Just Solutions to Climate Change: A Climate Justice Proposal for a Domestic Clean Development Mechanism

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INTRODUCTION

The weighty and unequal toll that climate change is wreaking on the global poor is no less devastating for the poor, black, and brown of the United States. The federal response to the climate crisis—which has been both belated and insubstantial—has failed to take seriously the potentially devastating impacts of climate change and climate change policies on poor and of-color communities. This inaction does not reflect the sentiment of significant American institutions and communities who are now demanding immediate change in our domestic climate policy. Congress, by all indications, is pressing for a mechanism that will cap allowable greenhouse gas emissions while permitting the trade of emissions credits between entities. This market-based response to the climate crisis will have inherent disadvantages for poor and of-color communities. In order to protect these communities, this Article, consistent with a climate justice framework, argues for supplementing the emerging cap-and-trade system with a domestic clean development mechanism.

The fundamental purpose of an emergent *climate justice* movement is to address the issues and concerns that arise from the intersection of climate change with race, poverty, and preexisting environmental risks. To date, issues of climate justice, as a parallel environmental justice concern, have been widely overlooked in policy circles and underappreciated in the legal academic arena as well. This Article seeks to center climate justice in the legal discourse. It also advocates for a domestic climate justice policy-mechanism, which is a critical contribution in making the nation's first comprehensive climate policy a *just* one.

In the lengthy and discordant international negotiations on creating sound climate policies, the disproportionate burdens borne by the global poor inspired repeated calls for distributive and procedural justice. As a result, the Kyoto Protocol did not adopt a cap-and-trade regime without addressing distributive concerns. In particular, the Protocol codified a Clean Development Mechanism (CDM) to specifically address uneven development positions across countries. The mechanism provides credits to be used in international carbon trading in exchange for investment in green and renewable energy projects in developing

countries. The exclusive purpose of the mechanism is to assist least developed countries in achieving sustainable development through "green" projects, while providing sellable emissions reduction credits from CDM projects undertaken in these countries.

The *domestic* clean development mechanism this Article proposes would likewise introduce an infrastructure that provides incentives for economically depressed and of-color communities to become venues for emissions abatement. The mechanism would also include, and partially finance, an adaptation fund. Generally, "adaptation" aims to "realize gains from opportunities or to reduce the damages that result from climate change."[1] "Mitigation," alternatively, describes actions that will slow or constrain climate change.[2] The fund, similar to the one established by Kyoto and hinted at in currently proposed domestic climate bills, would provide monies for adaptation to those who lack the basic resources to support green development projects, but who are nonetheless expected to bear the most significant burdens.

Given the current domestic legal and political exigencies, the United States will likely adopt a cap-and-trade system, for which a clean development mechanism is a critical supplement. In the coming year, therefore, those crafting climate rules in Congress and beyond will have an unparalleled opportunity to implement policy that accounts for climate justice concerns. This critical window introduces a particular urgency for communities at risk of disproportionate harm to participate meaningfully in the policy set to emerge. This is especially true if that legislated

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1. Neil A. Leary, *A Welfare Theoretic Analysis of Climate Change Inequities*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE 155, 155 (W. Neil Adger et al. eds., 2006). "Unlike mitigation, adaptation is a *response to* rather than a *slowing* of global warming." Stephen H. Schneider & Janica Lane, *Dangers and Thresholds in Climate Change and the Implications for Justice*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE, *supra*, at 23, 45. The Intergovernmental Panel on Climate Change identifies two types of adaptation, autonomous (non-policy-driven reactive response) and planned (passive and anticipatory). *See id*. at 45.

In this Article, I use "mitigation" and "aggressive mitigation" to describe the implementation of actions that would reduce seventy percent of greenhouse gas emissions as soon as possible, as urged by climate scientists and environmentalists.

2. Leary, *supra* note 1, at 155.

approach threatens to exacerbate harm to poor communities and communities of color, which a pure cap-and-trade program might well do. Instead, a domestic clean development mechanism, as an indispensable component of market-based climate policy, would provide two significant benefits. First, poor and of-color communities would gain entry into the cap-and-trade market that would otherwise exclude them, allowing such communities to create offsetting projects consistent with the emerging policy consensus. Second, the United States as a nation could begin to rectify its overwhelming contribution to the climate crisis, while still meeting its responsibility to those who suffer particularly severe effects of climate change.

To be sure, advocating a domestic CDM is controversial to some. The Kyoto CDM has been the subject of much criticism; however, the global project is floundering for reasons that we need not replicate at a national level. Kyoto's failures, as I will show, are due to weaknesses in implementation of the program, not in the mechanism's foundational concept. In this Article, I do acknowledge these current weaknesses of Kyoto's CDM and point out the disadvantages of market-based remedies, which, in the context of U.S. domestic policy, have demonstrated that a least-cost response to emissions abatement efforts can exacerbate certain communities' pollution burden. I maintain, however, that the CDM's innovative framework—once corrected—is currently the most viable option for meeting domestic climate justice goals.

The Article proceeds in four parts. In Part I, I briefly summarize the grave threat climate change poses and then discuss the observed and predicted impacts climate change will have on environmental justice communities—that is, poor and of-color communities. In Part II, I explore the environmental justice framework and suggest that if looked at through this frame, climate change solutions would not only address disproportionate impacts, but also include the optimal measures for Americans to mitigate and adapt to the risk. This, at base, is the essence of climate justice.

In Part III, I first provide evidence of America's emerging consciousness of the risks of climate change, Congress's singular focus on market mechanisms, and the enthusiastic support displayed for those mechanisms by many sectors of the public as well as the business, social,

and government power elites. I then introduce the domestic Clean Development Mechanism (dCDM) as my contribution to climate justice-oriented strategies, and as a powerful and politically palatable means of aiding environmental justice communities. A dCDM would, in short, introduce reliable revenue streams for burgeoning green projects in poor and of-color communities across America. Finally, in Part IV, I explain that, even if the dCDM is not as forceful and decisive as more aggressive mitigation strategies, it is a vital short-term response to both climate risks and the social inequalities that uniquely engage environmental justice.

I. CLIMATE CHANGE, RACE, AND CLASS

A. *Climate Change—Science and Impacts*

The unparalleled scale of impact the climate crisis has had, and will continue to have, on the globe has been forecasted for almost a century.[3] Most recently, the Intergovernmental Panel on Climate Change (IPCC) has concluded that the warming of the climate system is "unequivocal."[4] With this warming comes the threat of more

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3. The nineteenth century scientist Svante Arrhenius was the first person to identify the "connection between temperature and human activity." Emma Duncan, *The Heat Is On: A Special Report On Climate Change*, ECONOMIST, Sept. 9, 2006, at 3. In 1938, British engineer Guy Calendar told the Royal Meteorological Society that the world was warming; "he was regarded as an eccentric." *Id.* Finally, in 1957, Roger Revelle and Hans Suess confirmed concerns about the possibility of anthropogenic warming voiced earlier in the century. As early as fifty years ago, these two scientists had already expressed the incredible enormity of human impact on the climate:

> [H]uman beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future. Within a few centuries we are returning to the atmosphere and oceans the concentrated organic carbon stored in sedimentary rocks over hundreds of millions of years.

Ando Arike, *Owning the Weather: The Ugly Politics of the Pathetic Fallacy*, HARPER'S MAG., Jan. 2006, at 72.

4. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 5 (Susan Soloman et al. eds., 2007) [hereinafter CLIMATE CHANGE 2007]. Incorporating new findings from the past six years of research, the IPCC found that in addition to observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and

extreme weather, including more intense and longer droughts than have already been observed,[5] heavy precipitation including increased intensity of tropical cyclones,[6] and hot extremes and heat waves.[7] While these changes sound merely inconvenient and perhaps costly, they have been described by the IPCC Chairman, without hyperbole, as dangers that risk "the ability of the human race to survive."[8] In the short term, these extremes will risk the survival of communities that are ill-equipped to adapt to warming as they struggle to moderate and cope with its consequences.[9]

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the global rising sea levels, eleven of the last twelve years (1995-2006) rank amongst the warmest years in the "instrumental record of global surface temperature." *Id.*

5. More severe droughts have already been observed over wider areas since the 1970s. *Id.* at 8. According to several American climate scientists, most practicing scientists "were skeptical that we would see strong signs of human-induced climate change in our lifetimes." Brief of Amici Curiae Climate Scientists David Battisti et al. in support of Petitioners at 2, Mass. v. EPA, 127 S. Ct. 1438 (2007) (No. 05-1120) [hereinafter Brief of Amici Curiae Climate Scientists]. However, the beginning of this decade has already proved them wrong. Among the many observed changes are the rise of global temperatures, the shift in plant and animal ranges, the retreat of glaciers globally, the rise of sea levels, and the increasing acidification of oceans. *Id.*

6. "Tropical cyclone" is the generic term used in the IPCC report to describe hurricanes and typhoons. *See* CLIMATE CHANGE 2007, *supra* note 4, at 8 nn.10, 16; *see also* John Young, *Black Water Rising: The Growing Global Threat of Rising Seas and Bigger Hurricanes*, WORLD WATCH, Sept.-Oct. 2006, at 26 (finding that in the last thirty years, there has been an eighty percent increase in the number of Category 4 and 5 hurricanes, which are the strongest storms and often bring huge storm surges).

7. Scientists have already observed a greater frequency of heavy precipitation events over most land areas. *See* Young, *supra* note 6.

8. Arike, *supra* note 3, at 72 (stating that Dr. Rajendra Pachauri expressed this fact to IPCC delegates in 2005). Stanford scientist Stephen Schneider recently expressed a similar warning, in response to the 2007 IPCC report on human impacts. *See* Arthur Max, *Climate Report: Poor Will Suffer Most*, GLOBAL POL'Y F., Apr. 6, 2007, http://www.globalpolicy.org/socecon/envronmt/climate/2007/0406climatereport.htm. Schneider stated that without action to curb carbon emissions, humanity's livable habitat will shrink starkly; "[d]on't be poor in a hot country, don't live in hurricane alley, watch out about being on the coasts or in the Arctic, and it's a bad idea to be on high mountains with glaciers melting." *Id.*

9. In the IPCC's recent report, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, the Panel defines adaptive capacity as "the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope

Human beings, and in particular U.S. citizens, are responsible for this dramatic change.[10] Global atmospheric concentrations of greenhouse gases—including carbon dioxide, methane, nitrous oxide,[11] and hydrofluorocarbons—have increased markedly as a result of human activities since 1750 and now "far exceed" pre-industrial values.[12] These activities include land-use changes and, most importantly, the combustion of fossil fuels. As a result, the current concentration of carbon dioxide in the atmosphere is the highest in at least a million years.[13] The changes that result from the concentrations are non-linear, such that positive feedback loops accelerate the adverse effects that climate change sets in motion.[14] These changes will continue for centuries because of the "timescales associated

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with the consequences." INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY 21 (M.L. Parry et al. eds., 2007) [hereinafter IMPACTS REPORT].

10. *See* CLIMATE CHANGE 2007, *supra* note 4, at 3 (stating that there is a "*very high confidence* that the globally averaged net effect of human activities since 1750 has been one of warming"). The rate of increase during the industrial era is "*very likely* to have been unprecedented in more than 10,000 years." *Id.*

11. *See* Dean Scott, *Capping U.S. Greenhouse Gas Emissions Now Would Stem Large Future Costs, Authors Say*, Chemical Reg. Daily (BNA), at D-13 (Nov. 7, 2006).

12. CLIMATE CHANGE 2007, *supra* note 4, at 2. "The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture." *Id.*

13. John R. Christy, *The Ever-Changing Climate System: Adapting to Challenges*, 36 CUMB. L. REV. 493, 496 (2005). Pre-industrial values of carbon dioxide were 280 parts per million (ppm). That number increased to 379 ppm in 2005. CLIMATE CHANGE 2007, *supra* note 4, at 2. Some say that it has been as many as 10 million years since CO_2 concentrations have been this high. Young, *supra* note 6, at 27 ("The last time the atmosphere contained this much carbon dioxide was about 10 million years ago, when Greenland had no significant ice sheets, sea level was several meters higher, and temperatures were several degrees above today's.").

14. Climate feedback loops can be either positive (reinforcing warming) or negative (countering warming). *See* Emma Duncan, *In the Loop: Warming May Set off Mechanisms that Make It Warmer Still*, ECONOMIST, Sept. 9, 2006, at 4 [hereinafter Duncan, *In the Loop*]. For example, positive feedback loops, which scientists have most often identified, will reinforce the warming of the Arctic. *See id.* Because "water reflects far less sunlight than ice or snow, . . . when sea ice turns to water during the Arctic summer, the amount of energy absorbed goes up by a factor of nine." Young, *supra* note 6, at 28.

with climate processes and feedbacks."[15] In other words, even if anthropogenic emissions were to stabilize at this very moment, the average time for removal of added carbon dioxide from the atmosphere is measured in centuries, during which climate change effects will continue to manifest.[16]

Particularly frightening to those communities least able to adapt to climate change, is the great possibility that continued greenhouse gas emissions will trigger an abrupt climate surprise.[17] The evidence supporting the urgency of climate change, generally, is based on fairly linear data points and does not—in fact, cannot—take into account an abrupt shift in climate patterns due to feedback loops that are difficult to model.[18] The result of such a shift could be significant regional cooling or warming, widespread droughts, shifts in hurricane frequency, or flood regimes that could occur in as little as a decade, yielding very rapid, large-scale impacts on ecosystems and human health and welfare.[19] Regional changes in climate are particularly dangerous because of the challenges and risks they pose in a modern world marked by increasing population and limited resources.[20]

B. *Environmental Justice Communities and Climate Change*

1. *General Impacts*. As Rajendra Pachauri stated at the release of the April 2007 IPCC report on impacts,

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15. CLIMATE CHANGE 2007, *supra* note 4, at 17.

16. *See* Brief of Amici Curiae Climate Scientists, *supra* note 5, at 12, 14.

17. *Id.* at 14.

18. According to climate scientists, these abrupt climate changes have happened in the past. "We do not understand these switches very well, but there is a finite but unknown risk that continued emission of greenhouse gases will trigger a climate change surprise." *Id.* at 15. As an example, "[d]ramatic warming of the Arctic region could 'conceivably' influence conditions for much of the planet, triggering a 'sudden rearrangement' of existing circulation systems in the atmosphere and oceans." Dean Scott, *Abrupt Climate Change, Effects on Arctic Focus of Two Draft U.S. Assessment Reports*, 29 Int'l Env't Rep. (BNA), at 870 (Nov. 15, 2006).

19. *See* Brief of Amici Curiae Climate Scientists, *supra* note 5, at 14-15.

20. *See* Scott, *supra* note 18.

adaptation, and vulnerability,[21] "[t]he poorest of the poor in the world—*and this includes poor people in prosperous societies*—are going to be the worst hit."[22] North America is set to experience more severe storms, hurricanes, floods, droughts, heat waves, and wildfires.[23] The coasts, similar to those worldwide, will be inundated by rising sea levels.[24] There are, consequently, many serious public health and welfare implications for environmental justice (EJ) communities due to global warming.

While all risks will affect the low-income earners more acutely, risks that will undoubtedly yield disproportionate

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21. In the IPCC's recent report, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, the Panel defines vulnerability as "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes." IMPACTS REPORT, *supra* note 9, at 21.

22. Max, *supra* note 8 (emphasis added). While Africa will be hardest hit, with up to 250 million people likely exposed to water shortages in just thirteen years and food production in some countries potentially falling by half, *see id.*, North America will experience more severe storms with human and economic loss, and cultural and social disruptions. *See generally* IMPACTS REPORT, *supra* note 9. The continent "'has already experienced substantial ecosystem, social and cultural disruption from recent climate extremes.'" *Climate Report: Droughts, Starvation, Disease—Global Warming Effects Could Mean Hundreds of Millions Without Water*, MSNBC, Mar. 10, 2007, http://www.msnbc.msn.com/id/17554963/.

For discussion of climate change impacts on African Americans specifically, see generally CONG. BLACK CAUCUS FOUND., INC., AFRICAN AMERICANS AND CLIMATE CHANGE: AN UNEQUAL BURDEN (2004) [hereinafter AFRICAN AMERICANS AND CLIMATE CHANGE], *available at* http://www.rprogress.org/publications/2004/CBCF_REPORT_F.pdf. The three basic findings of the report are as follows

> (1) African Americans are already *disproportionately burdened* by the health effects of climate change, including deaths during heat waves and from worsened air pollution . . .
>
> (2) African Americans are *less responsible* for climate change than other Americans . . . historically and at present . . . [and,]
>
> (3) [p]olicies intended to mitigate climate change can generate large health and economic benefits or costs for African Americans, depending on how they are structured.

Id. at 2. I address the third finding in Parts III and IV, *infra*.

23. *See* IMPACTS REPORT, *supra* note 9. Indeed, the continent "has already experienced substantial ecosystem, social and cultural disruption from recent climate extremes," such as hurricanes and wildfires. *Id.*

24. *See* Max, *supra* note 8.

adverse impact are the consequences of heat extremes. Increased temperatures with the attendant extreme weather events are widely accepted consequences of global warming.[25] Heat stress has already been a public health nightmare for the poor and of-color.[26] As an example, older black males living alone with poor health status suffered a disproportionate share of excess fatalities after the 1996 heat wave in Chicago.[27] Such a result is not exclusive to Chicago's black males. A study of the fifteen largest U.S. cities found that "climate change would lead to more heat-related deaths in the inner city. Due to demographics and social factors, people of color would be more likely to die in a heat wave and to suffer more from heat-related stress and illness."[28] A study of heat-related deaths in St. Louis, as an example, showed that non-whites were twice as likely as whites to die as a result of heat waves.[29]

Mortality rates due to pollution-related respiratory illnesses will also unevenly affect EJ communities. Asthma prevalence, hospitalization, and mortality, for example, are

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25. Average temperatures are expected to increase 3.2 to 7.2 degrees Fahrenheit by 2100. Diane Carman, *The Scary Truth About The Climate*, DENV. POST, Feb. 4, 2007, at 1C. In its most recent report, the IPCC has found that "[p]rojected climate change-related exposures are likely to affect the health status of millions of people, particularly those with low adaptive capacity, through," among other things, "increased deaths, disease and injury due to heatwaves, floods, storms, fires and droughts . . . [and] the increased frequency of cardio-respiratory diseases due to higher concentrations of ground-level ozone related to climate change." IMPACTS REPORT, *supra* note 9, at 12.

26. *See, e.g.*, Brief of Amici Curiae Climate, *supra* note 5, at 14.

27. W. Neil Adger et al., *Toward Justice in Adaptation to Climate Change*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE, *supra* note 1, at 1, 6.

28. Julie Sze, *Race and Power: An Introduction to Environmental Justice Energy Activism*, *in* POWER, JUSTICE, AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT 101, 114 n.14 (David Naguib Pellow & Robert J. Brulle eds., 2005); *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 3, 10 (finding that future heat waves will be most lethal in the inner cities of the northern half of the country, such as New York City, Detroit, Chicago, and Philadelphia, and that empirical evidence from Chicago, Texas, Memphis, St. Louis, Kansas City, and others indicate that African Americans are already up to twice as likely as non-African Americans to die during heat waves).

29. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 10. Warmer summers with longer and more frequent heat waves are dangerous for seniors, particularly for those who cannot afford air conditioning. *Id.*

three times higher among minorities than among whites.[30] And these disparities exist even after controlling for income.[31] Climate scientists have already found that smog, and associated health risks like asthma,[32] are "very likely to increase with temperature, especially in the North-eastern United States, where many areas currently experience ozone levels that exceed [Environmental Protection Agency (EPA)] Clean Air Act standards on hot summer days."[33]

The EJ communities will also, of course, be subject to the more general and commonly cited negative effects of climate change; and, further aggravating these outcomes, the dire economic forecasts for the globe will be felt acutely by EJ communities. The environmental risks these communities disproportionately suffer, mentioned just above, acquire a more dangerous hue when income is taken into account. A report by noted economist Sir Nicholas Stern warns that unless urgent action is taken, the planet faces an economic calamity on the scale of the Great Depression

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30. *See* MANUEL PASTOR ET AL., IN THE WAKE OF THE STORM: ENVIRONMENT, DISASTER, AND RACE AFTER KATRINA 17 (2006); *see also* Bunyan Bryant & Elaine Hockman, *A Brief Comparison of the Civil Rights Movement and the Environmental Justice Movement*, *in* POWER, JUSTICE, AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT, *supra* note 28, at 23, 34 ("Power plants are the biggest industrial source of air pollution in the United States. Most African-Americans live near a power plant. Asthma attacks send African-Americans to the emergency room at three times the rate of whites."). There is evidence that such disparities correlate with differing air toxics levels. *See id.*; *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 2 ("In every one of the 44 major metropolitan areas in the U.S., [African Americans] are more likely than Whites to be exposed to higher air toxics concentrations.").

31. PASTOR ET AL., *supra* note 30, at 17.

32. The health effects of rising temperatures include an increase in pollution-related respiratory illnesses, such as asthma, reduced lung function, and respiratory inflammation, aggravated by ground-level ozone. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 2, 3, 11, 29-34.

