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Climate Change and Environmental Assessment Law

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Dave Owen*

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INTRODUCTION

As anyone who reads *Sports Illustrated*¹ or watches the Oscars—let alone follows trends in environmental science, policy, or law—knows, anthropogenic global climate change² is a very big problem. Scientists predict that in California, the state on which this article focuses, unchecked climate change would decimate water supplies, intensify heat waves, accelerate coastal erosion, degrade air quality, increase wildfires, and reduce wildlife habitat, among other impacts.³ Similar consequences are likely worldwide.⁴ These impacts threaten to create major social and economic costs,⁵ and although climate change will probably affect almost everyone, the burdens for low-income or otherwise vulnerable communities are likely to be particularly heavy.⁶

Those threats have led to widespread academic and, increasingly,

1. See Alexander Wolff, *Going, Going Green*, SPORTS ILLUSTRATED, March 6, 2007, available at <http://sportsillustrated.cnn.com/2007/more/03/06/eco0312/index.html>.

2. This Article refers to “climate change,” which encompasses both higher temperatures and changed storm and precipitation patterns, rather than using the narrower term “global warming.” In most popular discussions, however, the terms are used interchangeably.

3. See, e.g., CAL. CLIMATE CHANGE CTR., OUR CHANGING CLIMATE: ASSESSING THE RISKS TO CALIFORNIA 2 (2006) [hereinafter OUR CHANGING CLIMATE]; CAL. ENVTL. PROT. AGENCY, CLIMATE ACTION TEAM REPORT TO GOVERNOR SCHWARZENEGGER AND THE LEGISLATURE 5 (2006) (“[G]lobal warming will impose compelling and extraordinary impacts on California . . .”).

4. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS SUMMARY FOR POLICYMAKERS 12 (2007) [hereinafter IPCC, THE PHYSICAL SCIENCE BASIS] (describing some of the expected effects of climate change); INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: CLIMATE CHANGE IMPACTS, ADAPTATION AND VULNERABILITY (2007) [hereinafter IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY]; *Massachusetts v. EPA*, 127 S. Ct. 1438, 1455 (2007) (“The harms associated with climate change are serious and well recognized.”).

5. See IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4; see CAL. HEALTH & SAFETY CODE § 38501(a), (b) (West Supp. 2007); see also An Open Letter from California Economists to Governor Schwarzenegger and California Legislators (Aug. 2006), http://calclimate.berkeley.edu/CA_Economists_Letter.pdf (“California’s economy is vulnerable to climate change impacts, including changes in water availability, agricultural productivity, electricity demand, health stresses, environmental hazards, and sea level.”).

6. See REDEFINING PROGRESS, CLIMATE CHANGE IN CALIFORNIA: HEALTH, ECONOMIC AND EQUITY IMPACTS (2006); see also IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4, at 19 (observing that factors like poverty can limit adaptive capacity); Julie Eilperin, *Military Sharpens Focus on Climate Change*, WASHINGTON POST, April 15, 2007, at A06 (discussing the U.S. military’s fears that climate change will exacerbate strife in politically unstable areas).

political interest in developing new legal mechanisms for addressing climate change. Many states now are acting;⁷ Congress has begun considering proposed legislation;⁸ international discussions continue; and academic and popular commentary increasingly focus on potential new responses at all levels of government. Nothing in this article questions the importance of such innovations or the need for new national and international approaches. The central thesis of this article, however, is that existing provisions of some old, familiar laws also can help.

Specifically, this article discusses one such law.⁹ After providing background discussion of the causes and effects of climate change and of existing regulatory efforts, it explains how the California Environmental Quality Act (“CEQA”),¹⁰ a somewhat typical environmental assessment statute,¹¹ can limit the emissions that drive climate change.¹² CEQA requires that California’s state and

7. See *infra* Part II.B.3; see also Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 *ECOLOGY L.Q.* 183 (2005) (describing state programs and exploring why states are taking the lead); *Massachusetts v. EPA*, 127 S. Ct. 1438 (2007) (lawsuit seeking to compel federal regulation of automotive emissions); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1521–29 (2007) (describing state efforts, which the authors predict will spur federal legislation).

8. See DeShazo & Freeman, *supra* note 7, at 1554–57 (discussing proposed federal legislation).

9. This article focuses on CEQA for several reasons. First, California has led efforts to address climate change—including the enactment of significant new legislation—and its experiences can provide a concrete context in which to analyze the interplay between environmental assessment and other regulatory approaches. Second, the relationship between environmental assessment laws and climate change has quickly assumed prominence in California, and its resolution of these questions likely will help define the debate elsewhere. Third, some of CEQA’s characteristics—particularly its substantive mandate, its well-developed body of caselaw on cumulative impacts, and its history of sympathetic judicial implementation—make it particularly useful for exploring the potential benefits of applying environmental assessment laws to climate change. Finally, the state of California is important in its own right because it has a huge economy and is a major source of emissions. Additional discussion of climate change and the National Environmental Policy Act (“NEPA”) may be a subject for a future article.

10. CAL. PUB. RES. CODE §§ 21000–177 (West 2007).

11. Environmental assessment laws require an evaluation and public disclosure of the environmental consequences of planned projects, alternatives to those projects, and mitigation measures addressing the impacts of those projects. The evaluation and disclosure must occur before the project can be approved. See, e.g., Nat’l Envtl. Policy Act, 42 U.S.C. § 4332 (2000). They also generally include provisions allowing public comment. See, e.g., CAL. PUB. RES. CODE §§ 21003.1(a), 21081.2(b), 21091 (West 2007).

12. CEQA also creates obligations for agencies to evaluate how climate change will affect the environmental context of their projects—for example, whether other environmental impacts will become more significant if superimposed upon a changing climate—but that

local agencies identify and, if feasible, mitigate or avoid the significant adverse environmental impacts of projects they propose or approve.¹³ Climate change is a classic example of a “cumulative” environmental impact, and CEQA requires identification of projects’ contributions to such significant cumulative impacts.¹⁴ Mitigation of those contributions almost always will be feasible; between on-site changes and off-site measures, like purchases from emissions markets, agencies should be able to avoid or fully offset projects’ emissions of pollutants that cause climate change.¹⁵ Therefore, CEQA effectively requires that the projects it regulates make climate change no worse. Whether this requirement will translate into actual results is still uncertain, for actual results will likely depend upon the nature of implementation and judicial enforcement. The idea that CEQA constrains greenhouse gas emissions is sufficiently new that no published judicial decisions have addressed this issue,¹⁶ and many agencies are professing confusion about how they should comply.¹⁷ But on paper, at least, the law imposes constraints that could create significant shifts in actual practice.

The article then addresses a related normative question, which has received little academic attention: can environmental assessment laws like CEQA provide effective mechanisms for responding to climate change?¹⁸ That question is highly relevant

obligation is not within the scope of this article.

13. See CAL. PUB. RES. CODE § 21002 (West 2007). CEQA applies to both government-sponsored projects and private projects that require discretionary approvals from government agencies. See *Friends of Mammoth v. Bd. of Supervisors*, 502 P.2d 1049 (Cal. 1972).

14. See *infra* Part III.B.2.

15. See *infra* Part III.B.3.

16. One case that settled before trial aroused extensive political debate. See Mike Lee & Michael Gardner, *Brown’s Plans for Emissions Disputed*, SAN DIEGO UNION-TRIBUNE, August 4, 2007, at A-1; *People v. County of San Bernardino et al.*, No. CIVSS0700329 (Cal. Super. Ct. dismissed Aug. 28, 2007). As of this writing, other cases are pending, but none has produced a published decision. See *Ctr. for Biological Diversity v. City of Banning*, No. RIC460967 (Cal. Sup. Ct. filed Nov. 21 2006); *Ctr. for Biological Diversity v. City of Desert Hot Springs*, No. RIC464585 (Cal. Super. Ct. filed Jan. 24, 2007); *Ctr. for Biological Diversity v. City of Perris*, No. RIC477632 (Cal. Super. Ct. filed Aug. 9, 2007); *Arcadia First! v. City of Arcadia*, No. BS108937 (Cal. Super. Ct. filed May 17, 2007).

17. See E.J. Schultz, *Brown: Consider Climate Change*, FRESNO BEE, Aug. 9, 2007, at B1 (“Planners say they can’t address climate change until the state Air Resources Board tells them how.”).

18. No published academic articles have discussed the relationship between CEQA and climate change, and the author has found just one academic work—a comment published in

and politically divisive¹⁹ within California. California's contributions to climate change are not small, and CEQA, which applies to thousands of projects every year, could make a significant dent in those emissions. But implementing agencies and the judiciary are only just beginning to consider the statute's applicability, and have not yet resolved whether its mandate will be embraced or circumscribed.

The question also has broad relevance outside California. In responding to climate change, as in many other areas of environmental regulation, California has been a pioneer, and its approach to climate change and environmental assessment law may be imitated elsewhere. Mechanisms for such imitation are widespread; legal systems in the United States and throughout the world include laws like CEQA.²⁰ Attorneys have begun testing the ability of some of those laws to constrain greenhouse gas emissions.²¹ This article's analysis therefore applies, albeit with

1989—that considers (fairly briefly) the National Environmental Procedure Act and climate change. See Jennifer Woodward, *Note: Turning Down the Heat: What United States Laws Can Do to Help Ease Global Warming*, 39 AM. U. L. REV. 203, 224–28 (1989).

19. Non-profit groups, particularly the Center for Biological Diversity and the California Attorney General's office, have filed multiple lawsuits challenging development projects approved following environmental reviews that did not address climate change. California's Republican legislators have retaliated by demanding CEQA exemptions, which Democrats have refused to grant, as conditions for budget approval. See Samantha Young, *Ca. Land Use Dispute Complicates Budget*, FORBES, July 26, 2007, available at <http://www.forbes.com/feeds/ap/2007/07/26/ap3956150.html>. The Legislature ultimately resolved the impasse by passing a law creating a narrow CEQA exemption, but not before delaying the budget for nearly two months. Mike Zapler, *Lawmakers End Battle Over Budget*, OAKLAND TRIBUNE, August 22, 2007.

20. See, e.g., Nat'l Env'tl. Policy Act, 42 U.S.C. § 4332 (2000); N.Y. ENVTL. CONSERV. LAW § 8-0109 (McKinney Supp. 2007)); European Comm'n, Environmental Assessment, <http://ec.europa.eu/environment/eia/home.htm> (describing environmental assessment requirements in the European Union); Canadian Env'tl. Assessment Agency, Introduction and Features: Canadian Environmental Assessment Act, http://www.ceaa-acee.gc.ca/013/intro_e.htm#3 (last visited Nov. 26, 2007); Jesse L. Moorman & Zhang Ge, *Promoting and Strengthening Public Participation in China's Environmental Impact Assessment Process: Comparing China's EIA Law and U.S. NEPA*, 8 VT. J. ENVTL. L. 281 (2007); WORLD BANK, THE WORLD BANK OPERATIONAL MANUAL: ENVIRONMENTAL ASSESSMENT, OP 4.01 (2004), available at <http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/toc2/9367A2A9D9DAEED38525672C007D0972?OpenDocument>; see also Environmental Assessment in Countries in Transition, Legislation, <http://www.ceu.hu/envsci/eianetwork/legislation/index.html> (last checked January 23, 2007) (providing links to environmental assessment laws in former Soviet Bloc countries).

21. See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, No. 06-71891, 2007 U.S. App. LEXIS 26555, at *101–38 (9th Cir. Nov. 15, 2007) (holding that the NHTSA was obligated to prepare an EIS before setting new fuel economy standards); see

some modification, to compliance with the National Environmental Policy Act (“NEPA”)—CEQA’s federal-law counterpart²²— several existing state laws,²³ laws in many other countries, and even the operational rules of institutions like the World Bank.²⁴ It also can provide guidance for jurisdictions considering enactment or modification of environmental assessment laws.

The question is not rhetorical. The prevalence and staying power of environmental assessment laws attest to their electoral support, but their value has been vigorously contested, sometimes in academic and often in political circles, since they first emerged in the early 1970s.²⁵ Disagreements about the wisdom of decentralized environmental enforcement mechanisms²⁶— mechanisms upon which laws like CEQA largely rely—also can be intense, particularly if those laws would address geographically

Michael B. Gerrard, *Climate Change and the Environmental Impact Review Process*, 22 NAT. RESOURCES & ENV’T (forthcoming Jan. 2008) (summarizing litigation and development of environmental impact review laws with respect to greenhouse gas emissions in California, Massachusetts, New York, Montana, Washington’s King County, and Australia, and also under United States federal law).

22. See, e.g., *Ctr. for Biological Diversity*, 2007 U.S. App. LEXIS 26555, at *101–38; *Border Power Working Group v. Dept. of Energy*, 260 F. Supp. 2d 997, 1028–29 (S.D. Cal. 2003) (holding that failure to evaluate CO₂ emissions created a violation of NEPA).

23. See, e.g., EXECUTIVE OFFICE OF ENERGY AND ENVTL. AFFAIRS, COMMONWEALTH OF MASSACHUSETTS, MEPA GREENHOUSE GAS EMISSIONS POLICY AND PROTOCOL 1, <http://www.mass.gov/envir/mepa/pdf/files/misc/GHG%20Policy%20FINAL.pdf> (requiring discussion of GHG emissions in reports for certain projects being reviewed under the Massachusetts Environmental Policy Act (“MEPA”).

The key distinction between CEQA and many other environmental disclosure laws is that CEQA includes express substantive constraints; unlike NEPA, it is not “purely procedural.” Compare *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350–51 (1989) with CAL. PUB. RES. CODE § 21081 (West 2007). There are other differences, and a reader should be aware that not all environmental assessment laws are the same.

24. See Schultz, *supra* note 17.

25. Most debate has focused on NEPA rather than NEPA’s state-law counterparts. See, e.g., Bradley C. Karkkainen, *Whither NEPA?*, 12 N.Y.U. ENVTL. L.J. 333, 338–43 (2004) (describing those debates); Robert W. Adler, *In Defense of NEPA: The Case of the Legacy Parkway*, 26 J. LAND RESOURCES & ENVTL. L. 297 (2006); Dinah Bear, *Some Modest Suggestions for Improving the National Environmental Policy Act*, 43 NAT. RESOURCES J. 931 (2003); TASK FORCE ON IMPROVING THE NAT’L ENVTL. POLICY ACT AND TASK FORCE ON UPDATING THE NAT’L ENVTL. POLICY ACT, H.R. COMM. ON RES., INITIAL FINDINGS AND RECOMMENDATIONS (Dec. 21, 2005) [hereinafter CONGRESSIONAL TASK FORCE] (critiquing NEPA, and proposing changes). See Adler, *supra* (critiquing the revisions proposed by the House of Representatives’ NEPA Task Force). However, CEQA also caused occasional consternation. See Young, *supra* note 19.

26. This article uses the term, “environmental enforcement,” rather than “citizen enforcement,” because many CEQA suits are filed not by individual private citizens or citizens’ groups but by professional environmental organizations or government agencies.

extensive problems.²⁷ CEQA thus exemplifies a potentially widespread but probably controversial method for addressing climate change, and one might reasonably ask whether the potential environmental gains are worth the associated expenses and disputes.

The article concludes that the potential gains are worthwhile, and that CEQA's model, although not perfect, is very good and well worth utilizing. As decentralized, adaptable legal mechanisms, environmental assessment laws can influence and improve many individual projects, creating environmental benefits that would escape other regulatory approaches. And by allowing flexible—even market-friendly—compliance techniques, laws like CEQA can achieve those benefits efficiently. Because environmental assessment laws are not comprehensive or cost-free solutions and are usually implemented unevenly, their presence does not obviate the need for complementary regulatory approaches. But those complementary regulatory approaches also have flaws, and because no single legal device is likely to provide an adequate response, portfolios of regulatory approaches probably will prove necessary.²⁸ Environmental assessment laws can contribute substantially to such portfolios.

I. CLIMATE CHANGE BACKGROUND

A. A Brief Overview of the Problem

In the 1970s and 1980s, climate scientists increasingly came to a troubling consensus.²⁹ Carbon dioxide (“CO₂”), which the fossil-

27. See, e.g., *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 576 (1992) (“Vindicating the public interest . . . is the function of Congress and the Chief Executive.”); *Massachusetts v. EPA*, 415 F.3d 50, 60 (D.C. Cir. 2005) *rev'd*, 127 S. Ct. 1438 (2007) (Sentelle, J. concurring) (“The generalized public good that petitioners seek is the thing of legislatures and presidents, not of courts.”); William W. Buzbee, *The Story of Laidlaw: Standing and Citizen Enforcement*, in ENVIRONMENTAL LAW STORIES 201, 230–34 (Richard J. Lazarus and Oliver A. Houck, eds. 2005) (describing controversies over and complications of citizen suits as part of the backdrop for the Supreme Court’s decision in *Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc.*, 528 U.S. 167 (2000)); Mark Seidenfeld & Jana Satz Nugent, “The Friendship of the People”: Citizen Participation in Environmental Enforcement, 73 GEO. WASH. L. REV. 269 (2005) (providing a qualified endorsement of decentralized enforcement).

28. See *infra* Part IV.A.

29. For a concise overview of several decades of climate change research, see Spencer Weart, *The Modern Temperature Trend*, THE DISCOVERY OF GLOBAL WARMING (2007), available at <http://www.physicists.net/history/climate/20ctrend.htm>.

fuel-powered economy was pumping into the atmosphere in increasing quantities, creates a “greenhouse effect.”³⁰ While it lets light energy into the earth’s atmosphere, CO₂ reduces the amount of reflected heat released.³¹ Other gases create similar effects, and some, like methane, have greenhouse properties substantially more intense than CO₂.³² Consequently, scientists predicted that as atmospheric levels of CO₂ and other greenhouse gases (“GHGs”) rose, the earth’s climate would warm.

Those predictions have almost certainly proven accurate. Primarily because of fossil fuel combustion, atmospheric CO₂ levels have risen in recent decades and are continuing to rise.³³ Global average temperatures also have been warming for several decades, and while warming earlier in the twentieth century was probably natural, human activity appears to have caused the more recent change.³⁴ There is no real scientific doubt that anthropogenic emissions will warm our climate even more if they continue unabated into the future.³⁵ The Intergovernmental Panel on Climate Change predicts worldwide average temperature increases ranging from 1.1 to 6.4 degrees Fahrenheit (with the lower figure assuming efforts to minimize GHG emissions) by the end of the 21st century.³⁶

Those temperature increases will cause many major environ-

30. See James E. Hansen et al., *Climate Impact of Increasing Atmospheric Carbon Dioxide*, 213 SCIENCE 957, 957, 964 (1981).

31. See PEW CENTER FOR GLOBAL CLIMATE CHANGE, *THE CAUSES OF GLOBAL CLIMATE CHANGE* (2006).

32. See THE CAL. CLIMATE CHANGE CTR., *MANAGING GREENHOUSE GAS EMISSIONS IN CALIFORNIA I-7* (2006), http://calclimate.berkeley.edu/I_Introduction.pdf. [hereinafter *MANAGING GREENHOUSE GAS EMISSIONS*] (describing the impacts of other GHGs).

33. See IPCC, *THE PHYSICAL SCIENCE BASIS*, *supra* note 4, at 2 (“Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values . . .”); *Massachusetts v. EPA*, 127 S. Ct. 1438, 1446–49 (2007) (describing the rise in CO₂ levels, and early governmental responses).

34. See IPCC, *THE PHYSICAL SCIENCE BASIS*, *supra* note 4, at 8; *Massachusetts v. EPA*, 127 S. Ct. at 1446 (“Respected scientists believe the two trends are related.”).

35. See IPCC, *THE PHYSICAL SCIENCE BASIS*, *supra* note 4, at 10; see also Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCIENCE 1686, 1686 (2004) (“Politicians, economists, journalists, and others may have the impression of confusion, disagreement, or discord among climate scientists, but that impression is incorrect.”).

