

CALL FOR A PILOT PROGRAM FOR MARKET-BASED ADAPTATION FUNDING

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I. INTRODUCTION

Anthropogenic, or human-caused, climate change threatens to impose tremendous damage on countries that lack the resources to adequately adapt. Although climate change mitigation¹ has been the primary focus of environmental policy work and institutions, developing countries need a better system for funding adaptation² to climate change to prepare for environmental changes. An ideal program for funding adaptation would maximize cost effectiveness and distributional equity, while minimizing hurdles associated with political economy.

1. Climate change mitigation involves "human intervention to reduce the sources or enhance the sinks of greenhouse gases," such as by reducing the amount of climate-changing gases created and existing in the atmosphere. United Nations Framework Convention on Climate Change, Glossary of Climate Change Acronyms, http://unfccc.int/essential_background/glossary/items/3666.php (last visited Mar. 12, 2010).

2. Adaptation to climate change is any "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." *Id.*

This Note proposes a pilot program, the Adaptation and Development Mechanism Pilot Program (“ADMPP”), for including adaptation in the already existent Kyoto carbon market, which will result in raising private money to fund adaptation. Funding urgently needed climate change adaptation projects in developing countries would generate emissions allowances, which could then be counted toward emissions reduction quotas or sold in the carbon market. In many ways, this program would be analogous to the Kyoto Protocol’s Clean Development Mechanism (“CDM”), a program through which firms generate tradable emissions allowances by funding emissions reductions in developing countries.³ The program would differ, however, in that projects would be awarded through a reverse auction, which would make the program a true market mechanism and would maximize the goals of cost effectiveness, distributional equity, and political economy.

This Note draws justification for the ADMPP from two important conceptual points. The first, the weak version, is that current adaptation programs simply do not provide enough funding for adaptation to climate change. The ADMPP aims to supply an additional tool for funding adaptation, using primarily private money provided through the Kyoto carbon market and a reverse auction, in order to get closer to the goal of funding all the currently under-funded adaptation projects. The strong conceptual point, or justification, is that in order to improve human welfare, which is arguably the ultimate objective of addressing climate change, we must employ adaptation in addition to mitigation efforts. When adaptation is more cost-effective or more urgently necessary than mitigation, resources for addressing climate change should be directed at adaptation. Simply put, funding adaptation is a good investment, and this Note proposes a streamlined legal framework for doing so.

The poorest nations are likely to be the most affected by and have the least capacity to adapt to climate change;⁴ this

3. United Nations Framework Convention on Climate Change [UNFCCC], About the Clean Development Mechanism, http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php [hereinafter “CDM Website”] (last visited Mar. 12, 2010).

4. See, e.g., NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW* 42 (Cambridge University Press 2007) (“The poorest [coun-

Note suggests a mechanism through which the world's polluters could play a positive role in funding adaptation in developing countries. Part II provides a survey of climate change and background information on mitigation, adaptation, and the CDM. Part III elaborates the details of the ADMPP and discusses the anticipated benefits of employing market mechanisms to further climate change adaptation. Part IV outlines and critiques current programs and suggestions for funding climate change adaptation. Part V addresses anticipated problems with this Note's proposal and suggests possible solutions.

II. BACKGROUND ON CLIMATE CHANGE, MITIGATION, AND ADAPTATION

Climate change mitigation concerns reducing the emission of greenhouse gases ("GHGs"). Climate change adaptation, on the other hand, deals with methods for preparing for and reducing the consequences of the unavoidable impacts of climate change. Through the use of an international GHG trading program,⁵ the Joint Implementation program,⁶ and the CDM,⁷ Kyoto signatories employ flexible market-based mechanisms for reducing global emissions.⁸

tries]. . . are likely to have the least capacity to adapt" and will have the "greatest need for adaptation.") [hereinafter "STERN REVIEW"].

5. Protocol to the United Nations Framework Convention on Climate Change, art. 17, Dec. 10, 1997, 37 I.L.M. 22 [hereinafter "Kyoto Protocol"] (establishing emissions trading infrastructure); United Nations Framework Convention on Climate Change, About Emissions Trading, http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php (last visited Apr. 2, 2010) [hereinafter "Kyoto Emissions Trading Website"] (reviewing basic apparatus for Emissions Trading).

6. See Kyoto Protocol *supra* note 5, at art. 6 (articulating framework for Joint Implementation Program); United Nations Framework Convention on Climate Change, About the Joint Implementation Program, http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php (last visited Apr. 2, 2010) (reviewing basic apparatus for Joint Implementation Program).

7. See Kyoto Protocol, *supra* note 5, at art. 12 (defining Clean Development Mechanism); see also CDM Website, *supra* note 3, (last visited Apr. 2, 2010) (reviewing basic apparatus for Clean Development Mechanism).

8. See, e.g., RICHARD B. STEWART & JONATHAN B. WIENER, RECONSTRUCTING CLIMATE POLICY: BEYOND KYOTO 4 (2003) (explaining that the Kyoto Protocol adapted both "a comprehensive approach to limiting net greenhouse gas emissions. . . and international greenhouse gas emissions trading).

A. *Global Climate Change Generally*

A brief overview of the science behind global climate change will be helpful to the present discussion.⁹ Currently, the planet is undergoing global warming, sea level rise, and snow and ice decreases.¹⁰ According to the Intergovernmental Panel on Climate Change (“IPCC”) global temperatures are also increasing, likely due to anthropogenic GHG emissions, which are human emissions of gases that cause a global greenhouse effect.¹¹ It is difficult, if not impossible, to predict the exact consequences of global warming, but it will almost certainly result in a net detriment.¹² Gradual warming may initially improve agriculture in some areas, while eventually having adverse effects worldwide, such as by hurting crop yields, expanding the spread of tropical disease, destroying ecosystems, and increasing tropical storm intensity.¹³ Global warming will adversely affect GDP in almost every country.¹⁴ Developing countries will incur the most serious impacts due to a variety of factors including a lack of resources for adaptation.¹⁵ While the United States, China, and Russia are expected to lose very little, India and Africa are anticipated to be major losers in global warming.¹⁶

B. *Mitigation Generally*

Global climate change must be addressed with two simultaneous approaches: mitigation and adaptation. As noted above, mitigation involves the reduction of GHG emissions. There is no single method or technology through which the

9. For a detailed scientific analysis on climate change, see STERN REVIEW, *supra* note 4, and Intergovernmental Panel on Climate Change [IPCC], Fourth Assessment Report of the IPCC: Climate Change 2007 Synthesis Report (2008), *available at* http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html [hereinafter “IPCC AR4”].

10. *E.g.*, IPCC AR4, *supra* note 9, at 30.

11. *Id.* at 37.

12. *E.g.*, STEWART & WIENER, *supra* note 8, at 21.

13. *E.g.*, *id.* at 22.

14. See Cass R. Sunstein, *Of Montreal and Kyoto: A Tale of Two Protocols*, 31 HARV. ENVTL. L. REV. 1, 48 fig.7 (2007) for a useful table depicting the expected GDP loss of several countries and regions as a result of an increase in global temperature by 2.5°C.

15. *E.g.*, STEWART & WIENER, *supra* note 8, at 22–23.

16. Eric A. Posner & Cass R. Sunstein, *Climate Change Justice*, 96 GEO. L.J. 1565, 1581 (2008).

necessary emissions reductions, or mitigation, can be achieved.¹⁷ Rather, emitters in a variety of sectors, including transportation, manufacturing, energy, and agriculture, must lower their GHG emissions in order to achieve mitigation goals.¹⁸

In 1992, developed countries (including the United States) signed the United Nations Framework Convention on Climate Change (the “UNFCCC”), an international mitigation tool, recognizing that anthropogenic GHG emissions may “adversely affect natural ecosystems and humankind.”¹⁹ The goal of the UNFCCC is to stabilize atmospheric GHG content at a level that would prevent dangerous human-caused climate change.²⁰ The UNFCCC parties fleshed out their commitments to reducing GHG emissions in the Kyoto Protocol, though not all of the parties ratified it.²¹

Many of the European Union member states and a number of other countries have ratified the Kyoto Protocol despite the United States’ failure to do so.²² The Kyoto Protocol contemplates flexible market mechanisms for achieving compliance with mitigation goals.²³ The flexibility of market-based techniques makes them superior to command and control methods, which mandate the use of a certain, specified type of technology. Moreover, market mechanisms are more cost-effective because they allow regulated entities to use the cheapest method possible to reduce emissions.²⁴ Further, these mar-

17. See S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Change Problem for the Next 50 Years with Current Technologies*, 305 SCI. 968, 968 (2004) (“no [method or technology] is a credible candidate” for achieving the necessary reductions by itself”).

18. See *id.* at 969–71 (articulating fifteen options to reduce carbon dependency).

19. United Nations Framework Convention on Climate Change pmbl., May 9, 1992, S. Treaty Doc. No. 102-38, 1771 U.N.T.S. 107, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

20. *Id.* art. 2.

21. See Kyoto Protocol, *supra* note 5 (outlining binding GHG emissions reduction goals and programs).

22. *E.g.*, STEWART & WIENER, *supra* note 8, at 4 (discussing President Bush’s decision to “stay out” of the Kyoto Protocol).

23. Kyoto Protocol, *supra* notes 5–7 and accompanying text.

24. *E.g.*, STEWART & WIENER, *supra* note 8, at 29–30.

ket mechanisms provide regulated entities with an economic incentive to innovate cheaper mitigation methods.²⁵

The flexible market mechanisms include the CDM, Joint Implementation, and Emissions Trading.²⁶ Parties to the Kyoto Protocol have accepted targets for reducing emissions, which are divided into “assigned amount units.”²⁷ Through the Emissions Trading Program, countries and firms can buy or sell emissions allowances, such that a country with emissions units to spare (i.e. emissions permitted but not used) may sell excess units to countries that have exceeded their targets.²⁸ It is not only emissions that can be traded; the “carbon market” also includes the buying and selling of removal units (i.e. the creation of “sinks,” such as forests, that drain GHGs from the atmosphere), emission reduction units generated through Joint Implementation, and certified emissions reductions generated through the CDM.²⁹ The ADMPP, further explained below,³⁰ would generate emissions allowance units through the completion of adaptation projects, and these units could be bought and sold in the global carbon market.

C. *Adaptation Generally*

Regardless of the extent to which mitigation is undertaken globally, adaptation will also be required to reduce the adverse consequences of global warming.³¹ Climate change is already occurring, and some of its effects will be felt before mitigation can have any impact.³² Even if emissions are stabilized relatively soon (an unlikely prospect), sea level rise and anthropogenic warming will likely continue for many years to

25. *Id.* at 30.