33. Brief of Amici Curiae Climate Scientists, *supra* note 5, at 14. The climate scientists found that "[c]old related stress would decline in a warmer climate, while heat stress and smog induced respiratory illnesses in major urban areas would increase, if no adaptation occurred." *Id.* at 28. This is consistent with outcomes predicted in the IPCC's recent report on climate change impacts. *See* IMPACTS REPORT, *supra* note 9, at 14-15. In North America, "[c]ities that currently experience heatwaves are expected to be further challenged by an increased number, intensity and duration of heatwaves during the course of the century, with potential for adverse health impacts. Elderly populations are most at risk." *Id.* at 15.

and the world wars.[34] Using formal economic models, Stern suggests that climate change will produce "market failure on the greatest scale the world has seen,"[35] which should lead the world to grave concern.[36] This is particularly relevant to EJ communities, as the first and most severe effects of economic downturn are borne by the poor.[37] Less obvious climate change risks include increases in the costs of energy and food, employment restructuring within and across industries, and impacts on the uninsured. With respect to costs of basic goods, increases will come with clear, attendant disadvantages, as these costs already represent a large proportion of the budgets for the poor and of-color.[38] Employment restructuring, including layoffs and hiring freezes, with the "last hired, first fired" phenomenon, will certainly worsen the economic damage of global

34. Thomas Wagner, *Global Warming Could Devastate Economy*, LIVE SCI., Oct. 30, 2006, http://www.livescience.com/environment/061030_ap_gw_economy.html; *see also* Sir Nicholas Stern, *The Global Climate Imperative*, BUS. WK., Apr. 16, 2007, at 90. Stern, a former chief World Bank economist and now senior British economist, released the 700-page report entitled *The Economics of Climate Change* at the end of 2006. Specifically, it is warned that "climate change would eventually cost the world the equivalent of between 5 percent and 20 percent of global gross domestic product each year." Wagner, *supra*. In contrast, "acting now to cut greenhouse gas emissions would cost about 1 percent of global GDP each year." *Id.* Without abatement, predicted losses equal at least five percent of global GDP each year, forever; and, that loss could rise to twenty percent of global GDP or more. *See id*.

Of course, these kinds of calculations have their own imperfections. "The report acknowledged that its predictions regarding GDP relied on sparse data about high temperatures and developing countries, and placed monetary values on human health and the environment, 'which is conceptually, ethically and empirically very difficult.'" *Id.*

35. *Stern Warning*, ECONOMIST, Nov. 4, 2006, at 14, 14.

36. If not panic. *See id.*

37. This is true on a global as well as domestic scale. For example, projected decreases in GDP for Africa and India increase existing climate change vulnerabilities. "It is not just that Africa and India are already hot; being poor, they are also more dependent on agriculture than the rest of the world; and agriculture is more vulnerable to climate change than are investment banking or car assembly." Emma Duncan, *Dismal Calculations: The Economics of Living with Climate Change—or Mitigating It*, ECONOMIST, Sept. 9, 2006, at 14, 14 [hereinafter Duncan, *Dismal Calculations*]. Domestically, impacts will also be great. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 45-52.

38. *See* Adger et al., *supra* note 27, at 6; AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 45-52.

warming caused to individuals, families, and communities.[39] Finally, warming will hit the uninsured hardest. At present, of the tens of millions of Americans who are without health insurance, for example, the rate for people of color is twice that for whites.[40] Natural disasters in EJ communities are particularly fierce, as many of the communities' residents are often renters, without renter's insurance, and lack savings to recover from disasters.[41] Additionally, low-income earners typically are without the resources to compensate for the lack of insurance.[42] These factors, according to the Intergovernmental Panel on Climate Change, will be critically important as education, health care, prevention initiatives, and infrastructure and economic development directly shape the health of populations.[43] Existing conditions suggest troubling, substantial impacts on domestic populations.

2. *The Arctic Villages*. Current climate impacts on EJ communities are frightening harbingers of things to come. In the discourse on disparate impacts, climate change impacts on indigenous peoples have been well postulated and well documented by climate scientists, ethicists, and others.[44] Though most Americans are totally oblivious to

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39. *See* Adger et al., *supra* note 27, at 4-9; *see also*, AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 3. For example, "[d]uring such periods of economic downturn African Americans are far more negatively affected in terms of employment and wages than other Americans . . . ." *Id.* at 4.

40. *See* Adger et al., *supra* note 27, at 6; *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 3. The total number of Americans without health insurance in the United States is approximately 47 million; of those, approximately 8.7 million are children. John Donnelly, *47 Million Americans Are Uninsured*, BOSTON GLOBE, Aug. 29, 2007, at A-2.

41. *See* Adger et al., *supra* note 27, at 6; *see also* Mark Stallworthy, *Sustainability, Coastal Erosion and Climate Change: An Environmental Justice Analysis*, 18 J. ENVTL. L. 357, 364 (2006) ("Although exposure to flood risk might not naturally be characterized as class-based, vulnerability can still arise differentially, say where self-defence or insurance is available and taken up only by those who can afford it; also, as seen above, the economically disadvantaged are geographically less mobile."). For further discussion of this in the context of Katrina and "second disasters," see *infra* Part III.

42. *See* Adger et al., *supra* note 27, at 6.

43. *See* IMPACTS REPORT, *supra* note 9, at 8.

44. The climate change predictions have always been more dire for the Arctic. *See, e.g.*, Brief of Amici Curiae Alaska Inter-Tribal Counsel et al. in

the realities of the Arctic, native communities within our own borders are among the first sacrificed by climate change.[45] Greenhouse gas emissions are affecting Native Alaskans so completely that their very existence is being threatened. There have been measurable disruptions of soils, water, vegetation, animals, wildlife, weather, and climate—resulting in damage to and deterioration of property, creation of transportation hazards, and compromised personal comfort and well-being.[46]

There is a more profound and devastating cultural impact as well. In the jargon of science and policy, it is known that Arctic sea ice is most important in influencing climate[47] and that the polar regions control the Earth's heat balance.[48] From the indigenous perspective, the experience

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Support of Petitioners at 7, Mass. v. EPA, 127 S. Ct. 1438 (2007) (No. 05-1120) [hereinafter Brief of Amici Curiae Alaska Inter-Tribal Counsel et al.]; *see also* Adger, *supra* note 27, at 25, 117 (finding that indigenous peoples are losing traditional medicinal plants to a warming climate, and subsistence households are suffering from loss of species that are unable to adapt). The impact on Native communities in the lower forty-eight will also have myriad impacts. Bob Gough identifies three scales on which poor indigenous communities will be disproportionately affected: health, economic, and cultural. Robert Gough, *Indigenous Peoples and Renewable Energy: Thinking Locally, Acting Globally: A Modest Native Proposal for Climate Justice from the Northern Great Plains* 4 (Second Nat'l People of Color Envtl. Leadership Summit - Summit II, Resource Paper Series, Oct. 23, 2002), *available at* http://www.ejrc.cau.edu/summit2/IndigenousClimateJustice.pdf.

45. It is well known that the rate of warming in the Arctic is twice that of the rest of the world, with the attendant consequences. Brief of Amici Curiae Alaska Inter-Tribal Council et al., *supra* note 44, at 1.

46. *Id.* at 4 (finding that because air and water temperatures are climbing, "sea ice is disappearing, weather patterns are less predictable, permafrost is melting, vegetation cover is changing, wildlife populations are threatened and declining, roads and villages are crumbling, and key subsistence species are no longer found in traditional hunting areas during the expected seasons"). Eleven distinct cultures, politically organized into 228 federally recognized tribes, comprise Alaska Natives. *Id.* at 2; *see also* IMPACTS REPORT, *supra* note 9, at 7. "Artic human communities are already adapting to climate change, but both external and internal stressors challenge their adaptive capacities. Despite the resilience shown historically by Arctic indigenous communities, some traditional ways of life are being threatened and substantial investments are needed to adapt or re-locate physical structures and communities." *Id.* at 15.

47. Brief of Amici Curiae Alaska Inter-Tribal Council et al., *supra* note 44, at 13 (identifying evidence of rapid loss of permanent sea ice, suggesting that within a century the Arctic Ocean may have ice-free summers).

48. *See id.* at 14 (describing science showing that the northern regions of

of climate change is more wide-reaching and pervasive than it would be for non-indigenous populations. In short, climate change's impact on the weather is more acutely felt by subsistence communities like those of Alaska. The Arctic Inupiat communities depend on the sea for food—including whales, seals, and walruses—clothing, and other necessities.[49] Since the 1970s, Alaska Natives have reported environmental anomalies "outside the bounds of normal variability."[50]

> From sources of indigenous knowledge across the Arctic come reports that the weather seems more variable, unfamiliar, and is behaving unexpectedly and outside the norm . . . . Storms often occur without warning. Wind direction changes suddenly. In many places it is increasingly cloudy . . . . As noted by several elders, "the weather is harder to know."[51]

Many Arctic communities are hunting at their own great peril due to tenuous and unpredictable ice cover, for example.[52] For Native Alaskans, there are no practicable alternatives for food supplies in most cases.[53] As Ronald Brower, Sr., speaking on behalf of the Inuit Circumpolar Conference, describes, "We are experiencing things in one lifetime that should take five or six generations . . . . We are making do with less subsistence food and trying to make the most of it."[54] Evon Peter of Arctic Village, Alaska, shared the deeper implications of these subsistence losses:

> The practice of coming out here and being on the land and hunting caribou is not only about feeding our families, because it is all we have to survive from . . . . But it's also about maintaining our culture and our spiritual relationship with these animals that

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North America, including Alaska, are exceeding global mean warming by about forty percent).

49. *Id.* at 17.

50. *Id.* at 11.

51. *Id.* at 12.

52. *See id.* at 18.

53. *See id.* at 13. "Fifty percent of food for three-quarters of the Native families in Alaska's small and medium villages is acquired through subsistence uses, and 40 percent of such families spend an average of six to seven months of the year in subsistence activities." *Id.*

54. *Id.* at 2 (quoting Ronald Brower, Sr.).

> we've had for time immemorial.[55]

Finally, Arctic storms are growing more fierce and frequent. The village of Shishmaref lost approximately fifteen meters of land overnight as a result of one storm. This is consistent with the increasingly rapid loss of land, which in the past thirty years has been between 100-300 feet of coastline, half of which has eroded since 1997.[56] Shishmaref's erosion coordinator, Robert Iyatunguk, describes the urgency of the crisis:

> The storms are getting more frequent, the winds are getting stronger, the water is getting higher and it's noticeable to everyone in town. If we get 12 to 14 foot waves, this place is going to get wiped out in a matter of hours. We're in panic mode because of how much ground we're losing. If our airport gets flooded out, there goes our evacuation by plane.[57]

With the seas relentlessly encroaching, Shishmaref residents voted to leave the community they have inhabited for the past 4000 years.[58] However, due to the costs of relocating to a site just twelve miles away, residents will have to stay despite the federal government having declared their village in "imminent danger."[59]

3. *New Orleans*. The last community known to many to be in "imminent danger" was destroyed before it could be fully evacuated. The city of New Orleans has been the quintessential site of environmental injustice historically. The increased vulnerability of the city was the unsurprising result of racial discrimination and environmental degradation that are often inextricably intertwined. This correlation is typical of the South.[60] The plantation system, as Manuel Pastor et al. recount, exploited humans as well as regional ecologies.[61] This exploitation was also a byproduct of segregation and Jim Crow. As a function of these policies

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55. *Id.* at 12 (quoting Evon Peter).

56. *Id.* at 23. According to the United States General Accounting Office, 184 of 213 Alaska Native villages have experienced some form of erosion. *Id.* at 24.

57. *Id.* at 22 (quoting Robert Iyatunguk).

58. *Id.* at 24-25.

59. *Id.*

and practices, particularly after slavery, black communities were forced to live in the least desirable parts of town.[62] According to Vernice Miller-Travis, "[e]very community in the southern United States and many outside the South had an area called the 'bottoms.' These were almost always low-lying and frequently flooded areas . . . . The bottoms were the part of town literally on the other side of the railroad tracks."[63]

New Orleans was, of course, no different. The area most vulnerable to floods, the Lower Ninth Ward, was ninety-eight percent black.[64] By contrast, whites by and large lived on the land above sea level.[65] Indeed, "[p]eople in New Orleans [knew] that the class and race distinctions in the city correspond[ed] to the sea levels of the residents."[66] Consequently, the night before Hurricane Katrina struck, the city was almost two-thirds black,[67] while in the days and weeks after, mass displacement and death "left New Orleans older, whiter and more affluent."[68] The degree of

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60. PASTOR ET AL., *supra* note 30, at 3. It is typical of the South, but not exclusive to the South. According to Pastor et al., "[t]he problem is not limited to the South and its legacy of Jim Crow. Research suggests that environmental disparities by race are rampant in much of the United States, that rational land use choices and market mechanisms do not explain the pattern of difference, and that there are often important consequences for the health of diverse communities." *Id.* at 40.

61. *Id.* at 3.

62. *See* Vernice Miller-Travis, *And the Floodwaters Came: Environmental Justice Implications of Hurricane Katrina*, NAT'L WETLANDS NEWSL., Jan. 2006, at 40, 40. Many of these bad practices were rooted in the Reconstruction and Post-Reconstruction periods. *Id.*

63. *Id.*

64. Eric Mann, *Race and the High Ground in New Orleans*, WORLD WATCH, Sept./Oct. 2006, at 40, 40. Further, "[i]n New Orleans, 'poor' and 'black' were virtually synonymous." *Id.*

65. *See id.* "Even in the central city area, whites lived on the land above sea level: the Garden District (eighty-nine percent white), Audubon (eighty-six percent), Touro (seventy-four percent), and the French Quarter (ninety percent)." *Id.*

66. *Id.*

67. *Id.*

68. Bill Quigley, *Katrina, Ten Months Later: Gutting New Orleans*, SALT EQUALIZER, Sept. 2006, at 24, 24. When Katrina struck, "a black city, called by activists the most Afro-centric city in the United States, was almost literally blown off the face of the Earth. At least 1,836 people were killed, 70 percent or

devastation needs no further discussion, as most Americans are vividly aware of what occurred. Further, in many ways the entire event was unremarkable in its essential inevitability. Indeed, the "wholesale devastation of Hurricane Katrina fell most heavily on the poor and black, just as the impact of natural disasters worldwide falls most heavily on those with the fewest resources to cope."[69] The difference is that this disaster occurred in the United States.

Here is where the capacity to adapt to climate change becomes central and a uniquely engaging point for climate justice. Katrina laid bare the truism that some are more equal than others.[70] Low-income and of-color Americans are more likely to be underserved by government and private relief agencies before, during, and after environmental disasters.[71] A disaster is more devastating to the poor, and the aftermath of that event constitutes a "second disaster," in which failures of social infrastructure vis-à-vis the underprivileged are blatant and equally, if not more, devastating.[72] In addition to the great tangible losses, including greater problems with homelessness, the poor and

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more of them black." Mann, *supra* note 64, at 40.

69. Mann, *supra* note 64, at 40.

70. This has certainly come to be a common adage, particularly in reference to Katrina and disparate outcomes for white and black Americans post-disaster. It is, of course, adapted from George Orwell's *Animal Farm*: "All animals are equal, but some animals are more equal than others." GEORGE ORWELL, ANIMAL FARM 148 (Harcourt, Brace & World, Inc. 1946) (1945).

71. *See* PASTOR ET AL., *supra* note 30, at iii. This is compounded by the relative lack of preparedness and insurance discussed *supra* Part I.B.1; *see also* PASTOR ET AL., *supra* note 30, at iii.

72. *See* PASTOR ET AL., supra note 30, at 29-30 (describing the phenomenon of the "second disaster" as slow recovery problems that often arise in the process of rebuilding and recuperation). The lack of flood insurance was a particularly powerful shortfall. The Congressional Black Caucus Foundation's report on climate change impacts on African Americans notes: "The overwhelming loss of life and property by the poorest residents of the gulf region provides another example of how climate change is devastating communities and families of color who are unable to afford Flood Insurance and other necessary protections that will allow them to rebuild and restore their lives as they were before the disaster." CENTER FOR POL'Y ANALYSIS & RES., CONG. BLACK CAUCUS FOUND., CLIMATE CHANGE AND EXTREME WEATHER EVENTS: AN UNEQUAL BURDEN ON AFRICAN AMERICANS 4 (Kenya Covington ed., 2005) [hereinafter CLIMATE CHANGE AND EXTREME WEATHER EVENTS]. For additional discussion of lack of access to insurance, see *supra* Part I.B.1 (discussing general economic impacts).

people of color experience unique psychological impacts.[73] In particular, elderly African-Americans experience slower "psychosocial recovery" as compared to their white counterparts, partly due to economic restraints.[74]

A well-established consequence of climate change is that the gulf and east coast states will continue to experience the bulk of the impact. An ability to adapt to the inevitable risks of climate change, as a lesson from Katrina and the second disaster phenomenon, will be a crucial determinant of the depth of that risk.

The profound injustices that inhere in climate change's disproportionate effects are obvious, yet two of them bear explication. One is that the unequal burden that is occurring, and is predicted, falls on those who have not been primarily responsible for climate change, domestically as well as internationally.[75] African Americans, for example, are "*less responsible* for climate change than other Americans; . . . at present, African Americans emit 20 percent less greenhouse gases per household,"[76] and on a per capita basis.[77] It is also true that the less wealthy half of America, regardless of race, is far less responsible for carbon dioxide emissions as well.[78] Further, historically these percentage disparities were even higher.[79] The second, and perhaps most compelling, injustice is the compounding effect of the environmental risk on the underlying societal inequities—inequality that resulted in the uneven patterns of development and access to resources

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73. *See* PASTOR ET AL., *supra* note 30, at 22.

74. *Id.*

75. *See, e.g.*, CLIMATE CHANGE AND EXTREME WEATHER EVENTS, *supra* note 72; AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22.

76. CLIMATE CHANGE AND EXTREME WEATHER EVENTS, *supra* note 72, at 6; *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 64-79. This is true across the United States, making the unequal burden on African Americans, in this case, particularly unjust. *See id.* at 68-69 (citing statistics demonstrating that the "typical black household uses significantly less gasoline and electricity than other groups, and emits less carbon dioxide," and "[a]s such, Blacks are simply less responsible for the U.S. contribution to climate change than whites").

77. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 68.

78. *See id.* at 70.

79. *Id.* at 3.

and opportunity in America.[80] In other words, the legacy of slavery, segregation, the placement of reservations for indigenous populations, and the more elusive systemic discrimination that has followed, for example, is now locking in differentiated experiences of a warming planet. The reach of that racial discrimination has deep implications for the structuring of sound and just climate policy.

The distribution of climate change impacts is likely to be increasingly unjust; for that reason, it is imperative that the solutions proffered neither entrench existing vulnerabilities nor introduce new ones.[81] Without early and meaningful participation from EJ communities, the interests and needs of those communities will insufficiently inform strategies to mitigate and adapt to climate change.[82] In short, climate policy for both mitigation and adaptation can create its own "winners and losers,"[83] and without fair decisionmaking in the process of crafting solutions, "fair outcomes will only ever be coincidental."[84]

In Part II, I identify guiding principles for creating just climate policy. Drawing from the lessons of environmental justice, I explore an emerging climate justice movement.

II. THE CLIMATE JUSTICE FRAMEWORK

The environmental justice movement is concerned with the interplay of race, poverty, and environmental risk, generally. Findings that poor and of-color communities suffer from pollution more frequently and severely than their white

80. This is clearly true on an international scale as well. *See* Adger et al., *supra* note 27, at 3 (identifying climate injustices "likely to compound past injustices, such as underdevelopment and colonialism, that themselves have resulted in the uneven patterns of development in today's world").

81. *See id.* The first key observation of Adger et al.'s book is the following: "In terms of distributive justice . . . the distribution of climate change impacts is likely to be unjust and . . . climate change impacts are likely to create new vulnerabilities, the causes and distribution of which are unfair." *Id.*

82. *See* Jouni Paavola, W. Neil Adger & Saleemul Huq, *Multifaceted Justice in Adaptation to Climate Change*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE, *supra* note 1, at 263, 268. "This is why adaptation plans and decisions can aggravate inequality and vulnerability rather than reduce them." *Id.*

83. Adger et al., *supra* note 27, at 4.

84. *Id.* at 14.

counterparts spurred the development of significant practical and theoretical responses. With the advent of perceptible climate change, a new framework of climate justice—mindful of the particulars of a warming Earth as well as the principles of environmental justice—must emerge.

