country reduces costs and perhaps allows the plant operator to get by on a lower grade of fuel.[184] The effect of reducing greenhouse gas emissions might be an incidental one; thus, in terms of the Protocol's main goal of reducing GHG emissions, it might be counterproductive to reward such projects under the CDM.[185] According to one (non-African) commentator, if the CDM is used to fund a technology that would have been adopted anyway via an economic development strategy, the CDM will become "merely a tool for resource transfer rather than a tool for reducing emissions."[186]

Suggested solutions for the "mere resource transfer" issue include a heightened efficiency baseline for CDM projects, which would enable decision-makers to distinguish between GHG-reduction projects and standard development projects.[187] However, this heightened baseline also comes with an unintended social cost—it is likely to crowd out local technology developers who lack the resources of the more efficient multinational corporations.[188]

178. WHAT PROSPECTS FOR AFRICA?, *supra* note 40, at § 2.2.

179. *Id.* § 5.1.

180. *Id.*

181. Gray E. Taylor, *Global Climate Change Agreements—Do the Storm Clouds Have Silver Lining?*, 45 ROCKY MT. MIN. L. INST. § 2.03[2][a][i] (1999).

182. *See* Mumma, *supra* note 153, at 200-201. *See also* R.S. Maya & John Turkson, *CDM Baseline and Additionality in the African Context—The Issues, in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM, *supra* note 5, at 19-33.

183. *Boiling Point, supra* note 71, at 79.

184. *Id.*

185. *Id.*

186. *Id.*

187. *Id.*

188. *Id.*

B. Inequitable Assignment of Emission Credits

A particular sore point among many developing countries is their restricted role in the market for trading emission-reduction credits, an opportunity that has evolved from the emissions-trading and joint-implementation mechanisms.[189] The primary function of emission reduction credits is to offset the emission-reduction obligations of countries subject to the emissions cap; developing countries, which are not subject to the cap, might seem to be excluded almost by definition.[190] However, the developing countries, which can obtain credits only through the CDM process, do not wish to be restricted to a limited secondary market.[191] The credit trading market is a profit-making opportunity, and many developing countries view emission rights and the attendant tradable credits as "de facto property rights" in which they should be allowed to share freely.[192]

One possible approach is to distribute credits among all states, including the developing countries. At several points in the Kyoto-implementation process, the African delegation proposed a plan to allocate emission rights on a per-capita basis.[193] The per-capita approach reflects the view that all of the world's citizens have an equitable right to share equally in the right to use the atmosphere.[194] A premise of the per-capita rights proposal is a theory of gradual "contraction and convergence, in which the developed countries currently using more than their share of the atmosphere's assimilative capacity will progressively reduce their emissions while the underdeveloped regions such as Africa would increase their emissions until they achieved a comparable state of economic development.[195] This approach is frequently associated with an invocation of historical patterns of overproduction of greenhouse gases.[196]

Another African proposal goes further, suggesting an allotment "based on the Poverty Index, reflecting the country's need to develop (i.e., the poorer the country, the higher the assignment)."[197] In accordance with its position in favor of an avoidance criterion, the African countries also suggest that the credit allotment be based on "emissions foregone" rather than emission reduction.[198]

A different kind of alternative is to allocate a share of the CERs generated by

189. A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 3.1.

190. *Boiling Point*, *supra* note 71, at 79.

191. *Id.*

192. JEAN-PHILIPPE THOMAS, YUOBA SOKONA & STEPHEN HUMPHREYS, ENDA TIERS MONDE PROGRAMME, AFTER BUENOS AIRES: A DEVELOPMENT AND ENVIRONMENT NGO PERSPECTIVE 2 (Feb. 1999), *at* http://www.oecd.org/dataoecd/33/19/2059382.pdf [hereinafter *After Buenos Aires*]; A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 3.1.

193. This proposal was raised at the seventh *ad hoc* working group on the Berlin Mandate, which met in Bonn in 1997, and again after the 1998 Buenos Aires conference of the parties. *After Buenos Aires*, *supra* note 192; *Boiling Point*, *supra* note 71, at 55.

194. *See, e.g.*, *A Southern Perspective*, *supra* note 22, at 387· Baer, *supra* note 17, at 393, 401.

195. *Boiling Point*, *supra* note 71, at 55, citing Rungano Karamanzera, Zimbabwean delegate to AGBM-7.

196. *A Southern Perspective*, *supra* note 22, at 402.

197. Mumma, *supra* note 153, at 203-05.

198. *Id.* at 206-07.

a CDM project to the host state.[199] This approach has been characterized as a tradeoff between cash and CERs; the potential problem is that a host country that demands a share of the project CERs would simply induce the investor to cut back on the monetary benefits it will offer.[200] Perhaps a more promising suggestion is to allow the developing country to fund CDM projects and earn the CERs as an investor.[201] This approach would permit the developing countries to tailor CDM projects to their own development agenda.[202] Moreover, with the added inducement of the CERs, African infrastructure projects could become more attractive and affordable to cash-strapped African countries.[203] Another creative suggestion is to distribute CERs as a reward domestic policy changes that create sustainable development, even if the policy's GHG-reduction effect is incidental.[204]

C. Insufficient Emphasis on Emission Reductions in the Developed Countries

Like many other developing countries, the African countries propose that developed countries meet a greater share of their emissions-reduction obligations at home. As formulated by African NGO groups,

> This issue extends beyond the UNFCCC, whose global reduction objectives cannot in any case be reached solely through application of the Kyoto Protocol and its flexibility mechanisms (i.e., least cost reduction). At best the mechanisms should be considered as instruments to assist a variety of societies to transit towards low carbon energy and economic systems.[205]

In addition to the safety valve offered by the flexible mechanisms, there are several loopholes in the Kyoto Protocol that allow developed countries to minimize their obligation to reduce their domestic emissions. For example, the Protocol addresses a combination of six greenhouse gases.[206] Some of these gases also qualify as ozone-depleting gases, which emitters are already obligated to phase out under the Montreal Protocol.[207] Developed countries also may buy "hot air" credits from Eastern European countries that are currently in economic decline and whose baseline levels are therefore unrealistic, and cheap CDM credits from the developing world, and bank them on a long-term basis to postpone the need to reduce fossil fuel emissions.[208]