26. Kyoto Protocol, *supra* notes 5–7 and accompanying text.

27. Kyoto Emissions Trading Website, *supra* note 5.

28. *Id.*; *see also* Kyoto Protocol, *supra* note 5.

29. Kyoto Emissions Trading Website, *supra* note 5.

30. *See infra* Part III.B.

31. IPCC AR4, *supra* note 9, at 56.

32. *See* Daniel A. Farber, *Adapting to Climate Change: Who Should Pay*, 23 FLA. ST. U. J. LAND USE & ENVTL. L. 1, 2 (2007) (noting that climate change “will continue to occur before mitigation measures can have any real impact”).

come.³³ While “mitigation is critical to the welfare of later generations, . . . adaptation is critical to our generation.”³⁴

The costs of climate change are expected to rise most dramatically in developing countries, making adaptation especially important for those nations.³⁵ Poorer countries that rely heavily on agriculture and tourism will be disproportionately affected by global warming and simply cannot afford the cost of climate change responses.³⁶ Many developing countries also lack the “absorptive capacity” to implement adaptation measures even when funding is available.³⁷ That is, developing countries will simultaneously be the most affected by global warming and the least capable of halting its progress and effects.³⁸

The UN predicts that, among other adverse effects, global warming will put 80 to 120 million additional people at risk of hunger, will escalate vector- and water-borne diseases, and could pose an existential threat to small island states.³⁹ For example, the entire population of the Maldives, like those of other small island states, could be forced to relocate because of global warming.⁴⁰ Recognizing the imminent adverse im-

33. *Id.* at 8 (citing IPCC, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 17 (2007), available at <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>).

34. *Id.* at 3.

35. See Daniel A. Cole, *Climate Change, Adaptation, and Development*, 26 UCLA J. ENVTL. L. & POL'Y 1, 3 (2008) (explaining that climate change will be especially destabilizing for developing countries in warm climates, “where the marginal effects of additional heating are likely to be greater”).

36. *Id.*

37. Benito Müller, *International Adaptation Finance: The Need for an Innovative and Strategic Approach* 4 (Oxford Inst. for Energy Stud., Working Paper, June 2008), available at www.eed.de/fix/files/doc/2008_BMueller_int_adapatation_finance.pdf.

38. Ruth Gordon, *Climate Change and the Poorest Nations: Further Reflections on Global Inequality*, 78 U. COLO. L. REV. 1559, 1560 (2007).

39. *Id.* at 1592–93. See also United Nations Framework Convention on Climate Change, *Investment and Financial Flows to Address Climate Change, Executive Summary*, § 2.2, ¶ 25 (2007) [hereinafter “UNFCCC Executive Summary”], available at http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/background_paper.pdf (noting that small island developing States may have problems raising the necessary funds to adequately respond to a rising sea level).

40. See Nicholas Schmidle, *Wanted: A New Home for My Country*, N.Y. TIMES MAGAZINE, May 10, 2009, at MM38 (describing the Maldives’ president’s quest to “find a new homeland” for the nation’s people due to rising sea levels).

pacts of global warming, the adaptation approach to addressing climate change seeks to prepare for and blunt the effects of unavoidable global warming.

It is still unclear exactly how much money adaptation requires because the process will need to be widespread and heterogeneous, though it will likely require tens of billions of dollars per year for the next several decades.⁴¹ The World Bank estimates a cost of between \$9 billion and \$41 billion for adapting to climate change in developing countries.⁴²

Regardless of the exact dollar amount needed for adaptation, the UNFCCC has said that funding additional to existing domestic sources will be necessary in the range of tens of billions of dollars,⁴³ especially for sectors and countries already heavily reliant on development assistance.⁴⁴ For example, adaptation funding mechanisms for health sectors in least developed countries and for coastal infrastructure in developing countries that are vulnerable to sea level rise are insufficient.⁴⁵ The bottom line is that “the level of international funding for adaptation in developing countries is woefully inadequate to meet projected needs.”⁴⁶ The pilot program envisioned in this Note aims to fill at least some of this funding gap.

At the United Nations Climate Change Conference in Copenhagen in 2009, signatories of the Copenhagen Accord, a nonbinding international agreement that sets targets for emissions reductions and adaptation support, noted the need for adaptation and committed developed countries to “provide adequate, predictable, and sustainable financial resources . . . to support the implementation of adaptation action in developing countries.”⁴⁷ That said, the parties were unable to agree on binding emissions targets and adaptation funding, and de-

41. See, e.g., Farber, *supra* note 32, at 2; Müller, *supra* note 37, at 4.

42. See Müller, *supra* note 37, at 6 tbl.1 (citing The World Bank, *Clean Energy and Development: Towards an Investment Framework*, at 144 tbl.K.1, DC2006-0002 (Apr. 5, 2006)).

43. See UNFCCC Executive Summary, *supra* note 39, ¶ 25 (“Estimated overall additional investment and financial flows needed for adaptation in 2030 amount to several tens of billion United States dollars.”).

44. *Id.* ¶ 28.

45. For useful sector-by-sector estimates of adaptation costs, see *id.* ¶ 25.

46. See Müller, *supra* note 37, at 4.

47. Conference of the Parties to the Framework Convention on Climate Change in, Copenhagen, Den., Dec. 7–18, 2009, *Copenhagen Accord*, ¶ 3, U.N. Doc. FCCC/CP/2009/L.7 (Dec. 18, 2009) [hereinafter “*Copenhagen Accord*”].

veloped and developing countries had disagreements about both issues.⁴⁸ Developed countries agreed to provide \$30 billion to split between adaptation and mitigation in developing countries, with an emphasis on adaptation for the most vulnerable countries.⁴⁹ They also committed, though they did not detail specifics, to provide additional adaptation funding in the future through an “effective and efficient” mechanism.⁵⁰ The ADMPP seeks to be such a mechanism.

Despite the urgency of adaptation, it has been placed on the back burner while governments concentrate on mitigation efforts. Adaptation has often been neglected, as environmentalists in developed countries have feared that raising political pressure for adaptation would undermine mitigation efforts.⁵¹ Despite the focus on GHG mitigation by policy and research experts,⁵² it is crucial to begin adapting to the unavoidable impacts of global warming and assisting those countries that lack the resources to do so.

D. *The CDM*

This Note proposes the creation of a pilot program for adaptation, the ADMPP, which would be in some ways analogous to the Kyoto Protocol’s Clean Development Mechanism. The CDM allows countries with commitments under the Kyoto Protocol to generate certified emissions reduction (“CER”) credits by implementing emissions-reducing projects in developing countries.⁵³ CERs can be counted toward Kyoto compli-

48. See Andrew C. Revkin & John M. Broder, *A Grudging Accord in Climate Talks*, N.Y. TIMES, Dec. 20, 2009, at A1 (describing the political difficulties during the Copenhagen conference).

49. *Copenhagen Accord*, *supra* note 47, ¶ 8.

50. *Id.*

51. See Farber, *supra* note 32, at 2 (“Adaptation has been a neglected topic, in part because . . . environmentalists [fear] that discussing possible adaptive measures might undermine the political pressure for mitigation.”).

52. See Ira R. Feldman & Joshua H. Kahan, *Preparing for the Day after Tomorrow: Frameworks for Climate Change Adaptation*, 8 SUSTAINABLE DEV. L. & POL’Y 61, 63 (2007) (“GHG mitigation has been the focal point of most climate change research and discussions.”).

53. Kyoto Protocol, *supra* note 5, art. 12; see also CDM Website, *supra* note 3 (describing purpose, structure, and function of Clean Development Mechanism).

ance or sold in the carbon market.⁵⁴ The CDM introduces geographic flexibility by encouraging emissions to be reduced beyond the borders of the parties to the Kyoto Protocol.

According to the Kyoto Protocol, a project that generates CERs must be voluntary; produce real, measurable, and long-term results; and reduce emissions beyond any reduction that would occur in the absence of the CDM project.⁵⁵ The CDM has played an important role in transforming the global carbon market into a multi-billion-dollar institution.⁵⁶ It has also demonstrated the international capacity to create a regulatory infrastructure for evaluating projects and issuing credits.⁵⁷ That is, the CDM is useful not only in generating investment in clean development but also in expanding the global carbon market, both in terms of participants and activities.⁵⁸ Perhaps the most important contribution of the CDM is the successful use of private economic interests and incentives to effectuate public climate policy.⁵⁹

III. USING MARKET MECHANISMS TO FUND ADAPTATION: CALL FOR A PILOT PROGRAM

A. *Adaptation Wedges*

In their article *Stabilization Wedges: Solving the Climate Change Problem for the Next 50 Years with Current Technologies*, Stephen Pacala and Robert Socolow argue that there is no single technology that can be used to achieve desired mitigation goals.⁶⁰ Rather, they envision seven wedges, or components,

54. E.g. Christopher Carr & Flavia Rosembuj, *Flexible Mechanisms for Climate Change Compliance: Emission Offset Purchases Under the Clean Development Mechanism*, 16 N.Y.U. ENVTL. L.J. 44, 48 (2008).

55. Kyoto Protocol, *supra* note 5, at art. 12(5)(a)–(c).

56. See Carr and Rosembuj, *supra* note 54, at 60 (“CDM [was] successful in bringing substantial amounts of capital into the carbon market in a short amount of time.”).

57. *Id.* at 60–61.

58. See *id.* at 61 (describing the carbon market’s vast growth since the advent of the CDM).

59. C.f. Christina Voigt, *Is the Clean Development Mechanism Sustainable? Some Critical Aspects*, 8 SUSTAINABLE DEV. L. & POL’Y 15, 15 (2008) (“CDM. . .brings together private economic interests and public climate policy by helping to channel private sector investment toward climate friendly projects that otherwise might not have taken place.”).

60. Pacala & Socolow, *supra* note 17, at 968.

that will cumulatively reduce emissions.⁶¹ The stabilization wedges approach is thus appealing and realistic, as it relies on current technology and recognizes that emissions mitigation will have to come from several places. This implies that we should not wait around for one breakthrough innovation.

The Pacala and Socolow article provides a useful framework through which adaptation financing can be viewed. Rather than attempting to raise all the money necessary for climate change adaptation through one mechanism, we should focus on a wedges-type approach. Some financing could be raised through the CDM Adaptation Fund, some through burden sharing, some through an international travel tax, etc. The ADMPP is intended to be another adaptation wedge. Although this proposal could not provide all the needed funding for adaptation on its own, it could play a useful role in getting us closer to providing an adequate level of adaptation funding.