A. *The Environmental Justice Frame*

From the environmental justice perspective, geography is destiny, and the right to a flourishing environment is a basic human right.[85] Depressed spaces, both rural and urban, will determine the educational attainment and economic prosperity of their citizens.[86] As they lag behind the rest of the nation in these public welfare indicators, they will also lag in their access to environmental health and amenities. In other words, the limits inherent in population growth, industrialization, pollution, and resource depletion are borne unequally by poor and of-color communities.[87] The poor and politically powerless are "confined to national environmental sacrifice areas"

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85. Of course, there has been a general tendency to balk at the use of "rights" language in traditional environmental law—and certainly outside of the environmental law arena. For instance, NEPA's original statutory language, which was amended in committee, declared that "each person has a fundamental and inalienable right to a healthful environment." Notes from lecture by James "Skip" Spensley (Apr. 19, 2007) (on file with author); *see also* Tanner v. Armco Steel Corp., 340 F. Supp. 532, 539 (S.D. Tex. 1972) (explaining that the committee revision demonstrated Congress's "assiduous care" in "foreclos[ing] the possibility" that the statute could be interpreted "as creating a legally enforceable right to a 'healthful environment.'"). *But see, e.g.*, Joseph W. Dellapenna, *International Law's Lessons for the Law of the Lakes*, 40 U. MICH. J.L. REFORM 747, 791 & n.274, 792 (2007) (pointing to the "wide recognition today of a human right to a clean and healthy environment" and citing authority for that recognition); David Monsma, *Equal Rights, Governance, and the Environment: Integrating Environmental Justice Principles in Corporate Social Responsibility*, 33 ECOLOGY L.Q. 443, 470 & nn.153-54, 486-91 (2006) (quoting and citing a variety of international documents asserting the human right to a healthy environment).

86. *See* Karin Fischer & Sara Hebel, *The Geographic Have-Nots: Urban Centers and Rural Regions*, CHRON. HIGHER EDUC., Nov. 3, 2006, at A20.

87. *See* David Naguib Pellow & Robert J. Brulle, *Power, Justice, and the Environment: Toward Critical Environmental Justice Studies*, *in* POWER, JUSTICE, AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT, *supra* note 28, at 1, 2. The affluent, if exposed to these limits, can better absorb the associated price increases than the poor, working-class, people of color, and immigrants. *See id.* at 2.

throughout the nation, including Navajo or Western Shoshone lands, Chester, Pennsylvania, and Cancer Alley, Louisiana.[88]

These disadvantages are not solely associated with poverty.[89] Environmental risks are elevated for middle-class African-Americans, Latinas/os, and Asian-Americans.[90] The risk more accurately tracks differences in access to power. Though the quality and quantity of these risks decline as income rises, "[i]n both public and private arenas . . . power disparities drive outcome disparities—and the resulting patterns reflect race and ethnicity as well as wealth."[91] The causes of the disproportionate effects are manifold and include racism, inadequate healthcare, limited access to environmental information, and the simple lack of sufficient political influence.[92]

Environmental justice acknowledges and further unveils these environment-based inequities. As David

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88. *Id.* at 2.

89. Instead, Pastor et al. describe the deep and telling "connection of race, place, and the environment":

> [I]n a recent study of all metro areas in the United States, Rachel Morello-Frosch and Bill Jesdale (2006) found a persistent relationship between increasing levels of racial-ethnic segregation and increased estimated cancer risk associated with ambient air toxics across racial lines. Segregation, moreover, solidifies racial disparities in socioeconomic status . . . and shapes the distribution of resources and wealth at the individual, household, and community levels that can affect access to health services to mitigate the increased environmental risk.
>
> But it is more than just risk at play: the intersection of race and place affects access to jobs, education and public services, culture, shopping, level of personal security, medical services, transportation, and residential amenities such as parks and green space.

PASTOR ET AL., *supra* note 30, at 8-9.

90. *See id.* at 10.

91. *Id.* at 10, 16.

92. *See* Richard J. Lazarus, *Pursuing "Environmental Justice": The Distributional Effects of Environmental Protection*, 87 NW. U. L. REV. 787, 796 (1993); *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 36 ("The reasons for this disparity are both socioeconomic and racial: African Americans are more likely to live in urban areas, are more likely to be poor, are more likely to be discriminated against, and are more likely to lack access to resources to resist the siting of power plants in their neighborhoods. The evidence that African Americans are already exposed to worse air quality is sound.").

Pellow and Robert J. Brulle describe, "[t]he environmental justice (EJ) movement is a political response to the deterioration of the conditions of everyday life as society reinforces existing social inequalities while exceeding the limits to growth."[93]

The relationship between exploitation of the natural environment and that of human populations is, in fact, direct.[94] EJ seeks to tackle both axes of exploitation.

EJ has largely waged this struggle by framing environmental injustice in more traditional "rights" terms—civil rights, social justice, and human rights.[95] Robert Bullard identifies in the environmental justice framework five essential elements, which are consistent with this rights-based frame.[96] Three of those elements, in particular, suggest specific and targeted rights-based arguments about the nature and quality of our responses to climate change. Stemming from the civil rights frameworks,[97] the first element is the central right of all individuals to be protected from environmental degradation. The second element

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93. Pellow & Brulle, *supra* note 87, at 2-3.

94. *See id.* at 2. Pellow and Brulle cite to "well-developed literature" locating the origins of environmental degradation in the political economy of advanced capitalist economies. In other words, in this economy a "treadmill of production" yields self-reinforcing mechanisms of ever more production and consumption, which require growing inputs of energy and materials. *Id.* at 4. Importantly, in the face of increasing limits to resources, "the treadmill of production searches for alternative sources rather than conserving resources and restructuring production." *Id.* at 5.

95. *Id.* at 13. EJ has self-consciously shifted away from the more removed language of traditional environmentalists. Instead, "[t]he language of environmental justice has entered the lexicon of public health, corporate responsibility, climate change debates, urban planning, transportation development, and municipal zoning." Robert J. Brulle & David Naguib Pellow, *The Future of Environmental Justice Movements*, *in* POWER, JUSTICE, AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT, *supra* note 28, at 293, 293-94.

96. The five are

> (1) a right of all individuals to be protected from pollution; (2) a preference for prevention strategies; (3) a shift to polluters and dischargers of the burdens of proof; (4) a definition of discrimination that includes disparate impacts and statistical evidence; and (5) an emphasis on targeted action to redress unequal risk burdens.

Monsma, *supra* note 85, at 470.

97. *See* PASTOR ET AL., *supra* note 30, at 7.

demands a preference for prevention strategies. Finally, the third element shifts burdens of proof onto the polluters themselves, consistent with its delegation of primary rights to those affected. In light of this rights foundation and the theoretical and practical framework built upon it, environmental justice demands just solutions to climate change.

Brulle and Pellow imagine a future for environmental justice that considers not only how communities might repel toxic facilities and hazardous waste, but also "how communities might feed themselves, provide energy, build new systems of governance and decision making while influencing existing ones, and produce and control new knowledge about public health and the environment."[98] This is particularly important from a *climate* justice vantage point, as the uncertain and irreversible nature of the climate system and disruptions to it can lead to permanent, disastrous results for the most susceptible.[99] In light of this mandate, climate justice is indeed the "next generation of environmental justice theory and action."[100]

To date, however, climate justice as a sub-discipline of environmental justice (or environmental law for that matter), is not clearly carved out and cultivated in the legal literature.[101] In the following section, I elaborate on climate justice as a field addressing the United States' moral and other obligations to racial and class subalterns, particularly its own.

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98. Brulle & Pellow, *supra* note 95, at 295.

99. *See* Adger et al., *supra* note 27, at 3 (arguing that "climate justice requires the consideration of principles such as precaution and the protection of the most vulnerable because of the uncertainties and irreversibilities inherent in the climate system and climate science").

100. Brulle & Pellow, *supra* note 95, at 295.

101. David Monsma's recent work on environmental justice and corporate social responsibility does include a brief summary of the climate justice principles articulated in the *Ten Actions of Climate Justice Policies* (crafted at the Second National People of Color Environmental Leadership Summit in 2002), and in the *Bali Principles of Climate Justice* (released by the International Climate Justice Network, also in 2002). *See* Monsma, *supra* note 85, at 489 & n.244, 490-92.

B. *Climate Justice, Climate Change Ethics, and the United States*

The emerging field of "climate justice" is concerned with the intersection of race, poverty, and climate change. It takes, as a basic premise, that the disadvantaged in the United States stand to suffer the risks of warming more severely than others, as do their counterparts in the global South. Climate justice also recognizes the direct kinship between social inequality and environmental degradation, which is not isolated to the global south. The most obvious example is the relatively ubiquitous siting of industrial power plants in environmental justice communities, negatively affecting the public health and welfare of those who live in proximity while greatly contributing to global warming.[102]

As an ethical matter, an aggressive mitigation approach is virtually mandatory in light of the existing and predicted effects of climate change.[103] Extensive greenhouse gas emissions are a result of industrialization, and the byproduct of this lifestyle is great social, economic, and ecological destruction, unevenly distributed. The response of the

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102. *See generally* Bryant & Hockman, *supra* note 30. *See also* Sze, *supra* note 28, at 107-08 (citing a 2002 report showing that seventy-eight percent of African-Americans live within thirty miles of a power plant, as opposed to fifty-six percent of whites; and that the percentage of African-Americans living within five miles of a power plant site is higher than the percentage of African Americans in the overall population). In fact, Sze identifies "four areas in which energy development and race are intimately connected: nuclear power, oil refinery pollution, the high-energy society and post-industrialism, and the siting of electricity power plants." *Id.* at 103; *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 2 (finding that in every one of the forty-four major metropolitan areas, African Americans are more likely than Whites to be exposed to higher air toxics concentrations). "African American mothers . . . are almost twice as likely to live in the most polluted counties in the nation [than white mothers], even after controlling for education and region," and the African American *infant* mortality rate is nearly twice that of whites. *Id.* at 37, 41. Of course, a reduction in air pollution levels will have a two-fold advantage; it "would mitigate the health effects of climate change, while [simultaneously] decreasing air pollution related mortality, saving an estimated 10,000 African American lives per year." AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 3.

103. Of course, due to the inertia of the climate, unavoidable warming will occur even with the most aggressive mitigation. See discussion of climate inertia, *supra* Part I. There are, therefore, "some impacts for which adaptation is the only available and appropriate response." IMPACTS REPORT, *supra* note 9, at 19.

industrialized world, however, suggests blindness to the moral imperative at base.[104] That it is wrong to harm others, or risk harming others, for one's own gain is a universal ethical principle.[105] Paul Baer argues that the immorality of such action is justified by many moral frameworks, "from divine revelation to deontological ethics to social contract theory," if not common(sense) morality.[106] Further, the tenets of distributive justice make similar demands regarding immediate and aggressive mitigation. Donald Brown argues,

> [b]ecause distributive justice demands that the burdens of reducing a problem either be shared equally or based upon merit or deservedness, there is no conceivable equitably based formula that would allow the United States to continue to emit at existing levels once it is understood that steep reductions are called for.[107]

There is no plausible argument that merit and deservedness should favor the United States. Instead, the historical impacts of the lifestyle of the wealthy on the less well-off militate in favor of distribution bending steeply in favor of the poor.

U.S. patterns of consumption historically, and certainly today, introduce a particularly strong obligation for aggressively confronting climate change domestically. The utterly unsustainable nature of American consumption

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104. It is not my project here to prove this moral point, though I will elaborate *infra* pp. 193-99. For the ethical framework, see generally Paul G. Harris, *The European Union and Environmental Change: Sharing the Burdens of Global Warming*, 17 COLO. J. INT'L ENVTL. L. & POL'Y 309, 310-23 (2006). Convincing arguments range from the more simply stated, see Lisa Heinzerling, *Knowing Killing and Environmental Law*, 14 N.Y.U. ENVTL. L.J. 521, 534 (2006) ("When people expose other people to environmental hazards that are practically certain to cause some of the exposed people to die, the former have engaged in knowing killing and thus in presumptively morally problematic conduct."), to the more forthright, see Simon Caney, *Cosmopolitan Justice, Rights and Global Climate Change*, 19 CAN. J. L. & JURISPRUDENCE 255, 278 (2006) (arguing that "those who contribute to global climate change through high emissions are guilty of human rights violations and . . . should be condemned as such").

105. Paul Baer, *Adaptation: Who Pays Whom?*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE, *supra* note 1, at 131, 134.

106. *Id.*

107. Donald A. Brown, *The U.S. Performance in Achieving Its 1992 Earth Summit Global Warming Commitments*, 32 ENVTL. L. REP. 10741, 10762 (2002).

cannot be overstated.[108] Presidents to oilmen have straightforwardly articulated the excesses of American lifestyle. In 1997, President Clinton noted that the United States had less than five percent of the world's population, while having twenty-two percent of the world's wealth and emitting more than twenty-five percent of the world's greenhouse gases.[109] In 2006, Shell Oil Company President John Hofmeister stated that the "United States has 4.5 percent of the world's population but uses 25 percent of the world's oil and gas, and there needs to be a cultural or 'behavioral change' toward the use of energy."[110] That this is a result of lifestyle excesses, relative to our global counterparts, is undeniable.

For those who are not immediately convinced, however, Simon Caney lays out a persuasive ethical frame, which I will briefly summarize here. Caney argues that current consumption of fossil fuels is unjust because it generates outcomes in which people's fundamental interests are unprotected and, as such, undermines certain key rights.[111] As a baseline, Caney establishes that "[a] person has a right to X when X is a fundamental interest that is weighty enough to impose obligations."[112] The effects of global climate change damage a person's interests. Caney then asks, "Might the interests in 'not suffering from climate change' be trumped by the interests in 'using natural resources to support oneself'?"[113] He argues that the level of greenhouse gas emissions to "support oneself" would not in itself cause harmful climate change. Of course, supporting

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108. The incredible impact of the burning of coal and the promises of long-term use, for example, are powerfully described by Bob Gough. He explains that conventional utility assurances of 400 to 500 years of coal reserves in the U.S. are less reassuring when burning will accelerate the undoing of 200,000,000 years of carbon sequestration. Gough, *supra* note 44, at 7. Further, all of our conventional energy industries rely on the presumed abundance of fresh water for steam generation for cooling, according to Gough. *Id.*

109. Brown, *supra* note 107, at 10760.

110. Lynn Garner, *Shell Oil President Expresses Support for Greenhouse Gas Reduction Program*, Chemical Reg. Daily (BNA), at D-7 (Oct. 24, 2006).

111. Caney, *supra* note 104, at 255. Caney further argues "this is unjust whether those whose interests are unprotected are fellow citizens or foreigners and whether they are currently alive or are as yet not alive." *Id.*

112. *Id.* at 259.

113. *Id.* at 262.

oneself in reality only involves keeping warm, growing crops, and other essential activities, according to Caney. The climate endangering activities are far more peripheral. He contends: "What do contribute to dangerous climate change are the fossil-fuel intensive practices of the highly affluent industrialized world; and it is certainly possible to cut back on many of their high emission activities without compromising the fundamental interests invoked by the objection."[114]

He continues, arguing that with "the relatively trivial nature of many climate endangering activities, it is fair to conclude that adequate protection of the interest in not suffering from the ill-effects of global climate change does not impose unduly demanding obligations on others."[115] This is true, particularly in light of unfettered global warming.

According to Caney, therefore, the appropriate response to global climate change is to "engage[ ] in a policy of 'mitigation,'" to cut back on fossil fuels, in other words.[116] Cutting back on energy-inefficient cars, reducing the volume of air travel, eliminating poor building insulation, decreasing transportation of goods, and using renewable energy sources are a compromise of interests that seem insignificant in light of the fundamental interests at stake for most.[117] Even if, theoretically, the United States determined that the danger posed by existing climate change trends was acceptable to it, Donald Brown persuasively insists that "the question remains what right exists to unilaterally impose dangerous threats on the most vulnerable."[118] The United States must give the most

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114. *Id.* at 262-63; *see also* Jim Cochran, *Carbon on Credit: Global Warming and the Derivatives Markets*, WORLD WATCH, May/June 2007, at 14 (describing the immense role our heavily credit-based society plays in otherwise impossible rates of carbon emission). Cochran asks, "If some law required pay-as-you go purchasing, could the average American really afford to own a gas-guzzler, to buy a house that is half again as large as he or she really needs, and install cabinets made of wood imported from some distant rain forest? Probably not." *Id.*

115. Caney, *supra* note 104, at 263.

116. *Id.* at 258.

117. *See id.* at 263.

118. Brown, *supra* note 107, at 10757.

vulnerable—including those within its own borders, I argue—an opportunity to concur with current American interpretations of acceptable dangers.[119] Even putting this opportunity aside, severely compromising the fundamental interests of the poor and EJ communities carries its own significant obligation.

One might argue in response that the resulting liability must apply to all Americans, even the poor, and the distributive justice argument is more appropriate when assessing relative distributions between nations. It is true that the discrepancies between nations is quite astonishing, with the entire continent of Africa contributing only three percent of total greenhouse gas emissions since 1900 as compared to two-thirds of total emissions generated by the United States and Western Europe.[120] As Paul Baer convincingly argues, however, the "same distributional principles that apply between nations should apply within nations, with increased liability for those who are more responsible."[121] Liability is, as Baer argues, unequally

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119. *See id; see also* Mark Sagoff, *On Markets For Risks*, 41 MD. L. REV. 755, 764 (1982) (arguing that "people in the environmental, anti-nuclear, and consumer movements are less concerned about freedom than about autonomy"; that "[p]eople want to determine the background level of risk; they do not want the working conditions of their lives to be determined by others"; and that "[t]o environmentalists of this persuasion there is only one sort of acceptable risk[:] . . . a risk that people understand and to which they or their political representatives do, in fact, consent").

120. Andrew C. Revkin, *Poorest Nations Will Bear Brunt As World Warms*, N.Y. TIMES, Apr. 1, 2007, at 1. The following paragraph provides an excellent illustration of the scale differentials in energy use and related emissions:

> Total energy sector CO_2 emissions from Africa were only 3% of world emissions in 1990 (approximately 700,000 tons), even though Africa has 13% of the world's population. Sub-Saharan Africa, less South Africa, only accounted for 0.9% of world energy CO_2 emissions (WRI 1996). By contrast, the US commitment to a 7% reduction from 1990 levels under the Kyoto Protocol implies a reduction of 350,000 tons of CO_2, or half of Africa's total current emissions.

Randall Spalding-Fecher et al., *The Clean Development Mechanism: Energy Projects for Africa*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISMS 63, 64 (1999), *available at* http://www.uneprisoe.org/CDM/Accra/AccraPapers.pdf. I will be taking up the inter-nation discrepancies in cause and effect of global warming in a subsequent article that will consider global environmental reparations for the devastating impacts of climate change.

121. Baer, *supra* note 105, at 146.

divided between classes in both the North and the South.[122] While acknowledging the scarcity of information on intra-national distribution of emissions, he maintains that "there is a strong correlation between income and emissions, and between present income and past income."[123] With that correlation established, Baer uses current income distributions as a proxy for historical emissions and attempts to calculate what is owed from the U.S. wealthy to the U.S. poor.[124]

Ultimately, the adequacy of U.S. policy initiatives, or inaction, has existential implications.[125] Donald Brown details the consequences poignantly. He writes,

> [T]he full seriousness of the harm that could come from a doubling of atmospheric GHGs can be appreciated through an understanding of the reality that (1) it is probably already too late to avoid future damages, (2) some global warming-caused harm is already being experienced, and (3) the eventual doubling of atmospheric concentrations of GHG over pre-industrial levels is almost inevitable.[126]

Irrespective of the United States' perception of the climate crisis, for many—from Shishmaref to Dhaka, Bangladesh to New Orleans—a "*dangerous interference* with the climate system" is already occurring.[127]

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122. *Id.* at 149.

123. *Id.* at 146.

124. While the final calculation is based on a great deal of conjecture in Baer's project, the underlying correlation between wealth and emissions—and conversely poverty and decreased liability—is well established. There has been, for example, substantial research detailing the significantly lower contribution by African Americans, specifically. *See generally* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22.

125. According to the drafters of CLIMATE CHANGE SCIENCE, "national policy decisions made now and in the longer-term future will influence the extent of any damage suffered by vulnerable human populations and ecosystems later in this century." Brief of Amici Curiae Climate Scientists, *supra* note 5, at 19 (quoting COMM. ON THE SCI. OF CLIMATE CHANGE, NAT'L RES. COUNCIL, CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME OF THE KEY QUESTIONS 1 (2001)).

126. Brown, *supra* note 107, at 10755.

127. *Id.* at 10757 (emphasis added).

> [T]he issue facing the international community then is not whether climate damage can be avoided, but whether it is possible to avoid, in the words of the UNFCCC, "dangerous interference with the climate system." Yet those people who will be killed or greatly harmed by

I conclude that, from a climate justice perspective, the atmospheric changes are unequivocally in the realm of "dangerous interference." On an international scale, consequently, significant wealth and technology transfers are in order.[128] On a domestic scale, climate policy must facilitate three comprehensive and vital goals (i) the cultivation of sustainable, local communities, with renewable, community-based energy infrastructures at their core; (ii) the establishment of significant green spaces for the multiple purposes of generating carbon sinks and community gardens for currently deprived "concrete communities," in particular; and, (iii) the transfer of significant wealth and technologies for enhancing adaptive capacity. U.S. leadership must implement laws reflecting these goals, and legal practitioners should actively facilitate the creation of these kinds of communities and their substructures. Climate justice principles demand that local communities and indigenous peoples are active crafters and beneficiaries of solutions;[129] yet the favored cap-and-trade approach, as currently contemplated, does not inherently provide either

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almost inevitable increases in floods, droughts, and vector-borne disease would likely argue that "dangerous interference" has already occurred.

Id.