Forcing wealthy developed countries to make more domestic reductions

199. CDM Policy Workshop, *supra* note 161, at 4.
200. *Id.*
201. *Id.*
202. *Id.*
203. *See id.*
204. *Id.*
205. *After Buenos Aires, supra* note 192, at § 1(c).
206. The six greenhouse gases covered by Protocol are carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, and sulfur hexafluoride. Kyoto Protocol, *supra* note 3, at Annex A.
207. *Boiling Point, supra* note 71, at 65.
208. *A Southern Perspective, supra* note 22, at 77-78.

would tend to promote an earlier commercialization of non fossil-fuel energy technology· such countries would have little choice but to regulate their coal-fired power plants more stringently and to redirect subsidies to low-emitting renewable fuels.[209] An increased subsidization of alternative energy technologies would in turn affect the range and cost of technologies available to developing countries under the CDM.[210]

A greater range of commercial, low-polluting energy technologies would fit in well with African environmental policies, which are stringent but are not yet backed up by strong enforcement capabilities. On a political level, African solutions for environmental problems have been emphatically progressive ones environmentally, and have included the Bamako Convention, which took a strong stand against the transport of unwanted hazardous waste into Africa, and the Lagos Plan of Action, 1980, which formulated a plan for environmentally sound, regional economic development.[211] Africa, like other developing areas, does not want to be a haven or dumping ground for emission-intensive industries.

There are historical and current bases for the fear of becoming a "dumping ground." Developed countries have a history of exporting their pollution-intensive industries and less efficient technology to developing countries with lower environmental standards.[212] Africa might well assume the role of a pollution haven in the energy sector as the expected explosive growth of this sector in developing countries creates an increasingly "powerful incentive" to relocate coal technology to countries that have weak enforcement standards or capabilities and are not subject to the Kyoto emissions cap.[213] Once a capital-intensive coal infrastructure is built, it tends to remain in place for many, many decades; thus, such transfers have the potential to undermine local preferences and saddle the developing countries with expensive, outmoded, pollution-intensive energy technology that will constrain their environmental choices for years.[214]

D. Mismatch Between CDM and African Development Priorities

Key concern of African countries are whether the CDM can contribute to their sustainable development and the degree to which CDM projects fit the country's

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209. *See, e.g.*, COAL. AMERICA'S PAST, AMERICA'S FUTURE, *supra* note 147, at 2, stating that coal plants account for 76% of the CO_2 emissions of the electric utility industry. *See also* GREENPEACE, GLOBAL WARMING & ENERGY: THE GLOBAL WARMING CONNECTION *at* http://www.greenpeaceusa.org/climate/energytext.htm; Berger, *supra* note 21, at 411 *et seq.*

210. *See* the discussion in Section V(B), *infra*, for further reasons why the developing countries advocate a greater emphasis on domestic reductions in the developed countries.

211. Packer & Rukare, *supra* note 155, at 366. The Bamako Convention, 30 I.L.M. 775 (1991), requires the Parties to "promote clean production methods, to favor pollution prevention over pollution reduction, and to consider the environmental costs of the mining phase of production. DAVID HUNTER, ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 879 (Foundation Press 1998).

212. Cheng, *supra* note 7, at 63, 65.

213. *See* Alex G. Hanafi, *Note: Joint Implementation: Legal and Institutional Issues for an Effective International Program to Combat Climate Change*, 22 HARV. ENVT'L L. REV. 441, 471-72 (1998) (contrasting joint implementation with implementation solely in the developed countries).

214. *See* UP IN SMOKE, *supra* note 147, regarding the U.S. experience; Cheng, *supra* note 7, at 63.

unique economic and social development agendas.[215] The CDM requires "voluntary participation" by each party, and the developed countries maintain that voluntary participation is enough to assure that a CDM investor will respect the developing country's sustainable development strategy.[216] However, the Protocol's emphasis on sustainable development in accordance with local preferences might well be compromised by the large role given to private investors, who are not bound by Article 10's requirement that "parties" take regional development priorities into account.

Moreover, the current African investment situation does not provide the bargaining leverage to ensure the desired "African solutions for African problems."[217] Already passed over by most foreign investors, African countries are competing for investment on an investor's terms.[218] The CDM, with its project-by-project approach also tends to relegate host countries to a relatively passive "take-it-or-leave it" role.[219] In combination, such financial pressures could easily undermine a people's ability to say "no."[220]

Africans also seem to sense an impending necessity to fend off anti-development pressures from environmentalists.[221] The regional New Partnership for Africa's Development (NEPAD) plan for development of the African energy sector envisions the development of a fossil fuel infrastructure for natural gas power generation, including gas pipelines and gas-fired power plants.[222] The vision entails a full exploitation Africa's rich oil and gas resources for the benefit of African consumers, and is designed to relieve poverty by "guaranteeing a sustainable supply of affordable energy."[223] Noting that the Climate Change Convention does not require developing countries to subordinate their priority goals of economic development and poverty eradication to the goal of GHG reduction, they anticipate that they will be obliged to "find ways [to avoid]

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215. Spalding-Fecher et al., *supra* note 69, at 67.

216. Kyoto Protocol, *supra* note 3, at art. 12(5)(a); *Paper No. 6, Responses to G77/China Questions on Flexibility Mechanisms*, MATTERS RELATED TO DECISION 1/CP.3 PARAGRAPH 5 (Activities Implemented Jointly) (A Compilation of Submissions by Parties), FCCC/CP/1998/misc.7, COP 4, *at* http://unfccc.int/resource/docs/cop4/misc07.htm (Oct. 5, 1998).

217 Packer & Rukare, *supra* note 155, at 366-67

218. *See* Udombana, *supra* note 11, at 306.

219. Lucia Schild Ortiz, Mark Lutes & Rubens Born, *Ringside III: Not So Clean*, EQUITY WATCH (October 30, 2002), *at* http://www.cseindia.org/html/cmp/climate/ew/ew_oct30/clean.htm.

220. *See* CDM Policy Workshop, *supra* note 161, at 3, which also notes the negative influence of corruption.

221. *See, e.g.*, Drumbl, *supra* note 49, at 849.