B. *Mechanics of the Proposal*

1. *Program Overview*

The CDM allows firms to generate CERs (that can be used as carbon emissions allowances) by undertaking projects in other countries that result in a net decrease in emissions.⁶² CERs can then be bought and sold on the global carbon market as emissions allowances.⁶³ Similarly, through the ADMPP, firms would generate emissions allowances by assisting in climate change adaptation projects in developing countries; the emissions allowances could then be bought and sold in the carbon market. The ADMPP could be established under the Kyoto Protocol (or its successor) or it could be established as a separate entity.

Under the program, each country requesting adaptation assistance would start by submitting a National Adaptation Plan of Action ("NAPA"). Recognizing that least developed countries have a limited ability to adapt to climate change, NAPAs are an existing tool through which least developed

61. *Id.* (describing the organization of stabilization technologies into seven "wedges").

62. See *supra* Part II.D for a more detailed discussion of the CDM.

63. *Id.* at 12.

countries identify and prioritize their most urgent needs for adaptation, though NAPAs are not frameworks of assessment or implementation.⁶⁴ The NAPA process is largely bottom-up and country-specific, drawing primarily from the input of local communities and focusing on urgency and cost effectiveness.⁶⁵ The ADMPP Executive Commission would then use NAPAs to identify the most urgently needed adaptation measures that should receive funding from the pilot program. The commission would then award emissions allowances, to whichever entity wins the bid for completing (and completes) the NAPA-identified adaptation project.

Although the ADMPP is in many ways analogous to the CDM, it differs in a few important respects. First, if we had followed a strict analogy to the CDM, firms would select their own projects and receive the corresponding amount of allowances for their work.⁶⁶ The application of this model to adaptation would cause insurmountable pricing problems because, unlike the CDM, there is no way to evaluate how many allowances a given adaptation project should produce. How, for example, could a commission evaluate how many emissions allowances to award for the completion of a sea wall, or perhaps even more difficult, assistance in the development of drought-resistant crops? One possible method would be to use the cost of the project. But, if cost were used, there would be no incentive to reduce the costs of adaptation; in fact, firms would have an incentive to over-report project costs. Another possible method would be to use some kind of aggregate welfare-generation measurement, whereby firms would be awarded allowances based on how much welfare was produced by a given project. However, this amount is also impossible to measure.⁶⁷

64. See, e.g. Feldman & Kahan, *supra* note 52, at 64 (describing the principal goal and strategies of NAPA); United Nations Framework Convention on Climate Change, National Adaptation Programmes of Action (NAPAs), http://unfccc.int/national_reports/napa/items/2719.php (last visited Apr. 10, 2010).

65. *Id.* For downloadable files of the NAPAs that have been submitted to date, see <http://unfccc.int/adaptation/napas/items/4585.php>.

66. See Cooperative Development Mechanism, About CDM, <http://cdm.unfccc.int/about/index.html> (last visited Apr. 10, 2010) (defining and explaining the operating details of the CDM).

67. It might be possible to make estimates of the monetary value based on lives or life years to be used, in addition to a valuation of one life year

To address these pricing problems and to make this program a truly market-based mechanism, the commission should have firms bid on adaptation projects and then award the job to the firm that can carry out the project for the best value (a combination of lowest cost and highest quality). The bidding process, or reverse auction, would be conducted in a manner similar to contracting and subcontracting in public projects in the United States.⁶⁸

This is not the first reverse auction proposal for dealing with climate change. David Bradford proposed that a reverse auction approach be used for climate change mitigation such that each country would contribute funding to a commission that would then purchase GHG emissions reductions from participating countries.⁶⁹ Bradford proposed this model as a successor to the Kyoto scheme as a way to fundamentally reshape the property rights regime currently in use.⁷⁰ The ADMPP and Bradford reverse auctions' share two major benefits. The first is that the reverse auction method allows for added flexibility; countries (or a commission) could more precisely decide how much adaptation (or mitigation in Bradford's model) to fund and could develop different criteria for doing so.⁷¹ For example, for any given year, the commission could decide how many projects to fund, how many allowances to provide, or how many projects of a given scale to pursue. The other shared benefit of the two proposals is that even if countries choose not to take part in the scheme directly (by funding adaptation projects), the burden would still be distributed geographically.⁷² While a given country's firms may

saved. This would then be used to determine the amount of emissions allowances that should be awarded. Such an estimation method, however, is far more complicated than the reverse auction proposed in this Note.

68. See *infra* Part V.B.1 for a more detailed discussion.

69. David F. Bradford, *Improving on Kyoto: Greenhouse Gas Control as the Purchase of a Global Public Good* (Princeton Univ. Cntr. for Econ. Pol'y Stud., Working Paper No. 96, 2004), available at <http://ideas.repec.org/p/pri/cepsud/106.html> (explaining his "purchase of a global public good" approach to controlling greenhouse gas emissions).

70. See *id.* at 5–9 (comparing the property rights regime of the Kyoto Protocol to the "purchase of a global public good" approach).

71. See *id.* at 19 (describing the flexibility of the "purchase of a global public good" approach).

72. See *id.* at 20 (explaining the burden distribution requirement of the "purchase of a global public good" approach).

choose not to participate in adaptation programs, all countries would bear part of the burden of the overall reduced number of emissions allowances because of cross-border projects run by other countries' firms.⁷³

It is irrelevant whether firms bidding on the projects are regulated industries or contractors who would then sell the allowances on the global carbon market. The commission would award the project to the firm providing the best value,⁷⁴ regardless of the type of firm. The auction method would create a market for adaptation projects, providing incentives for firms to innovate and to help countries adapt in the most cost-efficient manner.

This program might generate several potential problems and perverse incentives, which are addressed below in Part V. Although this proposal is not without flaws, if combined with other adaptation financing measures, it could make a meaningful impact on climate change adaptation as an adaptation wedge.

2. *The Commission*

The Executive Committee of the Montreal Protocol Multilateral Fund, which assists developing countries in reducing their emission of ozone-depleting substances, provides a useful example for how the ADMPP governing commission could be run.⁷⁵ The Multilateral Fund makes funding decisions through a rotating membership in the Committee, which is composed of an equal number of members from developed and developing countries.⁷⁶ The Committee makes funding decisions on a consensus basis or, if unable to achieve consensus, on a 2/3 majority basis.⁷⁷ The Multilateral Fund generally

73. Further discussed *infra* Part V.B.3.

74. Further discussed *infra* Part V.B.1.

75. See Multilateral Fund for the Implementation of the Montreal Protocol, About the Multilateral Fund, http://www.multilateralfund.org/about_the_multilateral_fund.htm (last visited Apr. 10, 2010) (explaining the role of the Executive Committee in managing The Multilateral Fund).

76. See, e.g., Phoenix X.F. Cai, *Aid for Trade: A Roadmap for Success*, 36 DENV. J. INT'L L. & POL'Y 283, 290 (2008).

77. *Id.* Note that the Committee has always come to a consensus. Multilateral Fund for the Implementation of the Montreal Protocol, Executive Committee, http://www.multilateralfund.org/executive_committee.htm (last visited Apr. 10, 2010).

has been considered a success.⁷⁸ The ADMPP could be run by a similarly balanced commission of experts that would evaluate NAPAs and make funding decisions. Certain higher-level policy decisions, such as how many projects to fund with the ADMPP, would probably have to be made by signatories to the Kyoto Protocol (or its successor) instead of the commission. Day-to-day operations and implementation of the ADMPP could be carried out by a secretariat similar to that of the Montreal Protocol.⁷⁹

3. *Emissions Allowances or Cash*

It is also important to briefly explain why it is better to pay firms for adaptation projects in emissions allowances rather than with cash payments. The primary reason is that any project that aims to move millions or billions of dollars from developed to developing countries could run into serious political economy problems. Additionally, although adaptation funding is urgently needed, developed countries are not in a hurry to send direct cash payments in the form of development assistance for adaptation. Rather, this project allows developing countries to receive funding from a variety of private sources that are not able to meet their individual emissions quotas. The ADMPP seeks to avoid, as much as possible, the use of official development assistance and instead to provide another fundraising avenue for adaptation.

4. *Choosing a Sector for the Pilot Program*

There are several sectors in a number of developing countries that are in need of adaptation financing.⁸⁰ The UNFCCC Executive Summary identifies nine priority areas for adaptation based on the most urgently needed measures.⁸¹ Listed from least to most costly, they are: national policies, human

78. See Cai, *supra* note 77 at 289. (noting that the Fund “was one of the keystones of the Ozone Convention’s success”).

79. See Multilateral Fund for the Implementation of the Montreal Protocol, Fund Secretariat, http://www.multilateralfund.org/fund_secretariat.htm (last visited Apr. 11, 2010) (explaining the role of the Multilateral Fund Secretariat).

80. See, e.g., UNFCCC Executive Summary, *supra* note 39, at 132 figs.VI-21, VI-22 (providing various tables of countries and sectors in need of adaptation financing).

81. *Id.*

health, infrastructure, national ecosystems, coastal zones, capacity building and research, extreme events, water supplies, and agriculture, forest and fisheries.⁸² The report utilizes existing NAPAs to determine cost and urgency.⁸³

This Note attempts to select one priority sector as the focus of the ADMPP. By selecting one sector in which to implement a pilot ADMPP, the commission will have greater flexibility to quickly resolve any unanticipated problems and, ideally, the pilot sector project will provide useful lessons that can then be applied to a broader program. After the pilot program has been implemented and adjusted, the program should be extended to all areas of adaptation and all developing countries so as to provide the greatest amount of distributional equity and to include the greatest number of projects in the adaptation market. The rest of this section is devoted to determining which sector is most appropriate to host the pilot program and, ultimately, identifies coastal zones as that sector.

a. *Human Health*

The least expensive sector identified by the UNFCCC Executive Summary, in terms of most urgently needed projects, is human health. Perhaps the most important benefit of choosing this sector would be the fact that climate-change-related disease is expected to cause losses of 3.6 million and 26.7 million life years in India and sub-Saharan Africa respectively, which could drive tremendous popular support for adaptive measures.⁸⁴ The main benchmarks for evaluating human health issues related to climate change are improving living standards and hygiene, and controlling disease vectors.⁸⁵

Addressing human health impacts in a pilot program, however, is problematic. The human health priority area suffers from significant causation concerns. Because human health problems have always been prevalent, it is one of the most difficult sectors to associate with climate change. Climate

82. *Id.*

83. *Id.*

84. Posner & Sunstein, *supra* note 16, at 1581.

85. *See, e.g.*, UNFCCC Executive Summary, *supra* note 39, § 6.2.1.5, at ¶ 529.

change will increase the spread of tropical disease,⁸⁶ but measuring the marginal increase that the ADMPP should address would be very difficult, if not impossible.

b. *Infrastructure*

The infrastructure priority area is also relatively inexpensive.⁸⁷ NAPAs identify the protection of tourism infrastructure and the enhancement of urban resilience to climate change as infrastructure concerns, along with road protection and expansion of communications infrastructure as the main tools for addressing these concerns.⁸⁸

Similar to the human health priority area, many of the methods used in infrastructure resemble general development strategies. For example, improving tourism infrastructure is similar to promoting economic development. This is potentially problematic because, as further discussed below in Part V(B)(2), even though general development is desirable it should not be the target of the limited funding that will be generated through the ADMPP. I concede, however, that this claim could be contested, since the best way for a society to be prepared to adapt is by having greater overall access to resources. Although some infrastructure will undoubtedly suffer because of climate change, application of the ADMPP to infrastructure should be postponed until after the program has been tested and refined.

c. *National Ecosystems*

The primary benefit of including national ecosystems in the ADMPP would be the clear causal link between global warming and ecosystem impacts. Changing weather patterns will put significant strain on natural ecosystems. That said, I predict that it will be easier to raise initial public support in developed countries for projects more directly related to peo-

86. See Gordon, *supra* note 38, at 1592 (noting that the Working Group on Climate Change and Development has predicted that vector- and waterborne diseases will escalate).

