

SUSTAINABLE BUILDINGS AND COMMUNITIES: CLIMATE CHANGE AND THE CASE FOR FEDERAL STANDARDS

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The current ad hoc, disjointed approach to climate change mitigation in the United States at state, regional, and local levels, while inspiring, is inevitably going to be too little, too late. This Article reviews current state and local efforts to reduce greenhouse gas emissions in the building, land use, and transportation sectors. This Article focuses on these sectors because they are critical to U.S. greenhouse gas reduction efforts, constituting approximately 83% of total U.S. greenhouse gas emissions. The Article critically analyzes current federal proposals and other possible legislative changes, and ultimately proposes, among other things, that the U.S. establish a mandatory federal building code, as well as regulate greenhouse gases through State Implementation Plans (SIPs) under the Clean Air Act, which has an established and effective enforcement system.

If subject to regulation under the Clean Air Act's SIP process, it is likely that states would have no choice but to commit to regulatory efforts to reduce greenhouse gas emissions in the building, land use, and transportation planning sectors in order to meet emission reduction targets. Federal approval of state plans would then need to evaluate whether states have a regulatory system in place that will ensure that federally approved state plans will be implemented at the local level.

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This proposal would ultimately affect many community design concerns including net density, street connectivity, and the mixing of land uses.

INTRODUCTION 336

I. STATUS SUMMARY: GREENHOUSE GASES 337

II. BUILDING CODES 343

 A. *Enormous Potential for Change in the Building Sector* 343

 B. *Status of Government Action on Building Codes at the Federal and State Level*..... 345

 C. *City and County Building Code Efforts* 348

 D. *Effective Green Building Possible at Minimal Cost*... 349

 E. *State and Local Building Codes are Inadequate*..... 353

 F. *The AESCA Proposes a Strong Federal Mandate and Program for Strengthening Building Codes* 356

III. SMARTH GROWTH STRATEGIES: LAND USE AND TRANSPORTATION..... 361

 A. *Enormous Potential for Change through Smart Growth* 361

 B. *State Climate Action Plans and Smart Growth* 366

 C. *Land Use and Transportation Planning: The ACESA is Not Strong Enough* 371

IV. REGULATING GREENHOUSE GASES UNDER THE CLEAN AIR ACT 373

 A. *Another Option to Force Change in the Building, Land Use, and Transportation Sectors*..... 373

 B. *Despite Past Performance, The CAA Could be an Effective Vehicle to Force Regulation of Land Use and Transportation Planning* 376

V. A PLAN TO MOVE FORWARD 378

 A. *The Building Sector* 379

 B. *Land Use and Transportation Sectors* 380

CONCLUSION..... 382

INTRODUCTION

Time is running out to avoid catastrophic consequences of climate change. The current ad hoc, disjointed approach to climate change mitigation at the state, regional, and local level, while inspiring, will inevitably be too little, too late. Focusing on demand side management in the building, land use, and transportation sectors, this Article argues that the federal government must take more aggressive action in these areas. The federal government must make stronger use of its regulatory and spending powers to better realize climate change mitigation progress nation-

wide. This Article reviews current proposals and other possible legislative changes that would better enable the United States to meet its climate change mitigation obligations. Radical regulatory change in the U.S. is essential to meet scientifically supported greenhouse gas emission reduction targets. The U.S. is already late in its efforts, and if, as the Obama Administration suggests,¹ the U.S. indeed plans on being a global leader as opposed to a laggard in climate change policy, it must act now.

This Article begins by reviewing the urgency of the situation as noted by climate change scientists. It briefly reviews the history of U.S. global greenhouse gas reduction efforts, and discusses the enormous potential for mitigation of greenhouse gas emission through regulation in the building, land use, and transportation planning sectors. This Article reviews the status of voluntary state and local efforts in these sectors, and concludes with a discussion of federal opportunities to “force” climate change mitigation at state, regional, and local levels. This Article discusses and evaluates proposed and possible federal legislative changes, including the building and transportation components of a comprehensive greenhouse gas reduction bill, the American Clean Energy and Security Act of 2009 (ACESA), recently passed by the House of Representatives.² While some of the proposals in this Article may seem extreme, the consequences of failing to act are too great to do any less.