222. NEPAD, *Executive Summary [Draft]*, SHORT-TERM ACTION PLAN: INFRASTRUCTURE § 2, http://www.csir.co.za/akani/2004/Mar/pdfs/nepad_action_infra.pdf (May 2002). NEPAD is an organization that promotes regional economic cooperation among African states. For a discussion of implementation of the SHORT-TERM ACTION PLAN, see NEPAD INFRASTRUCTURE SHORT-TERM ACTION PLAN (STAP): REVIEW OF IMPLEMENTATION PROGRESS AND THE WAY FORWARD (May 2003), *at* http://www.sarpn.org.za/documents/d0000652/NEPAD_Infrastructure_May2003.pdf.

223. NEPAD, *Executive Summary [Draft]*, SHORT-TERM ACTION PLAN: INFRASTRUCTURE, *supra* note 222, at § 2. This vision of sustainable development is quite similar to that of the international coal industry. See the definition of Ron Knapp, *supra* note 1, at 1.

measures that are contrary to their interest, i.e., that impede their development."[224]

The current economic distress of most African countries is caused in part by the export of about 80% of Africa's oil to fuel economic activity in other countries and pay off massive debts to banks in the developed world.[225] This export pattern is in turn linked to an increasing investment-related pollution problem in Africa.[226] Massive indebtedness makes it impossible for African countries to invest in improving their environment, and the resulting lower environmental standards create an incentive for developed countries to export their most pollution-intensive industries and technologies to African and other developing countries.[227] The situation has been characterized as the poor countries' subsidy of economic development and environmental improvement in the wealthy industrialized countries.[228]

The current African development plan to develop Africa's fossil-fuel resources for the benefit of African countries is supported by several U.N. resolutions designed to end the economic disadvantages of colonialism and neo-colonialism, particularly Resolution 1803, which affirms a developing country's permanent sovereignty over its natural resources.[229] The position of the African countries also finds some support in Kyoto Protocol Article 10, which sets forth the development obligations of the developing countries and specifies that the GHG-reduction agenda will take account of national and regional development priorities. Article 10, when read in conjunction with Article 12, which provides for the CDM, appears to confer a right to choose the fuel and energy technology most appropriate to a country's economic agenda, so long the subset of projects that seek CERs would reduce GHG emissions below a business-as-usual baseline. Clearly "clean coal" technology is an option both under a country's general development policy and under the CDM, even if another technology would facilitate a greater reduction.[230]

If the selection of fuels and energy technologies were made entirely on the basis of logic and developmental criteria, it would be driven in large part by the local mix of available fuels.[231] In Sub Saharan Africa, biomass is currently the

224. NOTE ON IMPLEMENTATION, *supra* note 13, at § I.1.

225. *Energy In Sub Saharan Africa*, *supra* note 83, at 6.

226. Cheng, *supra* note 7, at 59.

227. *Id.* at 61; Udombana, *supra* note 11, at 305-18.

228. Cheng, *supra* note 7, at 61.

229. United Nations Resolution on Permanent Sovereignty over Natural Resources, U.N.G.A. Res. 1803 (XVII), *reprinted in* 2 I.L.M. 223 (1963). For discussion of the developed countries' GHG emissions policies as a form of environmental imperialism, *see, e.g.*, Drumbl, *supra* note 49, at 849-50.

230. The prevalence of lower environmental standards and priorities in the developing countries has fueled a "meaningful participation" debate in the developed countries. The implicit assumption is that countries whose development policies entail lower environmental standards will overwhelm the emissions cutbacks of developed countries. Critics from the developed world note that emissions anywhere have a global impact, and suggest that a failure to create comparable restrictions on the developing countries' emissions and policy choices could render "American concessions completely ineffectual. Thomas et al., *supra* note 34, at 173.

231. *See* Jae Edmonds, *Atmospheric Stabilization: Technology Needs, Opportunities, and Timing*, U.S. POLICY ON CLIMATE CHANGE: WHAT NEXT? 53 (Aspen Institute 2002),

dominant fuel.[232] There is limited access to traditional commercial energy sources such as oil, gas, and hydropower, which are localized and require substantial infrastructure for delivery.[233] Sunlight is abundant everywhere, but there are financial barriers to developing a solar energy industry.[234] Coal is currently mined primarily in South Africa, but there are plans to develop coal deposits in other areas and build coal-fired power plants to diversify and improve the reliability of the continent's energy supply and promote use of local resources.[235] However, in the absence of sophisticated and expensive technology (a potential incentive for a CDM investment), coal emits substantially more greenhouse gases and other pollutants than most other fuels.[236]

V THE FRAMEWORK OF THE LARGER EQUITY DEBATE: DEVELOPED v DEVELOPING WORLDS

Kyoto's unique approach is of unique interest to fossil fuel industries because it implicates them in both the problem and the solution to climate change. CO_2 is the greenhouse gas of most crucial concern in the context of the effort to achieve a sustainable global industrialization.[237] Fossil fuels, particularly coal, have been targeted as the "primary source" of industrial CO_2 emissions.[238]

Some CO_2 –reduction strategies are particularly galling to the fossil fuel industry, such as proposals to finance the development of the industry's competitors by pollution taxes, remove fossil fuel subsidies, create incentives for consumers to switch to renewable fuels, and redirect government aid to the renewable fuel industry.[239] Another proposal (now defunct) was to end the Clean Air Act exemptions enjoyed by certain coal-fired power plants in the United States.[240] Thus, it is not surprising that within the Kyoto Protocol's "carrot-and-stick approach,"[241] it is the "stick" that first caught the industry's eye. The Kyoto

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http://www.aspeninstitute.org/aspeninstitute/files/Img/EdmondsEEEClimate.pdf (last visited Mar. 29, 2004).

232. Spalding-Fecher et al., *supra* note 69, at 64; *Energy in Sub-Saharan Africa*, *supra* note 83, at 2.

233. Spalding-Fecher, *supra* note 69, at 64.

234. *Id.*

235. *See* INTERNATIONAL ENERGY AGENCY, COAL IN AFRICA IN 2001, *at* http://www.iea.org/Textbase/stats/coaldata.asp?country=Africa&SubmitA=Submit (last visited Mar. 28, 2004) for chart describing coal usage in 2001. *See* ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2003: COAL (May 1, 2003), *available at* http://www.eia.doe.gov/oiaf/ieo/coal.html, for U.S. projections of coal development in various regions.