87. See UNFCCC Executive Summary, *supra* note 35, at 132 fig.VI-22 (comparing the costs of adaptations of various sectors).

88. *Id.* ¶ 532.

ple in developing countries.⁸⁹ Since this is only a pilot program and will later be expanded, the initial implementation should be in a sector with broad public support. Another factor weighing against starting with national ecosystems is that it is very difficult to measure success in the protection of ecosystems, a difficulty that could result in monitoring problems that are better left to a later stage when the program is more established.

d. *Capacity Building, Research, and National Policies*

NAPAs reveal that a sizeable amount of money must be raised to support developing countries' capacity building. Capacity building includes increasing the ability to research and implement adaptation methods, including the implementation of national policies that put adaptation into domestic agendas.⁹⁰ Such activities involve efforts such as human resource development, enhancement of institutions, and expansion of information and networking systems.⁹¹

These activities are relevant to every sector of climate change adaptation and are obviously important, though not necessarily appropriate for the ADMPP. For the ADMPP to be successful, there must be adequate human capacity and technology in the recipient country, both for implementation and monitoring of projects. The best way for every project to have an appropriate level of capacity is to require some percentage of each project's funds be devoted to capacity building, rather than funding it as a separate project. Such an approach would

89. Although this is only a prediction, there are studies suggesting that humanitarian projects tend to be the most popular types of foreign aid. See generally ROSEMARIE PHILLIPS & DIANA DAVIS, DEVELOPMENT ASSOCIATES, INC., AN ASSESSMENT REPORT: U.S. PUBLIC OPINION ON DEVELOPMENT ASSISTANCE 16 (2003) (concluding that, among Americans, "'[e]veryday themes' such as hunger and the need for medical assistance [. . .] such as the global environment continue to have universal appeal as worthy areas with which to help other countries and/or resources"); cf. Jan Szczycinski, *Public opinion polls in the European emerging donors on development cooperation*, UNITED NATIONS DEVELOPMENT PROGRAMME, Mar. 1, 2009, at 10 (reporting that "AIDS and other diseases (36%) and education in developing countries (35%) emerge as the areas where citizens feel that EU development aid can be most effective").

90. See UNFCCC Executive Summary, *supra* note 39, § 6.3 (describing the need for better human and capital resources to better collect data and strengthen institutions).

91. See, e.g., *id.* ¶ 535.

ensure that capacity and technology are calibrated with individual projects, thus keeping costs proportionate to need.

e. *Extreme Events*

NAPAs identify extreme events as another sector requiring urgent adaptation funding.⁹² Small island states and low-lying states with long coastlines strongly advocate for increased funding for this sector. Adaptation activities in this sector include enhancing disaster management, warning systems, and drought and flood prevention mechanisms.⁹³ However, because extreme events obviously occurred even before climate change, it may be difficult to determine which events, or which increased impacts of these events, are caused by climate change; thus, there will likely be causation problems when deciding how to implement the adaptation funding program in this sector.⁹⁴ The ADMPP should not fund extreme events activities that are unrelated to climate change, for reasons similar to those against funding general development activities.⁹⁵ A causal link between climate change and extreme events might be relevant if we want current polluters' payments to act as compensation for adverse impacts of historical emissions, rather than on areas not caused by climate change.

One possible way to mitigate the causation problems for extreme events adaptation would be to determine the percentage increase in disasters that is due to climate change and to fund preparation for extreme events proportionately. Daniel Farber suggests another possible solution: society could view causation in climate change as analogous to medical monitoring in US tort law.⁹⁶ Medical monitoring awards compensate plaintiffs who have suffered increased risk of a disease, before the disease has actually manifested itself. The plaintiff must

92. See *id.* at fig.VI-22 (identifying "extreme events" as one of nine NAPA priority activities).

93. *Id.* ¶¶ 525–26, 528.

94. See Posner & Sunstein, *supra* note 16, at 1597 (arguing that it "might well be impossible to show that greenhouse gas emissions in the United States 'caused' a monsoon in India).

95. See *infra* Part V.B.2 for arguments against funding general development activities.

96. See Daniel A. Farber, *Basic Compensation for Victims of Climate Change*, 155 U. PA. L. REV. 1605, 1635–36 (2007) (comparing climate change liability with toxic tort liability).

prove four elements: first, she has suffered exposure to a proven hazardous substance because of the defendant's negligent actions; second, the exposure is a proximate cause of the plaintiff's substantially increased risk of contracting a disease; third, the increased risk makes diagnostic medical examinations necessary; and, fourth, existing monitoring procedures make early detection possible and beneficial.⁹⁷ Although victims of extreme events have not been exposed to a hazardous substance, they suffer a substantially increased risk of extreme events as a result of the collective actions of developed countries, even where it is difficult to link a specific historic emission with a particular extreme event.⁹⁸ It is debatable whether the countries that have made the biggest contributions to global warming can truly be considered "negligent,"⁹⁹ but we are at least certain that the actions of developed countries have played a significant role in causing climate change.¹⁰⁰ Similarly, monitoring and preparing for extreme events is necessary to reduce their impact in developing countries. For purposes of the ADMPP, however, this Note seeks a sector that raises fewer causation problems than extreme events.

f. *Water Supplies*

NAPAs indicate that a sizeable amount of money is necessary to fund projects that address urgent concerns about diminished water supplies resulting from climate change.¹⁰¹ Such projects include, but are not limited to, protecting water supply infrastructure, improving management of surface water, constructing surface facilities, and slowing the rate of

97. See *id.* at 1636 (citing *In re Paoli R.R. Yard Litig.*, 916 F.2d 829, 852 (3d Cir. 1990) (articulating the necessary elements for a successful medical monitoring claim)).

98. See generally IPCC AR4, *supra* note 9 (reviewing the causes of climate change, laying much responsibility on developed economies, and anticipating the potential results of climate change).

99. See, e.g., Posner & Sunstein, *supra* note 16, at 1572 (arguing that "it is difficult to blame green-house gas emitters for wrongful behavior"). But see Daniel A. Farber, *The Case for Climate Compensation: Justice for Climate Change Victims in a Complex World*, 2008 UTAH L. REV. 377, 390-91 (2008) (arguing that multiple polluters who caused a single harm should not escape liability).

100. See IPCC AR4, *supra* note 9, at 36-41 (identifying pollution caused by industrialized economies as a primary cause of climate change).

101. See UNFCCC Executive Summary, *supra* note 35, at 132 fig.VI-22 (showing water supplies to be the second most costly adaptation sector).

salinization of water.¹⁰² The water supplies sector is a good candidate for the ADMPP because of its straightforward nature and should be among the first sectors addressed if the pilot program is expanded, though it should not be the initial sector chosen because, as argued below, in Part III(B)(4)(h), the coastal zones sector constitutes a slightly better candidate. Water supplies could feasibly gain substantial public support in developed countries, and issues such as salinization due to sea level rise lack the causation difficulties of extreme events.¹⁰³

g. *Agriculture, Forestry, and Fisheries*

Of the sectors prioritized by NAPAs, agriculture, forestry, and fisheries is by far the largest and most costly.¹⁰⁴ Adaptation activities in this sector include the development of drought-resistant crops and livestock, livelihood diversification for agriculture- and livestock-dependent rural communities, development of seed and food banks, forest management projects, improvement of agricultural and irrigation practices, and development of salt-tolerant fish and fish conservation.¹⁰⁵ Because this sector calls for so many different activities, it is difficult to pin down general benefits and detriments of the category. Some activities, such as developing drought-resistant crops and livestock, are without causation problems, but they would be almost impossible to monitor and quantify in a short period. That is, it would be relatively more time-consuming to monitor a firm's success in developing drought-resistant crops than, for example, building a sea wall. Because the ADMPP would meet with more support if its initial sector is easily quantifiable, this category should be saved for a later expansion of the ADMPP.

h. *Coastal Zones*

The costs of adaptation activities in the coastal zones sector are significantly lower than those in the agriculture, for-

102. *Id.* ¶ 520.

103. Sea level rise is associated with global warming. *E.g.*, IPCC AR4, *supra* note 9, at 31 fig.1.1.

104. *E.g.*, UNFCCC Executive Summary, *supra* note 35, at 132 fig.VI-22.

105. *Id.* ¶ 517.

estry, and fisheries sector.¹⁰⁶ NAPA-identified priority activities in coastal zones include improving and installing sea defenses and causeways, and planting mangroves.¹⁰⁷ Although this sector is not without difficulties, it is the sector best suited to the ADMPP because it suffers from the fewest causation and monitoring problems.

The coastal zones priority area consists of ways of responding to rising sea levels. A World Bank report states that without adapting to rising sea levels, the small island state of Kiribati could experience a reduction of 17 to 34 percent of its GDP.¹⁰⁸ Indeed, small island states are among the most vulnerable to climate change because of sea level rise.¹⁰⁹ Island and coastal states will experience higher levels of saltwater intrusion, coastal erosion, and storm damage as a result of rising seas.¹¹⁰ Sea level rise affects several priority areas, such as coastal zones, water resources, and human health.¹¹¹ Indeed, if sea level rise is not properly addressed, some small island states, Tuvalu for example, may have to evacuate their entire populations.¹¹²

Because coastal zone projects that address sea level rise lack causation concerns, are predictable, and produce measurable results, this is the best sector in which to implement the ADMPP. Sea level rise can be measured in a relatively straightforward manner, which results in fewer causation problems than other priority sectors.¹¹³ Sea level rise stems at least in part from global warming, and sea levels have risen at an average rate of 3.1 millimeters per year between 1993 and 2003 due to thermal expansion and melting glaciers, ice caps, and

106. *Id.* at fig.VI-22.