128. The details of such a strategy are beyond the scope of this Article, but I will be taking this up in a future article on global environmental reparations for climate change.

129. *See* Monsma, *supra* note 85.

> Climate justice advocates express concern that local communities and indigenous peoples have been kept out of the global processes to address climate change even though they are the hardest hit by the effects of climate change. "The principles of climate justice address the inadequacies of current negotiations to address climate change and put local communities at the center of the solution."

Id. at 490-91 (quoting Press Release, CorpWatch, Climate Justice Principles Released by Coalition (Aug. 29, 2002), *available at* http://greenyes.grrn.org/2002/08/msg00129.html; *see also* Stallworthy, *supra* note 41, at 357 (stating "that environmental justice analysis can help resolve ensuing conflicts, particularly through insistence that circumstances can justify mitigation or sharing of consequential burdens"). "[A]ny genuinely participatory process must engage communities at an early stage and 'before any policy outcome is a foregone conclusion.'" *Id.* at 373 (quoting B.A. WILLIAMS & A.R. MATHENY, DEMOCRACY, DIALOGUE, AND ENVIRONMENTAL DISPUTES: THE CONTESTED LANGUAGES OF SOCIAL REGULATION 201 (1995)).

group fair access to the market. As a modest—but vital—first step, I introduce the domestic clean development mechanism.

III. THE CASE FOR A MODIFIED CDM

A. *The Cap-and-Trade Solution*

There is now a groundswell of support within the United States to address the climate crisis. The American public, specifically, is accepting the certainty of the science and the gravity of the consequences. In response to the science and increasing demands for engagement, the Bush administration has relied in vain on voluntary abatement actions by greenhouse gas emitters.[130] This delayed and meager response is at odds with the more proactive desires of U.S. institutions and communities that are significant in size and influence.

Sectors of society, not traditionally aligned with environmental interests, are now joining the ranks of environmental advocates, seeking decisive solutions to mitigate and adapt to climate change. Irreversible risks—to future generations, but also to those living in the here and now—are alarming many.[131] Numerous organizations,

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130. *See, e.g.*, Mass. v. EPA, 127 S. Ct. 1438, 1451 (2007) (summarizing EPA's explanation that it would not regulate motor-vehicle emissions even if it could, because such regulation would conflict with the President's "comprehensive approach" to climate change, and that "[t]hat approach involves additional support for technological innovation, the creation of nonregulatory programs to encourage voluntary private-sector reductions in greenhouse gas emissions, and further research on climate change"). To be fair, Congress appears more in line with the interests of Americans with regard to climate change mitigation. At a climate change forum in Washington, attended by global political leaders, Senator John McCain told delegates, "I am convinced that we have reached the tipping point and that the Congress of the United States will act, with the agreement of the administration." *Global Leaders Reach Climate Deal*, BBC NEWS, Feb. 15, 2007, http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/6364663.stm.

131. The stories attributing problems to climate change are "getting louder" in the United States: "California burning (because the woods are too dry); ski resorts struggling (because the snow line is rising); alligators in Florida eating people (because their pools and thus their food supplies are drying up); polar bears eating each other (because melting ice makes it harder for them to hunt)." Emma Duncan, *Doing It Their Way: American Attitudes to Global Warming Are*

including the Hewlett Foundation and the Pew Charitable Trusts, are placing a laser focus on the climate crisis and at the same time pushing the discussion to the fore for politicians and others customarily less inclined to act.[132] Among the most recent to join the call are members of the religious right and the business sector, including large utilities, insurance companies, and behemoths like Wal-Mart.[133] Even oil companies, the staunchest global warming naysayers, have conceded that the debate is over and that their products are indeed contributing to the crisis.[134] In 2006, Christian evangelicals introduced the Evangelical Climate Initiative,[135] asked America "What would Jesus

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Complex, and Are Changing, ECONOMIST, Sept. 9, 2006, at 22 [hereinafter Duncan, *Doing It Their Way*].

132. The foundations are "key figures in commissioning research and working on politicians." *Id.* Among the most unlikely allies in an environmental struggle are the fiscal hawks and neoconservatives (concerned with the vulnerability of oil in unstable regions), the sod-busters (farmers seeking federal subsidies for ethanol production and wind power), hunters and fishers (who have "personally noticed climate change"), and even political figures such as Jim Woolsey, a "Prius-driving former head of the CIA." *Id.* at 23.

133. *See, e.g.*, *id.* (Six of the eight large energy companies, including Exelon and Duke Energy, said "they would welcome or at least accept mandatory caps on their greenhouse-gas emissions. Wal-Mart was keen, too."); *Allianz Group Report Urges Greater Effort From Insurers to Address Climate Change*, Int'l Env't Daily (BNA), at D-7 (Oct. 11, 2006) (detailing actions insurance companies are beginning to take).

134. *See* Garner, *supra* note 110 ("'From a Shell point of view, the debate is over,' Shell Oil Co. President John Hofmeister said Oct. 23, regarding whether climate change is real or not."); *Green America: Waking Up and Catching Up*, ECONOMIST, Jan. 27, 2007, at 22, 23 (finding that "Exxon Mobil . . . now concedes that there is a problem, and that its products are contributing to it.").

135. Duncan, *Doing It Their Way*, *supra* note 131, at 23; *see also* Bill McKibben, *Will Evangelicals Help Save the Earth?*, ONEARTH, Fall 2006, at 35 (suggesting that the Initiative may turn out to be as important in the fight against global warming as studies or computer models). The Initiative was signed by eighty-six evangelical leaders. This concern about global warming interestingly incorporates concerns about the global poor. *See id.* at 35, 37 (referring to Rick Warren's *The Purpose-Driven Life*, which suggests that "millions of people could die in this century because of climate change, most of them our poorest global neighbors"); *see also* Kristin Choo, "Acts of Faith," APA, Aug./Sept. 2006, http://www.planning.org/planning/member/2006augsep/faith.htm (according to the Rev. Jim Ball, Executive Director of Evangelical Environmental Network, "[y]ou can't love God without loving your neighbor . . . and loving your neighbor today means reducing pollution, whether that neighbor lives down the street or in Africa").

There is also a very deep critique of the root causes of ecological imbalance

drive?"[136] and urged their flocks to address the burning of fossil fuels.[137]

Congress has very recently initiated attempts at providing policy solutions, all of them based on a cap and trade mechanism for reducing emissions.[138] A cap-and-trade

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and climate change from the Catholic Church. Holy See envoy Archbishop Celestino Migliore told the United Nations that an "'ecological conversion' is necessary to tackle climate issues and that addressing the 'environmental consequences of economic activity' is among the world's 'highest priorities.'" He continued, "In a word, the world needs an ecological conversion so as to examine critically current models of thought, as well as those of production and consumption." *Climate Makes "Ecological Conversion" Urgent, Vatican Says*, CATH. NEWS, Oct. 27, 2006, http://web.archive.org/web/20061027200148/http://www.cathnews.com/news/610/148.php.

136. *See Green America*, *supra* note 134, at 23.

137. *Id.*

138. For a great, brief overview of the many bills making their way through Congress, see *New Democratic Leaders Call for Tough Climate-Change Legislation*, ISSUES IN SCI. & TECH., Spring 2007, at 23-24. Of course, the political response differs. Both Democrats and Republicans have weighed in. Senator Hillary Clinton (D-N.Y.) has condemned Bush's failures to act as "unAmerican." *Green America*, *supra* note 134, at 23. Saxby Chambliss (R-Ga.), after a visit to view Greenland's melting ice cap, remarked "[t]here really is something to it." *Id.* Congresswoman Nancy Pelosi (D-Cal.) and Senator Barbara Boxer (D-Cal.) have spearheaded non-legislative measures to assemble and reorganize, respectively, environmental panels for action on global warming. *See* Dean Scott, *Pelosi Says House Will Not Wait for Bush, Will Pass "Groundbreaking" Legislation*, 38 Env't Rep. (BNA), at 174 (Jan. 26, 2007); *Sen. Boxer Reorganizes Environment Panel, Naming Two Global Warming Subcommittees*, Daily Env't Rep. (BNA), at A-8 (Nov. 17, 2006).

Though my discussion here focuses on federal initiative, there are many more state and regional efforts. *See generally* Sondra Bogdonoff & Jonathan Rubin, *The Regional Greenhouse Gas Initiative: Taking Action in Maine*, ENV'T, Mar. 2007, at 9-11 (describing the cap-and-trade system, in which states have agreed to set limits on emissions and then auction, sell, or give away tradable allowances); *Green America*, *supra* note 134, at 22-23 (discussing the Northeast's cap-and-trade agreement, the Regional Greenhouse Gas Initiative; California's Global Warming Solutions Act, also based on a cap-and-trade scheme; actions by six governors in the West; and initiatives by 280 cities to aim for Kyoto Protocol targets); Duncan, *Doing It Their Way*, *supra* note 131, at 22 (discussing California and Oregon's emissions targets); William H. Carlile, *Panel Submits Recommendations to New Mexico's Governor for Review*, Daily Env't Rep. (BNA), at A-1 (Dec. 5, 2006) (reporting on the establishment of the Southwest Climate Change Initiative, aimed at initiatives for the desert southwest); *see also* Carolyn Whetzel & Lynn Garner, *Five Western Governors Form Partnership On Efforts to Reduce Greenhouse Gases*, Daily Env't Rep. (BNA), at A-9 (Feb. 27, 2007) (describing partnership between governors of Arizona, California, New Mexico, Oregon, and Washington for development and

approach, called for by business and other institutions as well as Congress, would create a fixed number of permits for emitting greenhouse gases (cap) and then distribute or auction these permits to businesses that can then buy, sell, or bank credits (trade) consistent with their ability to reduce emissions.[139]

Of the many and varied congressional bills, three deserve mention.[140] On one end of the spectrum, Senator

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implementation of strategies, including a multi-state cap-and-trade program, to curb greenhouse gas emissions); Carolyn Whetzel, *Four Western States Agree to Join Forces in Battle Against Global Warming*, Chemical Reg. Daily (BNA), at D-13 (Dec. 5, 2006); West Coast Governor's Climate Change Initiative, http://www.climatechange.ca.gov/westcoast/index.html (last visited Nov. 12, 2007).

139. *See* Kirk W. Junker, *Ethical Emissions Trading and the Law*, 13 U. BALT. J. ENVTL. L. 149 (2006). Emissions trading, generally, is:

> The creation of surplus emission reductions at certain stacks, vents or similar emissions sources and the use of this surplus to meet or redefine pollution requirements applicable to other emissions sources. This allows one source to increase emissions when another source reduces them, maintaining an overall constant emission level. Facilities that reduce emissions substantially may "bank" their "credits" or sell them to other facilities or industries.

Id. at 150. A cap sets a limit on tradable emissions, which will continue to fall in order to ensure pollution abatement.

140. Other major bills include the Feinstein-Carper Bill, Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong. (2007), that would use cap-and-trade to reduce carbon dioxide emissions to 2006 levels in 2010 and 2001 levels in 2015. Notably, it would only reduce emissions from coal-fired power plants and not touch other U.S. industries. *See id.*; Amena H. Saiyid, *McCain, Lieberman to Reintroduce Bill Requiring Reductions in Greenhouse Gases*, Daily Env't Rep. (BNA), at A-10 (Nov. 17, 2006). Senator Tom Carper (D-Del.) has also sponsored the Clean Air Planning Act of 2006, S. 2724, 109th Cong. (2006), which would use emissions trading to reduce emissions of nitrogen oxides, sulfur dioxide, and carbon dioxide from power plants. In the House, Representatives John Olver (D-Mass.) and Wayne Gilchrest (R-Md.) have introduced the Climate Stewardship Act of 2007, H.R. 620, 110th Cong. (2007), the first House legislation in the 110th Congress that calls for capping and reducing U.S. emissions through a trading scheme. *See* Dean Scott, *Olver, Gilchrest Propose House Climate Bill; Oversight Chairman Readies Similar Proposal*, Daily Env't Rep. (BNA), at A-4 (Jan. 26, 2007). Representative Henry Waxman (D-Cal.) has introduced a more ambitious bill, Safe Climate Act of 2007, H.R. 1590, 110th Cong. (2007), seeking eighty percent cuts below 1990 levels by 2050. *See* Amena H. Saiyid, *Waxman Reintroduces Climate Change Bill, Seeks Cuts 80 Percent Below 1990 Levels*, Chemical Reg. Daily (BNA), at D-9 (Mar. 21, 2007). (describing the Safe Climate Act). Additionally, Senators Barbara Boxer (D-Cal.) and Bernie Sanders (I-Vt.) have introduced a bill requiring mandatory emissions reduction, Global Warming and Pollution Reduction Act, S. 309, 110th Cong. (2007), and Senators John Kerry (D-Mass.) and Olympia Snowe (R-Me.) have introduced

Jeff Bingaman (D-N.M.) has introduced a bill modest in its expectations.[141] A cap-and-trade system across all industrial sectors, his proposal would slow the growth of greenhouse gas (GHG) emissions, and ultimately stabilize them at their 2013 levels by 2020.[142] On the other end, Senators Barbara Boxer (D-Cal.) and Bernie Sander's (I-Vt.) bill, which is more ambitious in its emissions abatement, is also a cap-and-trade proposal. Their bill, the Global Warming and Pollution Reduction Act of 2007, would first reduce emissions to 1990 levels by 2020, and would ultimately cut them to eighty percent of 1990 levels by 2050.[143] The measure is deemed bold because it also grants additional regulatory authority to the EPA if salient, negative climate indicators are reached.[144] Finally, falling somewhere in between the prior two, there is Lieberman and Warner's America's Climate Security Act of 2007, which is now considered to be the leading climate change bill.[145] The bill would, again, use a cap-and-trade approach to reduce

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their own proposal, Global Warming Reduction Act of 2007, S. 485, 110th Cong. (2007). *See generally* Dean Scott, *Bingaman Likely to Introduce Bill by Summer; Gas Association Endorses "Reasonable" Action*, Daily Env't Rep. (BNA), at A-10 (Feb. 23, 2007).

141. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. (2007).

142. *See id.* This bill is seen as a middle ground between industry and environmental groups. For further discussion of the proposal, see *Green America*, *supra* note 134, at 22-23; Duncan, *Doing It Their* Way, *supra* note 131, at 22; Steven D. Cook, *Bingaman Draft Bill Would Limit Emissions of Greenhouse Gases With Trading Program*, Daily Env't Rep. (BNA), at A-9 (Jan. 9, 2007).

143. S. 309; s*ee* Dean Scott, *Sanders, Boxer Offer Bill to Cut Emissions by 80% by 2050 Across U.S. Economy*, Chemical Reg. Daily (BNA), at D-6 (Jan. 17, 2007); *New Democratic Leaders Call for Tough Climate-Change Legislation*, *supra* note 138, at 24.

144. These milestones include the inability of U.S. emissions legislation, along with international efforts, to hold GHG emissions at 450 parts per million (ppm), the level many scientists view as the tipping point for severe global climate change; and the increase of global temperatures to two degrees Celsius above averages before late eighteenth century industrialization. For more detailed discussion of this measure, see Scott, *supra* note 143.

145. America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007) ("To direct the Administrator of the Environmental Protection Agency to establish a program to decrease emissions of greenhouse gases, and for other purposes."). This bill replaces the McCain-Lieberman Climate Stewardship and Innovation Act of 2007 (Climate Stewardship Act), S. 280, 110th Cong. (2007), which formerly had been considered the "most prominent cap-and-trade scheme." *Green America*, *supra* note 134, at 22.

emissions in transportation, electrical power, and industrial sectors to 2005 levels by 2012 and mandate further reductions of fifteen percent below 2005 levels by 2020.[146]

The Lieberman-Warner bill is significant as it is the most ambitious bill with serious Congressional support;[147] however, it shows no indication of being consistent with scientific necessity. The bill, for example, is far more timid with respect to emissions reductions to stave off the more dangerous climate change impacts than is Kyoto, which itself has been criticized for its conservative reductions-potential.[148] Further, while there are provisions for aiding low-income earners and for providing transition opportunities for workers,[149] the proposals are not at all comprehensive

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146. For greater detail on the bill, generally and on the emissions reduction schedule specifically, see S. 2191.

147. As the most ambitious bill, it serves as a guinea pig of sorts for this Article's exploration of the proposed domestic clean development mechanism.

148. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 123; Carolyn Whetzel, *Specialists Weigh Cap-and-Trade Potential, View Linked Programs as Key for Progress*, Int'l Env't Daily (BNA), at D-13 (March 2, 2007) (quoting Kevin Fay, executive director of the International Climate Change Partnership, stating that Kyoto will do little to stem global warming, but is a beginning, a "down payment"); *see also* Cass R. Sunstein, *The Complex Climate Change Incentives of China and the United States* 2 n.4 (Univ. of Chi. L. & Econ., Olin Working Paper No. 352), *available at* http://ssrn.com/abstract_id=1008598; Fiona Harvey, *Cashing in on Climate Change: Trade in Carbon Credits Takes Off*, FIN. TIMES, Oct. 22, 2004, at 15; Richard Gwyn, Opinion, *Learning to Live Within Our Limits*, TORONTO STAR, Feb. 18, 2005, at A21; *Kyoto Blurring Focus on Climate Change?*, GLOBAL ENVTL. CHANGE REP., July 1, 2003, at 1.

149. *See, e.g.*, S. 2191, § 3403(b) (allocating all proceeds from the sale of emission allowances that, among other things, mitigate economic impacts on low- and middle-income energy consumers), §§ 4601-4605 (outlining the Climate Change Worker Training Program, which will provide quality training that is linked to jobs that are created through low-carbon energy, sustainable energy, and energy efficiency initiatives). These provisions are piecemeal and lack a key component for environmental justice communities, namely a vehicle for developing adaptive capacity. In addition, the fraction of permits to be auctioned is currently far too small to generate much needed revenue for low-income communities and communities of color. For a general discussion on this point, see AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 124. Returned, or recycled, revenue from the auctioning of permits "is crucial in offsetting the impacts of energy prices increases [sic], costs associated with global warming, and investing in clean energy and energy-efficiency research and development." *Id.* For further discussion of the importance of the permit auction, see discussion *infra* Part III.A.

vis-à-vis environmental justice communities and are, in some cases, significantly underdeveloped. Most importantly, however, there is certainly no consideration of the specific impacts of yet another cap-and-trade program on environmental justice communities[150]—neither ensuring that affirmative harm will be avoided with its introduction, nor proactively aiding those who will need great help. What is included is at most inchoate, requiring significant elaboration. To that end, informed by the principles of climate justice, I offer a domestic Clean Development Mechanism as a necessary supplement to any cap-and-trade-based climate policy.

B. *Kyoto's Justice Packet*

The Kyoto Protocol is the result of great compromises, largely among industrialized nations, but also between these nations and developing countries. In 2005, the Protocol went into force, requiring the industrialized signatories to cut emissions by an average of five percent below their 1990 baseline emissions by the end of 2012.[151] The carbon market, for which the United States vigorously advocated in the drafting stages before ultimately failing to ratify the treaty, is the key flexibility mechanism included in Kyoto.[152] This international trading scheme allows

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150. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 139 (discussing local impacts of "tradable permits"). For environmental justice critiques of market-based mechanisms for pollution control, see generally Nicklas A. Akers, *New Tools for Environmental Justice: Articulating a Net Health Effects Challenge to Emissions Trading Markets*, 7 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 203, 203-04, 209-12, 220-22 (2001); Eileen Gauna, *An Essay on Environmental Justice: The Past, the Present, and Back to the Future*, 42 NAT. RESOURCES J. 701, 706-13 (2002); Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 WASH. & LEE L. REV. 111 (1999); Uma Outka, Comment, *Environmental Injustice and the Problem of the Law*, 57 ME. L. REV. 209, 215 n.41 (2005).

151. Dean Scott, *Parties Debate Russian Plan, Reforestation, Recognition of Carbon Storage Under CDM*, Daily Env't Rep. (BNA), at A-1 (Nov. 17, 2006) [hereinafter Scott, *Parties Debate Russian Plan*].

152. A "flexible" or "flexibility" mechanism allows for accommodations of an individual country's where, what, and when for emissions reductions. Kyle W. Danish, *The International Regime*, *in* GLOBAL CLIMATE CHANGE AND U.S. LAW, 31, 42-43 (2007). The "flexible mechanisms" included in the Protocol are the "Article 17 International Emissions Trading system, the Article 6 Joint

nations or companies to purchase emissions permits, which would be less expensive than alternative emissions abatement efforts, from countries with more permits than needed.[153] Kyoto also included two flexibility mechanisms specifically aimed at addressing the needs of transitional economies[154] and less developed countries (LDCs). For the latter, Kyoto established the Clean Development Mechanism (CDM).