I. STATUS SUMMARY: GREENHOUSE GASES

Significant global warming is unavoidable. The U.S. Public Interest Research Group (PIRG) noted in 2007 that “[t]he past nine years have all been among the twenty-five warmest for the contiguous United States, a streak unprecedented in the historical record.”³ Climate change has altered weather patterns and led to record droughts in the U.S. South and Southwest.⁴ Researchers predict a sea level rise of at least a meter by 2100 due to the expansion of oceans from higher temperatures and the addition of freshwater from melting glaciers, polar ice, and ice caps.⁵ The director for the Center for Environment and Population observed:

¹ See John Broder, *Obama Affirms Climate Change Goals*, N.Y. TIMES, Nov. 19, 2008, at A4.

² The American Clean Energy and Security Act, H.R. 2454, 111th Cong. (1st Sess. 2009). The bill also limits the application of the Clean Air Act provisions concerning hazardous pollutants to the greenhouse gases. See, e.g., *id.* § 832–33.

³ U.S. PIRG EDUC. FUND, *THE CARBON BOOM: STATE AND NATIONAL TRENDS IN CARBON DIOXIDE EMISSIONS SINCE 1990* 4 (2007), available at <https://www.uspirg.org/uploads/up/WJ/upWJ1agKj7szel-OU5n11A/carbonboom07.pdf>.

⁴ See VICTORIA MARKHAM, CTR. FOR ENV'T. & POPULATION, *U.S. POPULATION, ENERGY & CLIMATE CHANGE 15* (2008), available at <http://www.cepnet.org/documents/USPopulationEnergyandClimateChangeReportCEP.pdf>.

⁵ *Id.* at 17.

Average annual U.S. temperatures are over two degrees Fahrenheit higher than a century ago. There is increased frequency of severe weather events (such as rainstorms, heat waves and hurricanes), and major shifts in U.S. growing seasons and in the ranges of plant and animal species. Climatic change is causing the spread of vector-borne diseases rarely seen in the U.S., such as malaria and dengue fever. The nation's freshwater resources are more prone to drought and the consequences of less mountain snow pack. Glaciers are retreating, sea ice is melting, and sea level is rising.⁶

The World Glacier Monitoring Service (WGMS), a center based at the University of Zurich in Switzerland supported by the U.N. Environment Program (UNEP), has been tracking glaciers for over a century.⁷ Data from close to thirty reference glaciers in nine mountain ranges indicate that between "2004–2005 and 2005–2006 the average rate of melting and thinning more than doubled."⁸ According to Prof. Dr. Wilfried Haeberli, Director of the WGMS: "The latest figures are part of what appears to be an accelerating trend with no apparent end in sight."⁹

In 1992, when President George H.W. Bush attended the second Earth Summit, the United Nations Conference on Environment and Development, the initial approach was to use voluntary efforts to reduce greenhouse gas emissions to 1990 levels by the year 2000.¹⁰ Later, the U.S. negotiators in Kyoto agreed to a binding 7% reduction in emissions below 1990 levels by 2012.¹¹ The treaty was never ratified by the U.S.¹² In the years that followed, emissions continued to rise.¹³ By 1997, U.S. emissions had risen over 1990 levels by more than 8%.¹⁴ In 2000, President George W. Bush flatly rejected the Kyoto Protocol.¹⁵ The Bush Administration later announced a voluntary "greenhouse gas intensity" target to reduce the ratio of greenhouse gas emissions to U.S. economic

⁶ *Id.* at 5.

⁷ See ScienceDaily.com, *Glaciers Are Melting Faster Than Expected, UN Reports*, <http://www.sciencedaily.com/releases/2008/03/080317154235.htm> (last visited Nov. 24, 2009).

⁸ *Id.*

⁹ *Id.*

¹⁰ Eileen Claussen, President, Pew Ctr. on Global Climate Change, Remarks at the 4th Annual Dartmouth Student Sci. Cong., Tackling Climate Change: 5 Keys to Success (May 2, 2003), available at http://www.pewclimate.org/press_room/speech_transcripts/may022003.cfm.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

output, or GDP, by 18%.¹⁶ By 2001, U.S. greenhouse gas emissions were up 11.9% over 1991 levels.¹⁷ As of 2007, U.S. greenhouse gas emissions from human sources had increased an estimated 16.7% from 1990 levels.¹⁸