36. IPCC, *THE PHYSICAL SCIENCE BASIS*, *supra* note 4, at 11. The IPCC’s projections are based on a range of possible sociological, political, and technological scenarios, some involving higher emissions than others.

mental changes, most of them undesirable.³⁷ Rising sea levels threaten low-lying coastal areas with flooding and increase their vulnerability to Katrina-like storms.³⁸ Extreme weather events, including droughts and floods, will almost certainly occur more frequently.³⁹ In combination with the loss of glaciers and summer snowpacks in mountain regions, droughts will increase water shortages, disrupting both natural systems and human economies.⁴⁰ Rising temperatures will warm waters and shift climate zones north or uphill, extinguishing species that are unable to migrate, and facilitating the movement of others—crop pests and disease vectors, for example—that most people would prefer to avoid.⁴¹ Rising temperatures also can increase the frequency of extreme heat events like Europe's heat wave of 2003, which killed nearly 15,000 people in France alone.⁴² Not all of the changes will be negative; for example, scientists anticipate some increases in crop productivity.⁴³ But in general, most human and natural systems have attempted, sometimes successfully, to adapt to the more stable climate of recent history, and a combination of changing environmental norms and increased variability will do more harm than good.⁴⁴

Because changes already are occurring, total prevention of anthropogenic climate change is no longer possible.⁴⁵ But climate

37. See IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4.

38. See IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4, at 11 (projecting sea level rises, but not including the potential effects of changing ice flow in Greenland or Antarctica.); IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4, at 9.

39. See IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4, at 12.

40. IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4, at 8–9.

41. *Id.* at 9, 11 (“Approximately 20–30% of animal and plant species assessed so far are likely to be at increased risk of extinction if increases in global temperatures exceed 1.5 to 2.5 degrees C.”); see also Wayne Hsiung & Cass R. Sunstein, *Climate Change and Animals*, 155 U. PA. L. REV. 1695 (2007) (arguing that potential harms to animals are enormous).

42. See Myles Allen et al., *Scientific Challenges in the Attribution of Harm to Human Influence on Climate*, 155 U. PA. L. REV. 1353, 1388–94 (2007) (analyzing the heat wave, and concluding that “it is very likely that human influence on climate increased the risk of the 2003 heat wave by a factor of at least two, with the most likely risk increase considerably greater than two”); IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4, at 12.

43. See IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4, at 11.

44. See *id.* (describing both positive and negative impacts).

45. See IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4, at 4–9; AMY LYND LUERS & SUSANNE C. MOSER, PREPARING FOR THE IMPACTS OF CLIMATE CHANGE IN CALIFORNIA: OPPORTUNITIES AND CONSTRAINTS FOR ADAPTATION 3 (2006), <http://www.energy.ca.gov/2005publications/CEC-500-2005-198/CEC-500-2005-198-SF.PDF> (“climate change is demonstrably underway”); *id.* at 5 (table summarizing observed trends); *id.* at 6; CAL. CLIMATE CHANGE CTR., CLIMATE SCENARIOS FOR CALIFORNIA 1–2 (2006),

change and the resulting negative impacts are not all-or-nothing phenomena. They can occur to greater or lesser degrees, and the damage, therefore, still may be limited.⁴⁶ Limitations on GHG emissions will produce lower temperature increases,⁴⁷ which in turn should alleviate the severity of climate change's adverse consequences.⁴⁸ Similarly, increases at the middle of the projected range are less problematic than increases at the upper bound.⁴⁹ Taking steps to limit GHG emissions, and thus minimize climate change, therefore remains important. Incremental solutions can offer far greater environmental benefits than no solutions at all.⁵⁰

B. Climate Change and the State of California

While it derives from the aggregate effects of many local sources, climate change is a global problem. Unlike most air pollution problems, the location of GHG emissions matters little. GHGs generally are sufficiently long-lived to disperse throughout the atmosphere, and a ton of CO₂ emitted in California is therefore no more harmful to California than a ton of CO₂ emitted in Shanghai.⁵¹ The secondary environmental effects are similarly

<http://www.energy.ca.gov/2005publications/CEC-500-2005-203/CEC-500-2005-203-SF.PDF> (describing observed trends).

46. See *Massachusetts v. EPA*, 127 S. Ct. 1438, 1457–58 (2007) (finding causation and redressibility because EPA's actions could reduce climate change, even if EPA cannot avoid it entirely).

47. See CAL. CLIMATE CHANGE CTR., *supra* note 45, at 11 (“Regardless of which model is employed, the warming is greater for the higher-emission scenario than for the lower emission scenario.”).

48. See Katherine Hayhoe et al., *Emissions Pathways, Climate Change, and Impacts on California*, 101 PNAS 12422, 12427 (2004) (observing that impacts will be more severe with higher temperature increases); LUERS & MOSER, *supra* note 45, at 3 (“the state's long-term ability to cope with climate impacts depends on the pace and magnitude of global climate change”); see also CAL. ENVTL. PROT. AGENCY, *supra* note 3, at 38 (table showing degrees of impact).

49. See CAL. ENVTL. PROT. AGENCY, *supra* note 3, at 38 (table showing degrees of impact).

50. See generally *Massachusetts v. EPA*, 127 S. Ct. at 1457 (“Agencies . . . do not generally resolve massive problems in one fell regulatory swoop. . . . They instead whittle away at them over time. . . .”) (internal citation omitted).

51. See CAL. ENERGY COMM'N., INVENTORY OF CALIFORNIA GREENHOUSE GAS EMISSIONS AND SINKS iii (2006), <http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF> [hereinafter INVENTORY] (“GHGs affect the entire planet, not just the location where they are emitted”); NAT'L ACAD. OF SCI., CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME KEY QUESTIONS (2001), available at <http://books.nap.edu/html/climatechange/3.html> (“If the average survival time for a gas in the atmosphere is a year or longer, then the winds have time to spread it throughout the lower atmosphere, and its absorption of terrestrial infrared radiation occurs at all latitudes and longitudes.”).

dispersed. Some locations will feel climate change's impacts to a greater extent or in different ways than others, but few areas are likely to be unaffected.⁵² Furthermore, because the sources of climate change are also dispersed—no single country contributes a majority share of global GHG emissions—comprehensive solutions will almost certainly require international cooperation.⁵³ Nevertheless, some areas play major roles in contributing to climate change, some areas will experience especially pronounced effects, and some areas can make particularly important contributions to climate change prevention. California fits within each of these categories.

1. California's Contributions to Climate Change

California is a major contributor to global climate change. If it were an independent nation, California would be ranked (depending upon the study) as the tenth- to sixteenth-highest GHG-emitting nation in the world.⁵⁴ Indonesia, with a population of nearly 250 million people, emits similar GHG amounts, and California's emissions are on par with those of France.⁵⁵ California's emissions exceed—by a wide margin—those of any other state except Texas.⁵⁶ And while California's per-capita GHG emissions are among the lowest in the nation, those emissions nevertheless have been growing. According to the California Energy Commission, “[f]rom 1990 to 2004, total gross GHG

52. See IPCC, *THE PHYSICAL SCIENCE BASIS*, *supra* note 4, at 12; see also IPCC, *IMPACTS, ADAPTATION, AND VULNERABILITY*, *supra* note 4 (describing worldwide and regional impacts). To say that harms are global does not mean that climate change threatens the type of generalized and undifferentiated harm that cannot support a claim for standing. Particular places will be affected in particular ways.

53. See INVENTORY, *supra* note 51, at 20 (2006) (showing worldwide emissions); Jonathon B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961 (2007) (arguing that state-initiated efforts are likely to offer only slight improvement and may become counterproductive). *But see* DeShazo & Freeman, *supra* note 7 (arguing that state and local efforts may accelerate federal regulation).

54. The differences in emissions among the 10th through 19th-ranked nations are slight, and a slight difference in calculations can create a seemingly large difference in rankings. Compare INVENTORY, *supra* note 51, at i, 20 (ranking California sixteenth, while also counting Texas, which emits substantially more GHGs than California, as a nation) with MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32, at I-6 (“Only nine nations have greater total emissions than the state.”).

55. INVENTORY, *supra* note 51, at 20.

56. *Id.* at i, 14.

emissions rose 14.3%.”⁵⁷

2. Climate Change’s Effects Upon California

California also will be harmed substantially by climate change. Those harms are not unique and are by no means outlying worst-case scenarios. Other states and countries will face similar threats, and in some places—particularly places where resources are scarce, weather-related disasters already are likely, or poverty and political instability make social and economic adaptation difficult—the consequences could be much more severe.⁵⁸ But even if California alone were threatened, the likely adverse impacts still would be significant.

The litany of consequences reads like the script of a bad disaster movie. Average temperatures likely will rise, particularly in inland areas,⁵⁹ leading to a long list of secondary effects.⁶⁰ Air quality, already poor in much of California, will get worse.⁶¹ Much precipitation that now falls as snow in the future will be rain, increasing winter flooding, reducing spring snowpacks, limiting hydropower generation, and cutting water supplies in summer, when California needs water most.⁶² Cold-intolerant pests and

57. *Id.* at 8 (“California’s GHG emissions are large and growing . . . they are expected to continue to increase in the future under ‘business-as-usual’ unless California implements programs to reduce emissions”).

58. See IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4; see also Jeffrey Sachs, *Climate Change and War*, March 1, 2005, <http://www.globalpolicy.org/soecon/develop/africa/2005/0301sachs.htm> (connecting climate change and political conflict); Eilperin, *supra* note 6, at A06 (“The U.S. military is increasingly focused on a potential national security threat: climate change.”).

59. OUR CHANGING CLIMATE, *supra* note 3, at 2 (“The latest projections, based on state-of-the-art climate models, indicate that if global heat-trapping emissions proceed at a medium to high rate, temperatures in California are expected to rise 4.7 to 10.5 degrees Fahrenheit by the end of the century.”).

60. *Id.*; CAL. HEALTH & SAFETY CODE § 38501(a) (West Supp. 2007) (“Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California”).

61. OUR CHANGING CLIMATE, *supra* note 3, at 5 (“High temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation.”).

62. *Id.* at 6–7; Hayhoe et al., *supra* note 48, at 12425–26; REDEFINING PROGRESS, *supra* note 6, at 35; CAL. DEPT. OF WATER RES., PROGRESS ON INCORPORATING CLIMATE CHANGE INTO MANAGEMENT OF CALIFORNIA’S WATER RESOURCES 2-6, 2-22, 2-30–31 (2006) [hereinafter CAL. DEPT. OF WATER RES., INCORPORATING CLIMATE CHANGE]; CAL. DEPT. OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2005 at 4-32 (2006) (“Predictions include increased temperature, reductions to Sierra snowpack, earlier snowmelt, and a rise in sea level, although the extent and timing of the changes remain uncertain. The changes could have

pathogens may expand their ranges, damaging the state's agricultural economy and threatening human health.⁶³ Forest fires probably will occur more frequently.⁶⁴ Heat waves will become more frequent, extreme temperatures will be higher,⁶⁵ and those rising temperatures will degrade many terrestrial and aquatic ecosystems. Rising sea levels will increase flooding, accelerate erosion, and leave coastal construction increasingly vulnerable to storm damage.⁶⁶ Those changes in turn will create major consequences not only for the state's environmental quality but also for its economy; many of the state's most important industries are likely to suffer.⁶⁷

Those problems would strike a state already coping with difficult natural conditions. According to the California Climate Change Center,⁶⁸ “[t]he state’s vital resources and natural landscapes are already under stress due to California’s rapidly growing population, which is expected to grow from 35 million today to 55 million by 2050.”⁶⁹ Californians currently experience the nation’s worst air

major implications for water supply, flood management, and ecosystem health.”); *see id.* at 4-32-36.

63. OUR CHANGING CLIMATE, *supra* note 3, at 9 (“Continued climate change will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. . . . Continued climate change is likely to alter the abundance and types of many pests, lengthen pests’ breeding season, and increase pathogen growth rates.”).

64. *Id.* at 10-11 (observing that global warming will “increas[e] the risk of wildfire and alter[] the distribution and character of natural vegetation”).

65. *See id.* at 5 (“As temperatures rise, Californians will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory diseases caused by extreme heat. By mid century, extreme heat events in urban centers such as Sacramento, Los Angeles, and San Bernardino could cause two to three times more heat-related deaths than occur today.”); *see also* REDEFINING PROGRESS, *supra* note 6, at 19-26; Hayhoe et al., *supra* note 48, at 12424-45.

66. CAL. DEPT. OF WATER RES., INCORPORATING CLIMATE CHANGE, *supra* note 62, at 2-31-32, 2-47-52.

67. *See* CAL. HEALTH & SAFETY CODE § 38501(b) (West Supp. 2007) (“Global warming will have detrimental effects on some of California’s largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.”).

68. The California Climate Change Center is an academic research unit based primarily at the University of California’s Berkeley and San Diego campuses. Several of its reports have been sponsored by California state agencies. *See* OUR CHANGING CLIMATE, *supra* note 3, at 2.

69. *Id.* at 2; *see* LUERS & MOSER, *supra* note 45. Luers and Moser warn:

Today’s climate variability and weather extremes already pose significant risks to California’s citizens, economy, and environment. They reveal the state’s vulnerability and existing challenges in dealing with the vagaries of climate. Continued climate

quality, with much of the state's population living in areas with routine violations of federal and state air quality standards.⁷⁰ Water allocation is chronically contentious.⁷¹ Past logging and fire suppression have degraded forests, leaving them dangerously fire-prone.⁷² Other natural ecosystems are similarly strained, with dozens of plant and animal species threatened or endangered even under existing conditions.⁷³ Even without rising sea levels, the Sacramento-San Joaquin Bay-Delta, from which the state pumps much of its water supply, would be highly vulnerable to flooding.⁷⁴ All of these environmental problems create institutional, economic, and political strains, in addition to environmental and health costs. In California, litigious natural resource battles are ubiquitous.

While most Californians will feel the impacts of climate change, these impacts are likely to be particularly harsh for the state's poorest and most vulnerable people, many of whom are people of color.⁷⁵ In part, disproportionate impacts will arise because adjusting to environmental change generally requires money and insurance, and poorer people by definition lack the former and are less likely to hold the latter.⁷⁶ Geography also will exacerbate distributional disparities. Some of the largest temperature

changes, and the risk of abrupt or surprising shifts in climate, will further challenge the state's ability to cope with climate-related stresses.

Id. at v.

70. OUR CHANGING CLIMATE, *supra* note 3, at 5 ("Combined, ozone and particulate matter contribute to 8,800 deaths and \$71 billion in healthcare costs every year.").

71. *See id.* at 6-7 (describing California's water resources as "already over-stretched by the demands of a growing economy and population").

72. *See* CAL. BD. OF FORESTRY AND FIRE PROT. & CAL. DEPT. OF FORESTRY, CALIFORNIA FIRE PLAN 5-6 (1996), available at http://frap.cdf.ca.gov/fire_plan/ ("Deteriorating forest health, increasing fuel loads and other factors have led to more intense, destructive wildfires; unabated this pattern will continue."); Carl T. Hall, *Raging Tahoe Fire's Roots: 150 Years of Forest Abuse*, SAN FRANCISCO CHRON., June 26, 2007, at A1.

73. OUR CHANGING CLIMATE, *supra* note 3, at 10 ("The state's burgeoning population and consequent impact on local landscapes is threatening much of this biological wealth.").

74. *See, e.g.*, Delta Levee Break Information, http://www.calwater.ca.gov/calfed/newsroom/calfed_NewsInfo_Levees.html (last visited Dec. 4, 2007).

75. *See* REDEFINING PROGRESS, *supra* note 6. Internationally, similar disparities of impact are likely. *See* Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281, 288 (2003) ("The largest producers of greenhouse gas emissions are not necessarily the countries that will suffer the most from global warming.").

76. *See* REDEFINING PROGRESS, *supra* note 6, at 16-19, 36-37, 57-58, 63-64. As the post-Katrina flooding starkly illustrated, those problems can be particularly intense when extreme weather events demand rapid adjustment.

increases are likely to occur in California's Central Valley,⁷⁷ which already contains some of California's poorest areas, and poverty could increase as climate change disrupts the region's agricultural economy.⁷⁸ The Central Valley also is already one of California's hottest regions, and that heat contributes to one of the nation's worst air quality problems.⁷⁹

Though opposition to climate change regulation largely derives from fears of economic cost and disruption, California's economy actually may benefit substantially from responding to those problems. California's Environmental Protection Agency concludes that implementing climate change prevention strategies could add billions of dollars in additional income to the state economy.⁸⁰ Independent studies support those predictions. According to a recent California Climate Change Center report:

Globally, increasing GHG emissions are assumed to be essential to a growing economy. This is not true in California. The state can take an historic step by demonstrating that reducing emissions of GHG can accelerate economic growth and bring new jobs. . . . California can gain a competitive advantage by acting early in the new technologies and industries that will come into existence worldwide around the common goal of reducing GHG emissions.⁸¹

That message has resonated with state lawmakers. According to the California Legislature, "[b]y exercising its global leadership role, California will also position its economy, technology centers, financial institutions, and businesses to benefit from national and international efforts to reduce emissions of greenhouse gases."⁸²

77. *Id.* at 9–10; see Hayhoe et al., *supra* note 48, at 12424 (mapping projected increases).

78. See REDEFINING PROGRESS, *supra* note 6, at 3–4, 41–50 ("agriculture . . . is a significant source of employment for low-income groups and people of color. Shocks experienced by the industry could disproportionately affect these communities."); see also OUR CHANGING CLIMATE, *supra* note 3, at 8–9 (describing impacts to agriculture); Hayhoe et al., *supra* note 48, at 12426–27 (describing impacts to dairy and wine grape production).

79. See REDEFINING PROGRESS, *supra* note 6, at 19–35 (describing disparities in vulnerability to heat waves and describing threats posed by increasing ozone (smog) pollution); Hayhoe et al., *supra* note 48, at 12425 ("Individuals most likely to be affected (by increases in extreme heat) include elderly, children, the economically disadvantaged, and those who are already ill.")

80. CAL. ENVTL. PROT. AGENCY, *supra* note 3, at 65 (stating that implementing climate change prevention strategies could "increase jobs and income by an additional 83,000 and \$4 billion, respectively").

81. MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32, at 10–23.

82. CAL. HEALTH & SAFETY CODE § 38501(e) (West Supp. 2007).

Governor Schwarzenegger has made similar statements.⁸³

Climate change thus poses a significant but partially redressible threat to California. With consequences likely to strike across much of California's landscape and throughout many sectors of its economy, with potential harsh and costly impacts upon most residents—particularly those already vulnerable to economic and environmental risk—and with potential collateral benefits from a vigorous response, climate change threatens damage well worth minimizing or preventing. The key question, which legislators and lawyers have only begun to answer, is how.

3. Existing Regulatory Responses to Climate Change

Despite the threats posed by climate change, federal action to address these threats has been almost totally absent. The United States has neither ratified the Kyoto Protocol nor advanced any serious proposals for alternate international regulatory structures.⁸⁴ Domestic legislation has been similarly lacking; notwithstanding recent legislative proposals, Congress, as of this writing, has primarily thwarted efforts to address the problem.⁸⁵ Until rebuked by the Supreme Court, the United States Environmental Protection Agency ("EPA") declined to regulate carbon dioxide emissions, instead insisting it had no power to do so.⁸⁶ And although the Bush Administration now acknowledges the reality of anthropogenically-caused climate change, it has placed its faith largely in voluntary responses.⁸⁷

Unlike the federal government, California's leaders have recognized climate change as a problem requiring a vigorous

83. Governor of the State of Cal. Exec. Order S-3-05 (June 1, 2005) ("[T]echnologies that reduce greenhouse gas emissions are increasingly in demand in the worldwide marketplace, and California companies investing in these technologies are well-positioned to profit from this demand, thereby boosting California's economy, creating more jobs and providing increased tax revenue . . .").