236. *See, e.g.*, COAL: AMERICA'S PAST, *supra* note 78, at 2, describing the disproportionate contribution of coal-burning power plants to CO_2 emissions in the electric utility industry.

237. Jonathan Baert Wiener, *Designing Global Climate Change Regulation*, *in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 151, 153-58.

238. Clare Breidinich, Daniel Magraw, Anne Rowley & James W Rubin, *Current Developments: The Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 92 AM. J. INT'L L. 315, 317 (1998).

239. *See, e.g.*, Ottinger & Williams, *supra* note 178, at 359-60; Hanafi, *supra* note 213, at 460.

240. Mallery, *supra* note 111, at 471-76.

241. *See* Glenn Wiser, *Kyoto Protocol Packs Powerful Compliance Punch*, 25 BNA

Protocol has generated a war of words between developing and developed countries,[242] with the rhetoric from the developed countries driven in large part by their fossil fuel industries.[243]

A. The Developed Countries: U.S. Battlefront

Several major salvos in the battle have come from the United States—a country that is important because it is poised to become a major exporter of energy technology and because its refusal to participate might well scuttle the Kyoto Protocol.[244] The energy industry's viewpoint, reflected early and often in the United States political system, is that the Protocol would devastate not only the fossil fuel industry, but all industries that use large amounts of energy or petroleum products, as well as the workers and local governments that depend on those industries.[245]

In 1997 the U.S. Senate unanimously passed a resolution opposing U. S. participation in any climate change treaty that would harm the U.S. economy or fail to require "meaningful" participation by developing countries.[246] The resolution was supported by an energy-industry organization, the Global Climate Coalition, which had previously spearheaded a massive public relations campaign regarding the competitive impact of the Protocol's "more favorable" treatment of developing countries.[247]

One hot-button issue for environmentalists is the pervasive presence of largely "invisible" regulatory subsidies that create a misleading appearance of cost-

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INTERNATIONAL ENVIRONMENT REPORTER 86 (Jan. 16, 2002), *available at* http://www.ciel.org/Publications/INER-Compliance.pdf (last visited Mar. 28, 2004).

242. Mallery, *supra* note 111, at 481.

243. *See* Hanafi, *supra* note 213, at 450, citing the position of the Global Climate Coalition, "a U.S. consortium representing largely fossil-fuel business interests.

244. *See, e.g.*, U.S. STATE DEPARTMENT ROUNDUP OF INTERNATIONAL PRESS STORIES ON THE U.S. WITHDRAWAL FROM THE KYOTO PROTOCOL (Apr. 5, 2001), *at* http://www.climnet.org/news/bushroundup.html.

245. Thomas et al., *supra* note 34, at 173.

246. The Byrd –Hagel Resolution, Congressional Record, S8113-8131 (daily ed. July 27, 1997). *See* Armin Rosencranz, *U.S. Climate Change Policy, in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 221, 221-234, for further discussion and context. The Senate as whole, and the sponsors of the resolution have had change of heart. After the Bush Administration cited the Byrd-Hagel Resolution in rejecting the Kyoto Protocol, the Senate Foreign Relations Committee passed new resolution, declaring that Byrd-Hagel should not "cause the U.S. to abandon its shared responsibility to help find solution to the global climate change dilemma. Leonie Haimson, *Climate Change Negotiation History, in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 523, 528.

247. *See* Hanafi, *supra* note 213, at 450 (citing the Global Climate Coalition "a U.S. consortium representing largely fossil-fuel business interests, which predicted "massive job losses" and spikes in the price of necessities). Oil industry experts suggested that Kyoto would force a 20% reduction in oil use and "major lifestyle changes by consumers in the developed countries. Skip Maryan, R. Casey Olson, *Crystal Ball Gazing: An Outline of Issues Facing the Energy Industry in the 21st Century*, INTERNATIONAL OIL AND GAS LAW, CONTRACTS AND NEGOTIATIONS, Part No. 7 (Sw. Legal Found./Rocky Mt. Min. L. Found. 1996), *cited in* ERNEST E. SMITH, ET AL., INTERNATIONAL PETROLEUM TRANSACTIONS 49 (Rocky Mt. Min. L. Found. 2d Edition 2000).

effectiveness. [248] For example, loopholes in the U.S. Clean Air Act confer a competitive advantage on older coal-burning plants that use outmoded technology and a competitive disadvantage on other power plants that are subject to newer, higher environmental standards.[249] Such regulatory subsidies promote additional private and public investment in coal facilities and create a more favorable ratio between dollars invested and electricity output (investment cost per kWh).[250] This effect is a potential selling point to developing countries, which can be enhanced further by government-subsidized technology development.[251]

Government-subsidized technology development tends to reflect both an industry export agenda and the global trend toward deregulation of the utility industries in the developed countries. Coal companies in the developed countries are well positioned to take advantage of the opportunity presented by the CDM, due to the increasing consolidation and internationalization of the industry and a trend to do business through foreign affiliates.[252] Moreover, in response to deregulation, coal companies, which supply the fuel that currently dominates the electricity industry,[253] seek to reduce their price risk by diversifying their customer base.[254] One way to do this is to export more coal,[255] which has encountered increasing opposition from environmentalists in developed countries and is now primarily a local or regional fuel due to high transportation costs.[256] Industry involvement in developing new technologies that decrease transportation costs and reduce environmental impacts helps to promote the export model for coal.[257]

An export agenda is apparent in the energy-industry cooperation that occurred

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248. COAL. AMERICA'S PAST, *supra* note 78, at 8.

249. UP IN SMOKE, *supra* note 147, at 10, *citing* Clean Air Task Force, Testimony of Armond Cohen, before the U.S. House of Representatives Committee on Commerce, Subcommittee on Energy and Power.