The levels of carbon dioxide (CO₂) in the atmosphere have now increased from a pre-industrial level of about 284 parts per million (ppm), to more than 380 ppm today.¹⁹ In its benchmark 2007 report, the Intergovernmental Panel on Climate Change (IPCC) said that “the key for preventing dangerous global warming was to keep CO₂ concentrations below 450 ppm.”²⁰ According to a climate modeling study by the National Center for Atmospheric Research, “even if we hold carbon dioxide levels to 450 ppm global temperatures would [still] increase by 0.6 degrees Celsius (about 1 degree Fahrenheit) above current readings by the end of the century.”²¹ The study reported that other impacts would include:

- Sea level rise due to thermal expansion as water temperatures warmed would be 14 centimeters (about 5.5 inches) instead of the predicted 22 centimeters (8.7 inches) rise that will occur if emissions continue on their current trajectory. Significant additional sea level rise would be expected in either scenario from melting ice sheets and glaciers.
- Arctic ice in the summertime would shrink by about a quarter in volume and stabilize by 2100, as opposed to shrinking at least three-quarters and continuing to melt. Some research has suggested the summertime ice will disappear altogether this century if emissions continue on their current trajectory.
- Arctic warming would be reduced by almost half, helping preserve fisheries and populations of sea birds

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., EMISSIONS OF GREENHOUSE GASES IN THE UNITED STATES 2007 1, available at [http://www.eia.doe.gov/oiaf/1605/ggprpt/pdf/0573\(2007\).pdf](http://www.eia.doe.gov/oiaf/1605/ggprpt/pdf/0573(2007).pdf) [hereinafter U.S. DEP'T OF ENERGY, GREENHOUSE GASES 2007].

¹⁹ Univ. Corp. for Atmospheric Res., *Global Warming: Cuts in Greenhouse Gas Emissions Would Save Arctic Ice, Reduce Sea Level Rise*, Apr. 14, 2009, available at <http://www.ucar.edu/news/releases/2009/greenhousecuts.jsp> (citing WARREN M. WASHINGTON ET AL., HOW MUCH CLIMATE CHANGE CAN BE AVOIDED BY MITIGATION 36 GEOPHYSICAL RESEARCH LETTERS L08703 (2009)).

²⁰ Marlowe Hood, *Top UN Climate Scientist Backs Ambitious CO₂ Cuts*, AGENCE FRANCE-PRESSE, Aug. 25, 2009, available at <http://www.google.com/hostednews/afp/article/ALeqM5hacayDuUcngLmhNkplHB5VtG5GNw>.

²¹ Univ. Corp. for Atmospheric Res., *supra* note 19.

and Arctic mammals in such regions as the northern Bering Sea.

- Significant regional changes in precipitation, including decreased precipitation in the U.S. Southwest and an increase in the U.S. Northeast and Canada, would be cut in half if emissions were kept to 450 ppm.
- The climate system would stabilize by about 2100, instead of continuing to warm.²²

The U.S. Climate Change Science Program has cited 450 ppm as an attainable target.²³ However, the U.N.'s top climate scientist, Rajendra Pachauri, chairman of the IPCC, recently gave his personal endorsement to the goal of keeping atmospheric CO₂ concentrations below 350 ppm.²⁴ There is increasing scientific and political support for the lower CO₂ target level of 350 ppm as evidence continues to mount that the 450 ppm level may be inadequate to avoid catastrophic climate change impacts.²⁵ If left unchecked, emissions are now on track to reach about 750 ppm by 2100.²⁶

Negotiations to establish a new international climate change mitigation treaty are underway, but progressing slowly. On December 19, 2009, President Obama attended world climate talks in Copenhagen.²⁷ This was the first presidential visit to the annual U.N. conference since President George H.W. Bush's 1992 trip to Rio de Janeiro.²⁸ At Copenhagen, President Obama worked with 115 leaders of developed and developing countries in the hopes of crafting a new climate change treaty.²⁹ However, dissension stymied movement toward a legally binding climate change treaty with strong emission reduction targets and mitigation mechanisms.³⁰ Nevertheless, the resulting voluntary agreement, the Co-

²² *Id.*

²³ *See id.* (discussing U.S. Climate Change Science Program's findings).

²⁴ Hood, *supra* note 20.

²⁵ *See, e.g.,* James Hansen et al., *Target Atmospheric CO₂: Where Should Humanity Aim?*, 2 OPEN ATMOSPHERIC SCI. J. 217, 218 (2008), available at <http://arxiv.org/ftp/arxiv/papers/0804/0804.1126.pdf>.