1. *The Structure of the Kyoto CDM*. The two main components of Kyoto's carbon market, the international trading mechanism and the CDM, both reflect the market interests of industrialized countries; however, the CDM is also meant to provide a means for sustainable development.[155] Its objectives are essentially two-fold: to assist LDCs in economic development and to allow industrialized countries to acquire Certified Emissions Reductions (CERs) from CDM project activities for credit towards their own Kyoto targets.[156] In practice, companies

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Implementation, and the Article 12 Clean Development Mechanism." *Id.* at 42. According to Donald Brown, the United States conditioned its participation on the acceptance of these mechanisms even though they were not at all favored by the other industrialized nations. Brown, *supra* note 107, at 10754. "These flexibility mechanisms would allow the United States to achieve the majority of its greenhouse reduction target, not through actual emission reductions in the United States, but through paying for greenhouse reduction projects in other countries or by obtaining credit for carbon being stored by American forests." *Id.* at 10755. Needless to say, Japan and the European Union were particularly dismayed at the United States' refusal to participate. *See id.* at 10754.

153. Brown, *supra* note 107, at 10754.

154. The Joint Implementation Program is similar in purpose to the CDM; however, the beneficiaries are meant to be the countries of Eastern Europe and the former Soviet Union. Here, as well, developed nations can obtain credit toward their reduction targets by investing in emission reduction projects in these nations. *Id.* at 10754-55.

155. Wolfgang Sterk and Bettina Wittneben argue that this is the central goal for the CDM, as evidenced by projects that only intend to offset emissions of developed countries, not to lower GHG emissions globally. Wolfgang Sterk & Bettina Wittneben, *Enhancing the Clean Development Mechanism Through Sectoral Approaches: Definitions, Applications and Ways Forward*, INT'L ENVTL. AGREEMENTS: POL., LAW & ECON. 271, 276 (2006).

156. *See generally* Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, Article 12 [hereinafter Kyoto Protocol]; *see also* Sterk & Wittneben, *supra* note 155, at 275; Emma Duncan, *Selling Hot Air: Kyoto's Main Achievement Was To Create a Market in Carbon. It's Flawed, but Better than Nothing*, ECONOMIST, Sept. 9, 2006, at 17 [hereinafter Duncan, *Selling Hot Air*]. Here, Duncan describes Kyoto's two

have "emissions-reduction targets" that can be met in three different ways. A company can (i) cut its own emissions, (ii) buy other companies' allowances, or (iii) buy credits from developing countries.[157] Under the CDM, buyers from European companies, for example, opt for option three and collaborate with sellers from the global south. The credits or goods vary from "industrial gases to be captured from Chinese factories, [to] trees to be planted in Africa, [to] methane to be extracted from pig-effluent in Brazil."[158] The development mechanism's central feature is the generation of new CERs, which, importantly, must be certified as additional to what might have happened absent CDM project activity.[159]

The structure of the CDM and the lengthy process from project conception to certified credit is briefly outlined in Article 12 of the Kyoto Protocol.[160] Further developed in the

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parts. The first and largest in terms of money is "trade in allowances handed out to companies in the EU's five dirtiest industries under the [Emission Trading Scheme (ETS)]." *Id.* at 17-18. The second is exemplified by events such as the Carbon Fair in Cologne at which buyers from the ETS and Japan's voluntary-reduction program get together with sellers from developing countries. *See id.* at 18.

157. "The rich countries that ratified Kyoto are expected to produce 3.5 billion tonnes of carbon above their targets by 2012, so the prospects for sellers look good." Duncan, *Selling Hot Air*, *supra* note 156, at 18.

158. *Id.* at 17 (describing the carbon market fair in operation at Koelnmesse, Cologne Conference Center).

159. *See* Kyoto Protocol, *supra* note 156, at 12 (requiring real, measurable, and long-term benefits related to mitigation of climate change and reductions that are additional to any that would occur in the absence of certified project activity); *see also* Sterk & Wittneben, *supra* note 155, at 273-74. This additionality is not uncommon in U.S. environmental law. For example, the Clean Air Act employs an offsetting provision for new sources in non-attainment areas. 42 U.S.C. § 7503(c) (2000).

160. Kyoto Protocol, *supra* note 156, at 11-12 (describing Executive Board supervision; voluntary participation of private and/or public entities; independent auditing and verification of project activities; and, importantly, funds set aside for costs of adaptation for the "particularly vulnerable"); *see* discussion of the Adaptation Fund *infra* pp. 218-19; *see also* Mindy G. Nigoff, *The Clean Development Mechanism: Does the Current Structure Facilitate Kyoto Protocol Compliance?*, 18 GEO. INT'L ENVTL. L. REV. 249, 250-54 (2006). The CDM is further elaborated on in the 2001 Marrakesh Accords. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, *Action Taken by the Conference of the Parties*, REPORT OF THE CONFERENCE OF THE PARTIES ON ITS SEVENTH SESSION, HELD AT MARRAKESH FROM 29 OCTOBER TO 10 NOVEMBER 2001 (2001), *available at* http://www.ieta.org/ieta/www/pages/getfile.php?docID=1042; *see*

2001 Marrakesh Accords, the project pipeline currently consists of eight major steps. They are (i) design and formulation of the proposed project by project participants; (ii) approval by the Designated National Authority, which decides whether the proposed CDM is consistent with the country's sustainable development goals; (iii) validation by the first Designated Operational Entity (DOE A), the entity that provides CDM project activity validation by independently evaluating the project design document, describing the project's baseline and setting forth the case for the project's additionality, against the CDM requirements; (iv) registration by the Executive Board, which is the formal acceptance of a validated project consistent with the Marrakesh Accords; (v) preparation of financing by investors; (vi) monitoring by project participants; (vii) verification and certification by the second DOE (DOE B) to ensure that the monitoring methodologies have been applied correctly and that all documentation is complete and transparent; and, finally, (viii) issuance of Certified Emissions Reduction credits.[161]

Small-scale CDM projects include the construction of solar home systems, solar water heaters in urban areas, and industrial process improvements and fuel switching.[162] More importantly, the small-scale projects are fast-tracked, bypassing the more cumbersome procedural steps to which larger projects are subject.

2. *The Criticisms of the Early Kyoto CDM*. It is important to acknowledge that the CDM is currently operating under significant flaws, which might give one pause when considering a domestic version.[163] There are

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also, Danish, *supra* note 152, at 31-56. The Accords provided greater detail to the structures and mechanisms introduced in the Protocol. *Id.* at 37.

161. *See* Nigoff, *supra* note 160, at 254-60; *see also* Danish, *supra* note 152, at 49. This process might be simpler if the proposed project is of a smaller scale. *See* Nigoff, *supra* note 160, at 260. It is also important to note that the CERs are issued on a post-hoc basis, after a demonstration that the project has achieved reductions. Danish, *supra* note 152, at 48.

162. Nigoff, *supra* note 160, at 260. These local community-based projects are also occurring in the United States, though many currently lack a steady revenue stream. *See* discussion *infra* Part III.C.2.

163. For a brief description of critics' concerns, see Sterk & Wittneben, *supra* note 155, at 272-73; *see also* Nigoff, *supra* note 160, at 274-76 (arguing

three major criticisms of the CDM as conceived and currently implemented.[164] None, however, is a fatal flaw.[165]

First, the bureaucratic process is under-funded,[166] significantly slowing an already strained project pipeline. Again, there are eight major steps along the pipeline.[167] Further, their sub-steps substantially increase the transaction costs of getting from the design and formulation of a project to issuance of CERs. Based on this flaw alone, one critic has stated, "as currently structured, CDM is an inefficient and ineffective market mechanism upon which [industrialized countries] are unlikely to rely heavily to meet their Kyoto targets."[168] Recent CDM activity suggests, however, a very healthy increase in project development despite these early inefficiencies.[169]

Second, there is a wild differential between LDCs that are eligible and those that are favored for project development. In other words, countries like China, India,

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that the CDM is not meeting its stated goal because of the lengthy registration process); Whetzel, *supra* note 148.

164. These criticisms of the Kyoto mechanism should not be understated. One of the major critiques insists that the very creation of this mechanism was purely a tool to provide more credits to industrialized nations without any real regard for the plight of the least developed world while, at the same time, not requiring any level of sacrifice on the part of the citizens of industrialized nations. I am sympathetic to this criticism, particularly as it is consistent with more general critiques of market mechanisms. *See* discussion *infra* Part IV.A. Acknowledgement of these criticisms does not, however, counsel against this kind of mechanism being introduced as an important and viable supplement to the inevitable domestic cap-and-trade system. In fact, they counsel for vigorously ensuring a well-crafted mechanism. Additional advantages that might be incorporated in the dCDM are discussed *infra* Part IV.B.

165. There are, of course, many that celebrate both the potential and the adolescent stages of the CDM. *See, e.g.*, Vir Singh, *Indian Official Sees Untapped Opportunities to Use CDM Funding for Energy Projects*, Int'l Env't Daily (BNA), at D-10 (Apr. 20, 2007); Stern, *supra* note 34, at 90.

166. For example, the CDM Executive Board and its various panels are currently under-resourced relative to the regulatory tasks they must perform. FRANK LECOCQ & KARAN CAPOOR, STATE AND TRENDS OF THE CARBON MARKET: 2005, at 37 (2005).

167. *See* Nigoff, *supra* note 160, at 254.

168. *Id.* at 271.

169. *See* UNFCCC, CDM Statistics, http://cdm.unfccc.int/Statistics/index.html (last visited Nov. 7, 2007); *see also* Whetzel, *supra* note 148 (describing a vibrant market that has developed for CDMs).

and Brazil are receiving the lion's share of project investment, while countries like Senegal and others in sub-Saharan Africa are languishing.[170] As an example, "two-thirds of the [CDM] deals signed [by the World Bank] between January 2005 and March 2006, by value, were with China."[171]

The third major criticism concerns the value and the rigor of the projects proposed. The projects must be additional to what might have occurred absent the CDM.[172] Further, they must generate credits equivalent to the actual emissions offset.[173] Projects like reforestation efforts are questioned as legitimate emissions-reducing activities under the CDM.[174]

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170. At the market in Koelnmesse, for example, some sellers "are more popular and better organi[z]ed than others." Duncan, *Selling Hot Air, supra* note 156, at 18. China has a sophisticated book "crammed with projects," while Senegal has a "photocopied piece of paper with six projects, and no customers." *Id.* Two of the Chinese deals, organized by the World Bank, are worth $930 million. *Id.* This imbalance is not altogether surprising; it had been predicted prior to elaboration of the Protocol and its mechanisms. *See* R.S. Maya & John Turkson, *CDM Baseline and Additionality in the African Context—The Issues*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISMS, *supra* note 120, at 19 (discussing the predicted doom for CDM in Africa due to the difficulty of defining an economic baseline and competing for CDM projects). There is also a lack of capacity in countries that have "yet to establish their Designated National Authorities (DNAs), . . . the national bodies responsible for approving the projects." Sterk & Wittneben, *supra* note 155, at 275.

171. Duncan, *Selling Hot Air*, *supra* note 156, at 19.

172. *See, e.g.*, Nigoff, *supra* note 160, at 254-55. Under the Marrakesh Accords, additionality is determined by a baseline methodology described as follows: "a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity." *Id.* at 254-55.

173. One of the articulated project risks is that the projects meet all requirements of the CDM and actually generate the credits estimated in the project design document. *Id.* at 259. This has also been described as a "moral hazard" when the project sponsors and the host country are in cahoots. *Id.* at 258. For example, both parties may "exaggerate baseline carbon emissions, thereby skewing the actual reductions achieved by the project . . . . Using independent DOEs and the EB's careful review of the monitoring plan [however] ensures that DOEs have no conflict of interest with the project participants." *Id.* The consequence of this level of scrutiny, of course, is a more congested project pipeline.

174. Scott, *Parties Debate Russian Plan*, *supra* note 151 (reporting that debates continue "on various reforestation issues, including efforts to allow Brazil and other heavily forested nations to count reforested areas as emissions-

A final concern that one must acknowledge is whether the projects that are most likely to facilitate the host country's sustainable development goals are viable. This is not one of the more dire concerns for the Kyoto CDM per se but is important and relevant to the domestic Clean Development Mechanism (dCDM). Renewable energy, energy efficiency and transport project activities—smaller in scale and more diffuse by nature—are not competitive in the Kyoto CDM market and are, consequently, being marginalized. These will likely be the bread-and-butter projects for dCDM, and their relative attractiveness must be addressed at the outset.

The global project is floundering in short for reasons that the United States need not replicate on a domestic level. The failures are due to weaknesses in implementation of the program and not the foundational sustainable development philosophy of the mechanism.[175] Indeed, removing the international, trans-boundary element alone will significantly diminish the myriad concerns regarding transparency and authenticity. Moreover, numerous Kyoto CDM commentators have offered solutions that dCDM crafters would incorporate. I address these improvements in the next section.

C. *The Domestic CDM*

A domestic CDM (dCDM) is essential for American communities that will suffer disproportionately from

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reducing projects under the protocol's [CDM]").

175. For indications of early optimism about the foundational principles of CDM, see Maya & Turkson, *supra* note 170, at 19 (discussing the twin sustainable development and UNFCCC contributions of CDM and stating, "such a mechanism could provide an additional source of funding for projects for sustainable development, and such a prospect is welcome in principle"); Spalding-Fecher et al., *supra* note 120, at 66 ("One of the leading climate change NGOs in Africa, ENDA Tiers Monde in Senegal, points out that, if properly designed, CDM can make a decisive contribution to sustainable development in Africa, primarily through the implementation of desperately needed large-scale infrastructure development projects and programs."); *see also* Sterk & Wittneben, *supra* note 155, at 275 (arguing that CDM difficulties may have been typical start-up problems rather than fundamental flaws: "In particular, the bottleneck at the CDM Executive Board seems to have been the result of its lack of funding rather than overcomplicated procedures"). Sterk and Wittneben report that the CDM is now picking up "substantial steam." *Id.*

climate change, particularly because they are unlikely to benefit from international arrangements and domestic climate policy as currently drafted. This is true despite their adaptive capacities being comparable to those of some Least Developed Countries (LDCs).[176] As stated in Part II above, the aims of climate justice policy are far-reaching and comprehensive. The dCDM is an early step in reaching those goals.

1. *dCDM Financing and Structure*. The structure of the dCDM would be similar to that of the CDM; however, current imperfections in the international arena would be addressed at the mechanism's conception. The first and most important solutions to problems that have befallen the Kyoto mechanism include the provision of sufficient start-up capital and a streamlining of the registration process for any domestic mechanism.[177] With respect to capital, these

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176. Robin Leichenko & Karen O'Brien, *Is it Appropriate to Identify Winners and Losers?*, *in* FAIRNESS IN ADAPTATION TO CLIMATE CHANGE, *supra* note 1, at 97, 111 (arguing that resource-dependent communities in the United States have experienced chronic economic distress and may have adaptive capacities comparable to some of the LDCs, but losses to those communities are unlikely to be addressed by international arrangements).

177. *See* Nigoff, *supra* note 160, at 271. Nigoff also considers the "option of transferring some of the EB's responsibilities to the World Bank or private entities to accelerate . . . the project pipeline." *Id.* Again, to the extent the CDM is experiencing its current difficulties as a result of start-up costs, it will be even more important for the dCDM crafters to be mindful of these and plan around them. *See* Dean Scott, *U.N. Meeting Ends With Agreements on Fund for Adaptation; No Action on Carbon Capture*, Daily Env't Rep. (BNA), at A-1 (Nov. 27, 2006). Beyond start-up, a levy on the proceeds from dCDM projects, proportional to the size of the project, can cover administrative expenses as well as finance an adaptation fund. Danish, *supra* note 152, at 47. Under the Protocol's Article 12, this "share of the proceeds" (SOP) levy covers efforts similar to those described in this section. *Id.*

Further, the CDM Executive Board (EB) has already implemented another solution to the encumbered project cycle. The EB has built up "a library of standard emissions baseline methodologies for certain types of commonly implemented projects" and has encouraged project participants use these pre-approved methodologies. *Id.* Another solution is project-bundling, in which small-scale projects are aggregated and treated as one CDM project from registration to certification. Nigoff, *supra* note 160, at 264 (describing "[b]undling", or "the aggregation of small-scale projects that do not exceed the small-scale requirements and may be treated as one CDM project from registration to certification" adopted at the Eighth Conference of Parties (COP-8)). A related approach is the "sectoral CDM." Sterk & Wittneben, *supra* note 155, at 273. Under this proposed solution, the single-site approach would be

monies could come from a variety of sources including carbon taxes,[178] auctioning of allowances, and broadening relevant sections of the currently proposed climate policies before Congress.[179]

Indeed, the Climate Stewardship Act provides for financing of adaptation and mitigation assistance for low-income persons and communities.[180] Under the bill, "at least 10 percent of the proceeds derived from [allowance] trading activities [shall fund] climate change adaptation and mitigation programs to assist low-income populations identified . . . as having particular needs in addressing the impact of climate change."[181] In addition, transition assistance to dislocated workers and communities is considered.[182] Here, the bill calls for the allocation of a percentage of the allowance trading proceeds to provide "training, adjustment . . . and employment services to

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transcended and project activities would be clumped under a "programme of activities" within a particular sector, energy or transportation for example. *Id*. By definition, the sectoral approach would be best for renewable energy, energy efficiency, and transport projects that are difficult to fit into a single-site approach. *Id.* at 279. Similar to the small-scale project bundling, the sectoral approach also contemplates bundled large-scale projects registered as single CDM projects. These solutions would work quite well in a dCDM context. *See* discussion *infra* Part III.C.2. Ultimately, potential revenues that projects by and for EJ communities will generate can counterbalance even the length and the cost of the process, which may remain, however, streamlined the mechanism.

178. A carbon tax could be an important feature of a cap-and-trade scheme. It would provide an additional revenue source for progressive revenue recycling; it could also serve as an important "safety valve." *See* Whetzel, *supra* note 148 (citing Stanford law professor David Victor's recommendation that cap-and-trade programs include a carbon tax as a safety valve, to protect against excessive prices for emissions credits and still provide funding to invest in new technologies). This would be especially helpful for compensating "vulnerable or low-income groups." AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 85.

179. Additionally, dCDM participants could help finance administrative expenses for operating the dCDM by making contributions to an established Trust Fund. This would mirror the voluntary contributions Kyoto parties are invited to make to the UNFCCC Trust Fund for Supplementary Activities. *See* Nigoff, *supra* note 160, at 253. It would also go to funding adaptation measures for EJ communities.

180. Climate Stewardship and Innovation Act, S. 280, 110th Cong. § 202(b)(4) (2007).

181. *Id.*

182. *Id.* § 202(b)(2).

dislocated workers" and "to make income-maintenance and needs-related payments to dislocated workers."[183] EJ communities may not be those specifically contemplated in this particular section;[184] however, this particular earmark could also be directed at these communities and reflects an interest in similar just-transition goals of climate justice. Finally, proceeds for trading activity may also take the form of "grants to State and local government to assist communities in attracting new employers or *providing essential local government services*."[185] The availability of these kinds of monies is an integral part of dCDM start-up and continued success.

Under the dCDM, the government, specifically the Environmental Protection Agency (EPA), would manage allowances and require that, at least in the initial distribution, companies bid for their permits.[186] This is an important difference from merely distributing permits at no cost based on prior firm emissions; that is, grandfathering. Under grandfathering, the firms take the windfall profit of freely distributed permits that they can buy and sell at will.

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183. *Id.* § 202(b)(2)(A)(i), (ii).

184. Workers from traditional, carbon-intensive energy sectors, I suspect, are the primary concern for this section.

185. S. 280 § 202(b)(1) (emphasis added). This inclusion is particularly relevant to extant projects that I envision the dCDM supporting. *See* discussion on project possibilities *infra* pp. 223-32.

186. The European Union's Emissions Trading Scheme (EU ETS) has suffered deep criticism due to the incredible windfall profits power firms are set to make. *See* Roger Harrabin, *"£1bn Windfall" from Carbon Trade*, BBC NEWS, Mar. 24, 2007, http://news.bbc.co.uk/2/hi/science/nature/4961320.stm. The profits are likely the result of the initial carbon permit distribution. *See Climate Control*, ECONOMIST, Mar. 17, 2007, at 59, 59 (citing flaws in handing out too many permits and, worse still, handing them out for free). Firms were "given, free-of-charge, the carbon emissions permits on which the scheme is based. This . . . was like the government giving energy firms free money." Harrabin, *supra*; *see also* Duncan, *Selling Hot Air*, *supra* note 156, at 17, 19 (explaining that because the ETS allowances were given away rather than auctioned, the scheme "handed [the power generators and other polluters] wads of cash: they simply passed the extra costs on to consumers and pocketed the money"). Consequently, Britain's power sector made a profit of roughly $1.5 billion in the scheme's first year, and power prices increased "steeply." *Id.* at 19. For a more in-depth discussion on how this initial (free) allocation results in windfall profits for some firms and higher energy prices for consumer across the board, see Harrabin, *supra*. Some are now seeking post-hoc windfall taxes to be redirected into energy conservation efforts. *See id.*

If the permits are auctioned, the government can receive the needed revenue from these distributions.[187] In fact, a "true market scheme would see the permits auctioned, not given away by governments."[188] Further, and most important for current purposes, auctioning of permits would produce additional revenue that can be used to finance programs like the dCDM and provide seed funding for adaptation funds.[189] This would be a form of progressive revenue recycling; that is, directing income from auction (and subsequent trading activity) to invest in clean and renewable energy sources as well as to make direct financial assistance transfers to the most vulnerable, for example.[190] Absent the additional monies that might be

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187. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 140.