84. See Carlson, *supra* note 75, at 288–90 (describing the Bush Administration's climate change policies).

85. See Jonathan B. Wiener, *Something Borrowed for Something Blue: Legal Transplants and the Evolution of Global Environmental Law*, 27 *ECOLOGY L.Q.* 1295, 1329 (2001) (describing the Byrd-Hagel resolution opposing the Kyoto Protocol, which the Senate passed by a 95–0 vote); see also Carlson, *supra* note 75, at 290 (describing failed congressional efforts to address climate change).

86. See *Massachusetts v. EPA*, 127 S. Ct. 1438, 1450–51 (2007).

87. Engel & Saleska, *supra* note 7, at 186; see *MANAGING GREENHOUSE GAS EMISSIONS*, *supra* note 32, at 10–15 ("While helpful, there is no evidence that voluntary measures provide sufficient incentives to attain the Governor's targets.").

response. Many parts of California's state government have taken major steps. The California legislature passed legislation setting automotive emissions standards for greenhouse gases.⁸⁸ In 2005, Governor Schwarzenegger declared the climate change debate to be "over" and issued an executive order targeting ambitious reductions in the state's carbon emissions.⁸⁹ In accordance with the Schwarzenegger Administration's policy, many of California's administrative agencies are studying ways in which those agencies may respond to climate change.⁹⁰ The state attorney general's office has attempted repeatedly to use litigation to compel responses to climate change.⁹¹ These efforts build upon earlier achievements. In response to past energy shortages and severe air quality problems, California implemented many measures designed to improve energy efficiency.⁹² Partly because of those past

88. See CAL HEALTH & SAFETY CODE § 43018.5 (West 2007). The automotive industry almost immediately challenged that legislation. See *Cent. Valley Chrysler-Jeep Inc. v. Witherspoon*, No. CV-F-04-6663, 2005 U.S. Dist. LEXIS 26536 (E.D. Cal. Oct. 20, 2005) (allowing environmental groups to intervene in the automakers' lawsuit); see also Christopher T. Giovino, *California's Global Warming Bill: Will Fuel Economy Preemption Curb California's Air Pollution Leadership?*, 30 *ECOLOGY L.Q.* 893 (2003) (describing likely challenges, and arguing that California should prevail); Carlson, *supra* note 75 (describing the legislation and likely challenges). Other states have adopted the California standards conditionally, so that they will become effective in the event of an EPA waiver. See, e.g., *Green Mtn. Chrysler Plymouth Dodge Jeep v. Crombie*, 508 F. Supp. 2d 295 (D. Vt. 2007) (rejecting a challenge to Vermont's adoption of California's automotive standards).

89. See Bill Blakemore, *Schwarzenator v. Bush: Global Warming Debate Heats Up*, ABC NEWS, August 30, 2006, <http://abcnews.go.com/US/GlobalWarming/story?id=2374968&page=1> ("I say the [global warming] debate is over. We know the science," Schwarzenegger declared forcefully at a recent United Nations summit. "We see the threat, and we know the time for action is now.") (brackets in original); Exec. Order S-3-05, *supra* note 83. The order states, in part: "[T]he following greenhouse gas emission reduction targets are hereby established for California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80% below 1990 levels . . ."

90. See, e.g., DEPT. OF WATER RES., INCORPORATING CLIMATE CHANGE, *supra* note 62. The efforts have not been uniform; the governor's office recently proposed steep cuts in public transit budgets, and many state agencies have proven exceedingly reluctant to actually reduce their own contributions. See Rachel Gordon, *Governor's Budget Plan Diverts Millions from Public Transit*, SAN FRANCISCO CHRON., May 16, 2007, at B1.

91. See *Massachusetts v. EPA*, 127 S. Ct. 1438; *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, No. 06-71891, 2007 U.S. App. LEXIS 26555 (9th Cir. Nov. 15, 2007) (upholding challenges brought by California, several other states, and environmental groups); *California v. General Motors Corp.*, No. C06-05755, 2007 U.S. Dist. LEXIS 68547 (N.D. Cal. Sept. 17, 2007) (dismissing a nuisance case against automakers); *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (dismissing a nuisance case against power companies).

92. See INVENTORY, *supra* note 51, at i, 12-13 ("California's ability to slow the rate of growth of GHG emissions is largely due to the success of its energy efficiency and renewable

measures, Californians' per capita GHG emissions now are lower than those of most Americans, even though their aggregate emissions are still growing.⁹³

Adding to those efforts, the California Legislature recently enacted, and Governor Schwarzenegger signed into law, AB 32, also known as the California Global Warming Solutions Act of 2006. This landmark statute is designed to reduce California's greenhouse gas emissions.⁹⁴ AB 32 requires the California Air Resources Board ("CARB") to cap statewide emissions at 1990 levels.⁹⁵ It empowers CARB to use a variety of regulatory mechanisms to achieve compliance with that cap by 2020, if not sooner.⁹⁶ AB 32 also requires CARB to establish a monitoring and enforcement system and empowers CARB to take immediate steps to limit high-emitting sources.⁹⁷ The legislature left most of the other details to the agency's discretion; the statute specifically directs CARB to avoid environmental injustice in implementing its measures, but the program otherwise will take shape primarily through rulemaking processes.⁹⁸

Enacting AB 32 was a dramatic step.⁹⁹ No other state has a law like it,¹⁰⁰ and the federal government has taken only preliminary

energy programs and a commitment to clean air and clean energy.").

93. *Id.*

94. California Global Warming Solutions Act of 2006, 2006 Cal. Legis. Serv. 488 (West) (codified at CAL. HEALTH & SAFETY CODE §§ 38500-99 (West 2006 & Supp. 2007)).

95. *Id.* §§ 38550-51.

96. *Id.* §§ 38560-65.

97. *Id.* § 38530. That provision already has proved controversial. In June, 2007, two CARB officials were fired and blamed their dismissal on conflicts over efforts by the Schwarzenegger administration to slow implementation of AB 32. Greg Lucas, *Fired Air Board Head Says He Tried To Keep Integrity, He Says He Lost Job for Proposing Change To Reduce Emissions*, SAN FRANCISCO CHRON., June 30, 2007, at B2.

98. See CAL. HEALTH & SAFETY CODE §§ 38560-74 (West Supp. 2007).

99. See, e.g., Janet Wilson & Richard Simon, *Feinstein, Boxer Differ on Global Warming*, LOS ANGELES TIMES, January 18, 2007, at B1 (quoting California Assembly Speaker Fabian Nunez: "It's attracted worldwide attention, and it's landmark legislation"); Editorial: *Fueling the Future*, SACRAMENTO BEE, January 15, 2004, at A4 ("The signing of Assembly Bill 32—California's landmark global warming law—brought loads of publicity to Gov. Arnold Schwarzenegger last year.").

100. Other states and cities have taken important first steps toward addressing climate change, however, such as creating greenhouse gas registries or developing cap-and-trade programs applicable to limited sectors. See Engel & Saleska, *supra* note 7, at 216-22 (describing various types of local measures); Kirsten H. Engel, *Mitigating Global Climate Change in the United States: A Regional Approach*, 14 N.Y.U. ENVTL. L. J. 54, 65-66 (2005) (describing the "Regional Greenhouse Gas Initiative," an effort led by several northeastern states); DeShazo & Freeman, *supra* note 7, at 1521-30; Steven Mufson, *Power Plant Rejected*

steps toward passing anything nearly so ambitious.¹⁰¹ Prior to enactment of AB 34, California was leading domestic efforts to respond to climate change, and full implementation could put the state far ahead of most, if not all, of the rest of the United States. Nevertheless, and as discussed more fully in Part IV, its enactment is only a start. CARB's regulatory program has not yet taken shape, and no one knows how effective it will be, or to what extent AB 32 will join a long list of environmental statutes that only partially achieve their stated goals.¹⁰² Because neither AB 32 nor any other state statute purports to occupy the regulatory field,¹⁰³ both the need and the opportunity for complementary approaches therefore remain. As the next section discusses, CEQA provides such a complementary approach, and exemplifies how environmental assessment laws can bolster (or help compensate for the weakness or absence of) conventional regulatory regimes.

II. EXPLAINING THE OBLIGATION: HOW CEQA ADDRESSES CLIMATE CHANGE

A. CEQA's Requirements

CEQA exists to ensure that environmental considerations play a central role in state and local agency decision-making.¹⁰⁴ Its procedural and substantive mandates are designed to force

Over Carbon Dioxide for First Time, WASHINGTON POST, October 19, 2007, at A01 (describing Kansas' rejection of a proposed coal-fired power plant).

101. See Carlson, *supra* note 75, at 288–90 (describing federal responses). Following the November 2006 elections, several proposed climate change bills are likely to move, but chances of passage of effective regulation seem slim so long as President Bush holds a veto. See Wilson & Simon, *supra* note 99 (describing proposed bills by Senators Feinstein and Boxer).

102. See *infra* note 233 and accompanying text; see generally *infra* Part IV.A (describing the reasons why statutes do not achieve their stated goals); DeShazo & Freeman, *supra* note 7, at 1522 (“California’s ‘cap’ on emissions is, at the moment, more like a target, with implementation strategies all but unknown.”); *Arnie’s Uphill Climb*, THE ECONOMIST, June 23, 2007, at 36 (describing the challenges of implementing climate change legislation).

103. See CAL. HEALTH & SAFETY CODE §§ 38592(b), 38598 (West Supp. 2007).

104. CAL. PUB. RES. CODE §§ 21000(d), 21001(a), (d) (West 2007) (stating that agencies shall “[d]evelop and maintain a high quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state”; “take all coordinated actions necessary to prevent [critical environmental] thresholds being reached”; and “[e]nsure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions”).

fulfillment of that end. It imposes a few basic requirements, most of which parallel the requirements of NEPA and other environmental assessment laws. Any time a state or local public agency makes a discretionary decision¹⁰⁵ to approve or carry out a project with potentially significant environmental impacts—even if the project will be implemented by private parties¹⁰⁶—the agency must disclose any potentially significant adverse environmental consequences of its decision.¹⁰⁷ It also must identify and discuss measures capable of reducing or avoiding those adverse environmental impacts.¹⁰⁸ Unlike NEPA and many other environmental assessment laws, which mandate only procedural compliance, CEQA also imposes an express substantive constraint: if mitigation or avoidance measures can feasibly reduce significant adverse impacts, the lead agency cannot approve the project without adopting those measures.¹⁰⁹ If feasible measures are not available, the agency must provide findings justifying any decision to proceed with the project.¹¹⁰ The discussion below explains those requirements in more detail.

1. Disclosure of Significant Adverse Environmental Impacts

If a proposed project may cause significant adverse environ-

105. *See id.* § 21080(a); *Friends of Westwood v. City of Los Angeles*, 235 Cal. Rptr. 788, 793 (Cal. Ct. App. 1987) (holding that the existence of any discretion in an approval process triggers CEQA).

106. *See Friends of Mammoth v. Bd. of Supervisors*, 502 P.2d 1049 (Cal. 1972) (holding that CEQA applies to private projects receiving governmental approvals).

107. CEQA does exempt certain classes of projects. *See, e.g.*, CAL. PUB. RES. CODE §§ 21080(b), 21080.14 (creating an exemption for “affordable housing projects in urbanized areas”).

108. *Sierra Club v. State Bd. of Forestry*, 876 P.2d 505, 516–17 (Cal. 1994).

109. *See* CAL. PUB. RES. CODE § 21081. In practice, the differences may be smaller. NEPA lead agencies often will implement mitigation measures to avoid the procedural cost of EIS preparation, and thus substantive change sometimes will occur without an explicit substantive obligation. *See* Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing the Government's Environmental Performance*, 102 COLUM. L. REV. 903, 932–37 (2002) (describing the prevalent use of the mitigated finding of no significant impact). Compliance with CEQA's substantive mandate is generally reviewed under an abuse-of-discretion standard, creating a heavy burden for plaintiffs challenging alleged substantive non-compliance. *See City of Marina v. Bd. of Trs. of Cal. State Univ.*, 138 P.3d 692, 710 (Cal. 2006) (explaining that a decision about the sufficiency of mitigation measures “lies at the core of the lead agency's discretionary responsibility under CEQA and is, for that reason, not lightly to be overturned.”).

110. CAL. PUB. RES. CODE § 21081(b).

mental impacts,¹¹¹ CEQA requires the lead agency,¹¹² before approving or carrying out the project, to either prepare an “environmental impact report” (“EIR”)¹¹³ or require project changes that will avoid or fully mitigate that project’s potentially significant impacts.¹¹⁴ The EIR, if prepared, must identify and discuss the project’s potentially significant adverse environmental impacts.¹¹⁵

CEQA defines “significant impacts” broadly and inclusively. A lead agency must address not just impacts uniquely deriving from its project, but also significant “cumulative” environmental impacts—that is, contributions, even if small, to larger environmental problems.¹¹⁶ Under CEQA, a project’s cumulative effects have a “significant effect on the environment” if:

111. *See* CAL. CODE REGS. tit. 14, § 15002(f) (2005) (explaining the types of actions to which CEQA applies).

112. CEQA defines a “lead agency” as “the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment.” CAL. PUB. RES. CODE § 21067.

113. CEQA sets a precautionary standard for requiring EIR preparation. CAL. CODE REGS. tit. 14, § 15064. *See* Laurel Heights Improvement Assn. v. Regents of Univ. of Cal., 864 P.2d 502, 506 (Cal. 1993) (“[A] public agency must prepare an EIR whenever substantial evidence supports a fair argument that a proposed project ‘may have a significant effect on the environment.’”). EIRs are quite similar to the environmental impact statements required by NEPA.

114. CAL. CODE REGS. tit. 14, § 15065(b)(1). Section 15065(b)(1) states:

Where, prior to the commencement of preliminary review of an environmental document, a project proponent agrees to mitigation measures or project modifications that would avoid any significant effect on the environment specified by subdivision (a) or would mitigate the significant effect to a point where clearly no significant effect on the environment would occur, a lead agency need not prepare an environmental impact report solely because, without mitigation, the environmental effects at issue would have been significant.

Id.

115. *See* Sierra Club v. State Bd. of Forestry, 876 P.2d 505, 514 (Cal. 1994) (describing an EIR as “an environmental alarm bell” and a “document of accountability”).

116. This requirement is typical of environmental assessment laws. *See, e.g.*, 40 C.F.R. § 1508.7 (2007) (defining cumulative impacts); D.C. CODE § 8-109.03(a)(8) (2001) (same); MONT. CODE ANN. § 75-1-220(3) (2007) (same). Agencies also must discuss indirect effects following from direct physical consequences. *See* CAL. CODE REGS. tit. 14, §§ 15064(d)(2), 15358. That discussion should not be speculative, but where an indirect consequence is foreseeable, the existence of an extended causal chain between project and impact does not excuse the agency from discussing that impact. *See* Planning & Conservation League v. Dep’t of Water Res., 100 Cal. Rptr. 2d 173, 194 (Cal. Ct. App. 2000) (“We need not venture into speculation. But CEQA does compel reasonable forecasting.”).

The possible effects of a project are individually limited but cumulatively considerable. As used in this paragraph, 'cumulatively considerable' means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.¹¹⁷

Such problems are common. Seemingly small increases in air pollution can collectively add up to major regional air quality problems;¹¹⁸ individual projects that slightly increase noise levels may combine to create intolerable aggregate effects;¹¹⁹ and wildlife habitat may slowly be nibbled away by the incremental incursions of small development projects. Contributions to such cumulatively significant effects can trigger the obligation to prepare an EIR, for an agency must prepare an EIR if its "project has possible environmental effects that are individually limited but cumulatively considerable."¹²⁰ The EIR then must disclose those cumulative impacts.¹²¹

Judicial enforcement of those mandates has been rigorous. California's courts have repeatedly emphasized the importance of cumulative impacts analyses, cautioning that "[o]ne of the most important environmental lessons is that environmental damage often occurs incrementally from a variety of small sources. These sources appear insignificant when considered individually, but assume threatening dimensions when considered collectively with

117. CAL. PUB. RES. CODE § 21083(b)(2) (West 2007). The CEQA Guidelines similarly state that "[c]umulative impacts' refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." CAL. CODE REGS. tit. 14, § 15355. "While section 21083 governs the situations in which an agency must prepare an EIR, its provisions have also been applied to the contents of an EIR once it is determined an EIR must be prepared." *Los Angeles Unified Sch. Dist. v. City of Los Angeles*, 68 Cal. Rptr. 2d. 367, 370 n.6 (Cal. Ct. App. 1997) (citing *Laurel Heights Improvement Ass'n*, 764 P.2d at 278).

118. *See, e.g., Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650, 660–64 (Cal. Ct. App. 1990).

119. *See, e.g., Los Angeles Unified Sch. Dist.*, 68 Cal. Rptr. 2d. at 370–71; *Grand Canyon Trust v. FAA*, 290 F.3d 339, 343 (D.C. Cir. 2002) (requiring consideration of the cumulative noise impacts of additional flights over the Grand Canyon).

120. CAL. CODE REGS. tit. 14, § 15065 (a)(3).

121. *Id.* § 15130(a) (stating that agencies are obligated to "discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable"); *see Los Angeles Unified Sch. Dist.*, 68 Cal. Rptr. 2d. at 370–72; *San Franciscans for Reasonable Growth v. City & County of San Francisco*, 198 Cal. Rptr. 634, 639 (Cal. Ct. App. 1984) ("Part of [CEQA's] vital informational function is performed by a cumulative impact analysis.").

other sources with which they interact.”¹²² The courts therefore have required agencies to treat projects’ contributions to larger environmental problems as significant, even where the individual project contribution would seem small in isolation.¹²³ They also have rejected a regulatory *de minimis* exemption from that general rule, reasoning that such an exemption would contravene the core purposes of a cumulative impacts analysis.¹²⁴ Some debate remains about where exactly the lower boundary of a cumulatively significant contribution lies; though the rejection of a *de minimis* exception implies that even tiny contributions can matter, the same court criticized a “one-molecule” standard for air pollution.¹²⁵ But past decisions leave little doubt that CEQA’s full suite of obligations can be triggered even by a seemingly small contribution to a larger problem.

CEQA’s definition of significant impacts also includes impacts extending beyond California’s borders. While CEQA governs only decisions made and conduct occurring within California, nothing in its definition of significant impact allows agencies to ignore impacts outside state lines. Instead, “CEQA requires a public agency to mitigate or avoid its projects’ significant effects not just

122. *Cmtys. for a Better Env’t v. California Res. Agency*, 126 Cal. Rptr. 2d 441, 452–53 (Cal. Ct. App. 2002); see also *Bakersfield Citizens for Local Control v. City of Bakersfield*, 22 Cal. Rptr. 3d 203, 227 (Cal. Ct. App. 2004) (quoting *Cmtys. for a Better Env’t*); *Los Angeles Unified Sch. Dist.*, 68 Cal. Rptr. 2d at 371; *San Joaquin Raptor/Wildlife Rescue Ctr. v. County of Stanislaus*, 32 Cal. Rptr. 2d 704, 720 (Cal. Ct. App. 1994); *Las Virgenes Homeowners Fed’n, Inc. v. County of Los Angeles*, 223 Cal. Rptr. 18, 23 (Cal. Ct. App. 1986); *Whitman v. Bd. of Supervisors*, 151 Cal. Rptr. 866, 871–73 (Cal. Ct. App. 1979).