²⁶ Hood, *supra* note 20.

²⁷ *See* Jennifer Loven, *Obama Raced Clock, Chaos, Comedy for Climate Deal*, GUARDIAN, Dec. 20, 2009, available at <http://www.guardian.co.uk/world/feedarticle/8865608>.

²⁸ *See* Darren Samuelsohn, *Obama Weighing Appearance at Copenhagen Climate Talks*, HOYER SAYS, N.Y. TIMES GREENWIRE, June 4, 2009, <http://www.nytimes.com/gwire/2009/06/04/04greenwire-obama-weighing-appearance-at-copenhagen-climat-94106.html>.

²⁹ *See* INT'L INST. FOR SUSTAINABLE DEV., EARTH NEGOTIATION BULLETIN: SUMMARY OF THE COPENHAGEN CLIMATE CHANGE CONFERENCE: 7-19 DECEMBER 2009 27 (2009), available at <http://www.iisd.ca/download/pdf/enb12459e.pdf>.

³⁰ *See id.* at 28-29.

penhagen Accord,³¹ is viewed by most countries as a small but important step forward.³² The Accord sets a goal to limit global warming to less than 3.6 degrees Fahrenheit above the pre-industrial era,³³ and outlines a bottom-up approach whereby member countries submit their greenhouse gas reduction pledges for informational purposes to the Convention.³⁴ The Accord also sets out new measurement, reporting, and verification (MRV) requirements for developing countries, and provides mitigation funds to assist developing countries in reducing their greenhouse gas emissions.³⁵ In accordance with the Accord's January 31, 2010 deadline, 55 nations, accounting for 78% of global emissions, have restated previous pledges to reduce emissions.³⁶ The United States has pledged to reduce emissions in the range of 17 percent by 2020 as compared to 2005 levels.³⁷ Although encouraging, analysts have criticized the pledges as inadequate to contain global warming to less than 3.6 degrees.³⁸ For climate stabilization, the United States must, at a minimum, bring the CO2 level to approximately 33 percent below 1990 levels by 2030 to be on a path to a CO2 reduction of 60 to 80 percent by 2050.³⁹

Following the current trajectory, growth in greenhouse gases in the U.S. is expected to continue due in large part to continued growth in the U.S. economy, rapid growth in construction, increased travel from an estimated 70 million more residents (all with rising levels of personal consumption), and increased use of carbon intensive energy sources such as coal powered energy plants.⁴⁰ The United States, while representing only 5% of the global population, contributes nearly 25% to total global greenhouse gas emissions.⁴¹ The U.S. population has more than doubled

³¹ United Nations Framework Convention on Climate Change, Copenhagen Accord, FCCC/CP/2009/L.7 (Dec. 18, 2009), available at <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

³² See INT'L INST. FOR SUSTAINABLE DEV., *supra* note 29, at 29.

³³ John M. Broder, *Most Countries Submit Emission Reduction Targets by Deadline*, N.Y. TIMES, Feb. 2, 2010, at A10.

³⁴ See *id.*

³⁵ See INT'L INST. FOR SUSTAINABLE DEV., *supra* note 29, at 29.

³⁶ Press Release, Framework Convention on Climate Change Secretariat, *UNFCCC Receives List of Government Climate Pledges* (Feb. 2, 2010), available at http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/pr_accord_100201.pdf

³⁷ Broder, *supra* note 33, at A10.

³⁸ *Id.*

³⁹ REID EWING, KEITH BARTHOLOMEW, STEVE WINKELMAN, JERRY WALTERS & DON CHEN, *GROWING COOLER: THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE 4* (Urban Land Institute 2008) [hereinafter EWING ET AL.] (discussing study on vehicle emissions in the United States).

⁴⁰ See JON CREYTS, ANTON DERKACH, SCOTT NYQUIST, KEN OSTROWSKI & JACK STEPHENSON, *REDUCING U.S. GREENHOUSE GAS EMISSIONS: HOW MUCH AT WHAT COST? x* (McKinsey & Co., 2007), available at http://www.mckinsey.com/client/service/ccsi/pdf/US_ghg_final_report.pdf [hereinafter CREYTS ET AL.].