250. *See* MARSHALL GOLDBERG, FEDERAL ENERGY SUBSIDIES: NOT ALL TECHNOLOGIES ARE CREATED EQUAL 8-9 (July 2000), a research report produced for the Renewable Energy Policy Project, *at* http://www.repp.org/repp_pubs/articles/resRpt11/subsidies.pdf; *see also* COAL. AMERICA'S PAST, *supra* note 78, at 8-9.

251. *See, e.g.*, Robert M. Margolis & Daniel M. Kammen, *Energy R&D and Innovation: Challenges and Opportunities, in* CLIMATE CHANGE POLICY: A SURVEY, *supra* note 6, at 469, 486 *et seq.* For discussion of Australian subsidies, see CHRISTOPHER RIEDY, SUBSIDIES THAT ENCOURAGE FOSSIL FUEL USE IN AUSTRALIA (Institute for Sustainable Futures, Working Paper CR 2003/01, January 2003), *at* www.isf.uts.edu.au/publications/CR_2003_paper.pdf.

252. CHALLENGES OF ELECTRIC POWER RESTRUCTURING FOR FUEL SUPPLIERS, *supra* note 253, at 9. *See also* Energy Information Administration, *Chapter 6, Recent Trends in International Investment and Trade, in* COAL, PRIVATIZATION AND GLOBALIZATION OF ENERGY MARKETS, *at* http://www.itcilo.it/actrav/actrav-english/telearn/global/ilo/frame/coal.htm (n.d., last visited May 8, 2004).

253. *See, e.g.*, COAL. AMERICA'S PAST, *supra* note 78, at 8

254. ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY, CHALLENGES OF ELECTRIC POWER INDUSTRY RESTRUCTURING FOR FUEL SUPPLIERS 27, at http://www.eia.doe.gov/pub/electricity/chg_str_fuel.pdf (Sep. 1998).

255. *Id.*

256. INTERNATIONAL PETROLEUM TRANSACTIONS, *supra* note 247, at 45. Due to high transportation costs, only about 13% of hard coal production is traded internationally.

257. *Id.* At the current rate of technology development, experts do not anticipate a global coal trade similar to the market for oil will evolve in the foreseeable future for coal. *Id.*

after George W Bush was elected to the U.S. Presidency in 2000. Bush decisively repudiated the Kyoto Protocol after his election in 2000, citing the Protocol's impacts on the competitiveness of U.S. industries and the lack of adequate, cost-effective technology to reduce GHG emissions.[258] The Bush Administration then stepped up government funding for coal technologies vis-à-vis the funding for renewable energy technologies.[259] This current emphasis on coal technology derives both from a policy to reduce dependence on imported oil and an export agenda: One of President Bush's persistent themes is that coal, which is plentiful in the U.S., can be used as a primary industrial fuel without causing pollution or climate change and that the "clean coal" approach should be exported to developing countries.[260]

What is frequently not mentioned is the poor fit between clean coal technology and the needs of the rural poor in African and other developing countries. Subsidized fossil fuel technologies do not benefit rural populations that have little prospects of being connected to a developing country's electrical grid.[261] Indeed, it might be "far less costly to subsidize the energy needs of the poor directly than to subsidize fuels for all users."[262] An overriding investment in new fossil fuel technologies also would eliminate the possibility of a beneficial "leapfrog effect."[263] Subsidizing governments frequently invoke the interests of the poor, but subsidies to established industries tend to reflect pressures from privileged sectors of a society seeking cost containment and from companies seeking to maximize their profits.[264]

B. The Developing Countries

In response to the developed countries' arguments that they would be unduly disadvantaged by the Kyoto Protocol and that the CDM is not a sufficient offset to that disadvantage, the developing countries have fired back several equity-based arguments that the CDM is unduly favorable to developed countries. They suggest that the CDM is fundamentally flawed because it allows developed countries to buy their way out of their obligations to reduce own emissions.[265] The theory is that the CDM safety valve dissipates the political will to seek out less carbon-intensive forms of energy development and economic growth.[266]

One of the developing countries' most interesting arguments concerns a

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258. Rosencranz, *supra* note 246, at 227; Thomas et al., *supra* note 34, at 173.

259. COAL. AMERICA'S PAST, *supra* note 78, at 6-8; *Coal Is Central to Energy Policy, Bush Says*, CARE (COALITION FOR AFFORDABLE AND RELIABLE ENERGY) (Feb. 15, 2001), *at* http://www.careenergy.com/news/articleview.asp?iArticle=36..

260. *See Coal Is Central to Energy Policy, Bush Says*, CARE (COALITION FOR AFFORDABLE AND RELIABLE ENERGY) (Feb. 15, 2001), *at* http://www.careenergy.com/news/articleview.asp?iArticle=36.

261. Ottinger & Williams, *supra* note 178, at 344.

262. *Id.* at 344-45.

263. *Id.* at 354.

264. *Id.* at 344.

265. *See, e.g.*, *A Southern Perspective*, *supra* note 22, at 375.

266. *After Buenos Aires*, *supra* note 192, at 1(c).

loophole in the Protocol's technology-forcing scheme. The Kyoto Protocol, essentially a technology-forcing instrument as well as a social-justice document, contemplates that the binding GHG caps will force international energy companies to look for new markets and new ways to enhance their profits, thereby altering "the future growth and pattern of world energy demand."[267]

Paradoxically, however, the CDM might actually tend to prevent the global community from progressing beyond the fossil-fuel technology that has caused the global warming problem. Because it is structured as a market-driven mechanism, the CDM directs investment toward projects that minimize cost, effort, and risk for multinational corporations.[268] The easiest, cheapest emission credits are in simple technologies, such as coal-washing, that attempt to clean up fossil-fuel energy systems.[269] CERs earned by coal washing cost three dollars per tonne; those earned by creating zero-carbon energy systems cost twelve-to-fifteen dollars per tonne.[270]

According to the late Anil Agarwal, a prominent environmental activist from India, this market reality could lock the developing countries into a fossil-fuel development path whether they want it or not, and incidentally turn the CDM into a subsidy to export the most environmentally destructive industries in the developed world.[271] This fossil fuel lock-in effect might be particularly detrimental to Africa, where the 95% of the rural population not yet hooked in to a massive, costly electrical grid is uniquely positioned to benefit from a range of new energy technologies tailored to a rural environment.[272] International investment in the developing country's expansion of a traditional electricity grid directs scarce funding away from the villages in favor of the urban areas and helps to force the developed country into the role of a long-term captive fossil-fuel customer.[273] Absent this lock-in effect, rural African villages might bypass the antiquated fossil fuel technology entirely.[274]

Another equity issue that zeroes in on the CDM is the "low-hanging fruit" argument: the CDM allows the developed countries to cherry-pick the easiest options for GHG reduction in the developing countries.[275] Later, when the developing countries have reached relatively high levels of energy efficiency, the developed countries no longer have any incentive to buy emission credits from

267. INTERNATIONAL ENERGY AGENCY, WORLD ENERGY OUTLOOK 19-20 (1998), *cited in* INTERNATIONAL PETROLEUM TRANSACTIONS, *supra* note 247, at 46.