188. Harrabin, *supra* note 186. Economists like cap-and-trade schemes because they give maximum pollution savings at least cost to firms; however, auctioning is essential to any true market scheme. *Id*.

189. Auctioning off some portion of the allowances is a key component of the Regional Greenhouse Gas Initiative (RGGI), which is, for that reason, instructive. *See* Bogdonoff & Rubin, *supra* note 138, at 11. Under RGGI, "[e]ach state is required to sell or auction a minimum of 25 percent of its allowances." *Id.* The proceeds from the sales will be used for energy efficiency programs, rate-payer rebates, development of new clean technologies, or otherwise lower consumer costs from potential rate hikes. *Id.* at 14. In light of the above possibilities, there certainly are "justifications for auctioning even more than 25 percent," particularly for the benefit of the low-income. *See id.*; *see also* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 91 (stating "[a]uctioning permits has the added benefits of generating revenues that can be used to offset any regressive or transitional economic effects of the charges on African Americans").

Of course, firms will not favor this approach. Cap-and-trade generally puts a price on something, that is, pollution of clean air through a factory's emission of carbon gases, which has to date been free. *See* Steven Mufson, *Europe's Problems Color U.S. Plans to Curb Carbon Gases*, WASH. POST, Apr. 9, 2007, at A1. They will surely lobby vigorously for the receipt of permits free of charge; however, a powerful counterargument will demonstrate that firms have been benefiting significantly from the ability to emit carbon at no financial cost for decades. As a result, the global community is left to suffer the consequences, some more gravely than others.

190. For greater elaboration of this kind of recycling, see AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 87, 89, 137, 140.

> African Americans . . . stand to generally benefit from revenue-raising mechanisms such as auctioned permits and taxes over non-revenue mechanisms such as grandfathered permits, with the additional proviso that the revenues should be distributed progressively (through taxes, transfers, or provision of public services) or used to finance

used to recycle revenues, free distribution of credits could have perverse results, such as billion-dollar windfall profits for energy companies.[191]

The Climate Stewardship and Innovation Act contemplates auctioning of allowances, which is an important and appropriate inclusion.[192] There remain, however, two flaws that would need correction. First, the bill sets aside too few allowances for auction,[193] limiting the availability of significant revenue recycling. Second, the proceeds of the auction are only going to support stimulation of "innovation in development, demonstration, and deployment of technologies that have the greatest potential for reducing greenhouse gas emissions."[194] While this is an important goal, auctioning of allowances should be done at the highest plausible percentage, with a significant portion of the proceeds financing green development projects and funds for adaptation under the dCDM.

Importantly, the dCDM would include precisely such a domestic Fund for Adaptation to help all EJ communities irrespective of their ability to create local, and profitable, green projects.[195] With the Protocol in 1997, funds to help developing countries finance adaptation initiatives were

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further emission reductions or efficiency improvements.

Id. at 137. The Congressional Black Caucus Foundation Report also states that "the sudden application of strict greenhouse gas emission limits with zero revenue recycling harms the economy[; however,] environmental tax reform, in which moderate carbon taxes or auctioned permits are applied with the revenue used to lower taxes on work or investment, can benefit the economy if properly structured." *Id.* at 89.

191. *See* Harrabin, *supra* note 186. This is not a hysterical concern, but is exactly what tainted reviews of the EU ETS, particularly in the EJ camps. *See id.*; *see also* Luke Cole, Dir., Ctr. on Race, Poverty & Env't, Comments at The Climate of Environmental Justice: Taking Stock (Mar. 17, 2007).

192. Climate Stewardship and Innovation Act, S. 280, 110th Cong. § 162(g) (2007).

193. *See id.* § 162(g)(2), (3).

194. *Id.* § 323(a).

195. For many of these communities with fewer resources, it is also true that there are few emissions to cut, as their carbon footprint is slight (tracking their limited access to resources). As a result, for these kinds of communities only projects that generate carbon sinks, for example, would be viable. Absent these projects, or perhaps in spite of them in many cases, additional support to strengthen adaptive capacity will be essential.

established under an "Adaptation Fund."[196] This Fund is meant to support concrete projects and programs exclusively concerned with the adaptive capacity of developing countries with weaker economies.[197] It is supported by, among other things, a small levy, the "adaptation fee," placed on Kyoto CDM projects.[198] The Fund is a crucial supplement to the CDM, as its sole purpose is to ensure the adaptation of all global communities to the extent the Fund can cover those expenses. A domestic adaptation fund would be equally critical for the fair distribution of adaptive capacity in the United States.

For the dCDM, there are already viable funding sources for a domestic adaptation fund, such as those identified in the Climate Stewardship and Innovation Act.[199] In addition, the Clean Energy Act,[200] which passed the House (and, in an amended version, the Senate) in early 2007,[201] contemplates earmarking additional revenue for measures to mitigate and adapt to climate variations.[202] Conspicuously missing from these allotments, however, are considerations of the disproportionate burden experienced by EJ

196. *See* Wachira Kigotho, *At U.N. Climate Change Conference, Report Warns of Rising Threats to Africa*, 29 Int'l Env't Rep. (BNA), at 868 (Nov. 15, 2006).

197. Nigoff, *supra* note 160, at 253. Developing countries also receive assistance from the EB-administered CDM registry, into which two percent of CERs from projects are deposited. *Id.* The EB sells CERs and forwards revenues to host CDM countries and countries facing adverse effects of climate change.

198. *Id.* Of course, the current problem facing the Kyoto's Adaptation Fund is the small amount of revenue derived from the small amount of projects certified. As of November, 2007, the levy had provided only $3 million. Dean Scott, *Climate Change: U.N. Climate Talks Make Some Progress On Adaptation, Joint Implementation*, Int'l Env't. Daily (BNA), at D-12 (Nov. 15, 2006). For an updated list of total CERs in the Adaptation Fund holding account, see UNFCCC, The Share of Proceeds from the Clean Development Mechanism Project Activities for the Adaptation Fund, http://cdm.unfccc.int/Issuance/SOPByProjectsTable.html (last visited Nov. 2, 2007). The value of CERs, of course, is variable. In October, 2006, the U.S. EPA estimated the value of CERs at anywhere from $3 to $12. World Resource Institute, Carbon Value Analysis Tool 6 (Oct. 12, 2006), http://www.epa.gov/climateleaders/documents/events/oct2006/aulisi.pdf.

199. S. 280, 110th Cong. § 162(g) (2007).

200. H.R. 6, 110th Cong. (2007).

201. *See* CONG. INFO. SERV., BILL TRACKING REPORT, 110TH CONGRESS, 1ST SESSION, H.R. 6 (2007).

202. H.R. 6, § 301.

communities and the absence of adequate adaptation efforts without directed earmarks. The CLEAN Act, for example, repeals two tax breaks for the oil and gas industry by making producers pay royalties on hundreds of now royalty-free deepwater leases in the Gulf of Mexico.[203] This repeal is estimated to raise $14 billion over the next ten years. With that additional revenue, a new permanent fund would be established to finance the "Strategic Energy Efficiency and Renewables Reserve," which would support energy efficiency and renewable energy technologies.[204] A conservation fee would also be assessed if companies refuse to renegotiate these "favorable" leases, and continue to produce crude oil and natural gas.[205] Congress should redirect these revenues to a Fund for Adaptation to provide a needed supplement to the levy on dCDM projects.

As for the mechanics of the dCDM,[206] current inefficiencies in the Kyoto CDM's certification process would be examined, and then planned against by streamlining necessary steps to certification. The determination of beneficiary communities, an important first step, would be conducted in a manner similar to identifying enterprise zones or eligibility for community development block grants, under the Department of Housing and Urban Development, for example.[207] In short, the EPA could rely on qualified

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203. The CLEAN Act stands for "Creating Long-Term Energy Alternatives for the Nation" Act. *See generally* Lynn Garner, *Bill Targeting Tax Breaks, Royalties Seen as "First Step" Toward New Policy*, Daily Env't Rep. (BNA), at A-7 (Jan. 17, 2007) (The Act would also ban producers from obtaining new oil and gas leases, unless they renegotiate certain royalty-free, deepwater leases issued in 1998 and 1999 in the Gulf of Mexico, or agree to pay a "conservation of resources fee").

204. *Id.*; *see also* Lynn Garner, *House Democrats Introduce Bill to Reform Royalty Program, Create Renewables Fund*, Daily Env't Rep. (BNA), at A-7 (Jan. 16, 2007).

205. Garner, *supra* note 203, at A-7. The fee would be $9.00 per barrel of crude oil and $1.25 per million Btu for natural gas, whenever market prices exceed $34.73 a barrel for oil and $4.34 per million Btu for natural gas. *Id.*

206. I offer one possible outline for the dCDM; however, it is not my intention in this Article to explore or detail the myriad (and sound) legislative incarnations the dCDM could take.

207. *See generally* 26 U.S.C. §§ 1391-1393 (2000); 42 U.S.C. § 1397(f) (2000). Another way of identifying target communities might be found in the New Markets Tax Credit program, which has developed fairly sophisticated mapping technology to decipher census tracks. *See* Community Development Financial

census tracts to determine appropriate participation in "green development zones." Both public and private entities could participate in investment opportunities in green development zones.

The dCDM operating board, under the EPA, will actively facilitate project creation. It will serve as a project clearinghouse, collecting, classifying, and distributing information about the nature of potential projects, community demographics, and green-development grassroots organizers. It will also bring together private and public investors with community green-development co-ops.[208] Finally, the board will act as a broker, "actively seeking and accumulating funds and actively eliciting projects and programmes."[209] With this brokerage model in place, the operating board can actively seek out projects in communities that could benefit most.[210]

Taking a fictional green development co-op as an example, a regional solar panel installation program in the Southeastern United States could benefit communities of color, particularly African-Americans, who are well-represented in that region. Clean energy and job creation in cities like Atlanta will have the desired effect of establishing clean, affordable, renewable technologies for these communities and the attendant global warming mitigation effects. It will also help to meet the goal of creating independent and sustainable communities for

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Institutions Fund, New Markets Tax Credits Program, http://www.cdfifund.gov/what_we_do/programs_id.asp?programID=5 (last visited Nov. 12, 2007).

208. *See* Spalding-Fecher et al., *supra* note 120, at 68 (discussing ideal institutional structure of CDM).

209. *Id.* at 68. This expanded role will allow for a "more visionary and proactive"—and , I would add, *relevant*—dCDM executive board. *Id*. at 68-69 ("As a co-ordinating and funding body, the Board could set criteria and apply standards to ensure geographical equity considerations are taken into account, ensure that the CDM dual objectives of emission avoidance and sustainable development are given equal weight, and that funding is available for projects initiated by host countries.") (citation omitted).

210. This could also facilitate project-bundling or sectoral approaches, discussed above. "[P]ackaging many small initiatives into a larger umbrella programme, which can only be done by a more active CDM brokerage model, can reduce the transaction costs for investors and allow the CDM to address the large, regional energy infrastructure projects or capacity building efforts which contribute to more environmentally sound energy policies." Spalding-Fecher et al., *supra* note 120, at 71.

adapting to inevitable climate changes.[211] The funding, as discussed above, will come from investors in project development and from the fund established—and continually replenished—by levies on prior projects. This financing will cover administrative expenses and transaction costs, costs accrued from project conception to installation of solar paneled roofs by trained corps of community members across the southeast.

Support, financial and otherwise, will also be necessary for the implementation phase. Solar roof projects throughout the southeast will operate and yield emissions reductions benefits for decades. Consequently, implementation, monitoring, and certification will be ongoing processes, for which sustained support—such as training, maintenance, and capacity building—will be necessary.[212] Long-term job opportunities from a solar roof community co-op are inherent, as are local energy independence and increased adaptation capability to rising energy costs and scarcity. This project would undergo rigorous and sustained monitoring and verification of the training process and the intensity of emissions reduction as a result of the solar energy installation. Indeed, a key component of dCDM success is faith in the accuracy and authenticity of the process of credit generation. To that end, a hybrid approach of decentralized accreditation and centralized government-based monitoring would be the most effective certification regime.[213]

Finally, the EPA, or other governing institution, will certify the credits derived from the solar roofs project. To be accepted as a dCDM credit, offsets would have to be "real, surplus, verifiable, permanent, and enforceable."[214] Even

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211. Significantly, renewable energy sources are more labor intensive than the fossil fuel energy sector. *See* AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 4. Climate policies have the potential of creating hundreds of thousands jobs, perhaps as many as 1,400,000. *Id.* at 4, 83. The benefit for some EJ communities is clear: "[b]ased on historic hiring patterns, this increase in employment will disproportionately profit African Americans." *Id.* at 4. An additional benefit is in the reduction of associated air pollution mortalities, such that the reduction of CO_2 emissions could save 10,000 African American lives. *Id.* at 10.

212. Spalding-Fecher et al., *supra* note 120, at 71.

213. *See id.*

214. Bogdonoff & Rubin, *supra* note 138, at 12. These are the five strict

with a project that is ongoing, like this one, certification should occur over a fairly short timescale.[215] A solar roof project will have long-term benefits, militating in favor of, perhaps, periodic certification and transfer of credits. It would be unwise, however, to wait until the end of the project's life, as investors or potential credit purchasers would want to apply these dCDM-derived credits over the short term.[216]

The benefits of the dCDM are many, including attracting an increased flow of investments to green EJ development zones and stimulating technology transfers to communities that might not otherwise benefit from these technologies in the early development and dissemination phases.[217] This effort, most importantly, will bring communities closer to local, independent, and sustainable spaces for both the mitigation of and adaptation to climate risks.

2. *Project Possibilities and the Green Economy*. The most promising aspect of a dCDM is the myriad climate change mitigation and adaptation projects that it could fund in addition to the projects currently in existence, eager for a steady revenue stream. There are, as one commentator has described it, "[l]ots of firms . . . growing healthily on the back of America's sudden enthusiasm for alternative energy."[218] Wind and solar energy projects are booming and

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standards employed generally by flexibility mechanisms employing an offsetting provision, such as Regional Greenhouse Gas Initiative (RGGI).

215. *See* Spalding-Fecher et al., *supra* note 120, at 72.

216. *Id.* (describing investors' desire to see a "Carbon return" on investment in the short to medium term). All of this demands that "[i]mplementation, monitoring, and certification should therefore be an iterative process, rather than a once-off transaction." *Id*.

217. For an early discussion of the promises of the CDM, which has informed my discussion here, see Ogunlade R. Davidson & Youba Sokona, *Africa and the Clean Development Mechanism: Perspectives for Growth*, *in* AFRICAN PERSPECTIVES ON THE CLEAN DEVELOPMENT MECHANISMS, *supra* note 120, at 11, 16 (discussing the likely benefits and problems of CDM).

218. *Green America*, *supra* note 134, at 22. In fact, it is arguable that the continued investment and steady development in green technology is a positive effect of the CDM. For example, the general manager of a Chinese wind turbine project admits, "Without the Clean Development Mechanism, we'd still be [narrowly] profitable . . . [but] you need the C.D.M. for further expansion." Keith Bradsher, *Clean Power that Reaps a Whirlwind*, N.Y. TIMES, May 9, 2007, at C1.

localities are looking to renewables to curb their emissions.[219] California, for example, is introducing a program highly favorable to the solar industry. Under the "million solar roofs" plan, the state will spend more than $3 billion over the next decade to subsidize the installation of solar-power panels. In this public venture, as well as private ventures, there is a place for projects benefiting EJ communities. In fact, a number of EJ groups have already taken control of community development functions in their areas to own and manage housing units, agricultural firms, job training facilities, farmer's markets, urban gardens, and restaurants.[220] The history of community-grown project creation and implementation is long and has set the foundation for the success of present and future projects.

Specifically, these grassroots efforts build on other nascent projects that will address climate change and climate justice. Possible projects for EJ communities range from rural reforestation and afforestation projects in the spirit of Wangari Maathai's Green Belt Movement[221] to the bundling of large-scale energy efficiency efforts coordinated by alternative energy community co-ops in the inner city as well as the reservations of the Great Plains. Poor and of-color communities could also benefit from inclusion in disaster prevention and responses. In the context of post-Katrina cleanup, for example, there has been a call for actively including people of color and the lower and working classes by recruiting them for disaster professions and in the disaster research community, generally.[222]

The Bronx Environmental Stewardship Training (BEST) program and the Oakland Apollo Alliance are perfect examples of potential beneficiaries of a dCDM. BEST has been on the cutting edge of green-collar jobs

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219. *Green America*, *supra* note 134, at 60 (stating that "[a]lmost 400 cities have devised plans to curb or reduce . . . greenhouse gas emissions").

220. Pellow & Brulle, *supra* note 87.

221. Maathai is the founder of the Green Belt Movement, a large-scale, non-CDM project "aimed to encourage planting tree seedlings . . . and help reverse deforestation." *African Greenheart*, ECONOMIST, Sept. 23, 2006, at 94, 94. Maathai won the Nobel Peace Prize in 2004. *Id.*

222. PASTOR ET AL., *supra* note 30, at 39. This kind of disaster preparedness training is not directly credit-generating; however, it would be an integral part of any green job training programs.

training. As a project of Majora Carter's Sustainable South Bronx, BEST is an ecological-restoration job-training program, which recruits exclusively neighborhood residents, ninety-five percent of whom are on public assistance. Recruits range in age from twenty to forty-five and are trained to do everything from landscaping and green-roof installation to brownfield remediation. The training program is a prototype for other urban communities to have a primary stake in the revitalization of their neighborhoods, ecological and otherwise.[223]

Consistent with foundational environmental justice principles, this program is based on the community speaking for itself. According to Carter, however, a challenge for the Sustainable South Bronx is that they have had little support, financial or organizational, from other local or national environmental groups.[224] They have,

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223. *See* Amanda Griscom Little, *Majora League: An Interview with Majora Carter, Founder of Sustainable South Bronx*, GRIST, Sept. 28, 2006, http://www.grist.org/news/maindish/2006/09/28/m_carter/index.html.

> The South Bronx is home to numerous brownfield sites, and high unemployment and poverty rates. Too often, when money is available to fix the brownfield situation, the local residents are left out of the process. NO LONGER. Sustainable South Bronx's River Heroes program trains community members to both take advantage of the monies entering the South Bronx for clean up projects, and seeds the community with green collar workers who have an [sic] direct economic stake in the longer term future of their local environment. Their example inspires others to do the same.
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> . . . .
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> The 3-month program is designed to train individuals in riverine and estuarine restoration. The Bronx River becomes there [sic] hands-on classroom; trainees learn the science and techniques of salt marsh and streambed stabilization, plant identification, nursery management, and more. Our holistic approach also includes valuable life skills in time management, financial management, resume writing, and Environmental Justice. Trainees will also obtain certification in First Aid and CPR, Hazardous Materials Handling, OSHA, Tree Climbing and Pruning, and take classes at the New York Botanical Garden with one-on-one personal support to help trainees launch their lives in a new direction. This program is funded by Congressman Serrano, NOAA, and the Wildlife Conservation Society Fund.

Sustainable South Bronx, B.E.S.T. Bronx Environmental Stewardship Training, http://web.archive.org/web/20070507075515/http://www.ssbx.org (last visited Mar. 28, 2007).

224. *See* Little, *supra* note 223.

therefore, been largely excluded from a natural stream of funding. The dCDM could aid in funding these efforts where there is a nexus with climate change mitigation and potential credits. The carbon offset potential of the green roofing projects, for example, would be calculated for tradable credits. For those credits, investors would aid in the funding of training efforts and other project necessities.

The campaign for green-collar jobs is just as much about economic and social recovery for EJ communities as it is about environmental dividends. This kind of recovery will ultimately aid these communities in preparedness for the ongoing and increasingly onerous impacts of climate change, as predicted by economists like Sir Nicholas Stern discussed in Part I above. This kind of "green" takes on a number of significant meanings, therefore, for groups like the Apollo Alliance. The green-collar economy includes all "green jobs" like construction work on green buildings, organic farming, solar panel manufacturing, and bicycle repair. Cognizant of Oakland, California's "literal do-or-die struggle to build a sustainable local living economy strong enough to lift people out of poverty,"[225] community leaders under the banner of the local Alliance are committed to "job creation for the low-income and people of color in the green, sustainable economy."[226] There are numerous opportunities for Oakland; many already exist, but most are part of a package of innovative and bold solutions.[227] Oakland is, for example, one of the sunniest, windiest cities in California, poised to be a leader in solar and wind power, according to

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225. Van Jones & Ben Wyskida, *Green-Collar Jobs for Urban America*, YES! MAG., Feb. 28, 2007, at 21, 21, *available at* http://www.alternet.org/story/48490/.

226. *Id.* The Oakland Apollo Alliance is one of the nation's first roundtables committed to this goal. *Id.* Generally, the National Apollo Alliance is an effort to create three million clean energy jobs in the next decade. *Id.*

227. *See id.* First, and foremost, "the 'green wave' of investment is 'hottest' . . . in the Bay Area." *Id.* Second, recently elected mayor Ron Dellums has "promised to make Oakland 'a Silicon Valley' of green capital, pledging to make the growth of the green economy central to Oakland's comeback." *Id.* Projects proposed to Dellums by the Oakland Apollo Alliance include "the nation's first 'Green Jobs Corps', a training pipeline and partnership between labor unions, the community college system, and the City to train and employ residents, particularly hard-to-employ constituencies . . . in the new green economy." *Id.* at 23. Existing programs include Red Star Homes projects, in which developers connected to the Apollo Alliance are employing the formerly incarcerated to construct green buildings on the site of a once-toxic brownfield. *See id.* at 22.