⁴¹ MARKHAM, *supra* note 4, at 8.

since 1950, and is on pace to double again in 70 years.⁴² In addition, some population growth projections forecast the world's population of 6.5 billion reaching 10.6 billion by 2050.⁴³

The time for change is now. Many state and local governments have already started to pave the way, but there must also be a radical shift in our approach to the problem at the federal level. Summing up the status of recent federal efforts on climate change, the staff of the Committee on Energy and Commerce of the U.S. House of Representatives recently stated:

In the past two and half years, the Committee has held dozens of hearings on energy and climate change policy and has built a detailed factual record on the need for legislation in this area. The nation's dependence on foreign oil has significantly increased over the last decade. Consumers have faced increasing and volatile energy prices. Other countries have overtaken us in the manufacture of wind and solar energy. Energy company investments are paralyzed because of uncertainty about what policies the Congress will establish. Meanwhile, global warming pollution has increased unchecked.⁴⁴

On May 21, 2009, the House Energy and Commerce Committee approved a draft of the American Clean Energy and Security Act, which aims to reduce economy-wide greenhouse gas emissions by 17 percent below 2005 levels by 2050.⁴⁵ Complementary policies (domestic emissions cuts, avoided tropical deforestation, and discounted offsets) are estimated to bring the 2020 target to at least 28% below 2005 levels.⁴⁶ The long term target of the American Clean Energy and Security Act is a 75% cut below 2005 levels by 2050 with both a cap and complementary policies.⁴⁷ The bill was approved on June 26, 2009, by a vote of 219-212

⁴² *Id.* at 6.

⁴³ See U.N. Dep't of Soc. and Econ. Affairs, Population Division, *World Population to 2300* 4, U.N. Doc. ST/ESA/SER.A/236 (2004), available at <http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>.

⁴⁴ Memorandum from Democratic Staff of the Comm. on Energy and Commerce to Members of the Comm. on Energy and Commerce 1 (May 16, 2009), available at http://energycommerce.house.gov/Press_111/20090515/hr2454_summary.pdf

⁴⁵ The American Clean Energy and Security Act, H.R. 2454, 111th Cong., § 702 (1st Sess. 2009).

⁴⁶ 1 SKY, PRELIMINARY ANALYSIS OF H.R. 2454, THE WAXMAN-MARKEY "AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009" 2 (2009), <http://www.1sky.org/files/1Sky-HR2454-Analysis.pdf>.

⁴⁷ *Id.*

in the House, and awaits action by the Senate.⁴⁸ The bill proposes a comprehensive program that includes a cap and trade program, new renewable energy requirements for utilities, studies and incentives regarding new carbon capture and sequestration technologies, energy efficiency incentives for homes and buildings, transportation planning, and grants for green jobs.⁴⁹ The Senate is expected to write its own version of the bill.⁵⁰

This Article focuses on two parts of this comprehensive effort to address climate change: potential federal legislation that may affect the building sector, and the land use and transportation sectors. These sectors are enormously significant parts of the comprehensive effort to address climate change.

II. BUILDING CODES

A. *Enormous Potential for Change in the Building Sector*

The building sector is responsible for 50.1% of total annual U.S. energy consumption, with 42% going to building operations (residential, commercial, and industrial building Heating, Ventilating, and Air Conditioning (HVAC), hot water, and plug load), and 8% going to building construction and the embodied energy of building materials.⁵¹ The building sector represents 49.1% of total annual U.S. greenhouse gas emissions, and most of the projected 7.34 Quadrillion British Thermal Units (Qbtu) increase in U.S. electricity consumption by 2030.⁵² Between 1990 and 2008, residential sector CO₂ emissions grew by 27.5%.⁵³ Residential sector carbon dioxide emissions grew by an average of 1.6% per year from 1990 to 2007, while the U.S. population grew by an average of 0.9% per year.⁵⁴ Commercial sector electricity-related emissions grew 52.9%, or 2.4% per year between 1990 and 2008.⁵⁵

⁴⁸ See Richard Cowan, *House Passes Landmark Climate Change Bill*, REUTERS, June 26, 2009, available at <http://www.reuters.com/article/topNews/idUSTRE55O4R120090626?feedType=RSS&feedName=topNews/>.

⁴⁹ See H.R. 2454.

⁵⁰ See Cowan, *supra* note 48.