268. *A Southern Perspective*, *supra* note 22, at 386.

269. Anil Agarwal, *Back to Basics*, EQUITY WATCH (Nov. 20, 2000), *at* http://www.cseindia.org/html/cmp/climate/ew/art20001120_2.htm.

270. *Id.*

271. *Id.*

272. *Odingo's Report*, *supra* note 114. For information on the proportion of African households without electricity, *see* WORLD BANK, CAN AFRICA CLAIM THE 21ST CENTURY? 137 (Apr. 2000), *available at* http://www.rrojasdatabank.net/africa21/chapter_5.pdf, *cited in* Udombana, *supra* note 11, at 304. *See also* A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 2.2.

273. *See Back to Basics*, *supra* note 269.

274. *Id.*

275. *Boiling Point*, *supra* note 71, at 78.

them due to rising incremental costs.[276] Nevertheless, further emission reductions will be required in part because of the developed countries' failure to develop domestic and CDM technology for GHG reduction, at which point the developing countries will be left with only the most difficult, expensive options; these will cost the poor countries up to thirty times more than the credits the wealthy developed countries purchased to fulfill their own GHG-reduction obligations.[277] A developed country may bank emission credits without regard to its already high per-capita rate of largely "luxury" emissions, while developing countries with low per-capita "survival" emissions do not have the same privilege.[278]

There is also an intergenerational equity issue. The low-hanging fruit phenomenon places the developing countries in a position of "discounting their future" if they take advantage of the CDM.[279] Future generations will have to make further reductions, at much higher costs, than the costs of the options sold cheaply to the developed countries.[280] Moreover, the long banking period for cheap credits could mean, ironically, that the developed countries could still be using these cheap credits at a time when the developing countries would be forced to make higher-priced reductions.[281]

Perhaps most startling equity paradox is a cost-benefit argument sometimes used to bolster the status-quo fossil-fuel development pattern.[282] According to one global warming economist, "the total and long-term cost of emitting an extra ton of carbon today is the equivalent of $7.50"—allegedly far less than the economic benefit.[283] However, this figure is predicated in part on a country-specific valuation of the projected loss of life. Lives lost in tropical zones characterized by a high poverty rate, lower earning capacity, and shorter life spans are assigned a lower value than the lives in countries such as the U.S., which receive the bulk of the benefits of fossil fuel combustion.[284] Because a disproportionate number of the deaths attributable to global warming will occur in such regions, the costs of fossil-fuel-based development appear low and "cost-effective."[285] This is the classic environmental-justice problem.[286]

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276. *Id.*

277. *Id.*

278. *Id.*

279. *A Southern Perspective*, *supra* note 22, at 384-85.

280. *Boiling Point*, *supra* note 71, at 78.

281. *Id.*

282. *See* Douglas A. Kysar, *Some Realism About Environmental Skepticism: The Implications of Bjorn Lomborg The Skeptical Environmentalist for Environmental Law and Policy*, 30 ECOLOGY L.Q. 223, 262-67 (2003).

283. *Id.*, citing BJORN LOMBORG, THE SKEPTICAL ENVIRONMENTALIST: MEASURING THE REAL STATE OF THE WORLD 306 (2001).

284. Kysar, *supra* note 67, at 265.

285. *Id.*

286. *See, e.g.*, Dr. Robert D. Bullard, *Environmental Racism and "Invisible Communities*, 96 W VA. L.R. 1037 (1994).

VI. ROLE OF MULTINATIONAL CORPORATIONS

CDM projects may be undertaken either by private corporations or by government entities; indeed, the involvement of private actors is one of the treaty's defining features.[287] In practice, however, the power to take the initiative will lie mainly with private corporations, due to a major shift in the nature of capital flows from the developed to the developing countries. In recent years, private investment has become the dominant mode of transfer as official development assistance (ODA) has declined precipitously.[288] ODA, which comprised 56% of worldwide financial flows in 1990, had plummeted to 14% by 1996.[289] Moreover, the share of ODA that flows to utilities, energy, and transportation infrastructure declined from 23% in 1975-80 to 15% in 1995-2000.[290] This shift away from public investment might undermine some of Kyoto Protocol goals given the profit-making orientation of private investors, the weak governance of multinational corporations in international law, Africa's relatively weak bargaining position vis-a-vis these investors, and the weakness of African institutions that might be expected to exercise control over investors.

In the most general terms, Africa has been disadvantaged thus far by the shift to a private mode of wealth transfer. Although increased private investment has more than offset plummeting ODA at a global level,[291] Africa has not attracted its share of this capital.[292] In absolute terms, FDI increased in Africa increased between 1990 and 1996; however, FDI increased far less in Africa than elsewhere.[293] The increased investment was concentrated in twenty-five to thirty countries with superior infrastructure and perceived profit potential—and 80% flowed into just twelve developing countries.[294] Africa is essentially running in place, falling behind other countries because it needs capital to attract capital in an investment milieu where "globalization is propelled by capital—the potential of a given stock of assets to deploy new production "[295]

The problem is that Africa's small and weak markets "are not attractive to investors unless there is a longer-term incentive," according to African CDM designers.[296] Thus, Africans are attempting to create CDM opportunities with some profit potential other than the certified emission reduction credits, projects with "self-financing capacity" and the ability to attract continued corporate

287. Kyoto Protocol, *supra* note 3, at art. 12(9).

288. U.N.E.C.A. ECONOMIC REPORT ON AFRICA, *supra* note 10, at 29-30.

289. Yamin, *supra* note 36, at 65.

290. U.N.E.C.A. ECONOMIC REPORT ON AFRICA, *supra* note 10, at 29. This would seem to minimize the intended effect of the Kyoto Protocol's financial additionality criterion, which theorizes that CDM projects will not displace ODA.