123. See, e.g., *Kings County Farm Bureau*, 270 Cal. Rptr. at 660–64 (Cal. Ct. App. 1990) (rejecting an EIR that failed to consider whether project emissions, in combination with emissions from other sources throughout the San Joaquin Valley, would create a significant impact); *Los Angeles Unified Sch. Dist.*, 68 Cal. Rptr. 2d at 371 (“[T]he relevant issue to be addressed in the EIR on the [plan] is not the relative amount of traffic noise resulting from the project when compared to existing traffic noise, but whether any additional amount of traffic noise should be considered significant in light of the serious nature of the traffic noise problem already existing around the schools.”).

124. *Cmtys. for a Better Env’t*, 126 Cal. Rptr. 2d at 453–58 (following *Kings County Farm Bureau*, which it described as “[t]he seminal decision,” and also *Los Angeles Unified School District*). *Communities for a Better Environment* invalidated a “de minimis” exception, which the Resource Agency had set forth in its regulations, and also rejected a theory that would have focused on the percentage contribution made by an individual project rather than on the overall scale of the impact. That theory, the court observed, “contravene[d] the very concept of cumulative impacts,” for “the greater the existing environmental problems are, the lower the threshold should be for treating a project’s contribution to cumulative impacts as significant.” 126 Cal. Rptr. 2d at 455, 457.

125. *Cmtys. for a Better Env’t*, 126 Cal. Rptr. 2d at 457.

on the agency's own property but 'on the environment,' with 'environment' defined for these purposes as 'the physical conditions which exist within the area which will be affected by a proposed project.'¹²⁶ That functional definition invokes no political boundaries; if an area is affected, it is part of the relevant physical environment.

2. Identification of Alternatives and Mitigation Measures

In addition to requiring identification of significant environmental impacts, CEQA also requires agencies to discuss ways in which those impacts can be reduced or avoided. Agencies must "systematically identif[y] . . . feasible alternatives or feasible mitigation measures which will avoid or substantially lessen [a project's] significant effects."¹²⁷ According to the courts, that discussion of alternatives and mitigation measures forms the "core" of an EIR.¹²⁸

By requiring analysis of alternatives, CEQA attempts to compel agencies to consider whether different versions of the project, or even different projects, could accomplish most of the basic project purposes while reducing environmental costs.¹²⁹ Courts have repeatedly stated that agencies "must describe all reasonable alternatives to the project including those capable of reducing or eliminating environmental effects."¹³⁰ No universally-applicable list sets forth the alternatives agencies must consider; the scope of the analysis instead is governed by project-specific circumstances, the standards set forth in the statute, the California Resources Agency's CEQA guidelines, and a "rule of reason."¹³¹ Agencies often

126. *Am. Canyon Cmty. United for Responsible Growth v. City of Am. Canyon*, 52 Cal. Rptr. 3d 312, 327 (Cal. Ct. App. 2006) (italics removed) (quoting CAL. PUB. RES. CODE § 21002.1(b) and *City of Marina v. Bd. of Trs. of Cal. State Univ.*, 138 P.3d 692, 703-04 (Cal. 2006)); CAL. CODE REGS. tit. 14, § 15360.

127. CAL. PUB. RES. CODE § 21002 (West 2007); *see id.* § 21061 (stating that an EIR must "list ways in which the significant effects of such a project might be minimized" and "indicate alternatives to such a project").

128. *Citizens of Goleta Valley v. Bd. of Supervisors*, 801 P.2d 1161, 1167 (Cal. 1990).

129. *See* CAL. CODE REGS. tit. 14, § 15126.6.

130. *County of Inyo v. City of Los Angeles*, 139 Cal. Rptr. 396, 408 (Cal. Ct. App. 1977); *see Wildlife Alive v. Chickering*, 553 P.2d 537, 540 (Cal. 1976); *Laurel Heights Improvement Ass'n. v. Regents of Univ. of Cal.*, 764 P.2d 278, 288-89 (Cal. 1988); CAL. CODE REGS. tit. 14, § 15126.6.

131. *See* CAL. CODE REGS. tit. 14, § 15126.6; *Citizens of Goleta Valley*, 801 P.2d at 1168.

consider building in alternative locations,¹³² using different infrastructure to accomplish project purposes,¹³³ or scaling back a project's scope.¹³⁴ The sufficiency of alternatives analyses is often disputed; project opponents assert that agencies exclude viable possibilities or set up only straw man options and that judges are excessively deferential in their review of alternatives analyses. Nevertheless, in many EIRs, the alternatives analysis does form a substantial component of the analysis.¹³⁵

CEQA also requires discussion of mitigation measures.¹³⁶ The CEQA Guidelines describe several categories of mitigation measures, including "avoiding the impact altogether by not taking a certain action or parts of an action;" restoring the environment impacted by the action; altering project operations to minimize the impact; or—importantly, as later sections of this article will explain—"[c]ompensating for the impact by replacing or providing substitute resources or environments."¹³⁷ They also specify that

132. See, e.g., *Citizens of Goleta Valley*, 801 P.2d at 1171–75 (concluding that evaluation of a single off-site alternative was adequate); *San Bernardino Valley Audubon Soc'y, Inc. v. County of San Bernardino*, 202 Cal. Rptr. 423, 428–29 (Cal. Ct. App. 1984) (rejecting an EIR that considered too narrow a range of site alternatives).

133. See, e.g., *County of Inyo*, 139 Cal. Rptr. at 406–09 (rejecting an EIR for a water-delivery project that failed to consider conservation as an alternative to increased pumping); *Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650, 668–73 (Cal. Ct. App. 1990) (rejecting an EIR that did not provide enough data to facilitate an effective comparative analysis).

134. See, e.g., *Vill. of Laguna Beach v. Bd. of Supervisors*, 185 Cal. Rptr. 41, 44–46 (Cal. Ct. App. 1982) (upholding an EIR that considered a range of sizes for a proposed residential development).

135. Some NEPA commentators have argued that NEPA's alternatives analysis requirement has essentially been gutted through non-enforcement, and that the federal courts' rhetorical endorsements of alternatives analyses have not translated into actual holdings. See, e.g., Jason J. Czarnecki, Comment, *Defining the Project Purpose Under NEPA: Promoting Consideration of Viable EIS Alternatives*, 70 U. CHI. L. REV. 599 (2003). Nevertheless, many EISs and EIRs do contain extensive alternatives analyses. How often agencies actually adopt alternatives is another question, but it seems plausible to hypothesize that CEQA's mitigation requirement accomplishes much more than its alternatives requirement. Inducing lots of small, incremental changes seems much more practicable than creating a few big ones.

136. *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors*, 104 Cal. Rptr. 2d 326, 355 (Cal. Ct. App. 2001) (citing CAL. PUB. RES. CODE §§ 21100, 21002.1, 21061); see CAL. CODE REGS. tit. 14, § 15002(a)(2) (2005) (stating that one of CEQA's "basic purposes" is to "[i]dentify ways that environmental damage can be avoided or significantly reduced").

137. CAL. CODE REGS. tit. 14, § 15370. At the boundaries, the difference between an alternative and a mitigation measure may be fuzzy, but generally speaking, mitigation measures involve revisions within the same project, while alternatives involve fundamentally different versions of the project. See *Laurel Heights Improvement Ass'n v. Regents of Univ.*

“where relevant,” EIRs must describe mitigation measures capable of reducing “inefficient and unnecessary consumption of energy.”¹³⁸

3. Adoption, if Feasible, of Alternatives or Mitigation Measures Capable of Avoiding Significant Environmental Impacts

To the previously discussed procedural requirements, CEQA adds a substantive twist: the statute expressly forbids agencies from adopting projects without also adopting feasible mitigation measures or alternatives capable of reducing significant adverse environmental impacts.¹³⁹ CEQA, in other words, contains the unequivocal substantive constraints for which many of NEPA’s critics have long pined.¹⁴⁰ “[N]o public agency shall approve or carry out a project,” the statute directs, if “one or more significant effects on the environment . . . would occur if the project is approved or carried out,” unless the public agency formally finds either that the impacts will be mitigated to a less-than-significant level or that such mitigation is infeasible, but project benefits still justify proceeding.¹⁴¹ The CEQA Guidelines repeat that mandate, stating that the “basic purposes of CEQA” include “[p]revent[ing] significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.”¹⁴² Thus, if mitigation or avoidance of a project’s significant adverse impacts is feasible, an agency cannot approve

of Cal., 764 P.2d 278, 290 (Cal. 1988).

138. CAL. CODE REGS. tit. 14, § 15126.4; CALIFORNIA RESOURCES AGENCY, CEQA GUIDELINES APP. F, available at http://www.ceres.ca.gov/topic/env_law/ceqa/guidelines/Appendix_F.html (last visited June 11, 2007).

139. *Mountain Lion Found. v. Fish and Game Comm’n*, 939 P.2d 1280, 1298–99 (Cal. 1997); see *Sierra Club v. State Bd. of Forestry*, 876 P.2d 505, 516 (Cal. 1994) (“CEQA compels government first to identify the [significant] environmental effects of projects, and then to mitigate those adverse effects through the imposition of feasible mitigation measures or through the selection of feasible alternatives.”); *Sierra Club v. Gilroy City Council*, 271 Cal. Rptr. 393, 398 (Cal. Ct. App. 1990) (CEQA “require[es] public agencies to deny approval of a project with significant adverse effects when feasible alternatives or feasible mitigation measures can substantially lessen such effects”).

140. See, e.g., Nicholas C. Yost, *NEPA’s Promise—Partially Fulfilled*, 20 ENVTL. L. 533 (1990) (arguing that the U.S. Supreme Court has gutted NEPA of its substantive requirements); William H. Rodgers, Jr., *NEPA at Twenty: Mimicry and Recruitment in Environmental Law*, 20 ENVTL. L. 485, 500–01 (1990).

141. CAL. PUB. RES. CODE § 21081 (West 2007).

142. CAL. CODE REGS. tit. 14, § 15002(a)(3) (2005); see also *id.* §§ 15002(h), 15021.

the project without adoption of those mitigation or avoidance measures. This mandate exists not just on paper but also in practice. There is no real debate over whether agencies have an obligation to mitigate: Courts have consistently set aside actions that agencies attempted to implement without full mitigation.¹⁴³ Consequently, EIRs include, and lead agencies to routinely adopt, long lists of mitigation measures.¹⁴⁴

That mandate extends to mitigation of contributions to cumulatively significant impacts. CEQA requires mitigation, if feasible, of all significant impacts,¹⁴⁵ and a cumulatively significant impact is, by definition, a significant project impact.¹⁴⁶ That does not mean agencies must fully resolve environmental problems that their projects only partially cause; an agency may satisfy its obligations by mitigating its own contribution.¹⁴⁷ The agency also may accomplish its share of mitigation in a variety of ways, including participation in regional mitigation programs.¹⁴⁸ But an agency cannot simply ignore its project's share of a significant larger impact. If a project's contribution would be incrementally important and could be avoided or mitigated, the project cannot proceed without such mitigation.

143. *See, e.g.*, *City of Marina v. Bd. of Trustees of Cal. State Univ.*, 138 P.3d 692 (Cal. 2006) (setting aside an EIR and project decision because the lead agency declined to mitigate some project effects); *Lincoln Place Tenants Ass'n v. City of Los Angeles*, 66 Cal. Rptr. 3d 120, 134–38 (Cal. Ct. App. 2007) (explaining and enforcing the mitigation obligation); *Woodward Park Homeowners Ass'n, Inc. v. City of Fresno*, 58 Cal. Rptr. 3d 102, 132 (Cal. Ct. App. 2007) (“The city must require feasible mitigation measures for significant freeway traffic impacts, just as it must for other significant impacts.”); *San Joaquin Raptor Rescue Ctr. v. County of Merced*, 57 Cal. Rptr. 3d 663, 682–85 (Cal. Ct. App. 2007) (rejecting an EIR that described and adopted insufficiently specific mitigation measures).

144. *See, e.g.*, *Envtl. Council of Sacramento v. City of Sacramento*, 48 Cal. Rptr. 3d 544, 559 (Cal. Ct. App. 2006) (“Cognizant of their heavy burden to mitigate under [CEQA and the California Endangered Species Act], the City and Sutter fashioned an enormously comprehensive and integrated mitigation plan.”).

145. CAL. PUB. RES. CODE § 21081.

146. *See* CAL. CODE REGS. tit. 14, § 15065(a)(3) (“a lead agency shall find that a project may have a significant impact on the environment” if the project “has possible environmental effects that are individually limited but cumulatively considerable.”).

147. CAL. CODE REGS. tit. 14, § 15130(a)(3) (“An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.”); *see also id.* § 15064(h)(2).

148. *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors*, 104 Cal. Rptr. 2d 326, 356 (Cal. Ct. App. 2001).

B. Applying CEQA's Requirements to Climate Change

The CEQA provisions and principles above constrain state or local public agencies' contributions to climate change, for climate change is a cumulatively significant impact, and agencies' contributions can feasibly be disclosed and mitigated. The discussion below explains those obligations in more detail.

The discussion comes with a caveat: that the obligations exist does not mean they are presently being fulfilled. While the discussion below applies old (by environmental law standards) and settled legal principles, the idea that CEQA constrains greenhouse gas emissions is relatively new, and has only begun to be addressed by agencies and tested in court. As of this writing, there are no published decisions applying CEQA to climate change contributions, and no regulations expressly address CEQA's intersection with climate change. Analogous NEPA litigation is developing rapidly but has not yet created a settled body of caselaw.¹⁴⁹ The entire area is still subject to substantial debate. Consequently, careful implementation and judicial enforcement are not assured, and without such implementation and enforcement, CEQA-based climate change analysis and mitigation are unlikely to become prevalent. The underlying purpose of this section therefore is not to describe existing practice or settled climate change caselaw, though the discussion is grounded in established principles. Instead, it is to describe how caselaw should develop and agency behavior should change.

1. Government Projects and Climate Change Contributions

CEQA's threshold trigger is a discretionary state or local government action with potential environmental consequences,¹⁵⁰

149. The limited set of NEPA cases includes *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, No. 06-71891, 2007 U.S. App. LEXIS 26555, at *101–38 (9th Cir. Nov. 15, 2007); *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545 (8th Cir. 2006); *City of Los Angeles v. Nat'l Highway Traffic Safety Admin.*, 912 F.2d 478 (D.C. Cir. 1990); *Friends of the Earth, Inc. v. Mosbacher*, 488 F. Supp. 2d 889 (N.D.Cal. 2007); *Border Power Working Group v. Dept. of Energy*, 260 F. Supp. 2d 997, 1028–29 (S.D. Cal. 2003); and *Found. on Econ. Trends v. Watkins*, 731 F. Supp. 530 (D.D.C. 1990). Of these cases, *Center for Biological Diversity* provides the most extensive discussion and the clearest holding. See *infra* notes 178–182 and accompanying text. The remaining cases generally address preliminary motions on issues like jurisdiction, and collectively the cases prior to *Center for Biological Diversity* did not establish any clear legal rules on the merits of climate change-based NEPA claims.

150. See *Friends of Westwood v. City of Los Angeles*, 235 Cal. Rptr. 788, 792–93 (Cal. Ct.

and much of California's GHG emissions derive at least partly from discretionary government decisions.

Listing all public agency projects that emit GHGs would require a book, but a partial sampling illustrates the extent to which emissions follow from discretionary government action. While vehicular emissions are partly the product of private choices, public agencies plan and build transportation systems, and their decisions strongly influence driving and transit use patterns.¹⁵¹ Local government is largely responsible for land use planning, which plays a major role in determining automobile dependence.¹⁵² Timber harvests, which release some of the carbon previously stored in forests, are regulated by California's State Board of Forestry.¹⁵³ Construction of methane-generating agricultural or industrial facilities is typically subject to local land use authority. State and local agency decisions help control the construction of power plants. Government decisions also affect power demand;¹⁵⁴ every subdivision, industrial project, or water project that public agencies approve necessitates electricity use.¹⁵⁵ Public agencies also are major power consumers. The single largest power user in the state, for example, is California's State Water Project, which uses an extraordinary amount of energy delivering water to consumers in

App. 1987).

151. *See, e.g.*, Cal. Dept. of Trans., About Caltrans, <http://www.dot.ca.gov/about/caltrans.htm> (last visited January 23, 2007) (describing Caltrans' role in building state transportation infrastructure).

152. State and federal air quality planning already is highly intertwined with transportation planning, and just as government decisions help determine how much nitrogen dioxide, carbon monoxide, and particulate matter cars generate, those decisions also play a direct role in creating or controlling carbon emissions. *See* *Env'tl. Def. Fund v. EPA*, 82 F.3d 451, 454–55 (D.C. Cir. 1996) (describing these interrelationships); *see also* 1000 *Friends of Maryland v. Browner*, 265 F.3d 216, 221–22 (4th Cir. 2001); *City of S. Pasadena v. Slater*, 56 F. Supp. 2d 1095, 1101 (C.D. Cal. 1999), *rev'd on other grounds sub nom. City of S. Pasadena v. Mineta*, 284 F.3d 1154 (9th Cir. 2002).

153. *See* *Big Creek Lumber Co. v. County of Santa Cruz*, 136 P.3d 821, 825–26 (Cal. 2006). That state regulatory power does not extend, however, to the national forest system's extensive holdings within California. *See* U.S. CONST. art. IV, § 3, cl. 2.

154. *See, e.g.*, *Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650 (Cal. Ct. App. 1990) (considering the environmental consequences of constructing a new power plant); California Energy Commission, Welcome to the California Energy Commission, <http://www.energy.ca.gov/commission/index.html> (last visited Nov. 20, 2007) (explaining the CEC's role, which includes "[l]icensing thermal power plants 50 megawatts or larger").

155. *See, e.g.*, NATURAL RES. DEF. COUNCIL AND PACIFIC INST., ENERGY DOWN THE DRAIN: THE HIDDEN COSTS OF CALIFORNIA'S WATER SUPPLY 2 (2004) ("According to the Association of California Water Agencies, water agencies account for 7 percent of California's energy consumption and 5 percent of summer peak demand.").

southern California.¹⁵⁶ In short, governance and GHG emissions are deeply intertwined.

2. GHG-Emitting Projects and Significant Environmental Impacts

Not all discretionary public agency decisions trigger CEQA's requirements. The second element necessary to trigger CEQA's disclosure and mitigation obligations is a potentially significant environmental impact.¹⁵⁷ Projects causing GHG emissions create such potential, for the collective result of those contributions is a perfect example of the principle "that environmental damage often occurs incrementally from a variety of small sources."¹⁵⁸ What the Ninth Circuit recently said about NEPA applies equally to CEQA: "The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impact[]" that requires analysis.¹⁵⁹

Unless its emissions are effectively offset,¹⁶⁰ every individual GHG-emitting project contributes to climate change. GHGs are generally long-lived and well-mixed, so there is no inconsequential location or time for GHG emissions to occur, and each GHG-emitting project inexorably adds to the worldwide total.¹⁶¹ No reasonable doubt exists that rising worldwide totals are already causing, and will continue to cause, severe and sometimes catastrophic consequences.¹⁶² Although those individual contributions might seem small, and articulating a causal chain between individual contributions and particular storms or droughts is impossible, scientists generally agree that the more GHGs are emitted into the atmosphere, the more temperatures will rise, with corresponding increases in adverse consequences.¹⁶³ In other

156. *See id.* at 2 ("The California Energy Commission reports that SWP energy use accounts for 2 to 3 percent of all electricity consumed in California.").

157. CAL. CODE REGS. tit. 14, § 15130(b)(5) (2005). Subsection 15130(e), however, states that for certain types of projects, an EIR need not address cumulative impacts previously addressed in a prior EIR. *Id.* at § 15130(e).

158. *Cmtys. for a Better Env't v. Cal. Res. Agency*, 126 Cal. Rptr. 2d. 441, 452–53 (Cal. Ct. App. 2002).

159. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, No. 06-71891, 2007 U.S. App. LEXIS 26555, at *114 (9th Cir. Nov. 15, 2007).

160. *See infra* Part III.B.3 (discussing offsets and other mitigation measures).

161. *See INVENTORY*, *supra* note 51; *see also Massachusetts v. EPA*, 127 S. Ct. 1438, 1452–58 (2007) (rejecting EPA's argument that the contributions GHG emissions to climate change are insufficient to confer standing).

162. *See IPCC, THE PHYSICAL SCIENCE BASIS*, *supra* note 4; *see also IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY*, *supra* note 4; Oreskes, *supra* note 35.

163. *See CAL. ENVTL. PROT. AGENCY*, *supra* note 3, at 15 ("actions taken to reduce climate

words, while scientists cannot definitively determine that an individual GHG-emitting project raised temperatures by a specific amount or caused an event like Hurricane Katrina or the American Southwest's recent drought,¹⁶⁴ they know that each GHG-emitting project causes warming and makes such events incrementally more likely. The increment may be small and its exact scale indeterminate, but it certainly is real.

The cumulative consequences of those emissions are significant because the resulting problems are huge. As discussed in Part II, climate change poses an extraordinary environmental threat, with the potential to harm multiple ecosystems, damage resource-dependant economies, and diminish the health and safety of millions of people in California.¹⁶⁵ While California may face particularly acute threats, its likely burdens are not unique.¹⁶⁶ Every project that adds new GHG emissions therefore makes a serious environmental problem worse.

Those incremental contributions cannot legally be dismissed as *de minimis* or inconsequential. California's courts have rejected a *de minimis* exemption to CEQA's cumulative impact requirements precisely because seemingly tiny contributions to an environmental problem are often collectively consequential. The *Communities for a Better Environment* court instead held that "the greater the existing environmental problems are, the lower the threshold should be for

change emissions today can reduce the magnitude and rate of climate change this century"); Kirsten H. Engel, *Harmonizing Regulatory and Litigation Approaches to Climate Change: Incorporating Tradable Emissions Offsets into Common Law Remedies*, 155 U. PA. L. REV. 1563, 1590 (2007) ("each ton of GHG emitted by a defendant exacerbates the risks of global warming, though it is impossible to estimate by exactly how much"); Allen et al., *supra* note 42, at 1385-94 (2007) (explaining that scientists can potentially provide quantified estimates of the extent to which climate change increased the odds of particular outcomes, like a flood or heat wave, but cannot state that some specific events or event intensities were caused by climate change while others would have occurred naturally).

164. For this reason, and also because of the absence of regulatory guidance on this question, some CEQA attorneys argue that trying to determine whether emissions are significant is impossible or pointless. See, e.g., MICHAEL ZISCHKE & SARAH OWSOWITZ, CLIMATE CHANGE AND THE CALIFORNIA ENVIRONMENTAL QUALITY ACT 6-8 (2007), available at http://www.coxcastle.com/images/ps_attachment/attachment204.pdf. But a cumulative impacts analysis requires a lead agency only to discuss individual emissions and aggregate effects. There is no need to specify exactly how much difference in ultimate effects is attributable specifically to one project.

165. See OUR CHANGING CLIMATE, *supra* note 3; CAL. HEALTH & SAFETY CODE § 38501 (West 2007).

166. See IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4, at 12-13; IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4.

treating a project's contribution to cumulative impacts as significant."¹⁶⁷

Nor can agencies claim that their emissions are insignificant because they are addressed by other regulatory programs. A project's emissions of air pollutants like ozone or particulate matter may be treated as insignificant where the project's emissions are accounted for in air districts' plans for attaining federal and state air quality standards.¹⁶⁸ That approach, however, cannot yet work for greenhouse gases because California does not have a "state implementation plan" ("SIP") for GHG emissions.¹⁶⁹

The passage of AB 32 does not change the calculus. Because AB 32 does not mandate a plan for achieving safe emission levels, California still will lack the functional equivalent of a SIP when CARB finishes developing its AB 32 implementation program. Perfect compliance with the statute would reduce California's emissions only by approximately 25 percent, but many experts estimate that an 80 to 90 percent reduction ultimately will be necessary to eliminate anthropogenic climate change. The statute therefore is best understood as mandating first steps—crucial first steps, but first steps nonetheless—toward attainment, not as occupying the regulatory field and defining safe emission levels.¹⁷⁰ Instead, California's acknowledged need for drastic reductions, and for "[a]ll state agencies [to] consider and implement strategies to reduce their greenhouse gas emissions,"¹⁷¹ vitiates any argument

167. See *Cmtys. for a Better Env't. v. Cal. Res. Agency*, 126 Cal. Rptr. 2d 441, 453–58 (Cal. Ct. App. 2002).

168. See CAL. CODE REGS. tit. 14, § 15064(h)(3) (2005). As a practical matter, such compliance generally means that emissions from any new source must be offset by obtaining reductions in emissions from existing sources. See *Citizens Against the Refinery's Effects v. EPA*, 643 F.2d 183, 184–85 (4th Cir. 1981) (explaining the Clean Air Act's permitting requirements for new sources in non-attainment areas). CEQA's requirement of GHG-neutrality therefore is fairly similar to the requirements that probably would exist if California did have a CO₂ SIP.

169. Those plans generally are promulgated for pollutants listed under the federal Clean Air Act. See 42 U.S.C. §§ 7409–10. Greenhouse gases, however, are not listed.

170. See MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32, at I-4; Exec. Order S-3-05, *supra* note 83; Thomas Wigley, *The Kyoto Protocol: CO₂, CH₄, and Climate Implications*, 25 GEOPHYSICAL RESEARCH LETTERS 2285, 2288 (1998) (concluding that compliance with the Kyoto Protocol's modest targets would fall well short of removing the human footprint from the global climate). That does not mean these steps are not significant. Even partially reducing a colossal problem can create enormous benefits, especially where the intensity of that problem can increase or decrease incrementally. See *supra* notes 22–23 and accompanying text.

171. Exec. Order S-3-05, *supra* note 83; CAL. HEALTH & SAFETY CODE § 38592(a) (West

that adding any new source, unless somehow offset or so small that it is essentially non-existent,¹⁷² is concordant with some state plan for achieving safe emissions levels.

Though climate change cases are still relatively new to the courts, this type of cumulative environmental problem is not, and CEQA decisions addressing analogous environmental threats support treating GHG emissions as incrementally significant contributions to cumulative impacts. In *Kings County Farm Bureau v. City of Hanford*, a seminal cumulative impacts case, the respondent city had approved a power plant project that would emit ozone precursors.¹⁷³ That plant's contributions would have had little effect in isolation and represented only a small percentage of regional emissions, and the project proponent¹⁷⁴ argued that those emissions therefore could not be significant.¹⁷⁵ The court disagreed. Noting that the small contribution would affect an area already beset by excess air pollution, the court required the city to assess whether, given that regional problem, the project's increased emissions would contribute to a significant environmental impact.¹⁷⁶ The court held:

The relevant question to be addressed in the EIR is not the relative amount of precursors emitted by the project when compared with preexisting emissions, but whether any additional amount of

Supp. 2007).

172. *Cmtys. for a Better Env't*, 126 Cal. Rptr. 2d. at 457 ("the 'one-[additional]-molecule' rule is not the law") (brackets in original; quoting MICHAEL H. REMY ET AL., GUIDE TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT 476-78 (1998)).

173. *Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650, 660-64 (Cal. Ct. App. 1990).

174. Because CEQA applies to private projects that require discretionary government permits, often multiple parties defend the EIR. The lead agency may nominally be the respondent, but the permit recipient often leads and funds the defense.

175. *Kings County Farm Bureau*, 270 Cal. Rptr. at 660 ("The DEIR concludes the project's contributions to ozone levels in the area would be immeasurable and, therefore, insignificant because the plant would emit relatively minor amounts of precursors compared to the total volume of precursors emitted in Kings County."); *id.* at 661 (quoting the EIR's conclusion that "incremental effects of the project studied by the EIR are not significant, even though the cumulative ozone impacts of Valley-wide energy development might be considered substantial.").

176. *Id.* at 662 ("We find the analysis used in the EIR and urged by GWF avoids analyzing the severity of the problem and allows the approval of projects which, when taken in isolation, appear insignificant, but when viewed together, appear startling. . . . [T]he standard for a cumulative impacts analysis is defined by the use of the term 'collectively significant.'").

precursor emissions should be considered significant in light of the serious nature of the ozone problems in this air basin.¹⁷⁷

That reasoning is similarly applicable to climate change. Just as regional air quality problems derive incrementally from many sources, and no one source in isolation would seem important, climate change derives from the individually minor contributions of thousands of projects and actions worldwide, all of which collectively create major consequences.¹⁷⁸

The federal courts now have addressed similar questions, and the case most squarely addressing the cumulative consequences of GHG emissions has reached similar conclusions. In *Center for Biological Diversity v. National Highway Traffic Safety Administration*,¹⁷⁹ California, several other states, and several non-profit groups challenged the National Highway Traffic Safety Administration's ("NHTSA's") approval of new fuel economy standards. While slightly more stringent than existing standards, those standards were much weaker than those the petitioners claimed were possible. But in approving those new standards, the NHTSA determined that even the possibility of a significant environmental impact did not exist, and it did not prepare an EIS.¹⁸⁰ The Ninth Circuit rejected this position. It found that the decision to select the relatively weak standards, and thus decrease the rate of CO₂ buildup only slightly, could have potentially cumulatively significant environmental impacts. The court remanded to the agency for preparation of an EIS.¹⁸¹ *Center for Biological Diversity* involved strong facts—few government decisions have greater implications for GHG emissions, and thus more potential for environmental impact, than the setting of American fuel economy standards.¹⁸² The case nevertheless indicates that courts will apply environmental assessment laws to climate change contributions. Indeed, the court was emphatic in its holding, citing D.C. Circuit

177. *Id.* at 661.

178. Environmental policies and laws commonly contemplate the major consequences of cumulative minor actions. This phenomenon, however, is by no means unique or even always a problem. The same principle underlies our decision to go to the polls and protect the right to vote.

179. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, No. 06-71891, 2007 U.S. App. LEXIS 26555 (9th Cir. Nov. 15, 2007).

180. *Id.* at *124.

181. *Id.* at *101-38.

182. *See id.*, at *104-05.

Judge Wald's "prescient" warnings about incremental increases in GHG emissions, including her statement that "we cannot afford to ignore even modest contributions to global warming."¹⁸³

3. GHG Emissions and Avoidance or Mitigation

Because discretionary projects contribute to the GHG emissions that drive climate change, and because those emissions' cumulative environmental impacts are significant, any CEQA lead agency must also consider ways to avoid or mitigate project-specific contributions to those impacts.¹⁸⁴ Both carrots and sticks back that obligation. If, at the outset of the process, the lead agency incorporates into the project description measures that fully mitigate or avoid that project's potential GHG emissions, the agency may avoid the obligation to prepare an EIR, and thus may save substantial time and money.¹⁸⁵ Moreover, unless such avoidance or mitigation measures are infeasible, no CEQA-regulated project may be approved without such measures.¹⁸⁶ As discussed in detail below, such measures generally are available, affordable, and capable of generating collateral environmental and economic benefits. CEQA thus requires lead agencies not just to disclose but also to mitigate or avoid their projects' potential GHG emissions.

a. Project Alternatives

For many projects, functionally similar alternatives can vastly reduce GHG emissions. Renewable power sources, for example, provide alternatives to constructing fossil fuel power plants. Constructing transit systems often provides a lower-emissions alternative to constructing new roads.¹⁸⁷ Rather than building new

183. *Id.* at *115, 137 (citing *City of Los Angeles v. NHTSA*, 912 F.2d 478, 500, 501 (D.C. Cir. 1990) (Wald, C.J., dissenting)).

184. CAL. PUB. RES. CODE §§ 21002, 21061 (West 2007).

185. *See* Karkkainen, *supra* note 109, at 932-37 (explaining the appeal of using mitigation to avoid EIS preparation).

186. CAL. PUB. RES. CODE. § 21081.

187. *See, e.g.*, Letter from Bill Lockyer, California Attorney General, to Glenn Campbell, Orange County Transportation Authority, at 3-4 (Mar. 30, 2006) (on file with author) (identifying "[i]ncreased public transportation" as one of many measures capable of reducing the GHG emissions from a new regional transportation plan); REDEFINING PROGRESS, *supra* note 6, at 80 (summarizing community testimony from low-income Fresno residents, who "noted that the development pattern forces people to use their own cars . . .").

water delivery projects, which tend to consume huge amounts of energy, project proponents could implement water use efficiency programs.¹⁸⁸ Instead of breaking new ground and building new housing in undeveloped areas, local governments could focus their land use approvals on infill development projects, which tend to require substantially less energy-intensive infrastructure, or could promote higher-density transit-oriented development.¹⁸⁹ Such alternatives will not always be feasible—some projects may require a particular location or design—and often environmentally-beneficial alternatives still will create some GHG emissions. Nevertheless, alternatives capable of substantially reducing GHG emissions are often available.

b. On-Site Mitigation

Even if no alternative is capable of avoiding a project's emissions, on-site measures often can substantially mitigate greenhouse gas emissions.¹⁹⁰ Developers can use green-building technology and renewable power systems, and can build housing with ready transit access and internal or nearby options for grocery shopping and recreation, reducing their projects' energy footprint.¹⁹¹ A variety of measures, ranging from water recycling to appliance standards to tiered pricing, can reduce energy used to transport, distribute, heat, and dispose water.¹⁹² Highways, where necessary, can include HOV lanes, and dairy farms and landfills can be constructed with methane-recovery technologies.¹⁹³ These examples provide only a

188. See, e.g., ENERGY DOWN THE DRAIN, *supra* note 155, at 34 (describing the costs and benefits of alternative methods of boosting San Diego's water supplies).

189. Many air pollution control districts already publish guidelines for development patterns that minimize emissions of other pollutants and the same principles can help minimize GHG emissions. See, e.g., SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DIST., RESIDENTIAL DESIGN CONSIDERATIONS, <http://www.slcleanair.org/business/pdf/residential%20flyer.pdf> (last visited January 23, 2007); SOLANO TRANSP. AUTH. ET AL., TRANSPORTATION AND LAND USE TOOLKIT (2003), available at <http://www.ysaqmd.org/planning-info.php>.

190. The distinctions between an alternative and a mitigation measure can blur. Alternatives can mitigate impacts, and a large number of mitigation measures can effectively create an alternative version of a project.

191. See SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DIST., *supra* note 189; SOLANO TRANSP. AUTH. ET AL., *supra* note 189.

192. See ENERGY DOWN THE DRAIN, *supra* note 154 (describing measures capable of reducing water use and explaining their benefits).

193. See U.S. Envtl. Prot. Agency, Methane, <http://www.epa.gov/methane/projections.html> (last visited January 23, 2007) ("for many methane sources, opportunities

partial sampling, and as efforts toward GHG management intensify, an increasing variety of mitigation measures will likely become available.

c. Off-Site Mitigation

Sometimes neither project alternatives nor on-site mitigation measures can fully avoid GHG emissions. But even for those projects, off-site mitigation should allow projects to achieve GHG neutrality. The primary available method is generally known as emissions trading.¹⁹⁴

The concept behind emissions trading is straightforward. To compensate for increased emissions resulting from a project, the project proponent can reduce its own emissions elsewhere, pay some other entity to commensurately reduce emissions, or undertake or fund actions that will permanently sequester an equivalent amount of carbon.¹⁹⁵ For example, a municipality approving a housing development with some unavoidable emissions might require the project developer to fund a city-wide energy efficiency program creating equivalent emissions reductions, or might offset the emissions deriving from a new transportation project by ensuring the conversion of cleared land to a permanent forest.¹⁹⁶

In practice, the complexity is greater than in theory, because trading presents potential transparency and verification problems.¹⁹⁷ The basic premise of an offset—that it creates a

exist to reduce emissions cost-effectively or at low cost by capturing the methane and using it as fuel. . . . EPA also provides information on cost-effective mitigation options for ruminant livestock emissions.”).

194. The term “emissions trading” describes both cap-and-trade systems (in which emissions allowances are traded within a regulated group collectively subject to an emissions cap) and offsets (in which regulated entities pay non-regulated entities to reduce their emissions). Because CEQA extends obligations to emissions not regulated by a cap-and-trade system, this article focuses primarily on offsets as a means of reduction.

195. See 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, 2-3 (1998) (explaining the basic appeal of emissions trading and discussing why trading schemes should be somewhat less enticing than they superficially seem); THE CLIMATE TRUST, ABOUT OFFSETS: OVERVIEW, http://www.climatetrust.org/about_offsets.php (last visited Nov. 25, 2007).

196. See, e.g., THE CLIMATE TRUST, PROJECTS: OVERVIEW, http://www.climatetrust.org/offset_projects.php (providing links to project descriptions) (last visited Nov. 25, 2007).

197. See generally James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607 (2000) (describing common pitfalls of environmental trading systems).

different emissions pattern than otherwise would have existed—can facilitate gaming and false accounting; calculating what would happen without the offset can be a speculative counterfactual exercise.¹⁹⁸ “Not-carbon,” as one article recently described it, is a difficult thing to measure.¹⁹⁹ Offset credits may support emissions-reducing measures that would have happened even in the absence of payment or legal requirement.²⁰⁰ Similarly, offset credits may go to projects that do not really reduce emissions. Growing a forest provides no meaningful sequestration if the forest later burns, or if the landowner simply shifts its logging trucks to a forest it otherwise would have left uncut.²⁰¹ Finally, some advocates fear that offsetting may create distributional inequities. Mitigating GHG emissions often creates substantial collateral benefits, and trading can relocate those benefits out of the project areas. This can be problematic if agencies or industries in lower-income areas purchase offsets and retain carbon-emitting activities while entities in relatively affluent areas prefer to sell offsets and reap the associated benefits.²⁰² Effective reporting schemes or vigilant regulators could minimize those problems, but if either are absent—and sometimes both will be, for offset markets are presently self-regulated²⁰³—the reality, and thus the legality, of off-site mitigation measures may be difficult to discern.²⁰⁴

198. See TONY DUTZIK & ROB SARGENT, STOPPING GLOBAL WARMING BEGINS AT HOME: THE CASE AGAINST THE USE OF OFFSETS IN A REGIONAL POWER SECTOR CAP-AND-TRADE PROGRAM 9-11 (2004), available at http://www.connpirgstudents.org/uploads/Rg/97/Rg97OQbyPIAjTJbKLxD6_Q/Stopping_Global_Warming.pdf.

199. *Trading Thin Air*, THE ECONOMIST, May 31, 2007, available at http://www.economist.com/surveys/displaystory.cfm?story_id=9217960&CFID=9630437&CFTOKEN=30746497; see Alan Zarembo, *Trying to Buy a Greener Conscience*, LOS ANGELES TIMES, Sept. 2, 2007 at A1 (critiquing voluntary carbon offsets).

200. See, e.g., Jeff Goodell, *Capital Pollution Solution?*, NEW YORK TIMES, July 30, 2006 (Magazine) at 36 (describing “offset” payments to no-till farmers who had been no-till farming for years before the payments occurred).

201. See DUTZIK & SARGENT, *supra* note 198, at 10.

202. See *id.* at 16–17 (describing collateral benefits of GHG regulation of power plants); see, e.g., Jonathon Remy Nash & Richard L. Revesz, *Markets and Geography, Designing Marketable Permit Schemes to Control Local and Regional Pollutants*, 28 ECOLOGY L.Q. 569, 613–14 (2001) (describing criticisms of the South Coast Air Quality Management District’s RECLAIM program). Those concerns should be much less salient with GHG regulation than with other pollutants, for most GHGs do not pose health risks other than through their contributions to climate change, which have little to do with their source location.