⁵¹ *Energy Efficiency in Buildings: Hearing Before the S. Comm. on Energy and Natural Res.*, 111th Cong. 13 (2009) (testimony of Edward Mazria, Founder and Executive Director of Architecture 2030) (basing his calculations on the combined energy demand from the U.S. building sector, residential buildings (operations) sector, commercial buildings (operations) sector, and industrial buildings (operations) sector).

⁵² ARCHITECTURE 2030, FACT SHEET 1 (2009), available at http://www.architecture2030.org/downloads/2030FactSheet_published.pdf [hereinafter ARCHITECTURE 2030, FACT SHEET].

⁵³ U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., U.S. CARBON DIOXIDE EMISSIONS FROM ENERGY SOURCES 2008 FLASH ESTIMATE 9 (2009), available at <http://www.eia.doe.gov/oiaf/1605/flash/pdf/flash.pdf> [hereinafter U.S. DEP'T OF ENERGY, 2008 FLASH ESTIMATE].

⁵⁴ U.S. DEP'T OF ENERGY, GREENHOUSE GASES 2007, *supra* note 18, at 16.

⁵⁵ *Id.* at 17.

Over the next 30 years, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) estimates that roughly half the entire building stock in the United States will need to be renovated.⁵⁶ Dr. Chris Nelson, the Director of the Metropolitan Institute at Virginia Tech, also predicts a staggering level of new and replacement building over the next 15 years equal to 40% of all housing and 93% of commercial square feet of building space in the U.S. as of 2000.⁵⁷ Based on an analysis of census population, employment data, and national building inventory age data, Nelson projects that by 2025, the U.S. will produce an estimated 51.5 million new or replacement residential units and 78 billion square feet of new or replacement nonresidential building space.⁵⁸ A report prepared by McKinsey & Co. on U.S. greenhouse gas emissions projects that by 2030 the commercial building stock will grow from 73 billion to 108 billion square feet, and residential homes will grow from 113 million homes to 147 million, a 30% increase.⁵⁹

Recognizing the enormous potential for change, many government, non-profit, and private sector organizations have been joining in the “2030 Challenge” promoted by Architecture 2030, a nonprofit aimed at reducing greenhouse gas emissions through transforming building design.⁶⁰ The “2030 Challenge” challenges the global architecture and building community to adopt the following targets:

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, [greenhouse gas]-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, [greenhouse gas]-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- The fossil fuel reduction standard for all new buildings and major renovations shall be increased to: 60% in 2010, 70% in 2015, 80% in 2020, 90% in 2025, and

⁵⁶ Gordon V. R. Holness, *Improving Energy Efficiency in Existing Buildings*, 50 AM. SOC'Y. HEATING REFRIGERATION AIR-CONDITIONING ENGINEERS J. 12, 12 (2008).

⁵⁷ Arthur C. Nelson, *Leadership in a New Era*, 72 J. AM. PLAN. ASS'N 393, 393–409 (2006).

⁵⁸ *Id.*

⁵⁹ See CREYTS ET AL., *supra* note 40, at 10, 39.

⁶⁰ Architecture 2030, *The 2030 Challenge*, http://www.architecture2030.org/2030_challenge/index.html (last visited Feb. 1, 2010).

carbon-neutral in 2030 (using no fossil fuel [greenhouse gas] emitting energy to operate).⁶¹

Supporters of the “2030 Challenge” include the American Institute of Architects (AIA), the U.S. Conference of Mayors, the National Association of Counties, many professional and industry organizations, design firms, and many cities, counties, and states.⁶² The AIA has created a voluntary program, the AIA 2030 Commitment, where it asks member firms and other entities “to make a pledge, develop multi-year action plans, and implement steps that can advance the goal of carbon neutral buildings by the year 2030.”⁶³

B. *Status of Government Action on Building Codes at the Federal and State Level*

Federal climate policy has historically focused on the use of voluntary and incentive-based programs to reduce emissions and to promote climate technology and science.⁶⁴ Still governing today is Section 304 of the Energy Conservation and Production Act of 1976, which was adopted to reduce energy demand through development of energy-efficient residential and commercial buildings.⁶⁵ Under this Act, as codified and amended, the federal government may provide technical assistance and encourage states to adopt and enforce certain model code standards.⁶⁶ The statute imposes procedural burdens on states to comply with a certification process for residential buildings codes.⁶⁷ These requirements include a public hearing and, if the state declines to adopt the requisite model code, a statement of the reasons for this determination is

⁶¹ *Id.*

⁶² ARCHITECTURE 2030, FACT SHEET, *supra* note 52.