107. *Id.* ¶ 524.

108. SOFIA BETTENCOURT ET AL., THE WORLD BANK, NOT IF BUT WHEN: ADAPTING TO NATURAL HAZARDS IN THE PACIFIC ISLANDS REGION 7 (2006), available at <http://siteresources.worldbank.org/INTPACIFICISLANDS/Resources/Natural-Hazards-report.pdf>.

109. STEWART & WIENER, *supra* note 8, at 23.

110. Stephen Tully, *The Contribution of Human Rights as an Additional Perspective on Climate Change Impacts within the Pacific*, 5 N.Z. J. PUB. & INT'L L. 169, 171 (2007).

111. See, e.g., Feldman & Kahan, *supra* note 52, at 65 (describing the environmental problems facing the island nation of Tuvalu that are due to a rising sea level).

112. E.g., Farber, *supra* note 32, at 10.

113. Farber, *supra* note 96, at 1607.

polar ice sheets.¹¹⁴ Unlike extreme events, sea level rise is predictable,¹¹⁵ and, because it is more clearly tied to anthropogenic GHG emissions, causation is a relatively minor problem.

In addition to lacking in causation problems, coastal zone projects are easier to monitor and quantify, making them ideal for a pilot program. To return to a previous example, it will likely be less time-consuming for those overseeing the ADMPP to do quality control on the construction of a sea wall than, for example, preventing vector-borne diseases or creating drought-resistant crops.

If the ADMPP is successful in addressing coastal zone projects, it should next be expanded to cover all adaptation areas related to sea level rise since they have fewer causation concerns, such as water resources and human health. Hopefully with some experience, the commission overseeing the ADMPP will be proficient enough in monitoring projects to expand its scope even further, gradually taking on projects in all priority areas.

C. *Benefits of Using Market Mechanisms to Address Climate Change Adaptation*

The current mechanisms used to fund climate change adaptation are falling drastically short of providing comprehensive adaptation funding, even for the most urgently needed projects.¹¹⁶ Market-based mechanisms could fill at least some of this gap and make a meaningful impact on adaptation financing. The most obvious benefit of the ADMPP is that it would provide an additional source of funding. In addition, the ADMPP would provide substantial benefits specific to its design and its market-based nature.

1. *Distributive Equity*

A major problem with the Kyoto Protocol's CDM is the way in which it concentrates funding in only a few countries.

114. IPCC AR4, *supra* note 9, at 30.

115. See Farber, *supra* note 96, at 1611 ("Sea level rise is one of the most predictable consequences of climate change.").

116. See generally UNFCCC Executive Summary, *supra* note 39 (providing a detailed analysis of the need for additional adaptation and mitigation funding).

China represents 50 percent of the CDM market¹¹⁷ and, since projects in China can be completed relatively more cheaply than in other countries, it has become almost impossible for African countries to receive the advantages of the CDM.¹¹⁸ This compounds development problems in African countries because they already have much more difficulty attracting foreign direct investment.¹¹⁹ For that reason, African countries have called for geographical quotas on the CDM, a proposal that has been generally opposed by northern countries.¹²⁰ It is also likely that geographical quotas would distort the carbon market, but these distortions could be outweighed by long-term economic and distributional benefits.¹²¹

Although the ADMPP is roughly analogous to the CDM, it would promote greater distributive equity. Firms would only be able to carry out ADMPP projects in areas with the most urgent adaptation needs. Unlike the CDM, the ADMPP would be governed by a commission that evaluates NAPAs and selects projects for bidding. In contrast to the CDM, which is dominated by Chinese projects, ADMPP projects would be selected on the basis of urgency and distributive equity, which would result in the selection of projects from a variety of developing and least-developed countries rather than from only one or a few countries. Additionally, least developed countries would be most served by the program since they are most vulnerable to climate change.¹²² Unlike the CDM, firms would not be able to select only the cheapest projects in which to implement adaptation, a practice that has resulted in the overrepresentation of China in the CDM. This restriction would introduce some distortion to the market, making the market less flexible and mitigation marginally more costly, but it is a necessary

117. See, e.g., Carr & Rosembuj, *supra* note 54, at 53.

118. Cf. Ian H. Rowlands, *The Kyoto Protocol's "Clean Development Mechanism": A Sustainability Assessment*, 22 *THIRD WORLD Q.* 795, 806 (2001) (noting that African countries are lobbying for "geographical quotas of CDM activity because Africa has no single country that will attract investment").

119. *Id.*

120. See Rowlands, *supra* note 118, at 806.

121. *Id.* at 806-07.

122. See STEWART & WIENER, *supra* note 8, at 22-23 (noting that developing countries are most vulnerable to climate change because of "their location, climate, environment, larger share of economic activity in climate-sensitive sectors such as agriculture, and lack of resources and capacity for taking measures to adapt").

measure to ensure distributive equity. Further, competition generated through the reverse auction will hopefully drive down the cost of implementing a project, which translates to lower mitigation costs.

Of course, the ADMPP will first focus only on countries with coastal zones, a limitation which will also result in some market distortions. However, of the sixteen countries whose NAPAs were evaluated in the UNFCCC Executive Summary, eleven have coasts.¹²³ Thus, most countries urgently in need of adaptation assistance would be included in the program's market, thereby minimizing market distortions. Further, if the ADMPP were expanded beyond a pilot program, far more developing countries could be involved, eliminating this market distortion completely.

2. *Greater Overall Flexibility to Meet Emissions Quotas*

Richard Stewart and Jonathan Wiener have argued that in order to protect the climate in the most cost-effective way, all nations with significant GHG emissions should be included in the global climate change regime.¹²⁴ As of this writing, the United States, China, India, and Brazil are not part of the Kyoto reduction scheme and are hampering international mitigation efforts with their unchecked emissions.¹²⁵ The failure to include all major emitters will result in: the discouragement of Kyoto participants from meeting their commitments; emissions leakage (where emission-producing activities are simply shifted to unregulated countries); less than maximum cost efficiency in emissions trading; and undue concentration of market power in a few countries (such as Russia and Ukraine).¹²⁶

There are obstacles, however, in getting full participation in the global carbon market and emissions reduction schemes. Perhaps the biggest problem is that some important countries will continue to decline taking on Kyoto commitments for reasons of self-interest.¹²⁷ Simple cost-benefit analysis keeps

123. See UNFCCC Executive Summary, *supra* note 52, at 132 fig.VI-21.

124. STEWART & WEINER, *supra* note 8, at 37.

125. *Id.*

126. See *id.* at 37–40 (arguing that fewer participants in the global carbon market drives prices up, while having only a few sellers allows them to gain disproportionately).

127. *Id.* at 40.

countries from reducing emissions where the detriment to the national economy outweighs the benefits realized from a cleaner environment.¹²⁸

The ADMPP would partially ameliorate this problem by adding further flexibility to the Kyoto emissions trading scheme. Similar to what Stewart and Weiner argue, greater flexibility in meeting emissions requirements could result in cheaper mitigation because marginal decreases to the cost of mitigation will theoretically result in a marginal increase in countries whose self-interest tips toward taking on mitigation commitments.¹²⁹ It is clear that in order to meet global mitigation targets, the number of countries involved in the global carbon market must be expanded.¹³⁰

The ADMPP would not necessarily be enough to draw the major polluters who are not parties to the Kyoto Protocol into the regime. However, it could result in lower costs for meeting mitigation targets, which would have a marginal impact on countries' cost-benefit analyses. The creation of an additional flexible tool to help countries meet emissions targets would bring us closer to the goal of establishing a climate change regime that includes all major emitters. Of course, a major problem with the ADMPP is that countries would be getting credit for lowering emissions when they have not actually done so.¹³¹

3. *Broader Private Participation in Adaptation*

Both emitting firms and non-emitting firms could bid on ADMPP projects. Emitting firms could bid on the projects and then hire other firms to carry them out, or non-emitting firms (e.g. local contractors) could bid on the projects and in turn

128. See, e.g., Posner & Sunstein, *supra* note 16, at 1568 (stating that China and the United States might not receive a net benefit from a climate agreement "that would be optimal from the world's point of view").

129. See STEWART & WEINER, *supra* note 8, at 37, 38, 58 (arguing that countries make decisions about climate change abatement based on "broad judgments about [. . .] overall national interest," which includes economic costs, and that wide participation in climate change mitigation and flexibility in "what, how, where, and when" emissions are reduced decreases overall costs).

130. UNFCCC Executive Summary, *supra* note 39, ¶ 10.

131. For a more detailed discussion of this problem, please see *infra* Part V.B.3.

sell emissions allowances in the global carbon market. It is possible that there could be some combination of emitting and non-emitting firms, with bidding based partially on local contractors' awareness of the projects and willingness to work for emissions allowances, since allowances are not the same as cash and would have to be sold in the carbon market. In the long run, assuming perfect knowledge, whoever could perform the adaptation project with a combination of lowest cost and highest quality (this Note's definition of "best value") would win the bid. Allowing additional private actors to bid on the projects would create more competition and further lower the cost of adaptation, thus making it appealing to allow more bidders rather than fewer.

The ADMPP could theoretically make it profitable for private, non-emitting, companies to become involved in climate change adaptation. Local contractors could win bids and then sell the allowances generated, not only resulting in urgently needed adaptation but also giving a boost to the local economy. Even if emitting firms win the bid, they will likely have to hire local contractors to carry out much of the adaptation project, because direct participation will often be inefficient.¹³² It is also possible that, if the ADMPP were to expand beyond the pilot phase, other private firms—pharmaceutical companies for example—might bid on adaptation projects that involve human health. Because drug companies are experienced in human health-type projects, they would be the most likely to bid on adaptation projects as a part of their normal profit-making operation. Using a market mechanism for adaptation would thus open the carbon market to companies beyond those that emit.