203. See, e.g., Goodell, *supra* note 200 (describing reservations about the Chicago Climate Exchange).

204. See *City of Marina v. Bd. of Trs. of Cal. St. Univ.*, 138 P.3d 692, 707 (Cal. 2006) (requiring evidence that mitigation fees will generate results).

Despite those caveats, well-designed and transparent emissions trades could fulfill CEQA's legal requirements. Though sometimes subject to criticism, using offsets is already endorsed by CEQA's implementing regulations²⁰⁵ and is a commonly used mitigation practice.²⁰⁶ Additionally, agencies often mitigate project impacts by contributing fees to regional mitigation programs.²⁰⁷ That approach has parallels under other legal regimes. For example, new projects in areas with deficient air quality often offset emissions by purchasing reduction credits from existing sources.²⁰⁸ Those approaches have legal limitations; a "commitment to pay fees without any evidence that mitigation will actually occur is inadequate" under CEQA, and fictitious or non-verifiable offsets therefore cannot constitute legally sufficient mitigation.²⁰⁹ But so long as the reality of reductions or sequestration is verifiable, emissions trades should pass legal muster.²¹⁰

Trading also can facilitate mitigation that otherwise would not occur. Often neither alternatives nor on-site mitigation measures can fully avoid GHG emissions, but purchasing offsets, which are available from a growing number of providers, will be feasible.²¹¹

205. CAL. CODE REGS. tit. 14, § 15370 (2005) (allowing agencies to mitigate impacts by "replacing or providing substitute resources or environments").

206. Common examples of offsets include purchasing conservation easements as partial mitigation for conversion of farmlands or habitat and constructing new wetlands to compensate for wetlands destroyed. *See, e.g.,* *Envtl. Council of Sacramento v. City of Sacramento*, 48 Cal. Rptr. 3d 544, 558–59 (Cal. Ct. App. 2006) (describing typical mitigation measures).

207. *See* CAL. CODE REGS. tit. 14, § 15130(a)(3) (allowing this practice). Commentators have endorsed carbon offset trading as a potential remedy under other legal regimes. *See, e.g.,* Engel, *supra* note 163.

208. *See, e.g.,* *Berkeley Keep Jets Over the Bay Com. v. Bd. of Port Comm'rs*, 111 Cal. Rptr. 2d 598, 613 (Cal. Ct. App. 2001) (referring to this technique); *Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650, 657 (Cal. Ct. App. 1990) (same); 42 U.S.C. § 7503 (requiring offsets as conditions for permitting new air pollution sources in non-attainment areas); *Citizens Against the Refinery's Effects, Inc. v. EPA*, 643 F.2d 183, 184–85 (4th Cir. 1981).

209. *City of Marina*, 138 P.3d at 707.

210. Unlike NEPA, CEQA requires lead agencies to develop and adopt a "reporting or monitoring program" whenever they rely on mitigation measures to avoid a significant adverse environmental impact. *See* CAL. PUB. RES. CODE § 21081.6(a)(1) (West 2007); Karkkainen, *supra* note 109, at 952 ("this modest step represents an important conceptual advance over the federal statute").

211. Already several private organizations are offering offsets, the Kyoto Protocol allows emissions trading, and even small amounts of offsets can be purchased quickly, and thus with minimal transaction costs, on-line. *See, e.g.,* www.terrapass.org; The Climate Trust, <http://www.climatetrust.org/index.php> (last visited January 24, 2007); The Climate

Under such circumstances, the availability of offsets creates a legal obligation to implement mitigation that agencies otherwise could write off as impossible.²¹² Similarly, reluctant agencies and project proponents may sometimes contend that a project's climate change contributions are too small to justify full-scale environmental review or the expense of on-site mitigation. But trading creates a correspondingly non-intrusive method for addressing such minor emissions. If a project's emissions contributions really are small, so too will be the cost of purchasing offsets, and the agency should be able to cheaply mitigate its impacts, potentially even avoiding the obligation to prepare an EIR.²¹³ By expanding the realm of the feasible, trading can expand mitigation obligations, potentially minimizing emissions that otherwise would be unrestrained.

III. EVALUATING THE OBLIGATION: SHOULD CEQA ADDRESS CLIMATE CHANGE?

The basic point of the foregoing discussion is that CEQA requires California's state and local agencies to eliminate or offset GHG emissions from projects they implement or approve. But that begs an additional question: *should* CEQA address climate change? Or, to put the question more broadly, should we use environmental assessment laws to help control GHG emissions? The answers are not automatic, for laws like CEQA often provoke controversy and debate. Some detractors argue that they primarily create cost and delay and facilitate obstructionism.²¹⁴ Others claim that they rely

Exchange, *The Carbon Counter*, www.carboncounter.org; *Trading Hot Air*, THE ECONOMIST, Oct. 19, 2002 at 60 (describing the Chicago Climate Exchange); Goodell, *supra* note 200 (discussing the Chicago Climate Exchange, and also describing the reservations of some of its critics); Driesen, *supra* note 195, at 30-35 (describing the Kyoto Protocol's mechanisms for emissions trading). Because of transparency issues, some of these offset sources might not qualify as adequate mitigation under CEQA, but some organizations do provide independently-verifiable offset projects. See Goodell, *supra* note 200 and text accompanying note 203 (describing transparency concerns about the Chicago Climate Exchange).

212. If a project has significant environmental impacts that can be mitigated feasibly, the agency cannot proceed with the project without such mitigation in place. If, however, the project has significant adverse environmental impacts that cannot feasibly be mitigated, the agency may proceed without mitigation so long as it adopts a "statement of overriding considerations" justifying its decision. See *City of Marina*, 138 P.3d at 710.

213. See *supra* note 211 and accompanying text (describing offset costs).

214. See CONGRESSIONAL TASK FORCE, *supra* note 25, at 5 ("time and again public sector entities, companies, individuals and organizations have raised issues of cost and process burdens").

on a naïvely idealistic assumption that obligatory studies can improve environmental outcomes.²¹⁵ Even some NEPA and CEQA proponents may view the laws as instruments of project derailment rather than mechanisms for governmental improvement.²¹⁶ For years, those critiques have provoked political and academic defenses, many centering on the common-sense notion that it seems reasonable to require agencies to disclose environmental consequences before they finalize their actions, and it is perhaps telling that legislative amendments never have significantly weakened CEQA or NEPA.²¹⁷ Nevertheless, skepticism about both laws remains common.

That skepticism overlaps with common distrust of decentralized environmental law enforcement.²¹⁸ Assessment laws like CEQA and NEPA generally do not designate enforcement agencies, and instead are enforced through the discretionary initiatives of professional non-profit groups, ad-hoc citizens' groups, and state or local governments. Such dispersed enforcement, though often hailed as one of environmental law's most effective innovations,²¹⁹ creates tensions with common conservative preferences for consolidating public law enforcement authority within the executive branch.²²⁰ The geographic scope of climate change is

215. See, e.g., Joseph L. Sax, *The (Unhappy) Truth About NEPA*, 26 OKLA. L. REV. 239, 239 (1973) ("I think the emphasis on the redemptive quality of procedural reform is about nine parts myth and one part coconut oil."). But see COUNCIL ON ENVTL. QUALITY, *THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS* iii (1997) ("Overall, what we found is that NEPA is a success—it has made agencies take a hard look at the potential environmental consequences of their actions, and it has brought the public into the agency decision-making process like no other statute.").

216. See Karkkainen, *supra* note 25, at 339–41 (describing the perspective of a "NEPA monkey wrencher").

217. See, e.g., Adler, *supra* note 25; Bear, *supra* note 25; COUNCIL ON ENVTL. QUALITY, *supra* note 215. In a qualified defense, Professor Karkkainen argues that NEPA is less valuable as an informational device and more valuable as a deterrent against approving projects with potentially significant environmental impacts. See Karkkainen, *supra* note 25.

218. See, e.g., *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 576 (1992) ("Vindicating the public interest . . . is the function of Congress and the Chief Executive."); Antonin Scalia, *The Doctrine of Standing as an Essential Element of the Separation of Powers*, 17 SUFFOLK U. L. REV. 881 (1983) (arguing that access to the courts should be limited in order to preserve executive discretion and curtail "the judiciary's long love affair with environmental litigation").

219. See, e.g., Barton Thompson, *The Continuing Innovation of Citizen Enforcement*, 2000 U. ILL. L. REV. 185 (2000).

220. See *Friends of the Earth v. Laidlaw Envtl. Servs. (TOC)*, 528 U.S. 167, 198, 210, 215 (Scalia, J., dissenting) ("The undesirable and unconstitutional consequence of today's decision is to place the immense power of suing to enforce the public laws in private hands.").

likely to exacerbate those tensions; a belief that grievances affecting broad swaths of society should not be addressed in the courts has animated many objections to environmental litigation.²²¹ Because CEQA is a state law, and climate change is a national and international problem, its application to climate change also could conflict with trends toward limiting state environmental protection authority.²²² Finally, even proponents of aggressive climate change regulation may argue that a focus on any state law is misplaced and that international arrangements alone hold the promise of achieving genuine progress.²²³ Drawing upon those strains of skepticism, litigants already have raised many arguments against addressing climate change at any level besides the national executive branch, and at any time before the national executive branch is good and ready to act.²²⁴ CEQA litigation is likely to arouse similar objections.

Critics also are likely to argue that CEQA-based regulation of climate change is unnecessary, for California already has begun developing a new statutory and regulatory framework for addressing climate change—a framework that probably will become more comprehensive than CEQA in some respects.²²⁵ Parallel arguments likely will arise as other jurisdictions create new regulatory schemes. Even where no climate change legislation exists, skeptics may argue that advocates should focus solely on creating it, not on trying to invoke existing law.

Other regulatory programs do present advantages. While

221. See, e.g., *Massachusetts v. EPA*, 415 F.3d 50, 59–60 (2005), reversed, *Massachusetts v. EPA*, 127 S. Ct. 1438 (2007) (Sentelle, J., concurring) (“The generalized public good that petitioners seek is the thing of legislatures and presidents, not of courts.”).

222. See Robert L. Glicksman, *From Cooperative to Inoperative Federalism: the Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 786–98 (2006).

223. See, e.g., Wiener, *supra* note 53 (arguing that many state initiatives will accomplish little and may actually be counterproductive (but also identifying arguments in favor of well-constructed state arrangements)).

224. See, e.g., *Cent. Valley Chrysler-Jeep Inc. v. Witherspoon*, No. CV-F-04-6663, 2005 U.S. Dist. LEXIS 26536, *4 (E.D. Cal. Oct. 20, 2005) (describing arguments made in the automakers’ challenge to California’s regulation of automotive GHG emissions); Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293, 319–28 (2005) (describing, and ultimately rejecting, a foreign policy pre-emption argument; EPA unsuccessfully deployed a similar argument in the *Massachusetts v. EPA* litigation. See 127 S. Ct. 1438, 1463 (2007)); *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (dismissing a nuisance claim on political question grounds); *California v. General Motors Corp.*, No. C06-05755, 2007 U.S. Dist. LEXIS 68547 (N.D. Cal. Sept. 17, 2007) (following *American Electric Power Co.*, and dismissing a nuisance case against automakers).

225. See *supra* Part II.B.3.

environmental assessment laws generally govern only new discretionary decisions by government agencies, statutes like AB 32 can address purely private actions and can regulate emissions that follow solely from past decisions.²²⁶ The AB 32 program offers the potential benefits of centralized regulation, including the economies of workload and communication that generally follow from delegating responsibility to a single agency. Agencies implementing statutes like AB 32 also may have a diversity of regulatory instruments at their disposal. For example, within the few limits set by AB 32 and by traditional administrative law constraints, CARB can ban practices or products, order monitoring and reporting, establish markets, and generally select, apply, and enforce whatever regulatory instruments it determines will achieve the statutory caps most efficiently.²²⁷ Under CEQA, by contrast, each agency must perform its own studies, identify its own impacts, generate its own avoidance or mitigation measures, and engage in its own monitoring to ensure those measures' effectiveness, and no centralized authority enforces those obligations. Finally, laws like AB 32 offer the possibility of an enforceable cap on emissions, which could be an important feature if, as is likely, domestic climate change laws become part of the implementation infrastructure for international emissions-reduction commitments. Environmental assessment laws, by contrast, create no overall caps, and their project-by-project applicability makes overall reductions difficult to predict with any quantified specificity. A skeptic might therefore ask what laws like CEQA really can add.

The answer, as explained below, is quite a lot. Even statutory schemes that purport to be comprehensive—and AB 32 does not—rarely function that way, and environmental assessment laws can help limit or compensate for the “slippage” that inevitably occurs.²²⁸ Environmental assessment laws can adapt to new environmental problems, and their amenability to dispersed enforcement allows a breadth of coverage exceeding that achievable under a law implemented solely through the efforts of a single agency. By

226. See *County of Inyo v. Yorty*, 108 Cal. Rptr. 377, 383–86 (Cal. Ct. App. 1973) (considering CEQA's applicability to a change to an existing project).

227. CAL. HEALTH & SAFETY CODE §§ 38560-74 (West Supp. 2007) (requiring the CARB to establish an emissions-reduction program, but establishing few constraints on that program's form).

228. See Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297 (1999).

allowing broad flexibility in selecting mitigation measures and alternatives, environmental assessment laws sometimes can improve environmental outcomes and spur innovative management at relatively low cost. The disclosure and dialogue they sometimes succeed in compelling can also bolster other regulatory approaches by providing regulatory agencies information and leverage points.²²⁹ And since laws like AB 32 are rare, environmental assessment laws can fill in where such complementary approaches are non-existent. Neither CEQA nor any other environmental assessment law is a regulatory panacea. Compliance does not come free, and environmental assessment laws have by no means served as perfect antidotes to poor environmental decision-making.²³⁰ Nevertheless, and as explained in more detail below, the potential benefits of applying environmental assessment laws to climate change are substantial, and at least in the context of climate change, many of the standard objections have little force. Environmental assessment laws therefore can provide valuable tools, which agencies, judges, and legislators should not hesitate to use.

A. The Necessity of Complementary Approaches

Individual statutes hardly ever provide comprehensive responses to environmental problems. Sometimes this is by design, as legislators attempt only a preliminary response, leaving comprehensive regulation for a later date.²³¹ Other gaps are inadvertent and unwanted. Understanding the scientific or economic foundations of a problem may prove difficult, and consequent mistakes can lead legislators to choose ineffective or

229. One need not be a full-fledged “NEPA optimist,” to use Professor Karkkainen’s term, to see some value in the acts’ procedural requirements. Based on experience as a NEPA and CEQA practitioner, the author thinks it is naïve to suppose that environmental impact studies or reports uniformly produce the kind of informed, open, pre-decisional dialogue for which NEPA proponents traditionally hope. But NEPA and CEQA processes do often focus attention on important environmental issues, create an imperfect but real forum for dialogue, lead to both small and significant beneficial project changes, and sometimes stop unwise projects from proceeding. See Adler, *supra* note 25 (describing a moderately successful, and in this author’s view typical, NEPA process).

230. See Sax, *supra* note 215 (conducting a case study in ineffectiveness).

231. See, e.g., CAL. HEALTH & SAFETY CODE §§ 38550-51 (West Supp. 2007) (requiring cutbacks only to 1990 emissions levels; a long-term solution probably will require significantly greater reductions).

insufficiently demanding regulatory instruments.²³² Funding mechanisms may leave implementing agencies short of the resources or leverage necessary to translate statutory aspirations into actual achievement.²³³ New problems may emerge, or old problems may prove more intractable than expected.²³⁴ Executive hostility to legislative mandates may result in those mandates simply being ignored. These problems seem to be particularly recurrent with first attempts at addressing problems. For example, the Clean Air, Clean Water, and Endangered Species Acts all required several iterations to reach their present form, and each, though highly successful in some respects, has provided only incomplete responses to the problems it was designed to resolve.²³⁵ As legislators begin drafting statutory remedies for climate change, they may learn from that history, but sometimes they may also be doomed to repeat it.

Exclusive reliance on one implementing agency or enforcement mechanism exacerbates the potential for gaps. Environmental laws are filled with provisions whose mandates long went un-enforced or under-enforced, and with regulatory programs that agencies have ignored or found themselves unable to implement.²³⁶ From unmet

232. For example, the State Implementation Plan-based regulatory system set up by the Clean Air Act has widely failed to ensure compliance with air quality standards. The system assumes that planning agencies will be able to predict with accuracy what regulatory measures will achieve compliance with air quality standards, but in practice offering such accurate predictions has often proved exceedingly difficult. See James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901 (2005).

233. See, e.g., *Ctr. for Biological Diversity v. Kempthorne*, 466 F.3d 1098, 1101 (9th Cir. 2006) (considering, and rejecting, the Fish and Wildlife Service's decision to refrain from listing a species because of an alleged funding shortage); Dave Owen, *The Disappointing History of the National Marine Sanctuaries Act*, 11 N.Y.U. ENVTL. L.J. 711 (2003) (contrasting Congressional aspirations for the National Marine Sanctuaries Act with actual achievements, and attributing the discrepancies partly to funding shortages).

234. Classic examples of this problem include unanticipated but huge increases in vehicle-miles traveled, which delayed Clean Air compliance by offsetting many of the gains from the act's technology standards. See Michael P. Vandenberg, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 557-59 (2004).

235. As discussed in the following notes and cited sources, many Americans live in areas that do not meet federal air quality standards; many American rivers do not comply with water quality standards; and while few species living in the United States have gone extinct since the Endangered Species Act ("ESA") was enacted, many have been listed, and few have recovered enough to no longer need the ESA's protections.

236. See Thompson, *supra* note 219, at 189-90 (describing compliance gaps); see also Farber, *supra* note 228 (same).

Clean Air Act deadlines²³⁷ to the troubled history of total maximum daily loads²³⁸ to the rarity of recovering endangered species,²³⁹ environmental statutes provide numerous cautionary examples demonstrating that just because a legislative body promulgates a mandate does not mean the mandate will be fulfilled.²⁴⁰ Sometimes implementation falls short because regulated parties use litigation to delay or block rulemaking or enforcement.²⁴¹ Politics and budgets also create limits. Indeed, because of such limitations, enforcement of mandates like the Clean Water Act's pollutant discharge prohibitions have sometimes defaulted largely to private organizations.²⁴² Scientific uncertainties also can create enforcement problems, as agencies struggle to assign responsibility and overcome burdens of proof. Consequently, when regulators confront any environmental problem, and particularly one with which they have little prior experience, it is naïve at best and cynical at worst to suggest that all eggs can safely go in one enforcement basket.

Similar gaps could easily emerge through the processes of implementing legislative responses to climate change.²⁴³ California's AB 32, for example, though a landmark law, does not purport to offer a complete response. Full compliance with the

237. See, e.g., Richard Lazarus, *The Tragedy of Distrust in the Implementation of Federal Environmental Law*, 54 LAW AND CONTEMPORARY PROBS. 311, 324 (1991) (describing failures to achieve goals set by the Clean Air Act); Oliver A. Houck, *More Unfinished Stories: Lucas, Atlanta Coalition, and Palila/Sweet Home*, 75 U. COLO. L. REV. 331, 386–87 (2004) (same).

238. *Natural Res. Def. Council v. EPA*, 915 F.2d 1314, 1316–17 (9th Cir. 1990) (describing the troubled early history of Congressional attempts to impose water quality standards); Oliver A. Houck, *TMDLs, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REP. 10,391, 10,401 (1997) (describing later failures to implement the Clean Water Act's program for achieving compliance with water quality standards).

239. Federico Cheever, *The Road to Recovery: A New Way of Thinking About the Endangered Species Act*, 23 ECOLOGY L.Q. 1 (1996) (describing the failure of the Endangered Species Act to promote species recovery, despite statutory provisions ostensibly designed to achieve that goal).