⁶³ American Institute of Architects, AIA 2030 Commitment, <http://www.aia.org/about/initiatives/AIAB079543> (last visited Feb. 1, 2010).

⁶⁴ U.S. Evtl. Prot. Agency, Basic Information on Climate Change, <http://epa.gov/climatechange/basicinfo.html> (last visited Feb. 1, 2010). The federal government has recently committed to invest heavily in energy efficiency and alternative technology. The U.S. Department of Energy (DOE) State Energy Program (SEP) will distribute \$3.1 billion to the states under the American Recovery and Reinvestment Act (ARRA) of 2009, and \$16.8 billion is designated for the Office of Energy Efficiency and Renewable Energy. U.S. Dep’t of Energy, Overview of the American Recovery & Reinvestment Act of 2009, <http://www1.eere.energy.gov/recovery/> (last visited Feb. 1, 2010). Distributions include \$5 billion for the DOE Weatherization Assistance Program, and \$117 million for the Solar Technologies Program. *Id.* In addition, “over \$2.6 billion in formula grants [will be allocated] to states, U.S. territories, local governments and Indian tribes under the Energy Efficiency and Conservation Block Grants (EECBG) Program.” U.S. Dep’t of Energy, Energy Efficiency and Conservation Block Grants, http://apps1.eere.energy.gov/wip/block_grants.cfm (Feb. 1, 2010).

⁶⁵ See Energy Conservation and Production Act, Pub. L. No. 94-385, 90 Stat. 1125 (1976), 12 U.S.C. § 1701z-8 (2006); 15 U.S.C. § 787 (2006); 42 U.S.C. §§ 787–90h (2006); 42 U.S.C. §§ 6801–92 (2006).

⁶⁶ See 42 U.S.C. § 6831(b).

⁶⁷ See *id.* § 6833(a).

required.⁶⁸ For commercial codes, the language suggests that it is mandatory for the states to adopt standards that meet or exceed the federally prescribed standard.⁶⁹ However, the statute does not specify an enforcement mechanism, and the Supreme Court has held, in the context of other federal regulatory action, that the federal government cannot directly order or “commandeer” state governments to take desired actions.⁷⁰ Federal efforts under this statute as it is written and enforced today are inadequate. As discussed below, some states have not adopted building codes at all, and others fall far short of contemporary standards.

The federal government has taken some steps to encourage green building, but the model codes are primarily the work of private organizations. The Energy Independence and Security Act of 2007 created the Office of Commercial High-Performance Green Building, which has promoted research and development; provided outreach, education, and technical assistance; created a consortium to advise the Department of Energy (DOE) on high performance green building issues; and established the goal of developing commercial buildings that have zero net energy consumption annually.⁷¹ The federal government has also created the Building and Energy Codes Program under the DOE, which provides states with direct financial and technical assistance to promote the adoption, implementation, and enforcement of state and local building energy codes.⁷² The program also helps states adjust national model energy codes to meet state needs and develop state-specific code compliance software and training materials.⁷³ States are provided with code compliance training and analyses of the energy and economic impact of state and local building codes.⁷⁴ The DOE works with what it calls the “primary code developers,” two private organizations: the International Code Council (ICC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).⁷⁵ Most U.S. cities, coun-

⁶⁸ *See id.*

⁶⁹ *Id.* § 6833(b)(1) (“Such certification shall include a demonstration that such State’s code provisions meet or exceed the requirements of ASHRAE Standard 90.1–1989”); *id.* § 6833(b)(2)(B)(i) ([E]ach State shall . . . certify that it has reviewed and updated the provisions of its commercial building code regarding energy efficiency in accordance with the revised standard.”).

⁷⁰ *See* *New York v. United States*, 505 U.S. 144, 161 (1995); *Printz v. United States*, 521 U.S. 898, 927–31 (1997).

⁷¹ *See* Energy Independence and Security Act of 2007, §§ 421–22, 42 U.S.C.A. §§ 17081–82 (West 2009).

⁷² U.S. Dep’t of Energy, What Are Building Energy Codes Projects in the States?, http://apps1.eere.energy.gov/state_energy_program/topic_definition_detail.cfm/topic=104 (last visited Feb. 10, 2010).