4. *Common but Differentiated Responsibilities and Corrective Justice*

The term "common but differentiated responsibilities" stands for the idea that some countries should pay more for

132. For example, a factory owner in Europe might win a bid for a project in Kiribati. He has little technical expertise about the project. Rather than sending his own personnel to Kiribati to implement the project, it is in his best economic interest to hire a local contractor. He would need similar local assistance to bid an appropriate amount on a project, and might consult local contractors to do so.

global public goods than others, based on their relative wealth.¹³³ This principle implies that developed countries should bear a heavier burden than developing countries in mitigating climate change because developed countries have contributed the most to global GHG concentrations and possess the best economic and technological resources to deal with emissions.¹³⁴

Because economic development is the primary method for eradicating poverty and because mitigation efforts involve regulating industry, which can hamper an economy, it may not be equitable for developing countries to share equally in the mitigation burden.¹³⁵ A number of developing nations have argued that they are entitled to allow their emissions to grow to the same per capita level as developed countries.¹³⁶ Developed countries have historically emitted the most GHGs, and it is arguably unjust for them now to make development more costly for developing nations.¹³⁷ However, Richard Posner and David Weisbach challenge this argument, arguing that new data show that some developing countries are not innocent victims of developed countries' industrial emissions but have also contributed substantially to climate change through their land use policies.¹³⁸

Even if some developing countries have played a significant role in emissions, there is still a strong case for applying common but differentiated responsibilities in adaptation. Posner and Sunstein argue that although the transfer of wealth from rich to poor nations can be a laudable goal, doing so

133. Christopher D. Stone, *Common but Differentiated Responsibilities in International Law*, 98 AM. J. INT'L L. 276, 299 (2004).

134. E.g., Anita M. Halvorssen, *Common, but Differentiated Commitments in the Future Climate Change Regime: Amending the Kyoto Protocol to Include Annex C and the Annex C Mitigation Fund*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 247, 254-55 (2007).

135. *Id.* at 254.

136. Gordon, *supra* note 38, at 1602.

137. Halvorssen, *supra* note 134, at 254.

138. ERIC A. POSNER & DAVID WEISBACH, *CLIMATE CHANGE JUSTICE* 37-38 (2010). The authors go on to concede, however, that the fifteen most vulnerable countries to climate change include fourteen in Africa and Bangladesh, none of which has contributed significantly to climate change. These countries "cannot adapt as easily as rich countries", and "countries in Africa emit very little. . . regardless of the measure of emissions used." *Id.* at 19, 22.

through in-kind transfers makes little sense because it is an inefficient transfer of wealth that favors future poor people over current poor people.¹³⁹ Rather, they suggest that if rich nations are to transfer wealth to poor nations, something more direct than climate change mitigation should be employed.¹⁴⁰ Such direct aid to today's poor countries is exactly what the ADMPP calls for. Unlike mitigation, which seeks to prevent future harms, adaptation deals with inevitable and imminent harms, and projects providing in-kind adaptation assistance would directly help those currently affected (or those who will be affected in the very near future) by global warming. Additionally, although some developed countries have played significant roles in contributing to climate change, it is clear that many of those most affected have not.¹⁴¹

Up to this point, this Note has greatly oversimplified much of the causation-type argument for the sake of brevity, arguing as if there were only two groups—developed and developing countries, the former having contributed to climate change and the latter suffering the future harm. In truth, however, there is a great deal of variance, with some developing countries (e.g., India, China, Indonesia, and Brazil) contributing substantially to climate change, and others (e.g., many African nations and small island states) having contributed insubstantial amounts of emissions.¹⁴² Rather than argue that the ADMPP should be targeted at developing countries generally, this Note proposes that it first be directed at countries that have contributed the least to climate change, particularly the most vulnerable African countries, Bangladesh, and small island states. The project should later be expanded to the most urgently needed projects in all developing countries.

139. See Posner & Sunstein, *supra* note 16, at 1571 (“Why should wealthy countries give money to future poor people, rather than to current poor people?”).

140. See *id.* at 1590 (“[I]n principle, greenhouse gas cuts do not seem to be the most direct or effective means of helping poor people or poor nations.”).

141. See POSNER & WEISBACH, *supra* note 138, at 22.

142. See World Resources Institute, Climate Analysis Indicators Tool, <http://cait.wri.org/> (last visited Apr. 12, 2010) (providing searchable databases of carbon emissions and land use change).

IV. THE INADEQUACY OF CURRENT ADAPTATION FUNDING PROGRAMS

A. *Current Adaptation Funding Mechanisms and Proposals*

Simply put, the aggregate of the programs currently in place is insufficient to fund even the most urgently needed adaptation measures.¹⁴³ At present, all adaptation aid, aside from the UNFCCC Adaptation Fund, is funded through official development assistance (“ODA”), which is made up of voluntary national contributions.¹⁴⁴ This section provides an overview of current adaptation programs and proposals, highlighting their collective inability to provide adequate funding, problems in political economy, and points on which the ADMPP could improve.

1. *UNFCCC Programs*

Under the UNFCCC and Kyoto Protocol, the Global Environmental Facility (“GEF”) operates a funding mechanism for adaptation finance, particularly for small island states and least developed countries.¹⁴⁵ Through this funding, the GEF operates three adaptation programs, including the Trust Fund, the Least Developed Countries Fund (“LCDF”), and the Special Climate Change Fund (“SCCF”).¹⁴⁶ The SCCF was established to “finance projects relating to adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management, and economic diversification.”¹⁴⁷ The LDCF was established specifically to help least developed countries implement NAPAs.¹⁴⁸

143. See UNFCCC Executive Summary, *supra* note 39, ¶ 5 (finding that “the additional estimated amount of investment and financial flows needed. . .to address climate change is large compared with the funding currently available under the Convention and its Kyoto Protocol”).

144. *E.g.*, Müller, *supra* note 37, at 4.

145. UNFCCC, Adaptation, <http://unfccc.int/adaptation/items/4159.php> [hereinafter “UNFCCC Adaptation Website”] (last visited Apr. 25, 2010).

146. *Id.*

147. UNFCCC, Special Climate Change Fund, http://unfccc.int/cooperation_and_support/financial_mechanism/special_climate_change_fund/items/3657.php (last visited Apr. 10, 2010).

148. UNFCCC, Least Developed Country Fund, http://unfccc.int/cooperation_and_support/financial_mechanism/least_developed_country_fund/items/4723.php (last visited Apr. 10, 2010).

The UNFCCC has also created a mechanism known as the Adaptation Fund.¹⁴⁹ It is financed by a two percent levy on CERs generated through the CDM and is intended to finance specific adaptation projects in developing countries that are parties to the Kyoto Protocol.¹⁵⁰ The Adaptation Fund is novel both in that it relies on funding collected from private firms through CERs, instead of official development assistance, and, through the use of NAPAs, it gives developing countries a significant stake in deciding where funding will go.¹⁵¹ Developing countries have recently proposed that a similar levy for adaptation be raised on the Kyoto Protocol's Joint Implementation and Emissions Trading Programs.¹⁵² However, the Adaptation Fund has run into obstacles. The two percent levy on CERs will raise only a small portion of the amount of money needed for adaptation.¹⁵³ Additionally, the amount the Adaptation Fund can raise is closely linked to the price of carbon, which has declined significantly due to the global financial crisis.¹⁵⁴ Further, the GEF has been criticized by developing countries as a political tool and an unwieldy bureaucracy since donors "typically insist on tight controls over where and how the money is spent."¹⁵⁵

149. See UNFCCC Adaptation Website, *supra* note 145.

150. UNFCCC, Adaptation Fund http://unfccc.int/cooperation_and_support/financial_mechanism/adaptation_fund/items/3659.php (last visited Apr. 10, 2010).

151. See Müller, *supra* note 37, at 4, 16 (arguing in favor of the two percent levy on CDM proceeds, and noting that developing countries have true ownership of the Adaptation Fund).

152. *Id.* at 18.

153. See Maxine Burkett, *Just Solutions to Climate Change: A Climate Justice Proposal for a Domestic Clean Development Mechanism*, 56 BUFF. L. REV. 169, 218 n.198. (2008) (arguing that "the current problem facing the Kyoto's Adaptation Fund is the small amount of revenue derived from the small amount of projects certified").

154. James Kanter, *Price of CO₂ Falls to New Low in Europe*, N.Y. TIMES, Jan. 21, 2009, available at <http://www.nytimes.com/2009/01/21/business/worldbusiness/21iht-carbon.4.19573594.html>. For a depiction of the variable value of carbon within the CDM market, see ANDREW AULISI, WORLD RESOURCES INSTITUTE, CARBON VALUE ANALYSIS TOOL 5 (Oct. 12, 2006), available at <http://epa.gov/climateleaders/documents/events/oct2006/aulisi.pdf>.

155. See Nathaniel Gronewold, *Red Tape, High Fees, Hamstring Int'l Green Funds*, N.Y. TIMES, Dec. 22, 2009, available at <http://www.nytimes.com/gwire/2009/12/22/22greenwire-red-tape-high-fees-hamstring-intl-green-funds-3156.html>.

2. *World Bank Pilot Programme*

The World Bank Pilot Programme for Climate Resilience (“PPCR”) is a program designed to provide ODA-type funding for assistance in climate change adaptation.¹⁵⁶ The PPCR builds on NAPAs and has a goal of integrating climate resilience into development planning and budgeting.¹⁵⁷ Nine countries were selected to participate in the program.¹⁵⁸ However, the PPCR has met with resistance. Opponents claim that the program competes with the UNFCCC Adaptation Fund.¹⁵⁹ Developing countries objected to the fact that the PPCR will be made up almost entirely of loans that will be counted as ODA.¹⁶⁰ These countries see adaptation costs as costs imposed on them by developed countries, and oppose receiving “compensation” in the form of loans and ODA that must be repaid.¹⁶¹

3. *Proposals for Bilateral and Multilateral Carbon Auction Levy Funding*

Under proposed bilateral and multilateral carbon action programs, governments taking part in carbon trading schemes would auction a percentage of their emissions allowances to the private sector in order to raise money for adaptation.¹⁶² That is, a country like the United States or a region like the European Union, would sell a portion of its allowances under the Kyoto Protocol, rather than allotting them to emitters, to raise money for adaptation and other causes. However, though auctioning might generate significant funds, these revenues will not be aimed exclusively at climate change adaptation in developing countries.¹⁶³ The United States and the European Union have both proposed carbon auction levy funding, but it is unlikely to raise a substantial amount of money.¹⁶⁴

156. See Müller, *supra* note 37, at 10.

157. Pilot Program for Climate Resilience, <http://www.climateinvestmentfunds.org/cif/node/4> (last visited May 20, 2010).

158. *Id.*

159. See Müller, *supra* note 37, at 10.

160. *Id.*

161. *Id.*

162. See *id.* at 12.

163. *Id.*

164. See *id.* at 12-13 (arguing that the funds generated by EU emissions auctioning will be divided among a number of sources).