291. The overall flow of public and private funding has "expanded by 184 percent since 1990" because of greatly increased corporate investment. Yamin, *supra* note 36, at 65.

292. *See* A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 3.1.

293. *Id.*

294. Yamin, *supra* note 36, at 65.

295. Udombana, *supra* note 11, at 306.

296. Brew-Hammond, *supra* note 173, at 76.

financing of related projects.[297] One example is Africa's structural reform of its energy sector.[298] State utilities are being privatized on a large scale, and these under-financed state utilities present opportunities for relatively easy improvements in efficiency as well as the profit-making lock-in effect identified by Agarwal.[299]

However, this strategy to attract foreign investment might conflict with some of Africa's other economic development priorities, namely its effort to improve the lot of the rural poor. It is not cost effective to extend the electrical grid into sparsely populated areas. Even if traditional grid-style delivery were economically feasible in rural areas, the desperately poor residents could not afford the power in a privatized economic environment where citizens must "pay for everything."[300]

Furthermore, when CDM investment is focused on cleaning up an existing fossil-fuel grid system, there is no guarantee that private investors will provide the latest technology unless the host country has a strong bargaining system and stringent emission regulations. There is an unfortunate history of corporate transfers of outmoded technology that they cannot use at home whenever "it is cheaper to do so and there are no regulations or supervision to prevent the use of such harmful technology."[301]

This is likely to continue in the African energy development sector because power plant operators have no incentive for ongoing use of clean coal technologies unless national regulations raise the cost of emitting carbon and other pollutants above the cost of using the technology.[302] Even if "clean coal" technology is made available, the African countries might find themselves unable to take advantage of it. If the United States' experience is any guide, a spike in natural gas prices or the reality of regulatory or other costs of "clean coal" technology will promote an increased use of "dirty" coal capacity (which currently exist in abundance in South Africa) and the construction of new facilities that can compete with these "dirty" facilities' low production costs, rather than expensive "clean coal" facilities.[303] Africa's consumers have little economic clout, and its regulatory enforcement capacity is low. In the U.S., even with far stronger, more environmentally oriented consumer markets, it has proved impossible to get power plant operators to use completely available technology in the absence of the necessary regulatory

297 Timothy Afful-Koomson, Paul Opoku-Mensah, *Participatory Implementation and Governance of Clean Development Mechanism (CDM) Projects in Africa*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISM 35, 37.

298. Spalding-Fecher et al., *supra* note 69, at 64.

299. *See* A CENTERPIECE OF THE KYOTO PROTOCOL, *supra* note 99, at § 3.1. *See also Back to Basics*, *supra* note 269, and U.N.E.C.A. REPORT, *supra* note 10, at 35-36.

300. Udombana, *supra* note 11, at 316-17.

301. M. SORNARAJAH, THE INTERNATIONAL LAW OF FOREIGN INVESTMENT 47 (Cambridge University Press 1999) (1994).

302. *Can Carbon Sequestration Solve Global Warming?* TERRADAILY, Feb. 25, 2003, *citing* Howard Herzog, principal research engineer at Massachusetts Institute of Technology Laboratory for Energy and the Environment, *at* http://www.spacedaily.com/news/greenhouse-03d.html (last visited Mar. 24, 2004).

303. UP IN SMOKE, *supra* note 147, at 4.

incentives.[304]

There is another problematic factor in the international legal framework. One African scholar has suggested that Africa "has been more acted on than actor, largely because existing international law norms do not 'bind states and global actors to promote the right to development globally' and, in particular, in Africa."[305] There are several international policy documents that instruct corporations to respect a host country's development priorities. The International Chamber of Commerce Guidelines for International Investment state that international investors "[s]hould ensure in consultation with the competent authorities that the investment fits satisfactorily into the economic and social development plans and priorities of the host country."[306] The voluntary OECD Guidelines for Multinational Enterprises state that corporate investors "should take fully into account" the policies of the host country and "contribute to economic, social, and environmental progress with a view to achieving sustainable development."[307] However, these policies are largely voluntary and aspirational.

Moreover, there is an emerging international human right to development in accordance with a people's indigenous priorities.[308] The United Nations Draft Declaration on the Rights of Indigenous Peoples[309] recognizes the potential conflict between international development projects and the right of indigenous people "to development in accordance with their own needs and interests."[310] However, human rights claims have been asserted against corporations primarily in situations involving major atrocities associated with resettlement projects, not in a primarily economic context.[311] The emerging right to development consistent with a people's development priorities does not provide a basis to force a corporation to forgo the most favorable profit opportunities.

Article 10 of the Kyoto Protocol, which requires all "parties" to take regional development priorities into account, is similarly unhelpful in binding multinational corporations to formulate projects that reflect the wishes of developing country partners that do not have a strong bargaining position based on profit potential. Corporations are of course not parties to the Protocol.

It is a disquieting reality that much of the momentum and policies for the

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304. *Id.*

305. Udombana, *supra* note 11, at 305, *citing* UNDP HUMAN DEVELOPMENT REPORT 2000, 9 (1999).

306. INTERNATIONAL CHAMBER OF COMMERCE, GUIDELINES FOR INTERNATIONAL INVESTMENT SECTION I. Investment Policies (Nov. 29, 1972).

307. OECD, Declaration on International Investment and Multinational Enterprises, Annex I, Guidelines for Multinational Enterprises, *available at* http://www.olis.oecd.org/olis/2000doc.nsf/4f7adc214b91a685c12569fa005d0ee7/c125692700623b74c1256991003b5147/$FILE/00085743.PDF (2000). The voluntary nature of the guidelines is set forth in Ch. 1, Concepts and Principles.

308. Sornarajah, *supra* note 300, at 45.

309. Resolution 1994/45, Draft Declaration on the Rights of Indigenous Peoples, E/CN.4/1995/2, E/CN.4/Sub.2/1994/56, at 105 (Aug. 26, 1994).