240. See Farber, *supra* note 228, at 299 (describing “slippage” as “a feature of environmental law so ubiquitous that we take it for granted”).

241. See, e.g., Thomas O. McGarity, *The Courts and the Ossification of Rulemaking: A Response to Professor Seidenfeld*, 75 TEX. L. REV. 525 (1997) (arguing that implementing rules are blocked with excessive frequency).

242. See Thompson, *supra* note 219, at 199–200 (describing water quality enforcement efforts by the Natural Resources Defense Council and others); Seidenfeld & Nugent, *supra* note 27, at 285.

243. In fact, California has already experienced difficulty implementing climate change legislation. See *Arnie's Uphill Climb*, *supra* note 102.

statute would reduce California's GHG emissions only to 1990 levels, but even in 1990 California's emission levels were unsustainable; experts predict that far steeper reductions will be necessary to stabilize the climate.²⁴⁴ Consistent with that limited goal, the statute expressly declines to occupy the regulatory field.²⁴⁵

Nor should full compliance, whether with AB 32 or with any other climate change statute, be assumed. CARB, the agency charged with implementing AB 32, has a poor record of attaining compliance with state and federal standards for other air pollutants.²⁴⁶ CARB's regulatory program may leave GHG sources unaddressed, either because the agency finds those sources too difficult, politically or practically, to regulate, or because it shies away from regulating sources outside its areas of traditional expertise.²⁴⁷ CARB may underestimate the degree of controls necessary to achieve the statutory goal, or the likelihood of obtaining compliance levels sufficient to fulfill those goals.²⁴⁸ Enforcement likewise could prove problematic, particularly if budgetary, legal, or political constraints delay CARB's ability to

244. See MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32, at I-4 (stating that "developed countries around the world will need to achieve" larger emissions reductions or face "very dangerous consequences"); Exec. Order S-3-05, *supra* note 83 (requiring larger emission cuts); Wigley, *supra* note 170, at 2285, 2288 (concluding that full compliance with the Kyoto Protocol, which establishes reduction targets similar to those of AB 32, will make only a small difference in climate change).

245. CAL. HEALTH & SAFETY CODE § 38592(a) (West Supp. 2007) ("All state agencies shall consider and implement strategies to reduce their greenhouse gas emissions."); *id.* at § 38592(b) ("Nothing in this division shall relieve any person, entity, or public agency of compliance with other applicable federal, state, or local laws or regulations, including state air and water quality requirements, and other requirements for protecting public health or the environment."); *id.* at § 38598 ("(a) Nothing in this division shall limit the existing authority of a state entity to adopt and implement greenhouse gas emissions reduction measures. (b) Nothing in this division shall relieve any state entity of its legal obligations to comply with existing law or regulation.").

246. Under the planning provisions of the CAA, CARB was responsible for developing plans to meet federal standards. See 42 U.S.C. §§ 7408–10. Despite CARB's efforts, air pollutants in most parts of California continue to exceed these standards. See OUR CHANGING CLIMATE, *supra* note 3, at 5 (describing California's present air quality problems).

247. For example, AB 32 implies that the State Board should focus initially on a subset of sources, see CAL. HEALTH & SAFETY CODE § 38530(b)(1), and for reasons of practicality and administrative efficiency the agency is likely to follow that directive. That means, however, that many smaller or more diffuse sources may escape regulation under AB 32, at least immediately and perhaps indefinitely, even though the aggregate effect of those smaller sources could be quite large.

248. See Farber, *supra* note 228, at 315–16 (noting that standards may be set based on erroneous assumptions of full compliance).

promulgate a regulatory program.²⁴⁹ None of these predictions assume any bad faith in CARB's implementation; as Professors DeShazo and Freeman explain, "[t]he task before the [CARB] is enormous, and substantial uncertainty remains about all of the hard issues"²⁵⁰ Nevertheless, this situation is far from atypical, and the unfortunate reality is that first statutory attempts at addressing major environmental problems, though indispensable, often fall short of achieving statutory goals.²⁵¹ The need for complementary approaches usually remains.²⁵²

B. The Functional Advantages of Environmental Assessment Laws

For several reasons, and in several ways, environmental assessment laws like CEQA can provide an important complementary regulatory approach, and their breadth of coverage and amenability to flexible compliance can facilitate effectiveness where other regulatory approaches fall short.

1. Breadth of Coverage

Unlike traditional centralized regulatory approaches, which typically focus on a limited set of problems, CEQA's scope is broad: it addresses threats to "the environment."²⁵³ That breadth of coverage allows adaptation to unanticipated environmental threats and reduces the risk of interstitial coverage gaps, because CEQA renders unnecessary debates about whether a particular type of environmental threat falls within the statutory scope.²⁵⁴ It likewise

249. See Thompson, *supra* note 219, at 190–92 (describing the challenges agencies face in monitoring compliance).

250. See DeShazo & Freeman, *supra* note 7, at 1533.

251. That problem is not unique to statutes, or to the United States. See, e.g., Tim Dyson, *On Development, Demography and Climate Change: The End of the World as We Know It?*, 27 POPULATION & ENV'T. 117, 132–33 (2005), available at <http://iussp2005.princeton.edu/download.aspx?submissionId=50222> (describing the failure of many nations to meet their obligations under the Kyoto Protocol).

252. Professors Freeman and Farber have put the point well: "success with every environmental problem . . . requires not only a suite of complementary regulatory tools and the coordination of multiple levels of government, but also a wide variety of informal implementation mechanisms and the ongoing participation of key stakeholders." Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 798 (2005).

253. See, e.g., CAL. PUB. RES. CODE §§ 21001 (g), 21002, 21002.1 (West 2007).

254. Such questions are ubiquitous in environmental litigation, and cases often turn not on whether a proposed action poses an environmental threat but rather on whether the threat is addressed by the particular statutory provisions at issue. See, e.g., *Sierra Club v. Abston Constr. Co.*, 620 F.2d 41 (5th Cir. 1980) (considering whether runoff qualified as a

avoids questions, much like those underlying the recent *Massachusetts v. EPA* litigation, about whether old statutes address new problems—if the problem is environmental, CEQA applies.²⁵⁵ That broad applicability can be invaluable in addressing a problem like climate change, which derives from the contributions of a diverse set of sources, not all of which CARB is likely to find the authority, political capital, or financial resources to regulate. CEQA, in short, can catch emissions that other regulatory programs would likely miss.

CEQA's traditional amenability to dispersed enforcement also provides a valuable backstop. CARB likely will face the same financial and human resource limitations that have left other regulatory agencies, including EPA, so heavily dependent upon citizen suits.²⁵⁶ Enforcement personnel may be few and may know little about most of the thousands of emissions-causing decisions around the state. Budgets will be limited, and CARB may find it has limited political capital to invest in enforcement actions likely to provoke vociferous opposition. CEQA can ease that burden by requiring other agencies to avoid GHG emissions without any initial direction or rulemaking from CARB.²⁵⁷ CARB also can use CEQA to complement its own enforcement efforts. CEQA processes can provide valuable information about emissions-causing decisions, and a CARB or EPA comment letter identifying deficiencies in an EIR's climate change discussion could spur prompt compliance. Lead agencies (and judges) tend to pay attention when expert agencies comment on problems with environmental reviews, and such comments can impel lead agencies to correct their environmental studies or bolster their

"point source" discharge subject to the Clean Water Act, with no suggestion that the point source determination would reflect the presence or absence of environmental harm). Likewise, some chemicals fall outside existing regulatory regimes not because they aren't harmful, but because no rule yet addresses the threat they pose. Environmental assessment laws generate their own threshold debates as well; most commonly, the key threshold question is whether sufficient discretion exists to trigger the laws' remaining requirements. *See, e.g., Dept. of Trans. v. Pub. Citizen*, 541 U.S. 752, 756 (2004). But those laws at least reach broadly enough to address any form of environmental threat.

255. 127 S. Ct. 1438 (2007). The merits turned on the question, answered in the negative by the D.C. Circuit but in the affirmative by the Supreme Court, whether CO₂ is a "pollutant" subject to the Clean Air Act, not whether CO₂ emissions are a cause of environmental damage.

256. *See* Thompson, *supra* note 219, at 190–92 (describing those limitations).

257. *See* CAL. PUB. RES. CODE § 21006 ("The Legislature finds and declares that this division is an integral part of any public agency's decisionmaking process . . .").

mitigation measures.²⁵⁸ Even without such agency participation, many projects will proceed under the watchful eye of community groups willing to use the CEQA process independently.

CEQA's age also provides advantages. Until CARB drafts and implements its regulatory program, no one will know how effective it will be, but past experience strongly suggests that it will produce mixed results, with areas of substantial progress but also significant glitches and gaps.²⁵⁹ Some key provisions may turn out to be difficult to enforce, and others may be ignored until CARB or non-governmental organizations establish a credible enforcement threat.²⁶⁰ CEQA, by contrast, has existed for decades. State and local agencies know its requirements and environmental groups, local governments, and the attorney general's office all have experience enforcing it. Courts are familiar with CEQA litigation and evince a basic understanding of the statute's purposes and goals.²⁶¹ It is by no means a perfect tool for compelling environmental compliance—between litigation costs and deferential standards of review, the odds generally favor an agency even where non-compliance exists²⁶²—but it is at least a familiar

258. See Michael C. Blumm & Lawrence R. Brown, *Pluralism and the Environment: The Role of Comment Agencies in NEPA Litigation*, 14 HARV. ENVTL. L. REV. 277 (1990); Adler, *supra* note 25, at 303–05 (describing EPA's participation in a NEPA process).

259. See *supra* notes 231–52 and accompanying text.

260. See *supra* notes 245–251 and accompanying text.

261. See, e.g., *Mountain Lion Found. v. Fish & Game Comm.*, 939 P.2d 1280, 1284 (Cal. 1997) (“CEQA is to be interpreted ‘to afford the fullest possible protection to the environment within the reasonable scope of the statutory language.’”) (quoting *Friends of Mammoth v. Bd. of Supervisors*, 502 P.2d 1049, 1056 (Cal. 1972)); *Laurel Heights Improvement Ass'n v. Regents of the Univ. of Cal.*, 764 P.2d 278, 281 (Cal. 1988); *Bakersfield Citizens for Local Control v. City of Bakersfield*, 22 Cal. Rptr. 3d 203, 232 (Cal. Ct. App. 2004) (emphasizing the costs of poor environmental review). The California Supreme Court has resolved cases in favor of environmental petitioners with far greater frequency than the U.S. Supreme Court, where no NEPA petitioner ever has won. See Jason Czarnezki, *Revisiting the Tense Relationship Between the U.S. Supreme Court, Administrative Procedure, and the National Environmental Policy Act*, 25 STAN. ENVTL. L.J. 3, 10 (2006); David C. Shilton, *Is the Supreme Court Hostile to NEPA? Some Possible Explanations for a 12-0 Record*, 20 ENVTL. L. 551 (1990).

262. While critiques of dispersed enforcement often seem premised upon the notion that plaintiffs need only show up in court to stop a project, as though judges hand out injunctions as readily as dentists provide toothbrushes, plaintiffs actually must take the risk of funding litigation. This is generally no small task for a non-profit group facing the resources of a government agency or private developer. The plaintiffs must tackle the difficult challenge of overcoming both procedural objections and deferential review to show that the defendant agency clearly did violate established law. See *Buzbee*, *supra* note 27, at 203 (“Citizen litigants cannot even begin a case, let alone win it, unless their preferences comport with several layers of political judgments that are part of duly enacted statutory law . . .”); CAL. PUB. RES.

one capable of producing immediate results.

None of the foregoing suggests that environmental assessment laws provide catch-all mechanisms for environmental protection. Other regulatory approaches can respond to some threats—particularly those deriving from completed projects—that environmental assessment laws do not redress. Many advantages follow from utilizing the centralized expertise and regulatory culture of a single implementing agency, rather than depending on the labors of many dispersed decision-makers, some of whom have little expertise in or commitment to environmental protection. The downside of dispersed enforcement can be uneven enforcement, with lawsuits reflecting parochial concerns rather than a coherent regulatory agenda. For all of these reasons, laws like CEQA do not obviate the need for laws like AB 32. But imperfection is the hallmark of environmental protection laws, and so long as comprehensive statutory responses are unavailable, reliance on complementary approaches will be indispensable to efforts to resolve any substantial environmental problem. As role players, if not the stars, in the game of environmental protection, environmental assessment laws like CEQA can add essential complements to a regulatory portfolio.

Likewise, none of the foregoing discussion suggests that laws like CEQA obviate the need for a comprehensive and binding international scheme. The coverage created by environmental assessment laws, though in some ways extensive, is nowhere near sufficient to create a comprehensive response to climate change. But an international scheme, if ultimately enacted, still will require implementing legislation to become effective. Treaty-based emissions-reduction mandates are not likely to be self-executing without subsidiary domestic legal structures.²⁶³ Laws like CEQA can function as important parts of such implementing systems,

CODE § 21168.5 (West 2007) (establishing that judicial review “shall extend only to whether there was a prejudicial abuse of discretion”); *Laurel Heights Improvement Ass’n*, 764 P.2d at 283 (describing the deferential standards of review for CEQA cases). To actually obtain injunctive relief, the violation generally also must have been prejudicial. CAL. PUB. RES. CODE § 21005(b) (directing courts to “continue to follow the established principle that there is no presumption that error is prejudicial”). Projects generally are enjoined, in other words, only when it is fairly obvious that the approval process was illegal and a plaintiff had the money, determination, and persistence to do something about it, not just because a plaintiff woke up feeling litigious.

263. See, e.g., Dyson, *supra* note 251 (describing poor implementation of the Kyoto Protocol).

ensuring that they are more comprehensive and ultimately more effective at achieving national or international reduction targets than they would be if solely reliant on other regulatory approaches. And in the period before an effective international system comes into existence, laws like CEQA help fill the void.

2. The Feasibility and Flexibility of Compliance

Broad applicability and ready enforcement of a law are of little benefit if the law is not effective or if the burdens it imposes dwarf the benefits it produces. Some commentators have leveled just such a critique at environmental disclosure laws like CEQA, claiming that the information they produce is largely irrelevant to actual decisions and that the costs of preparing environmental studies do not justify the meager benefits produced.²⁶⁴ Neither critique applies particularly well to CEQA-based regulation of climate change contributions, however, because the benefits are important, and the burdens, though real, could be surprisingly small.²⁶⁵

a. Benefits

Most importantly, applying CEQA to climate change should limit GHG emissions. CEQA's procedural incentives should discourage projects with large emissions and encourage reformulation of lower-emissions projects because procedural compliance will be easier if lead agencies neutralize their GHG emissions.²⁶⁶ Similarly, CEQA's substantive mandate should ensure that even if agencies do not limit emissions at the beginning of their processes, they will be compelled to do so as a condition of project approval. While the resulting limitations will not eliminate California's contributions to climate change and will not address emissions from other states or countries, even the imposition of incremental limits on a problem

264. See, e.g., Sax, *supra* note 215 (offering the irrelevance critique); CONGRESSIONAL TASK FORCE, *supra* note 25, at 5 (summarizing the cost critique). But see Joseph L. Sax, *The Search for Environmental Rights*, 6 J. LAND USE & ENVTL. L. 93, 98 (1990) (reassessing irrelevance critique and stating that NEPA does sometimes provide important opportunities for participation).

265. What follows is not a quantitative cost-benefit analysis, which would be exceedingly difficult for even a trained economist to produce. It instead is a qualitative discussion of the likely benefits and burdens. But even that qualitative discussion should be sufficient to allow useful comparisons.

266. See *infra* notes 275–277 and accompanying text.

of such massive scale can create significant aggregate benefits. A miniscule-percentage change in the risk of extreme weather events, for example, can represent a significant number of lives saved if the risk is borne by billions of people throughout the world.²⁶⁷ Moreover, while one cannot simply presume that incremental actions in places like California will spur complete resolution of climate change problems—California’s actions create few constraints elsewhere²⁶⁸—those local efforts can test policy strategies, spur the development of mitigation technologies, and defuse the common moral argument that until the U.S. reduces its emissions, other nations have no obligation to reduce theirs.

CEQA also can improve the equity of other regulatory approaches. Environmental regulation often creates thorny fairness questions, particularly where a subset of contributors to a problem is asked to bear all of the regulatory burdens.²⁶⁹ Those fairness concerns could be acute if regulation is left solely to CARB, which may only have the political will and institutional capacity to impose reductions upon a subset of sources while giving other new sources a free ride. Because emissions-reduction mandates create a zero-sum game, all new emissions created by non-regulated projects will either push California further from achieving its reduction targets or require greater sacrifices by those who fall under AB 32’s regulatory program. Regulated groups that might chafe at differential treatment therefore ought to appreciate the more inclusive approach allowed by CEQA.²⁷⁰ Some unevenness in the

267. Impact is generally a product of the change in risk and the extent of exposure. Suppose a hypothetical project creates a risk increase of one additional death per billion people per year, but the increased risk is felt among six billion people worldwide. While that risk might seem negligible if it impacted only one hundred people, worldwide it would likely cause an additional six deaths per year, an adverse outcome that might vastly outweigh the benefits from the project.

268. To posit a possible causal relationship, however, is not implausible. California’s actions and innovations could help spur federal responses, and many commentators believe no broadly-inclusive response will occur so long as American inertia provides a rhetorical justification for inaction elsewhere. See *Everybody’s Green Now*, THE ECONOMIST, June 2, 2007, special report at 6, available at 2007 WLNR 10206078 (“If America continues to refuse to control its carbon dioxide emissions at the federal level, there is no chance that countries such as China and India, whose emissions will soon overtake America’s, will control theirs.”).

269. See Carol M. Rose, *The Story of Lucas: Environmental Land Use Regulation Between Developers and the Deep Blue Sea*, in ENVIRONMENTAL LAW STORIES, *supra* note 27, at 237, 239 (describing how environmental regulation often becomes focused on a subset of the people or entities responsible for environmental problems).

270. Those regulated by CEQA might see a different sort of unfairness: why, they might ask, should their development be subject to a no-net-emissions requirement, when the ten-

distribution of regulatory burdens is of course inherent in almost any governmental action, and achieving perfect fairness in climate change regulation will be impossible. But by broadening the scope of coverage, CEQA can at least reduce the consequent “why-me?” moments, when regulated parties claim they bear a disproportionate share of regulatory burdens.²⁷¹

Compliance with CEQA’s mandates can also generate other significant collateral benefits. Limiting GHG emissions can spur development of mitigation technologies, which in turn may boost California’s economy by turning the state into an incubator for green research and development.²⁷² Should California then export those technologies, the state may benefit doubly: first from the economic benefits of its exports and again from consequent reductions in GHG emissions elsewhere. Other secondary economic and environmental benefits may follow from measures to limit GHG emissions: Such measures often promote efficiency and incidentally mitigate other potential environmental harms. For example, reducing energy consumption saves money; minimizing driving limits traffic, noise, and other pollutant emissions; and reducing water consumption can leave more water in rivers, streams, and aquifers.²⁷³ Though the primary benefit of emissions limitations almost always will be the consequent reduction in

year-old development down the street faced no such obligation? The availability of offsets should somewhat mitigate that complaint, for grandfathered sources then become potential sellers; if those grandfathered sources can reduce CO₂ emissions cheaply, they can be paid to do so, and new projects may proceed at lower cost. But ultimately, the disparity arises from a reality fairly common in environmental law: activities initiated before awareness of a problem often receive more favorable treatment than activities initiated after the problem is widely perceived. See Heidi Gorovitz Robertson, *If Your Grandfather Can Pollute, So Can You: Environmental “Grandfather Clauses” and their Role in Environmental Inequity*, 45 CATH. U. L. REV. 131, 140-41 (citing multiple examples).