Although the future of these proposals is uncertain since they have yet to be put in place, if implemented they would raise at least some private funding for adaptation, which would be important as a source of non-ODA adaptation funding.

4. *Global Carbon Tax*

The Swiss government has proposed a global carbon tax of \$2 for every ton of CO₂ emitted by every country, with proceeds going toward adaptation.¹⁶⁵ The Swiss plan provides for an exemption of 1.5t of CO₂ per inhabitant, which means that many least developed countries would not have to pay any tax at all.¹⁶⁶ The global carbon tax is a novel idea with great potential for raising a significant amount of private money for adaptation. If implemented, it would be a market-based mechanism through which the biggest polluters would contribute the most toward adaptation, and it would provide an incentive for countries to encourage emissions reductions while also funding adaptation. However, this proposal faces a potentially insurmountable political economy problem: it may be impossible to convince taxpayers in developed countries to directly send millions or billions of dollars abroad to fund foreign climate change adaptation.¹⁶⁷

5. *Burden Sharing Through an International Transportation Tax*

Tuvalu, a small island state, has proposed that an adaptation levy be raised on air and maritime travel.¹⁶⁸ In its Adaptation Blueprint, Tuvalu proposes a 0.01 percent levy on international airfare and maritime transport operated by nationals of developed countries, a 0.001 percent levy on airfare and maritime transport operated by other nationals, and an exemption for all flights and maritime travel to and from least developed countries and small island states.¹⁶⁹

One benefit of this proposal is that it is a truly international fundraising mechanism,¹⁷⁰ thus hopefully eliminating the political economy problem that is fatal to a straight carbon

165. *Id.* at 13.

166. *Id.*

167. *Id.* at 15.

168. *Id.* at 19.

169. *Id.*

170. *Id.*

tax. However, this plan has a severe limitation. According to 2005 data, the proposed levy would only generate \$37 million from developed countries, and it would have to be increased by a scale of about one hundred to have a meaningful impact on adaptation.¹⁷¹ This is problematic because the amount needed would result in a significant tax, and such a large tax on international travel could cause a tremendous political economy problem in the form of a backlash from affected travelers.

6. *Compensation-Based Adaptation Financing*

Daniel Farber has proposed that victims of climate change should be compensated in a manner resembling tort compensation.¹⁷² Although emitters have not always known of the adverse effects of climate change, they have long been able to sell their products at lower prices than they would have been able to if they were taking proper steps to safeguard the climate.¹⁷³ Requiring these emitters to pay is akin to the “common but differentiated responsibilities” argument,¹⁷⁴ essentially calling on emitters to compensate victims for the gains they made through unjust enrichment.¹⁷⁵

Farber envisions an international compensation commission that would evaluate claims from countries that have incurred adaptation expenses.¹⁷⁶ The commission would judge the claims and distribute corresponding compensation payments.¹⁷⁷ The commission would distribute compensation funding that it receives either directly from countries or through a mechanism set up in a global carbon trading system, and the payments would take the form of either direct ODA

171. *Id.*

172. See Farber, *supra* note 96, at 1635-40 (grounding the goals of a compensation framework upon the goals of tort law, and concluding that emitters of GHGs should bear the costs of climate change adaptation).

173. *Id.* at 1641.

174. The notion of “common but differentiated responsibilities” is explored above. See *supra* Part III.C.4.

175. See Farber, *supra* note 32, at 29 (arguing that some historical emitters have unjustly enriched themselves by pursuing greater production at the expense of the environment).

176. Farber, *supra* note 96, at 407.

177. *Id.*

financing or emissions allowances.¹⁷⁸ If funding were provided in the more novel form of emissions allowances, countries receiving such compensation would be able to sell the allowances in the global carbon market.¹⁷⁹ Thus, the firms presently emitting the most GHGs would indirectly fund adaptation, since the beneficiaries of the program would sell those allowances to the emitters.¹⁸⁰

Eric Posner and Cass Sunstein, however, argue that such corrective justice principles are troublesome when applied in the context of climate change.¹⁸¹ They argue that it is inappropriate to blame all gas-emitters for wrongful behavior because of their historical ignorance, “especially those from the past who are most responsible for the current stock of greenhouse gases in the atmosphere.”¹⁸² Farber responds that, like joint liability in tort law, emitters who contribute to atmospheric GHG saturation should be considered as having caused the adverse effects, regardless of whether the specific harm can be directly attributed to them.¹⁸³

Farber’s proposal is similar to the ADMPP, but it does not take full advantage of market mechanisms. Unlike the ADMPP, there is no incentive under Farber’s scheme to find more efficient ways to adapt. That is, victims of climate change would have no incentive to lower costs¹⁸⁴ on adaptation projects since all costs could potentially be recouped through the compensation mechanism. Another weakness of the Farber plan is that it seems unlikely that the compensation commission would be able to accurately appraise the value of a given project, resulting in potentially insurmountable pricing problems.

178. *Id.* at 407–08.

179. *Id.*

180. *Id.* at 408.

181. Posner & Sunstein, *supra* note 16, at 1572.

182. *Id.* at 1572.

183. Farber, *supra* note 96, at 391–92.

184. This critique does not assume that developing countries act in bad faith. It simply assumes that states, as rational economic actors, would attempt to include as many costs as possible as adaptation costs that would be reimbursed under the Farber system.

7. *The Copenhagen Accord*

The Copenhagen climate talks produced a nonbinding agreement that is worth mentioning despite the fact that it is nothing more than a political agreement to provide funding and does not specify the framework through which funding will be provided. The Copenhagen Accord commits developed countries to provide \$30 billion in assistance to developing countries for mitigation and adaptation efforts in the short term, with a long-term goal of providing \$100 billion per year by 2020 through “a wide variety of sources public and private, bilateral and multilateral, including alternative sources of finance.”¹⁸⁵ Such amounts would dwarf currently available climate change funds.¹⁸⁶

Although this agreement is not binding, it is a significant step forward in terms of a commitment by developed countries to fund adaptation in developing countries. There are, however, many details that remain unresolved. Particularly, it remains to be seen what types of mechanisms will be used to provide this huge level of funding. The ADMPP could serve as a significant contributor to the Copenhagen Accord’s funding goal by providing a substantial amount of private financing.

V. ANTICIPATED PROBLEMS WITH THE ADMPP AND PROPOSED SOLUTIONS

A. *ADMPP Problems Akin to Those Seen in the CDM*

In employing a market-based mechanism to fund climate change adaptation, as the CDM has done for emissions reductions in developing countries, two anticipated critiques must be addressed. The first critique is the possibility that the ADMPP will fund projects that would otherwise be funded without the ADMPP (i.e. the additionality problem). The second critique is that the ADMPP will reduce the incentive to innovate new ways to adapt. Both of these concerns can be disposed of upon further analysis.

185. Copenhagen Accord, *supra* note 47, ¶ 8.

186. *E.g.*, Gronewold, *supra* note 155.

1. *Additionality*

Concerns surrounding the additionality requirement are of great concern in the CDM. The additionality requirement says that for a project to qualify for CER credits through the CDM, it must generate reductions in emissions in the host developing country additional to any that would have occurred in the absence of the CDM.¹⁸⁷ However, countries and firms engage in strategic behavior, claiming that a project generates additional reductions when it does not, or claiming it is a greater overall reduction than it really is.¹⁸⁸

It is difficult to anticipate whether there would be a similar problem with the ADMPP. The reasoning behind the ADMPP is that certain adaptation projects will not be undertaken unless developed countries fund those projects, so it may be a good idea to include an additionality requirement in the ADMPP. That is, such a requirement would make certain that the funds are only used for projects in which they are required for the project's completion. It is an imaginable scenario in which, for example, a drug company immunizes a certain amount of people against a tropical disease for reasons not related to adaptation. The drug company would likely attempt to get emissions allowances under the ADMPP for that same project if it were able to, thus allowing it to reap additional benefits for a project it would have completed regardless of the existence of the ADMPP. A project like this one, which would be completed even without ADMPP funding, would not be additional and should thus be excluded from the scheme by an additionality requirement.

That said, the role of the ADMPP's commission in selecting the most urgently needed projects would ensure the condition of additionality. Unlike the CDM, in which firms can select to fund virtually any project they wish as long as it reduces GHG emissions, the projects available for ADMPP funding would be limited to those endorsed by the overseeing commission.

187. Kyoto Protocol, *supra* note 5, art. 12, ¶ 5.

188. Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential*, 55 UCLA L. REV. 1759, 1763, 1781-1790 (2008) (describing how firms generate more CER credits than they deserve through "baseline tinkering," particularly in the case of HCFC-22 production).

However, just as we have seen in the CDM, if the ADMPP were to have an additionality requirement, it might provide an incentive for countries not to take steps to adapt so that more projects would qualify as additional emissions reductions. On a related note, because the AMPP would address the most urgently needed projects, projects that countries might be forced to find a way to fund even without assistance, those projects might paradoxically be excluded from the ADMPP by an additionality requirement. This problem can best be addressed by an additionality requirement that is enforced by the ADMPP commission; the ADMPP commission, however, should take this problem into account and take care not to exclude the most urgently needed projects, even if host developing countries could find a way to complete them.

2. *Incentive to Innovate*

Another objection to the ADMPP might echo the critique that the CDM reduces incentives for the countries purchasing allowances to innovate better and cheaper ways to reduce emissions.¹⁸⁹ The ADMPP might similarly reduce incentives to innovate, as it would provide another method through which firms or countries could simply purchase emissions allowances. This seems inevitable, at least at a low level, due to the reality that more ways to meet emissions requirements without reducing emissions makes emitting less costly, which reduces the incentive to innovate ways to reduce emissions. But, because the number of emissions credits generated through the ADMPP would be small relative to the overall number of emissions allowances, the program is not likely to have a major impact. This also may not be a problem if we are willing to accept some marginally reduced level of innovation as a cost of funding adaptation in developing countries. In other words, society is trading some amount of hypothetical innovation for actual adaptation.

Similarly, one might argue that the ADMPP will reduce incentives to innovate better adaptation methods since developed countries are directly funding adaptation projects in de-

189. See, e.g., Hans-Jochen Luhmann & Wolfgang Sterk, *Climate Targets – Should They be Met at Home or Where it is Cheapest?*, INT'L POL'Y ANALYSIS, July 2008 (arguing that purchasing emissions abroad reduces the incentive to innovate at home).

veloping countries. This potential problem can be dealt with in two ways. First, the ADMPP should be designed to include a bidding mechanism. The bidding system proposed above would create competition, encouraging firms to perform every adaptation project more cheaply, and would provide an incentive to innovate ways to perform the project as cheaply as possible.¹⁹⁰ The second way to address this problem is conceptual: countries must agree that funding adaptation is more important than finding the absolute cheapest ways to do so and thus accept some reduced level of innovation in exchange for guaranteed completion of the most urgent projects.