310. Preamble, Paragraph 5, 8.

311. *See, e.g.*, Wiwa v. Royal Dutch Petroleum Co., 226 F.3d 88 (2d Cir. 2000), *cert. denied* 532 U.S. 941 (2001).

impending industrialization in the developing world come from a cooperation among a few highly developed countries and their multinational corporations.[312] The developing countries' perception of this "partnership, initially rooted in the colonial era, has given rise to a "dependency" theory of international investment, which posits that the dominant players in the developed world create investment regimes that keep developing countries in a subservient role.[313] Modern permutations include the view that developed countries' global warming policies are a thinly disguised attempt to hamper the developing world's industrialization—to "safeguard ongoing polluting behavior in developed countries [by preventing] new polluting behavior from emerging in the industrializing world."[314]

A related fear is that a climate-change regime dominated by the developed countries will disseminate the worst aspects of capitalism and globalization, unduly promoting privatization and undermining homegrown prescriptions for alternative development paths.[315] There is some cause for skepticism about the "clean coal" climate-change strategy formulated in developed countries for consumption abroad, at least in the sense that it will limit the options for Africa. One U.S. company, identified as the "largest single source of greenhouse gases in the western world,"[316] has begun investing heavily in "clean coal" plants for large customers such as China.[317] This overall trend, which will indeed limit the options available to Africans in the countryside, is bolstered by government-funded technology development programs[318] and reflects heavy campaign contributions by the coal industry.[319]

VII. CONCLUSION

The main issue posed by the foregoing factors is how to promote equitable, environmentally sound economic development where it is needed most. The African countries are the crux of this problem. It is in Africa that all of the challenges come together, presenting the best opportunity for restructuring the Protocol and the CDM in a creative way.

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312. Udombana, *supra* note 11, at 305.

313. Somarajah, *supra* note 300, at 43 et seq.

314. Drumbl, *supra* note 49, at 849-50.

315. Udombana, *supra* note 11, at 305. In addition to the economic clout of the developed countries at the policymaking level, climate-change science and technology is formulated in the developed world and funded by governments and large corporations and therefore tends to reflect their interests. *See A Southern Perspective*, *supra* note 22, at 379-80.

316. Susan Joy Hassol, Randy Udall, *A Change of Climate*, ISSUES IN SCIENCE AND TECHNOLOGY 39 (2000).

317 Bruce Yandle and Stuart Buck, *The Bootleggers, Baptists, and the Global Warming Battle*, 26 HARV. ENVTL. L. REV. 178, 215 (2002).

318. COAL. AMERICA'S PAST, *supra* note 78, at 7.

319. Dan Morgan, *Coal Scores with Wager on Bush*, WASH. POST, Mar. 25, 2001, at A5, *available at* http://www.cleanenergy.org/energy/coal/bush.html. (last visited Mar. 29, 2004). *See also* Ken Ward, Jr., *Bush Hauls In Coal Contributions*, THE CHARLESTON GAZETTE, July 24, 2000 (discussing campaign contributions by the mining, utility, and railroad industries); Holly Bailey, *Read My Lips: A Look at Coal Mining Industry Contributions to Bush and the GOP* MONEY IN POLITICS ALERT, Mar. 14, 2001, *available at* http://www.opensecrets.org/alerts/v6/alertv6_11.asp (last visited Mar. 29, 2004).

These largely undeveloped countries possess a not-to-be-missed opportunity to leapfrog over the archaic fossil fuel technologies that have caused global environmental problems. However, their opportunity might indeed be missed because the small, undeveloped markets and widespread poverty of these African countries deter foreign investment in the best technologies and encourage resource exploitation, a higher-than-necessary level of pollution, and investment in low-level technologies, especially those related to coal. These investments go hand in hand with the prospect that African countries might be locked in to expensive coal and other fossil-fuel energy systems that will deter creative investments well into the future.

The developed countries' suggestions for maintaining the credibility of Kyoto's joint implementation philosophy have included requiring developing countries to "sign on to some form of commitment" to a graduated scheme of emission-reduction obligations to secure the support of the developed countries.[320] Such suggestions seem to miss the point of the developing countries' equity arguments almost entirely. Another, perhaps more feasible solution is for the energy industry, rather than the African countries, to simply adapt. As the industry has noted, "change brings opportunities, and the Kyoto Protocol, which includes mechanisms to promote compliance on a cost-effective basis, may even provide benefits."[321] Despite their vocal public objections, the major fossil fuel companies have already begun to invest in offsets.[322]

There are a number of feasible pathways from African energy development under the CDM. Large-scale and costly clean coal and other fossil-fuel technologies are useful for large-scale commercial development. Small-scale and decentralized energy technologies are uniquely suited to populations that will otherwise be overlooked. In accordance with international law, Africans should choose their own development path and set of associated problems. Perhaps the key point is that there be "challenges and opportunities" for Africans to seize.[323]

However, the African energy dilemmas also point out a need for greater awareness in the developed world. The Africans have presented several creative suggestions. Some of these suggestions, such as the emission-avoidance approach and a possible restructuring of the CER market, offer improvements both in the flow of funds and technology to Africa and in the affordability of sustainable development worldwide. Currently, technology development is being guided along a "clean coal" pathway This pathway should be reexamined in the context of the fossil fuel lock-in effect identified by Agarwal and the potential common interest in the development of small-scale energy technologies with applications in both developing and developed countries. The Kyoto Protocol presents an opportunity to drop our belief that technology transfers benefit only the developing

320. Hanafi, *supra* note 213, at 473.

321. Gray E. Taylor, *Global Climate Change Agreements—Do the Storm Clouds Have Silver Lining?*, 45 ROCKY MT. MIN. L. INST. § 2.01 (1999).

322. *Id.*

323. Moussa Cisse, Yuoba Sokona & Jean-Philippe Thomas, *Introduction* to NOTE ON IMPLEMENTATION, *supra* note 13.

world.[324] The key premise of the Protocol and its CDM is the feasibility of a "win-win" outcome.[325]

324. *Id.* at 65.
325. Hanafi, *supra* note 213, at 443.