Van Jones's Ella Baker Center for Human Rights.[228] It is also home to one of the world's largest, dirtiest ports that the Alliance seeks to transform into a "healthy port" by dramatically reducing emissions.[229]

Again, "[b]y their nature, green jobs are local jobs,"[230] and a Green Jobs Corp, for example, will necessarily be an expression of the community speaking for itself. The Oakland Apollo Alliance has the larger vision of turning Oakland into a "'global green city,' where the pathway out of poverty is the new green wave."[231] A major impediment, of course, is investment. Other market sectors are not going to Oakland, forcing Jones to ask, "If green isn't the answer, what is?" For meeting environmental and climate justice demands, a well-funded green movement must indeed be the answer.

Solar panel installation, green-roofs, and the like are projects that would more likely fall under a small-scale dCDM project,[232] yet would provide the ancillary benefit of preparing these ventures for retail markets. Local entrepreneurship and community patronage are increasing by leaps and bounds, boding well for the prospect of additional revenue from solely private transactions. In other words, communities may benefit from the projects that have generated credits by using the initial project investment to spur growth for community co-ops, for example. There is an "extraordinary range" of new economic associations that "both anchor jobs and change the nature of wealth ownership."[233] There are about 11,000 substantially or wholly employee-owned businesses now operating around the United States.[234] Neighborhood-based community

228. *Id.*

229. *Id.* at 23. The Oakland Apollo Alliance seeks to turn one of Oakland's greatest public health threats into an international model for sustainability. Ancillary projects include a nearby biodiesel fueling station and manufacturing plants, as the Port converts to biodiesel. *See id.*

230. *Id.*

231. *Id.*

232. *See* discussion of small-scale CDM projects *supra* Part III.B.1. Of course, these projects might also be bundled as one city-wide or region-wide project.

233. Gar Alperovitz, *You Say You Want a Revolution*, WORLD WATCH, Nov.-Dec. 2005, at 19.

234. *Id.*

development corps actively working across the country number at around 4000.[235] And, most importantly, more than 115 million Americans are members of co-ops, indicating a vibrant and growing customer base.[236] This kind of capacity to anchor jobs is "of extreme importance to community stability,"[237] and an encouraging indicator for a solar roofs co-op as discussed above.

Specifically, retail markets for climate change projects are booming, also boding well for the community-based effort.[238] Companies and individuals without significant emissions who wish to be climate neutral increasingly participate in these markets,[239] offsetting their carbon-intensive activities through brokered investment in green projects. At present, "[s]everal 'retailers' serve this small but growing market by implementing larger emissions reduction projects."[240] The dCDM can ready EJ communities for full participation in these markets, and provide steady revenue sources in the meantime.[241]

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235. *Id.* at 20.

236. *Id.*

237. *Id.* at 19-20.

238. *See, e.g.*, The Climate Trust, What is an Offset, http://www.climatetrust.org/about_offsets.php (last visited Nov. 4, 2007); Eco_2Balance, http://www.eco2balance.com (last visited Nov. 4, 2007); NativeEnergy, Why Offset with NativeEnergy, http://www.nativeenergy.com/why_offset.html (last visited Nov. 4, 2007).

239. *See* LECOCQ & CAPOOR, *supra* note 166.

240. *Id.* at 13. The full quotation reads as follows: "Several 'retailers' serve this small but growing market, by implementing larger emission reduction projects, and then retiring slices of the emission reductions for their customers." *Id.* Participation in this retail market could also have decidedly positive impacts on reducing greenhouse gas emissions, and concomitant pollution-based public health concerns, with the retiring of credits by EJ co-ops paid for by individuals and companies. Further, the recent Supreme Court decisions in *Massachusetts v. EPA* and *Environmental Defense Fund v. Duke Energy Corp.* have boosted confidence in the growing importance of alternative energy. *See* Duane Morris LLP, Supreme Court Environmental Rulings Boost Confidence in Alternative Energy Investments, http://www.duanemorris.com/alerts/alert2471.html (last visited Feb. 15, 2008). As an indication of the growing strength of the market, Duane Morris writes, "Energy companies can feel confident investing resources in alternative energy, since both rulings almost assuredly will boost the market for energy alternatives such as solar, wind, biomass . . . technology." *Id.*

241. The dCDM might also leverage independent private investment. For the Protocol's CDM, Morgan Stanley has made plans to invest almost $3 billion

Urban-based dCDM projects will likely begin at the state and municipality level. Much can be done in conjunction with the "quiet explosion" of state and local policies aimed at building local self-reliance as well as green economies. The former policies are focused on retaining jobs and increasing local economic "multipliers" allowing money to recirculate in a community, producing additional jobs.[242] Public contracts, for example, are being used to help neighborhood-anchored community development corporations (CDCs) while improving the delivery of government services.[243] These CDCs are getting an additional boost with publicly sponsored "buy local" programs. Urban-based dCDM projects are natural fits for these locality-based efforts. The green policies are also proliferating in American cities. Many municipalities are creating jobs and generating revenues through landfill gas recovery business enterprises, turning methane into energy, for example.[244] Cities like New York, which currently accounts for two percent of total U.S. carbon emissions, seek to be leaders in the effort to go green.[245] The U.S. mayors' initiative has resulted in "[m]any of these cities [changing] building codes to encourage energy efficiency, . . . pushing nonautomobile transport, tree planting, rooftop gardens, and biodiesel in city vehicles."[246] At each of these points EJ community-operated organizations can benefit within, and as a result of, dCDM investments.

There are as many possibilities in rural communities.[247]

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in projects that will generate credits for emissions reduction over the next five years. *See $3 Billion Investment to Cut Greenhouse Gas Emissions Announced by Morgan Stanley*, Daily Env't Rep. (BNA), at A-2 (Oct. 30, 2006). Project beneficiaries include projects certified under the CDM. Venture capitalists are already investing heavily in green technologies like wind, solar, and biofuel, in anticipation of the "next big market." Duane Morris LLP, *supra* note 240. In fact, "U.S. investors made more than two-thirds of all green technology investments last year." *Id.*

242. Alperovitz, *supra* note 233, at 19.

243. *Id.*

244. *Id.* at 20. Methane is a byproduct of waste disposal. *Id.*

245. *Cooling the Planet at the Gas Roots*, CHRISTIAN SCI. MONITOR, Nov. 1, 2006, at 8, 8.

246. *Id.*

247. *See, e.g.*, Alan Scher Zagier, *Hard Pressed Farmers Turn to Wind for Cash*, MSNBC.COM, Nov. 2, 2006, http://www.msnbc.msn.com/id/15527920/.

Native wind projects, for example, are the most well-established cooperatives just waiting for a formal market, which the dCDM would provide. According to Winona LaDuke, Native American activist and environmental justice advocate, native people have their eyes on the horizon.[248] There is a movement for local control of energy as wind and solar projects proliferate throughout native lands. Specifically, there is a push for the creation of distributed energy systems with which local households and businesses can produce power and sell excess energy onto the grid.[249] This locality-based approach emphasizes small-scale and dispersed-alternatives generation, providing the possibility of production at the tribal level.[250] LaDuke perfectly summarizes the intersection of race, poverty, and just solutions, solutions that lack only the right of entry. She writes:

> The reality is that this region of North America has more wind power potential than almost anywhere in the world. Twenty-three Indian tribes have more than 300 gigawatts of wind generating potential. That's equal to over half of present U.S. installed electrical capacity. Those tribes live in some of the poorest counties in the country, yet the wind turbines they are putting up could power America—if they had more markets and access to power lines.[251]

Again, market access would be the very purpose and the incredible value of the dCDM.

Currently, significant tribe-based initiatives under NativeEnergy have begun selling renewable energy credits or "green tags" on a more ad hoc basis. The Rosebud Sioux, a founding member of the Intertribal Council on Utility

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Rural projects are introducing great possibilities. In this article, Zagier describes wind energy projects that are meeting the needs of northwest Missouri hog and soybean farmers. *Id.*

248. Winona LaDuke, *Local Energy, Local Power*, YES! MAG., Winter 2007, at 26, 26.

249. *See id.* at 27; *see also* Gough, *supra* note 44, at 7 (describing the development and marketing of wind power dependent on the integrated transmission grid operated through the Western Area Power Administration).

250. Local level alternative energy generation would also avoid the involvement of "big money and corporations." LaDuke, *supra* note 248, at 27.

251. *Id.* at 27-28.

Policy (COUP) in South Dakota, "pioneered the development of green power financing through the up-front sale of green tags (or renewable energy credits . . . RECs)."[252] NativeEnergy markets the tags to buyers who seek to reduce domestic carbon emissions while financially supporting tribal renewables projects. Bob Gough describes the end product as "sustainable homeland economies."[253] "Village power models" can develop renewables technology designed for remote off-grid applications, serving the grossly underserved on Indian lands, while restoring the balance upset by environmental and climate injustices.

The dCDM would ensure a long-term stable revenue source for projects that are already proceeding in a CDM-like fashion.[254] In its expansion phase, NativeEnergy envisions "further development of private marketing

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252. Bob Gough, *Embracing the Wind*, ENERGYBIZ, Jan.-Feb. 2006, at 82, 82.

253. Gough advocates on behalf of a "no regrets" strategy for the reduction of carbon emissions that fosters these local economies based on renewables and at the same time meets regional energy demand needs. Gough, *supra* note 44, at 1.

254. Or, more generally, for offsetting programs, which are accepted components of domestic pollution abatement efforts. *See supra* note 159 and accompanying text (describing 42 U.S.C. § 7503 (2000)). In addition, private markets have dabbled in carbon trading. The Chicago Climate Exchange (CCX) is a private and voluntary market for emission allowances between firms. LECOCQ & CAPOOR, *supra* note 166, at 12. The CCX operates as a pilot greenhouse gas "cap-and-trade system through which entities, mainly U.S.-based private firms, have agreed to voluntarily limit their . . . emissions . . . through internal reductions." *Id.* at 34. Firms can purchase allowances from other firms facing emissions limitations, or purchase credits from emission reduction projects that meet state criteria. *Id.* at 34-35. And, of course, U.S. companies that operate overseas have had to conform to Kyoto Protocol mandates. *See* Michael J. Zimmer, *Global Climate Change Creates a New Carbon Business for U.S. Companies*, 7 SUSTAINABLE DEV. L. & POL'Y 64, 64 (2007) (explaining that "[a]s part of a global economy, U.S. companies operating abroad are already participating in carbon management schemes because of local Kyoto compliance obligations in their host countries"). Offsetting measures, conducive to a dCDM program, have already been contemplated in proposed climate bills. The Feinstein-Carper bill, for example, would allow companies to engage in emissions trading and "offset" projects, such as tree planting, to meet targets. Mike Ferullo, *Climate Coalition Says Incremental Approach May Work Best for Cap-and-Trade System*, Chemical Reg. Daily (BNA), at D-16 (Feb. 14, 2007); *see also* Bogdonoff & Rubin, *supra* note 138, at 11 (describing RGGI provisions allowing some portion of emissions reductions to be gained from other sources: "RGGI specifies a number of categories of offset allowances, such as planting trees to absorb carbon").

strategies for the sale of green power, green tags and pollution credits"—all needed to support development of NativeEnergy projects.[255] The market share potential is great, as the Intertribal COUP presently assesses the wind potential in the Great Plains Indian reservations and conservatively estimates an energy generation of 530 billion kilowatt-hours annually.[256] Sustainable home economies can be fostered and advanced with the support of an independent, firmly established market infrastructure—the dCDM.

IV. JUSTICE IS MITIGATION

While articulating the virtues of the dCDM, I remain mindful of the inherent defects in the market structure in which it will operate. From the EJ perspective, market mechanisms often suffer fundamental flaws. The most significant, perhaps, is their inconsonance with principles of rights and equity. The market is at best unmoved by the differential experience of the poor and of-color. At worst, the mechanisms encouraged, like cap-and-trade, exacerbate disproportionate environmental risks producing ugly realities like toxic hotspots.[257] Cap-and-trade systems are also often criticized as red herrings, overshadowing more effective regulatory measures. In short, aggressive action to mitigate the disastrous effects of climate change is clearly warranted in order to avoid the most severe outcomes predicted—and

255. Gough, *supra* note 44, at 12.

256. Gough, *supra* note 252, at 82. This is compared to the 10,000 kilowatt-hours of power used annually by the average U.S. home. *Id.* The alternatives potential is not limited to wind energy, by any means. Indian lands have an enormous wealth of solar, geothermal, and biomass renewable energy resources. In addition, there is significant potential for the creation of carbon sink, through forest and prairie restoration. Gough, *supra* note 44, at 5, 8. But the wind potential should not be underestimated. According to Gough, "the 12 Indian reservations in North and South Dakota have a wind power potential of at least twice that necessary to meet the Kyoto target for the entire United States for the 1999 emissions levels." *Id.* at 6 (footnote omitted).

257. Hotspots occur when the pollution burden of a community or region, hosting a high-cost source is exacerbated by that source's ability to purchase allowances from a low-cost source. In other words, the emissions of the source that can only reduce emissions at a relatively higher cost will increase, with the disproportionate impact felt by its immediate neighbors. See further discussion of hotspots *infra* note 261.

cap-and-trade systems fall well below these preferred actions.

In this section, I highlight a few of the most salient EJ critiques of cap-and-trade. These critiques, coupled with the ethical groundwork laid out by climate change ethicists and described in Part I, demand nothing short of the cessation of fossil fuel combustion at present levels, perhaps immediately.[258] It is clear, however, that the political will to implement even moderate mandatory mitigation measures is absent. At this point in our history, it seems clear that ample and sufficient mitigation is untenable. And without a dCDM, a cap-and-trade approach will very likely repeat many old and dangerous mistakes.

A. *Inherent Flaws in Market Mechanisms*

Because of the qualified success of cap-and-trade in earlier emissions trading mechanisms, it is now seen by many as the panacea for all environmental risks.[259] Yet the

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258. Though I will not take it up in this Article, there are a number of compelling ethical arguments based on intergenerational harm. *See, e.g.*, FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004); John Edward Davidson, *Tomorrow's Standing Today: How the Equitable Jurisdiction Clause of Article III, Section 2 Confers Standing Upon Future Generations*, 28 COLUM. J. ENVTL. L. 185, 186-94 (2003); Douglas A. Kysar, *Discounting . . . on Stilts*, 74 U. CHI. L. REV. 119 (2007); Richard L. Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 COLUM. L. REV. 941, 946-48, 987-1017 (1999); Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment*, 84 AM. J. INT'L L. 198 (1990). With respect to cost-benefit analysis, used both to determine the level of risk posed and the solution chosen, economic modeling is an ethical failure. When performing the analysis across generations, standard cost-benefit analysis engages in discounting of future benefits, so that "the benefits beyond half a century barely count." Duncan, *Dismal Calculations*, *supra* note 37, at 15.

259. Title IV of the Clean Air Act is often heralded for the cap-and-trade program it established. *See*, *e.g.*, Dallas Burtraw & Byron Swift, *A New Standard of Performance: An Analysis of the Clean Air Act's Acid Rain Program*, 26 ENVTL. L. REP. 10411 (1996); Joseph Goffman, *Title IV of the Clean Air Act: Lessons for Success of the Acid Rain Emissions Trading Program*, 14 PENN ST. ENVTL. L. REV. 177 (2006); s*ee also* William Chameides & Michael Oppenheimer, *Carbon Trading Over Taxes*, SCI., Mar. 23, 2007, at 1670 (describing the United States' ability to "reduce sulfur oxide emissions ahead of schedule and at 30% of the projected cost using a market-based cap-and-trade system" (citation omitted)). The major advantage of cap-and-trade identified in the Chameides and Oppenheimer article is the potential for innovation

ancillary impacts, namely the toxic hotspot phenomenon in EJ communities, undermine any good-faith claims to progress. There are also very real questions as to whether a trading system will do much to reduce greenhouse gas emissions sufficiently.[260]

Cap-and-trade, unsupplemented, can actually aggravate disparate impact. With the implementation of the Clean Air Act's Title IV trading program, EJ communities suffered the brunt of the trading scheme. Those facilities unable to reduce their sulfur dioxide emissions, for example, simply purchased additional credits from companies that could do so more efficiently. The result was that certain neighborhoods, often traditional EJ neighborhoods near oil refineries and other industrial polluters, experienced a spike in their exposure to smokestack pollutants even while the overall emissions burden for a region fell. This toxic hotspot phenomenon is the prototypical scenario for cap-and-trade programs for pollutants.[261]

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incentives that market-based systems provide and the possibility of inexpensive CO_2 emission reductions. *Id.*

260. For broad critiques of cap-and-trade programs in the context of climate change, see Todd B. Adams, *Is There a Legal Future for Sustainable Development in Global Warming? Justice, Economics, and Protecting the Environment*, 16 GEO. INT'L ENVTL. L. REV. 77, 112-26 (2003); David M. Driesen, *Free Lunch or Cheap Fix?: The Emissions Trading Idea and the Climate Change Convention*, 26 B.C. ENVTL. AFF. L. REV. 1 (1998). Ruth Greenspan Bell expresses deep skepticism about emissions-trading regimes, claiming that they do very little to cap pollution. Relying on a trading system assumes, she argues, "that the opportunity to profit from . . . greenhouse gas emissions will [actually] motivate industrial emitters." Ruth Greenspan Bell, *What to Do About Climate Change*, 85 FOREIGN AFF., May-June 2006, at 105, 106-07. There is certainly concern about the efficacy of cap-and-trade over the long term. *See* Whetzel, supra note 148. At a University of California, Berkeley, conference there was general agreement among the speakers—economists and policy experts—that "while cap-and-trade programs might not be the best long-term mechanism to battle global warming, they have garnered widespread acceptance and offer near-term advantages." *Id.* Emissions reduction credits, even under the proposed dCDM, are suspect over the long-term. *See* Ben Elgin, *Another Inconvenient Truth*, BUS. WK., Mar. 26, 2007, at 96, 102 (quoting Tufts Climate Initiative outreach coordinator Anja S. Kollmuss's skepticism: "We cannot solve the climate crisis by buying offsets and claiming to be climate-neutral . . . . Nature does not fall for accounting schemes.").

261. EPA's trading system for mercury, for instance, has been roundly criticized for its creation of hotspots. *See, e.g.*, Michelle O'Donnell, *States Challenge Break on Mercury for Power Plants*, N.Y. TIMES, May 19, 2005, at B9 (describing a lawsuit filed by eleven states against the EPA on the ground that

Carbon trading, as a response to global warming, will exacerbate the negative effects of its co-pollutants that result from the same source. These co-pollutants include toxic and cancer-causing hydrocarbons, mercury, and particulate matter, among many others. As a general rule, however, those focused on market-tradable commodities will put the largest weight on aggregate impacts, satisfied solely with overall reduction.[262] Conversely, those with equity and justice concerns look to distributional effects. Climate justice principles, therefore, militate against these kinds of emissions abatement schemes.[263] Instead, climate justice advocates will look to responses that affirmatively address burden disparities. Market systems, which often go hand-in-hand with technological solutions, look to efficiency. But concerns regarding distributional effects arise in opposition to the dominance of efficiency and the over-reliance on technological fixes,[264] which tend to reinforce

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the mercury cap-and-trade system would create hot spots); Catherine A. O'Neill, *Mercury, Risk, and Justice*, 34 ENVTL. L. REP. 11070, 11098 (2004). These hotspots militate in favor of source-specific controls in a cap-and-trade system. If pure command-and-control is not adopted, limitations to the flexibility inherent in an emissions trading program must be built into the mechanism. *See* David A. Evans & Joseph A. Kruger, *Where are the Sky's Limits? Lessons From Chicago's Cap-and-Trade Program*, ENV'T, Mar. 2007, at 20, 26. This will yield a more complex trading mechanism, which in turn "increases the cost of [control in] administering the market mechanism and somewhat reduces its cost advantage over more traditional regulatory forms." AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* 22, at 139. In effect, a more just cap-and-trade system can only be accomplished if it loses its appeal as a low-cost alternative to command-and-control, revealing an inherent tension.

262. *See* Schneider & Lane, *supra* note 1. Pellow and Brulle argue that this market indifference is exacerbated by poor or non-existent government response. They argue that "not only does the market fail to take into account the ecological consequences of its actions; the state also fails to control the market." Pellow & Brulle, *supra* note 87, at 7.

263. Describing EJ principles generally, David Monsma explains, "[t]he principles also address the central role that industrialized nations and transnational corporations play in causing climate change, and question market-based mechanisms currently being promoted by climate change experts, which do not necessarily address the potential of disproportionate environmental impacts." Monsma, *supra* note 85, at 491.