B. *Problems Specific to the ADMPP*

1. *Bidding and its Relation to Quality*

A possible objection to the ADMPP is that firms may have an incentive to sacrifice quality to lower cost because they will be competing with each other to implement projects at the lowest possible cost. Monitoring quality in the ADMPP could be difficult because as compared to the CDM, in which only emissions output needs to be measured, ADMPP quality would at minimum depend on how well a project performs (e.g. how well a sea wall actually blocks sea level rise from inundating a community) and how long the project lasts. Evaluating a project's success or failure on these metrics may not be possible until years after the project is completed.

Although quality control is a real problem, it is one that has been successfully addressed in many contexts previously. To ameliorate this problem, the ADMPP bidding process should be designed in a manner similar to the "best value" model used in public projects contracting in the United States.¹⁹¹ Under the "best value" method, a contractor is evaluated on price, quality, past performance, experience and

190. See *supra* Part III.B.1. for more details about the mechanics of the bidding process.

191. See, e.g., Kimberly Hausbeck, *The Little Engine that Could: The Success of the Stewardship Contracting Authority*, 32 WM. & MARY L. & POL'Y REV. 33, 41 (2007) (discussing the "best value" method as utilized by the United States Forest Service); see also STUART D. ANDERSON & JEFFREY S. RUSSELL, TRANSP. RESEARCH BD., NCHRP REPORT 451: GUIDELINES FOR WARRANTY, MULTI-PARAMETER, AND BEST VALUE CONTRACTING 56, 68-71 (2001) (advising that "best value" contracting be used in the context of public transportation, and articulating guidelines to do so).

work quality, and benefits the contractor can provide to the local community.¹⁹² The body charged with selecting a contractor chooses the winner not only based on cost but on greatest overall benefit.¹⁹³ For example, in the United States, bids for projects with the National Forest Service will be evaluated on “price and non-price” factors.¹⁹⁴ That is, if a sea wall were to be built from point A to point B, firms would submit proposals outlining design and quality points and stating how many emissions allowances they would require to carry out the project. The commission overseeing the ADMPP would select a firm to carry out the project based on the greatest combination of quality and cost.

The “best value” method could also provide an important forum for host country participation. The host country will have an incentive to encourage selection of the project with the highest quality, which could provide a check against the ADMPP commission’s desire to select the lower-bidding firms.

2. *Blurring Adaptation and Development*

Another potential problem with the ADMPP is that it is difficult to draw a clear line between climate change adaptation projects and general development projects,¹⁹⁵ which is problematic since, as mentioned above, funding from the ADMPP should be targeted only at adaptation projects. The World Resources Institute has identified a continuum relating adaptation to development, in which adaptation projects are identified on a scale from “pure development” to “very explicit adaptation.”¹⁹⁶ For example, one component of adaptation identified by the UNFCCC is developing and protecting tourism infrastructures.¹⁹⁷

192. *E.g.*, Hausbeck, *supra* note 191, at 41.

193. *Id.*

194. Hausbeck, *supra* note 191, at 41 (citing U.S. DEP’T OF AGRIC., FOREST SERVICE HANDBOOK 2409.19 ch. 60.5, (2005)).

195. *See, e.g.*, HEATHER MCGRAY ET AL., WORLD RESOURCES INSTITUTE, WEATHERING THE STORM: OPTIONS FOR FRAMING ADAPTATION AND DEVELOPMENT I (2007), available at http://pdf.wri.org/weathering_the_storm.pdf (attributing the slow progression of the debate over how to manage adaptation to general confusion over the relationship between adaptation and development).

196. *Id.* at 2.

197. UNFCCC Executive Summary, *supra* note 39, ¶¶ 532, 759.

Projects in this area address vulnerability to climate change through economic development, and are thus difficult to distinguish from pure development.¹⁹⁸ In a project that develops tourism infrastructure, adaptation is likely an afterthought. Part of the difficulty in drawing a line between adaptation and development can be avoided by selecting coastal zones for the pilot program, because this sector is likely what the World Resources Institute would consider “managing climate risk,” a category closer to the “very explicitly adaptation” side of the spectrum.¹⁹⁹ As argued in Part III(B)(3)(h), part of the reason for choosing coastal zones for the pilot program is that projects in this sector are limited to combating sea level rise, which is more focused on adaptation than development. However, if the ADMPP is to expand to other adaptation sectors, this problem must be addressed.

In addressing this potential problem, we must first ascertain whether countries are likely to attempt to get adaptation program funding for general development projects. If funding is available through an adaptation program, it seems plausible that countries would attempt to make use of that funding for as wide a range of projects as possible, since it would be in their economic best interest to do so. Next, we must ask whether countries’ use of adaptation funds for development projects is problematic. After all, devoting more money to development, even if not adaptation in particular, is beneficial to developing countries, and it might be counterproductive to attempt to completely separate development and adaptation.²⁰⁰

For purposes of the ADMPP, however, the commission should allocate adaptation funds that are closer to the “explicit adaptation” side of the continuum, particularly in the beginning stages of the ADMPP. Although general development is desirable, the ADMPP and its global subsidies are intended to specifically target urgently needed adaptation projects, and di-

198. Cf. WEATHERING THE STORM, *supra* note 195, at 2 (explaining a category of projects titled “Addressing the Drivers of Vulnerability,” which refer to development strategies to alleviate “fundamental shortages of capacity that make people vulnerable to harm”).

199. See *id.* (describing “Managing Climate Risk” as incorporating climate information—such as local climate variability—into decisions aimed to reduce negative effects on resources and livelihoods).

200. See *id.*, at 17 (explaining that distinguishing between adaptation and development neglects “the real causes of vulnerability”).

verting these efforts to non-adaptation projects would reduce the effectiveness of the ADMPP. Because an adaptation program will generate only limited resources, and because adaptation is both pressing and grossly underfunded, it is important that the funds go to adaptation projects.

3. *Mitigation Targets*

The ADMPP calls for the generation of emissions allowances through the implementation of adaptation projects. Unlike the CDM, the ADMPP would allow firms to generate emissions allowances without an actual net global reduction in emissions. This could result in a problematic softening of mitigation targets and an increase in global emissions.

There are two ways to address this possibility. The first is to reduce the overall number of emissions allowances granted each year. This will make each allowance marginally more costly, but the cost will be counterbalanced by adding the additional flexibility of the ADMPP, through which regulated entities will have another method to meet their quotas. That is, the added flexibility the ADMPP generates would offset the marginal cost increase caused by the reduced overall number of emissions allowances.²⁰¹

The other possible approach to dealing with increased emissions is purely theoretical. That is, as stated in the “strong conceptual” justification for increased adaptation funding in Part I, the purpose of addressing climate change is to increase global net welfare. In the context of addressing climate change, global net welfare is a function of mitigation, adaptation, and their relative cost-effectiveness (since cost-effectiveness affects the ability to maximize net well-being). Therefore, an increase in emissions up to a certain level can be viewed as an acceptable tradeoff for gaining the ability to complete urgently needed adaptation projects. These increases in emissions will have only a slight impact on warming. On the other hand, if urgently needed adaptation projects are not carried out as soon as possible, the consequences may be annihilation

201. Note, however, that the extent to which the added flexibility would offset marginal cost increases would depend upon at least two factors: (1) the number of allowances the ADMPP could issue, and (2) the extent to which emissions allowances are reduced due to mitigation target concerns.

for some countries.²⁰² The tradeoff between emissions increases and adaptation projects is a tradeoff between two risks, and we must make a difficult but necessary decision about which will best reduce overall risk.

4. *Political Economy*

In agreeing to limit emissions in the Kyoto Protocol or its successor, countries are agreeing to take part in the generation of a global public good, i.e. goods that can be accessed by all, and which no one can be deprived of enjoying.²⁰³ By adding adaptation programs, however, parties would be subsidizing a purely local good that would be enjoyed by a comparatively small number of individuals. Since only a small number of countries could enjoy the benefits of the ADMPP, it could cause problems of political economy in which self-interested countries refuse to accept adaptation funding as a part of emissions trading.

This problem could be easily resolved if the ADMPP results in a net reduction of the cost of emissions allowances, because countries would pay less money for mitigation. That is, although they would be receiving less benefit in overall emissions reductions, they would also be paying less to reduce their emissions. If the price of mitigation goes up, however, the public versus private goods problem might be resolvable only by parties agreeing that the increased cost generated by subsidizing adaptation is worthwhile because it produces an aggregate increase in global welfare and succeeds in initiating adaptation activities that otherwise would not be undertaken.

VI. CONCLUSION

The exact consequences of global climate change are difficult or impossible to predict, but it is clear that countries will face adverse consequences.²⁰⁴ It is also clear that, regardless of mitigation efforts today, adaptation will be required to ad-

202. See, e.g., Gordon, *supra* note 38, at 1561 (arguing that the changing climate poses an existential threat to, for example, small island states).

203. See, e.g., Henry Hansmann, *The Role of the Nonprofit Enterprise*, 89 *YALE L.J.* 835, 848 (1980).

204. See e.g., STEWART & WIENER, *supra* note 8, at 21.

dress the consequences of past emissions.²⁰⁵ However, current financing mechanisms for adaptation are grossly inadequate, and, if the world does not take dramatic action to sufficiently fund adaptation, people of the poorest countries will be unable to adequately prepare for the consequences of climate change.²⁰⁶

This Note proposes an effective, although imperfect, new mechanism through which the global community can support urgently needed adaptation in developing countries. The ADMPP would take advantage of the global carbon market, implemented through the Kyoto Protocol, to build its funding. Under the ADMPP, the supervising commission would select urgently needed adaptation projects by assessing countries' NAPAs and would then set up a system through which firms can bid on carrying out these projects. Firms' bids would be evaluated on a best value model to find the best combination of cost and quality. Although the model faces potential problems, it attempts to capture the benefits of market-based mechanisms and apply them to climate change adaptation. Ultimately, the ADMPP seeks to play a small but necessary role in extending adaptation funding to sectors currently in dire need of financial support.

205. See Farber, *supra* note 32, at 2 (noting that the climate will continue to change before mitigation measures will have any effect).

206. *E.g.*, Müller, *supra* note 37, at 4.