271. See Rose, *supra* note 269, at 260–61. This does not suggest that focused GHG emissions regulation would be likely to effect a taking, but instead that it might offend the fairness instincts that also motivate many takings claims.

272. See CAL. ENVTL. PROT. AGENCY, *supra* note 3, at 65.

273. In fact, some of the potential collateral benefits are sufficiently significant that environmental justice advocates have warned of the potential unfairness if emissions trading regimes concentrate GHG-reduction efforts disproportionately in wealthy areas, while leaving low-income communities unable to reap the beneficial consequences of localized GHG reduction. *E.g.*, DUTZIK & SARGENT, *supra* note 198, at 16–17. Not all emissions-limitation strategies create win-win outcomes for the environment, however. For example, while nuclear power plants produce hardly any greenhouse gas emissions, the waste they produce has, as the D.C. Circuit explained, “the potential to devastate public health and the environment.” *Nuclear Energy Inst. v. EPA*, 373 F.3d 1251, 1257 (D.C. Cir. 2004).

climate change, the collateral bonuses also can be significant.

b. Burdens

Though few people dispute the value of some environmental protection, the most common critique of environmental assessment laws alleges that compliance requires time and expense disproportionate to any benefits received.²⁷⁴ Such critiques are likely to be particularly prevalent where environmental assessment laws apply to climate change. Why, critics will ask, should agencies go through all the procedural hassle of EIR preparation, let alone the financial cost of installing mitigation systems, to address GHG sources that contribute only fractions of a percentage of the worldwide output? In practice, however, those compliance burdens can be lower than some critiques of environmental assessment laws might suggest.

In most circumstances, proactive mitigation can minimize procedural compliance costs. An agency must prepare a full EIR only if its project may have significant adverse environmental impacts. Therefore, by committing at the outset to full mitigation of the project's contribution to any potentially significant impact, the lead agency can proceed on the basis of a "mitigated negative declaration," thus avoiding the expense and delay of EIR preparation.²⁷⁵ For example, if an agency's proposed project would annually emit 100 tons of GHGs, but the agency commits to on-site measures that avoid fifty tons of those emissions and purchases offsets that verifiably balance the remaining fifty tons, the agency will not be legally obligated to prepare an EIR (unless some other potentially significant impact remains). The agency still must do some work: It must prepare an "initial study," and a "mitigated negative declaration," and in order to offset its GHG emissions, it must calculate what those emissions will be. These obligations, however, are significantly less extensive than those involved in preparing a full-scale EIR.²⁷⁶ Consequently, for most CEQA projects and for an overwhelming majority of NEPA projects, lead agencies take exactly that course in addressing other

274. *E.g.*, CONGRESSIONAL TASK FORCE, *supra* note 25, at 5; Karkkainen, *supra* note 25, at 341–42 (describing this critique).

275. *See* CAL. CODE REGS. tit. 14, §§ 15065(b)(1), 15369.5 (2005).

276. *See* CAL. PUB. RES. CODE § 21081.6 (West 2007).

environmental impacts.²⁷⁷ By adopting all feasible on-site mitigation techniques and offsetting any potential impacts that remain—something agencies will often be obligated to do anyway at the end of the CEQA compliance process²⁷⁸—agencies can ensure that potential climate change contributions never create an obligation to prepare an EIR.

Even when agencies do prepare EIRs, a discussion of climate change contributions usually should add only moderately to the resulting expense. Tools are available online for calculating carbon footprints,²⁷⁹ and lead agencies also can piggyback their GHG emissions calculations on work they already must do to calculate energy consumption,²⁸⁰ traffic generation, and emissions of other air pollutants.²⁸¹ Some projects will require more than a ready-for-download analytical method, and some emissions may remain difficult to calculate precisely.²⁸² Nevertheless, as climate change regulation becomes more widespread and as carbon markets develop, the availability and sophistication of emissions-assessment tools should only increase.²⁸³ Likewise, discussions of the aggregate effects²⁸⁴ of GHG emissions could be essentially boilerplate. Every GHG-emitting project ultimately contributes to

277. See Karkkainen, *supra* note 109, at 932–37.

278. See *infra* Parts III.A.3, III.B.3.

279. See, e.g., California Climate Action Registry, Protocols, at <http://www.climateregistry.org/PROTOCOLS/> (last visited June 12, 2007) (providing links to protocols for assessing emissions).

280. See CEQA Guidelines App. F, available at http://www.ceres.ca.gov/topic/env_law/ceqa/guidelines/Appendix_F.html (last visited June 11, 2007).

281. The same fossil fuel combustion activities responsible for most of California's GHG emissions also emit conventional pollutants like nitrogen dioxide, particulate matter, and volatile organic compounds. Projects in non-attainment areas, which include most of California, generally must address those emissions as part of EIR preparation. See, e.g., *Kings County Farm Bureau v. City of Hanford*, 270 Cal. Rptr. 650, 660–64 (Cal. Ct. App. 1990) (addressing an EIR's discussion of pollutant emissions).

282. For example, calculating how land use changes will affect emissions may create some tricky causality questions, and views may differ on the extent to which emissions can be attributed to specific projects rather than background trends. But the fact that some contributions are uncertain does not vitiate the obligation to discuss those contributions that are reasonably foreseeable.

283. See CAL. HEALTH & SAFETY CODE § 38530 (West Supp. 2007) (providing for emissions inventorying and monitoring).

284. The basic premise of a cumulative impacts analysis is that aggregate, not individual, effects matter. An argument that a project's contribution cannot be significant because no one can identify a specific temperature increase, storm event, or other environmental result uniquely attributable to that project therefore would miss the whole point of the focus on cumulative impacts.

the same set of cumulative impacts, and those impacts are amply described in a large and growing set of reports, many available on-line and written to be accessible to lay audiences.²⁸⁵

Actual physical avoidance of GHG emissions is not cost-free, but CEQA's substantive mandate comports with what many environmental law scholars have described as a model method for efficiently achieving environmental protection. Since the 1970s, many legal and economic scholars have blasted technology-based, "command-and-control" environmental laws as inefficient and undemocratic. They argue that environmental laws instead should define performance standards and allow regulated parties flexibility, including access to emissions-trading systems, in achieving those standards.²⁸⁶ Environmental markets, they argue, and a willingness to allow diverse compliance mechanisms would create innovation incentives, allow lower-cost allocations of regulatory burdens, and focus government attention on more fundamental questions about regulatory goals and allowable pollutant levels rather than individual process technologies.²⁸⁷ Those critiques have been controversial, with other scholars arguing that a traditional approach was reasonably functional, that actual practice bore little correspondence to system described in the reformers' critique,²⁸⁸ or that the promise of markets is often exaggerated.²⁸⁹ Nevertheless, a restrained version of the reformers' core argument seems intuitive and has some empirical support.²⁹⁰ Market-based approaches often enjoy political support from groups that otherwise might be hostile to regulation, and they pervade

285. See, e.g., IPCC, IMPACTS, ADAPTATION, AND VULNERABILITY, *supra* note 4; OUR CHANGING CLIMATE, *supra* note 3; CAL. ENVTL. PROT. AGENCY, *supra* note 3.

286. See, e.g., Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985); Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVTL. L. 171 (1988). The Ackerman and Stewart articles are part of a substantial body of similar scholarship.

287. See Ackerman & Stewart, *Reforming Environmental Law*, *supra* note 286; Ackerman & Stewart, *The Democratic Case for Market Incentives*, *supra* note 286.

288. See Farber, *supra* note 228, at 316.

289. See, e.g., Howard Latin, *Ideal versus Real Regulatory Efficiency: Implementation of Uniform Standards and 'Fine-tuning' Regulatory Reforms*, 37 STAN. L. REV. 1267 (1985); see also Salzman & Ruhl, *supra* note 197 (analyzing factors affecting the effectiveness of environmental trading systems).

290. The most often-cited example of a successful market-based approach to environmental regulation is the acid rain program enacted as part of the 1990 Clean Air Act amendments. See, e.g., Salzman and Ruhl, *supra* note 197, at 621.

proposals for climate change regulation.²⁹¹

Though its enactment preceded the post-command-and-control scholarship, CEQA's substantive mandate establishes a regulatory methodology in some ways quite similar to what those reformers advocated. It defines a functional standard for substantive outcomes: projects shall not cause significant environmental impacts if those impacts are feasibly avoidable.²⁹² Other than mandating that mitigation commitments be verifiable and enforceable,²⁹³ however, it establishes few constraints on the methods agencies use to achieve those goals. Agencies can re-design projects, use any kind of on- or off-site mitigation, impose technology controls, create market mechanisms and other economic incentives, or invent some other technique. They just have to show that their chosen mechanisms will work. Indeed, many would argue that CEQA allows too much flexibility. It is rarely easy to monitor whether mitigation actually is working,²⁹⁴ and projects therefore may slide through the CEQA process based on credible but ultimately inaccurate assurances that mitigation programs will succeed.²⁹⁵ But if stakeholders and courts remain alert to the reality that real mitigation requires effective monitoring and enforcement structures,²⁹⁶ CEQA should allow creativity in selecting or developing cost-effective mitigation techniques without compromising environmental protection. Such flexibility cannot eliminate procedural compliance costs, but it can reduce them.

291. MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32, at ES-5 ("Emission offsets provide an opportunity for cost-savings and economic development, and thus should be included under conditions that reduce the prospects for fictional emissions reductions and inefficient revenue transfers."); DeShazo & Freeman, *supra* note 7, at 1540-45 (predicting that environmentalists and industry will advocate cap-and-trade programs); Engel, *supra* note 163, at 1565 (arguing that offsets present efficiency advantages, and could also help spur the development of a broader emissions market).

292. See CAL. PUB. RES. CODE § 21081 (West 2007).

293. See *City of Marina v. Bd. of Trs. of Cal. State Univ.*, 138 P.3d 692, 707 (Cal. 2006).

294. CEQA requires agencies to develop programs to monitor the effectiveness of any mitigation measures used to support a mitigated negative declaration, and requires that those measures be "fully enforceable." See CAL. PUB. RES. CODE § 21081.6. Nevertheless, attention to compliance with mitigation measures may be significantly less than attention to initial decisions, and mitigation conditions may be modified or deleted if an agency finds them "impracticable or unworkable." *Lincoln Place Tenants Assn. v. City of Los Angeles*, 31 Cal. Rptr. 3d. 353, 366-67 (Cal. Ct. App. 2005).

295. See Karkkainen, *supra* note 109, at 908 (identifying this threat with mitigated FONSI, which are the NEPA equivalent of mitigated negative declarations).

296. *E.g.*, *Lincoln Place Tenants Assn.*, 31 Cal. Rptr. 3d. at 366-67 (finding illegal a city's failure to comply with earlier mitigation measures); see CAL. PUB. RES. CODE § 21081.6.

That flexibility also can turn CEQA into an engine for innovation. By requiring many agencies to comply but allowing compliance in many different ways, CEQA can create incentives to develop and sell innovative GHG-mitigation techniques or technologies. It therefore can spur renewable-energy and green-development businesses, potentially creating stronger domestic markets for greenhouse mitigation products.²⁹⁷ As climate regulation progresses elsewhere, those technologies could be marketed profitably beyond the state's borders.²⁹⁸ Such markets could aid California in multiple ways—first, by boosting in-state businesses, and second, by lowering barriers to emissions limitations elsewhere.

C. The Logic of Non-Exclusive Local Control

The other likely objections to CEQA-based climate change regulation address not the burdens or benefits of environmental assessment laws, but rather the efficacy or even constitutionality of addressing a global problem through localized legal regimes. Local agencies, skeptics may suggest, have neither the authority nor the competence to address a problem with so many international dimensions, and response efforts ought to come from the federal or even international level. In its most extreme version, the argument suggests that local regulation will make climate change worse: by regulating internally, California might reduce the federal government's bargaining chips in international negotiations.²⁹⁹ In various forms, these theories have often been tested in climate change litigation, and such tests are likely to continue.³⁰⁰

297. *See supra* notes 80–83 and accompanying text (describing studies asserting that climate change regulation will substantially benefit the California economy).

298. *See id.*

299. *See, e.g.*, Transcript of Oral Argument at 50, *Massachusetts v. EPA*, 127 S. Ct. 1438, (2007) (No. 05-1120) (question from Justice Scalia) (“If we have done everything we can to reduce CO₂, you know, what deal do we make with foreign nations? What incentive do they have to go along with us?”). That argument is difficult to square with the Bush Administration's rhetorical endorsement of domestic emissions reductions. *See Green Mtn. Chrysler Plymouth Dodge Jeep v. Crombie*, 508 F. Supp. 2d 295, 396 (D. Vt. 2007) (“The United States has praised such efforts to the international community.”).

300. *See, e.g.*, *Cent. Valley Chrysler-Jeep Inc. v. Witherspoon*, No. CV-F-04-6663, 2005 U.S. Dist. LEXIS 26536, *4 (E.D. Cal. Oct. 20, 2005) (describing arguments made in the automakers' challenge to California's regulation of automotive GHG emissions); *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (dismissing a nuisance claim on political question grounds); *Massachusetts v. EPA*, 127 S.Ct. 1438 (2007) (rejecting standing arguments and arguments that presidential foreign policy powers

Nevertheless, those critiques wither under close examination, for CEQA asks local agencies only to analyze and address the consequences of their own actions, a task that exceeds neither local authority nor local competence.

While climate change is global, and climate change regulation does have international dimensions, CEQA's provisions fall well within the state's traditional regulatory power. CEQA governs only actions taken within California. Neither the statutory text nor any reported judicial decision purports to apply CEQA to decisions made or actions taken beyond the state's borders. Moreover, the triggers for CEQA's applicability—discretionary decisions by state and local government agencies—should further preclude charges of usurpation of other authority.³⁰¹ Absent directly contrary federal authority, states clearly can control the actions of their own political subdivisions, and federal jurisprudence has generally protected that prerogative.³⁰²

The fact that intrastate CEQA enforcement will limit cross-border benefits provides no reason for limiting that authority. Local actions clearly do have consequences outside California, and those consequences explain in part the significance of GHG emissions and the importance of addressing them.³⁰³ Nevertheless, a state law with cross-border impact is not at all unprecedented; many air or water pollution control rules benefit downwind or downstream jurisdictions. Such rules also are not unfair or politically suspect. While legal doctrines like the dormant commerce clause protect against state actions that unfairly protect in-state interests at others' expense, there is little reason to fear state laws that impose in-state obligations and create out-of-state benefits.³⁰⁴ Such laws simply require acting as a good neighbor.

Nor does CEQA's applicability to climate change threaten to improperly interject state or local agencies into international affairs. As a legal matter, state action does not constrain the ability

allowed EPA to avoid regulating GHG emissions); *Friends of the Earth v. Watson*, No. C 02-4106, 2005 U.S. Dist. Lexis 42335 (N.D. Cal. Aug. 23, 2005) (rejecting a challenge to the plaintiffs' standing).

301. See CAL. PUB. RES. CODE § 21000(g), 21002, 21002.1 (West 2007) (directing CEQA's mandates at the conduct of state and local agencies).

302. See, e.g., *New York v. United States*, 505 U.S. 144 (1992).

303. See IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4 (explaining those effects, and how they come about).

304. See, e.g., *Philadelphia v. New Jersey*, 437 U.S. 617 (1978).

of the federal government or of other nations to act on a broader scale. As a practical matter, state-based climate change regulation obviously does have some international effects—that is partly the point—but the mere existence of such effects does not imply any improper intrusion into foreign policy. Almost any state law could conceivably have some international effect, and few people would suggest that states should forfeit their police powers if exercising those powers might have a negative effect on trade, immigration, or some other subject of international discussion.³⁰⁵ The effects also may not be negative. California's efforts to curb GHG emissions may encourage efforts in China, India, or elsewhere; technological innovations may help lower the cost of reducing emissions elsewhere and thus reduce opposition to regulation. At the very least, such efforts may blunt arguments that America is in no moral position to ask other countries to act.³⁰⁶

Though the ultimate problem is in some ways global, the analyses required by CEQA also fall within the traditional realm of local agencies. With occasional assistance from agencies expert in air quality management, those local agencies generally will be well positioned to predict the quantity of GHGs their own projects could emit and to devise methods for avoiding such emissions.³⁰⁷ They are likely to be more familiar with proposed projects than any other governmental entity, and traditionally they are responsible for predicting the traffic patterns, energy consumption, and other consequences that follow from their planning decisions.³⁰⁸ Establishing the link between emissions and the larger problem of climate change has become similarly straightforward; local officials can simply rely on any one of an increasing number of reports prepared for policy-making audiences.³⁰⁹

305. See generally Merrill, *supra* note 224, at 328 (discussing federal nuisance claims: "A suit brought by legal officers of American States against American defendants under a cause of action based on American common law is not pre-empted just because a favorable outcome in the action might have reverberations or ramifications for the conduct of American foreign policy.").

306. See THE ECONOMIST, *supra* note 268, at 6 (asserting that China will do nothing significant if the U.S. does not act first).

307. See *supra* note 258 and accompanying text (discussing the ability of expert agencies to influence CEQA and NEPA processes by submitting comments).

308. See *supra* note 138 and accompanying text.

309. See, e.g., IPCC, THE PHYSICAL SCIENCE BASIS, *supra* note 4; OUR CHANGING CLIMATE, *supra* note 3; MANAGING GREENHOUSE GAS EMISSIONS, *supra* note 32; PEW CENTER FOR GLOBAL CLIMATE CHANGE, *supra* note 31.

IV. CONCLUSION

To date, academic discourse has given very little attention to the role environmental assessment laws could play in responding to climate change. While practicing lawyers are increasingly testing that possibility,³¹⁰ academics have primarily focused on the possibility of new legal regimes. Moreover, academic inquiry into traditional legal mechanisms has largely focused on the tort system.³¹¹ Among scholars, if not among the bar, the possibility that laws like CEQA or NEPA could help has generally been ignored.

The lack of focus on environmental assessment laws is not entirely surprising; as this article has explained, those laws cannot provide a stand-alone response to climate change. The creation of new legal mechanisms and the use of a range of other, older mechanisms will likely prove necessary to any sort of comprehensive response. The various frustrations with environmental assessment laws generally, and with NEPA in particular, may also explain why academics have focused their attention elsewhere. Many policymakers view these laws as procedurally onerous and many environmental advocates consider them substantively weak. The group that views the laws as important mechanisms for major change, though it exists, is probably small.³¹²

Nevertheless, environmental assessment laws can play an important and valuable role. California's CEQA provides a good example of the possibilities. By requiring government agencies to disclose their projects' potential contributions to climate change, CEQA can generate information about sources of GHG emissions. Its procedural requirements create powerful incentives toward minimizing or offsetting those emissions; if the agency can avoid or neutralize a project's contribution, no EIR will be necessary. By requiring implementation of feasible mitigation, CEQA adds prohibition to incentive. Through its scope of coverage and traditional amenability to dispersed enforcement, CEQA extends its requirements broadly. Despite establishing those strong

310. See Gerrard, *supra* note 21 (describing pending litigation).

311. *E.g.* Engel, *supra* note 163 (considering tort remedies); Merrill, *supra* note 224.

312. See Karkkainen, *supra* note 25, at 338–42 (describing perspectives on NEPA); Sax, *supra* note 215, at 239.

prohibitions, CEQA also reserves flexibility and allows agencies broad discretion in choosing mitigation measures. In sum, those features can reduce emissions while allowing reductions to occur in creative, low-cost ways.

CEQA's mandates still do not add up to a comprehensive regulatory scheme. Some other approaches will be necessary to address existing emissions sources and to fill the gaps where CEQA compliance slips. But if even moderately well-enforced, laws like CEQA can change many projects, some in small and some in major ways. They can help turn emissions minimization into a more pervasive societal practice, and can thus provide valuable complements to other regulatory approaches.