264. This reliance is overly sanguine irrespective of one's vantage point. In other words, one need not be a climate justice advocate to expose the naiveté inherent in technological reliance. *See, e.g.*, R.T. Pierrehumbert, *Climate Change: A Catastrophe in Slow Motion*, 6 CHI. J. INT'L L. 573, 580 (2006) (explaining that "[b]ecause of the extremely long-term impact of each additional

power and wealth disparities as access to technologies is not equitably distributed.[265]

Further, at base, cap-and-trade provides a profit-making means for complying with a preexisting ethical duty not to pollute.[266] In other words, rights and duties theory, "[w]hen applied to emissions trading, . . . demands that because a right to a clean environment exists as a statement of positive law, a corresponding duty exists among others not to pollute."[267] The argument becomes even more poignant from the perspective of the poor and of-color. As carbon trading is currently constructed, those that stand to benefit from that trading, in the United States and in the Kyoto framework, are those that are already in the business of producing intense greenhouse gas emissions. Few would argue that a market system in which extreme

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year's carbon dioxide emissions, the calculus of delay is completely changed as compared to other pollution problems"). In short, technological fixes in the long-term, in lieu of short-term mitigation measures, will not stem the irreversible chain of events set in play once the planet has reached the climate tipping point. As Pierrehumbert writes, "If we wait forty or fifty years before taking serious action, the die will have been cast and a thousand generations of our descendants will have to live with the consequences of the climate we bequeathed them." *Id.* at 580.

265. *See* Leichenko & O'Brien, *supra* note 176. "[A]daptation strategies based on a winners and losers framework may tend to emphasize technological solutions. . . . [S]uch actions tend to reinforce rather than alleviate inequitable distribution of economic and political power between and within social groups." *Id.* at 113-14 This disparity is apparent today as public health and welfare is compromised by varying access to "simple" and more commonplace technology, like the air conditioner. *See* Complaint at 12, California v. General Motors Corp., No. 06-05755 (N.D. Calif. Sept. 20, 2006); Adger et al., *supra* note 27, at 2; AFRICAN AMERICANS AND CLIMATE CHANGE, *supra* note 22, at 20-21.

266. *See, e.g.*, Junker, *supra* note 139, at 152-53, 160-70 (surveying the "catalogue of environmental rights" within both international and domestic law, and finding that "a remarkable number" of constitutions worldwide do "recognize the right of the legal person to enjoy a healthy or clean natural environment," while "nowhere will one find the act of polluting the natural environment explicitly established as a right for any legal person . . . in any international or municipal source of law"). Jerome Ringo, Chairman of the Board of the National Wildlife Federation, President of the Apollo Alliance, and environmental justice activist, revealed the absurdity of programs that essentially pay companies to follow the law when he stated simply, "You don't pay crack addicts to stop selling crack." Jerome Ringo, Chairman of the Bd., Nat'l Wildlife Fed'n, President, Apollo Alliance, Keynote Speech at The Climate of Environmental Justice: Taking Stock (Mar. 16, 2007). For a deeper discussion of the ethical implications of emissions trading, see Junker, *supra* note 139.

267. Junker, *supra* note 139, at 170.

wealth disparities are exacerbated—particularly in light of disparate climate effects—is ethically neutral.[268] Yet the expectation vis-à-vis emissions trading is that outcomes of processes such as markets, assumed to be procedurally just, should be accepted even if they produce unequal results. Jouni Paavola et al., however, argue convincingly that this expectation is problematic because it denies the significance of "unequal starting points, postulate[s] the legitimacy of [the powerful's] favorite procedures, and end[s] up affirming the fairness of *status quo*."[269] With the interplay of race and poverty, particularly when viewed on a global scale, the market is wholly inadequate.[270]

Current political exigencies suggest, however, that finding climate justice solutions concordant with current policy will ensure that communities have an opportunity to craft the most advantageous manifestation of these solutions. The consequences of not participating in crafting these solutions are simply too grave—climate change is the first enormous risk that is both uncertain and irreversible in its result with EJ communities uniquely situated in its path.[271]

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268. For greater elaboration on this ethical argument, see Schneider & Lane, *supra* note 1. Schneider and Lane argue: "Very few would view a market valuation of impacts in which the rich get richer and the poor get poorer as ethically neutral. In international negotiations, members of the political South often challenge supporters of the use of aggregated market damages . . . ." *Id.* at 32. Yet in their critique there is a positive place for the dCDM. They identify a "bottom-up approach [which] focuses on the vulnerability and adaptive capacity of individuals or groups, which leads to social indications of potential danger such as poverty, lack of access to healthcare, or ineffective political institutions." *Id.* at 33. Under the dCDM, with its emphasis on local, community-based, green economic development measures, these vulnerability and adaptive concerns will be specifically addressed.

269. Paavola et al., *supra* note 82, at 267; *see also* Richard N.L. Andrews, *Learning from History: U.S. Environmental Politics, Policies, and the Common Good*, ENV'T, Nov. 2006, at 29, 42 (arguing that free-market advocates offer "a vision of freedom from taxation and government compulsion, implying that individuals can buy the environment they want, but this scenario offers nothing to the less affluent and ignores the common-good elements of the environment that affect rich and poor alike").

270. My next article will tackle the formidable world of law and economics from an environmental justice perspective. I will explore the myriad objections to the law and economics approach in light of the particular devotion to rights espoused by many in poor and of-color communities.

271. While I generally shun the cynical strategies of *realpolitik*, it seems

B. *The dCDM is the Most Viable Alternative for Incorporating Environmental Justice Norms*

Despite strong ethical arguments outlined above, there are no indications that aggressive mitigation is a viable part of any policy package proffered today. In fact, even the more tepid cap-and-trade solutions proposed may "prove too exacting for [this] Congress."[272] In spite of the IPCC reports, the Bush Administration continues to tout the virtues of voluntary emissions caps, eschewing plans for mandatory emissions reductions programs.[273] A veto of a cap-and-trade

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that the EJ principle of participation and communities speaking for themselves trumps a more revolutionary approach, *at the moment*. Inclusion in the crafting of solutions and a dismantling of pervasive systemic failures should occur simultaneously. It seems to me that this first, immediate, and short-term effort to avoid exclusion is vital. It is important to note, however, that in offering the dCDM I am not advocating for a "co-opted and quiescent movement." *See* Robert Benford, *The Half-Life of the Environmental Justice Frame: Innovation, Diffusion, and Stagnation*, *in* POWER, JUSTICE, AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT, *supra* note 28, at 37, 53 n.14.

272. *Green America*, *supra* note 134, at 60 (describing the uphill battle for all bills in Congress with the added possibility of presidential veto); Scott, *supra* note 11 (citing Bush Administration officials expressing strong reservations on current bills that would establish mandatory greenhouse gas reduction programs); *see also* Carolyn Whetzel, *Feinstein Says Approval of Five Bills Would Help Reduce Carbon Emissions*, Int'l Env't Daily (BNA), at D-11 (Feb. 27, 2007) (quoting Feinstein as stating that "winning the 60 votes needed to pass the bills [to reduce emissions of carbon dioxide and other greenhouse gases] will be difficult"). Cap-and-trade, however, appears "to be less politically volatile than the prospect of [raising] energy taxes." *See* Dean Scott, *Combination of Research, Mandatory Limits Can Cut Greenhouse Emissions, Report Says*, 37 Env't Rep. (BNA), at 1942 (Sept. 22, 2006). This is true in spite of the carbon taxes' probable advantages. *See id.*; *It May Be Hot in Washington Too*, ECONOMIST, Nov. 4, 2006, at 69, 69 (finding that Europe mostly uses taxes and that most economists argue that a carbon tax would be the most efficient solution); Dean Scott, *Congressional Economist Says Carbon Tax More Efficient Than Cap-and-Trade Effort*, Chemical Reg. Daily (BNA), at D-7 (Mar. 28, 2006); *see also* Paavola et al., *supra* note 82. From a social justice standpoint, the carbon tax has an additional advantage. Namely, a uniform carbon tax can be tailored so that it falls on those who emit more in per capita terms or who have the highest cumulative historical emissions, and revenues could "replenish . . . fund[s] for compensating impacts of . . . and for assisting adaptation to climate change." *Id.* at 272.

273. Dean Scott & Larry Speer, *Bush Administration Embraces IPCC Findings But Resists Calls for Capping U.S. Emissions*, Chemical Reg. Daily (BNA), at D-16 (Feb. 5, 2007). At the June, 2007 meeting of the G-8 leaders, President Bush conceded only that the United States would "'seriously consider[ ]"

program, though the most attractive policy option, is possible. Further, absent the political will, the popular groundswell is nascent, and most Americans tend to balk at the prospect of generalized lifestyle inconveniences. Undoubtedly, the more modest task of stabilizing greenhouse gas emissions will require huge changes in behavior.[274] There are few signs that the United States as a nation is willing to undertake the necessary lifestyle sacrifices required to slow global warming. A more austere climate policy, though absolutely needed, is likely not viable at the present time.

Even more troubling for the prospect of more aggressive climate policy, is "the economy, stupid." Law and policy are relentlessly fixed on economic indicators, subjecting our very livelihood to cost-benefit analyses.[275] As described by

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a proposal targeting a fifty percent reduction in global greenhouse gas emissions by 2050; he continued to refuse to commit to binding cuts. *See* Stephen Gardner, *Climate Change: Environmental Groups Say G-8 Compromise Should Be Base for Post-2012 Framework*, Daily Env't. Rep. (BNA), at A-2 (June 11, 2007). Domestically, the President "is working with businesses to encourage voluntary, cost-effective greenhouse gas emission reductions" and promoting a "[n]ational [g]oal to [r]educe [e]missions [i]ntensity" (as opposed to capping and reducing overall emissions). The White House: Council on Environmental Quality, Addressing Global Climate Change, http://www.whitehouse.gov/ceq/global-change.html#2 (last visited Nov. 7, 2007); *see also* E. Donald Elliott et al., *Recent Clean Air Act Developments—2006*, 37 ENVTL. L. REP. 10274, 10283 (2007) (explaining the difference between "carbon intensity"—the "measure of GHG emissions per unit of gross domestic product"—and overall emissions).

274. Brown, *supra* note 107, at 10756. This is in contrast to actually reducing emissions to twentieth century levels. Brown insists that the United States must adopt a greenhouse gas reduction program that will reduce emissions to 1990 levels by no later than 2012, a deadline we are destined to miss. *Id.* at 10767. Brown also advocates an open embrace of the precautionary principle in the face of uncertainty and the placing of emissions reduction at the very top of the United States' domestic and foreign policy agenda. *Id.* at 10763, 10768.

275. *See, e.g.*, Lisa Heinzerling, *The Accidental Environmentalist: Judge Posner on Catastrophic Thinking*, 94 GEO. L.J. 833, 856-57 (2006) (review of RICHARD A. POSNER, CATASTROPHE: RISK AND RESPONSE (2004)) (highlighting the "profound bizarreness of attaching a dollar value to the continued existence" of the human race). My next article will critique the law and economics movement, and its devotion to cost-benefit analysis, from the perspective of climate justice. Schneider and Lane explain that:

> Traditional cost-benefit analysis (CBA) . . . tends to consider a sole numeraire, market values, and is often viewed as unjust . . . because nature and distributional aspects are rarely explicitly treated. In a traditional CBA, the ethical principle is not even classical Benthamite

one commentator, "some economists feel that the issue [of climate change] has been captured by economically illiterate climatologists who do not seem to understand that mitigating climate change means spending real money now . . . for uncertain benefits in a remote future."[276] For many, despite important positions like those advocated in the Stern Report, a gradual approach is cheaper and, therefore, preferred.[277] With this fixation all "rational" roads lead back to cap-and-trade.[278]

There is little space in the contemporary discourse on environmental law and policy for meaningful discussion of rights and equity. This is, of course, an unacceptable reality, one that must be shifted away from efficiency and back towards ethics and, in this case, climate justice. In the short term, however, cap-and-trade is immediately viable[279] and the dCDM could temper inequities.[280]

> utilitarianism (greatest good for the greatest number of people), but an aggregated market power form of utilitarianism (greatest good for the greatest number of dollars in benefit-cost ratios).

Schneider & Lane, *supra* note 1, at 31.

276. Duncan, *Dismal Calculations*, *supra* note 37, at 14.

277. *Id.* at 17. The go-it-slow approach is preferred despite being divorced from scientific necessity. Richard Richels of the Electric Power Research Institute, for example, estimates that stabilizing emissions at 550 ppm would cost a quarter as much as stabilizing emissions at 450 ppm, because the latter "would require existing plant[s] to be scrapped." *Id.* at 14, 16. The more strenuous 450 ppm goal, however, does not ensure against climate catastrophe. According to Gelbspan, "[t]he major national environmental groups focusing on climate . . . have agreed to accept what they see as a politically feasible target for 450 parts per million of carbon dioxide. . . . [That] may be politically realistic, [but] it would likely be environmentally catastrophic." *Quoted in* MICHAEL SHELLENBERGER & TED NORDHAUS, THE DEATH OF ENVIRONMENTALISM: GLOBAL WARMING POLITICS IN A POST-ENVIRONMENTAL WORLD 24 (2004).

278. Of course, when issues beyond price arise, there is a tepid, but telling, concession that arises. Ethical considerations and the moral obligations of the greatest emitters may resonate with economists, and may indeed counsel toward more aggressive mitigation, irrespective of costs. One admits, "[t]here are a couple of ethical questions that shift the argument towards mitigation." Duncan, *Dismal Calculations*, *supra* note 37, at 16.

279. And despite likely delay, it does appear inevitable. *See* Whetzel, *supra* note 148. Manik Roy of the Pew Center on Global Climate Change suggests that a successful vote on climate change legislation in 2007 is "plausible," but more likely in 2008, and "any national program would likely be a cap-and-trade scheme." *Id.*

280. In fact, in the Stern Review on the economics of climate change, the

The dCDM is the best, just solution in the face of none.[281] It is also consistent with traditional environmental justice norms, and, at the same time, soundly responds to some of the more salient criticisms leveled at EJ thus far. Specifically, consistent with the Ten Actions of Climate Justice Policies enumerated at the Second National People of Color Environment Leadership Summit, the dCDM would "ensure just transition[s] for workers and communities," by ensuring a place in the burgeoning "renewable resource economy."[282] It is, in fact, dependent upon the promotion of "ownership and stewardship of renewable resources" by workers and community members.[283] As a part of a domestic market, the dCDM will "allow communities to participate in the creation" and maintenance of the carbon market—meeting another important action point for Climate Justice Policies.[284] Another more general environmental justice goal that would be met is in creating possible carbon sinks, through afforestation and reforestation projects, for example, the dCDM could facilitate desperately needed efforts to green urban EJ communities. At present, urban communities of color are bereft of parks and open spaces,

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report endorses expansions of the use of instruments like the Clean Development Mechanism. *See* Tom Blass, *British Report on Economics of Warming Prompts New Initiatives to Cut Emissions*, Daily Env't Rep. (BNA), at A-4 (Oct. 31, 2006). Of course, aggressive mitigation is still the single best alternative, dwarfing short-term strategies like cap-and-trade and development mechanisms in a climate justice analysis.

281. It is also viable in its harmony with domestic bills, like America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007), that already contemplate domestic offsets, worker training programs, and climate provisions for the poor. See the discussion of Lieberman and Warner's America's Climate Security Act of 2007, *supra* Part III.A.

282. *See* Ansje Miller & Cody Sisco, *Ten Actions of Climate Justice Policies* 4 (Second Nat'l People of Color Envtl. Leadership Summit - Summit II, Resource Paper Series, Oct. 23, 2002), *available at* http://www.ejrc.cau.edu/summit2/SummIIClimateJustice%20.pdf (declaring that "[t]o ensure equity and self-sufficiency, policies must engage and empower communities with the information and resources to transition to a renewable resource economy").

283. *Id.* Of course, per principle 4, community participation would not only be required, but also imperative. *See id.* at 5.

284. *Id.* at 8. In fact, principle 8 calls for a portion of market revenues to be set aside for "grants of options to impacted individuals and communities who can then choose to buy permits, maintain sinks, or use the money in any other way to adapt to climate change." *Id*. This is certainly accounted for in the dCDM.

particularly as compared to their white counterparts.[285] Social justice and green infrastructures will, for once, have a committed and steady investment mechanism.[286]

The mechanism will also quiet EJ detractors. Organizations such as the Black Chamber of Commerce—and other political and economic forces in the African American community—have organized to oppose the EJ movement, claiming that it seeks to prevent all economic development in communities of color. The dCDM is an EJ and a climate justice solution that disproves the underlying premise of the above critique and encourages the kind of economic development that will ready communities for an unparalleled challenge.[287]

In assessing the future of environmental justice, Brulle and Pellow maintained that a "sophisticated EJ vision" would combine the creation of "innovative practices through existing entities" and the development of "new institutions apart from traditional ones."[288] The dCDM introduces both. With the opportunity presented by increasing demands for climate policy and the introduction of sustainable local economies in EJ communities, the dCDM is poised to incorporate environmental justice and climate justice norms in early climate policy decisionmaking.

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285. For example,

> [a] careful study of the Los Angeles area found that neighborhoods that were more than 75 percent white enjoyed thirty-two acres of park per thousand residents, whereas those that were more than 75 percent Latino enjoyed less than one acre per thousand residents, and those that were more than 75 percent black had about two acres per thousand residents.

PASTOR ET AL., *supra* note 30, at 18.

286. *See generally id*. at 37 (advocating a balance of green building and social justice in rebuilding the Gulf region).

287. Pellow and Brulle argue that "[h]ow the EJ movement understands, analyzes, and challenges this intra-racial resistance and highly organized opposition will be instructive and a harbinger of the future health of the cause." Pellow & Brulle, *supra* note 87, at 12. Indeed, the dCDM portends a very healthy future for EJ.

288. Brulle & Pellow, *supra* note 95, at 295.

CONCLUSION

Environmental justice norms demand that in choosing its response to climate change, the United States address the disproportionate burdens of the crisis. The emerging discussion of policy strategies to respond to global warming has failed to address concerns of communities that will be most negatively affected by related calamities. This policy failing reflects, in large part, a conceptual blind spot as to the relevance of environmental justice concerns to global warming. Indeed, U.S. legal academics to date have not developed and adhered to a concept of "climate justice," and thus policymakers are not alone in this regard. As this Article has made clear, however, climate justice is a powerful concern that must be placed within the broader environmental justice framework, and policymakers should be careful to address such concerns in adopting measures to address the climate crisis.

The urgency of the crisis requires prompt and substantive action. We now have an opportunity and a moral obligation to implement climate solutions that neither disregard disproportionate suffering nor aggravate it. In fact, a union of justice principles and climate change solutions will allow the United States to decisively demonstrate what it so often simply declares: the nation's claimed foundational commitment to justice and equity in our laws.[289]

In the short term, adoption of the domestic CDM, though not the overarching remedy that environmental justice advocates would like to see most, is the remedy that is consistent with the current trajectory of policy-makers and, as such, is the most feasible approach. There are also significant advantages that attach to this solution. Besides meeting the theoretical and practical mandates of the environmental justice movement, it is an important engine for emergent economic development opportunities across the nation's rural and urban communities. This and the struggle for more fundamental systemic changes can, and should, be done concurrently.

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289. Environmental justice scholars Bunyan Bryant and Elaine Hockman insist that "[i]t is within the context of climate justice that activists can make an impact that could surpass the impact of the [Civil Rights Movement]." Bryant & Hockman, *supra* note 30, at 34.

The additional, though less obvious, benefit of this analysis is that it sets a framework for how the United States can meet its responsibilities and obligations to poor and of-color communities throughout the globe. Climate justice, in other words, can forcefully encourage the United States to consider the consequences of its political and economic character and incorporate the attendant moral obligations into its choice of solutions. If the environmental justice movement cannot curb the excesses of the United States' political economy, however, it will surely be ill-equipped to do so on a global scale.[290] There is a growing sense that the continued relevance of the movement is hinged on its ability to have consequence in the fate of the global poor and of-color. The environmental justice movement, therefore, must be a critical and consequential crafter of domestic, and ultimately global, solutions.

The domestic CDM is, in fact, a model solution in light of the reconsidered EJ movement. From their review and critique of the first decades of EJ, Robert Brulle and David Pellow urge twenty-first century EJ scholars to balance the documentation of problems with an "orientation toward" solutions.[291] They explicitly request proposals that promote "new directions for society to heal itself and produce more just and sustainable forms of production."[292] This is the vital contribution of the dCDM to our communities as well as to the legal academy.

It is true that "[p]olitics and law can ultimately have no higher purpose than seeking fair outcomes for the survival of the natural world."[293] It is also true that adaptation measures produced by political and legal processes can reinforce rather than alleviate uneven distributions of power.[294] My purpose here has been to encourage an adaptive response that does not reinforce inequality, but instead takes the first, crucial step to charting a path in

290. *See* Pellow & Brulle, *supra* note 87; Brulle & Pellow, *supra* note 95, at 296 (arguing that EJ "must go global" to survive as a movement, because those who live in the North have a responsibility to those who live in the South).

291. Brulle & Pellow, *supra* note 95, at 296.

292. *Id.*

293. Adger et al., *supra* note 27, at 19.

294. Leichenko & O'Brien, *supra* note 176, at 105.

which all solutions, however flawed, may be just.