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ U.S. DEP’T OF ENERGY, ENHANCING ENERGY EFFICIENCY NATIONWIDE, FISCAL YEAR 2008 ANNUAL REPORT 3 (2008), available at <http://www.energycodes.gov/whatwedo/pdfs/>

ties, and states that adopt codes use the International Codes developed by the ICC.⁷⁶ Most states have adopted some version of the International Energy Conservation Code (IECC).⁷⁷

The DOE's Building and Energy Codes Program aims to improve the level of energy efficiency for residential codes by 30% by 2012 relative to the 2006 IECC, and for commercial codes by 30% by 2010 relative to the current commercial energy code.⁷⁸ According to its 2008 annual report, most of the DOE's code change proposals were approved by the ICC in the recent code development cycle.⁷⁹ The 2009 IECC requires 15% more energy efficiency than its predecessor, the 2006 IECC.⁸⁰ However, this code is only a model, not a mandate. The U.S. Department of Energy reports that only six states, Florida, Iowa, Illinois, Maryland, Massachusetts, and Pennsylvania, as well as the District of Columbia, have adopted the 2009 IECC or better for commercial codes.⁸¹ The same states, with the exception of Illinois, have adopted the 2009 IECC or better for residential codes.⁸² The benchmark commercial codes for the other states are as follows: twenty-two states are using the 2006 IECC equivalent or better; eight states are using the 2003 IECC or equivalent; two states are using the 1998–2001 IECC or equivalent; two states are using the 2000 IECC or equivalent; and nine states have no statewide commercial code.⁸³ For residential codes, twenty-four states are using the IECC 2006 or a stricter standard; eight are using the IECC 2003 or equivalent; two are using the IECC 1998–2001 or equivalent; one has codes older or less stringent than IECC 1998; and eleven states have no statewide energy code.⁸⁴

In sum, at this point, although there is some consensus in the professional community as to the viability of the goal set by the 2030 Challenge, most states fall short of its standards. Half of the states have not moved past the 2003 IECC model code.⁸⁵ Even the 2006 IECC falls 30% short of meeting or exceeding the 2030 Challenge's initial 50% re-

BECP_FY08_Accomplishments.pdf [hereinafter U.S. DEP'T OF ENERGY, ENHANCING ENERGY EFFICIENCY].

⁷⁶ ICCSAFE.org, About ICC, <http://www.iccsafe.org/news/about/> (last visited Feb. 10, 2010).

⁷⁷ U.S. DEP'T OF ENERGY, ENHANCING ENERGY EFFICIENCY, *supra* note 75, at 5.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ See U.S. Dep't of Energy, Status of State Energy Codes, http://www.energycodes.gov/Implement/state_codes/index.stm (last visited Feb. 10, 2010).

⁸² See *id.*

⁸³ See *id.*

⁸⁴ See *id.*

⁸⁵ See *id.*

duction target.⁸⁶ Approximately one-fifth of the states have no statewide code, and some appear to have little interest in moving forward. For example, in the 2005 legislative session in Arizona, following an effort funded by the DOE, a state energy code bill (HB 2278) was introduced that would have required municipalities to adopt the IECC 2004 code for commercial buildings. This bill was held in committee and had no support from local communities who have consistently resisted attempts to adopt statewide building codes.⁸⁷ To date, Arizona still does not have a statewide standard.⁸⁸

C. *City and County Building Code Efforts*

Although many cities have committed to take significant action to combat climate change, overall progress is inadequate. At least 1,000 mayors have signed the U.S. Mayors' Climate Protection Agreement.⁸⁹ The plan, launched by Mayor Nickels of Seattle, was to have mayors commit to meet or beat in their own communities the Kyoto Protocol target, which is 7% below 1990 levels by 2012.⁹⁰ A 2007 AIA survey of cities with populations greater than 50,000 revealed that 14% (about 1 in 7) have some sort of green building program.⁹¹ Some cities have aggressive programs;⁹² however, less than 50% of the programs in the AIA survey applied to the private sector, and these were generally in the form of incentives and voluntary programs.⁹³ A recent assessment of ten environmentally active cities whose mayors signed the Climate Protection Agreement found that all of these cities have recently increased, rather than decreased, their greenhouse gas emissions, and were highly unlikely to meet their reduction goals.⁹⁴ Except for Portland, Oregon (with only a

⁸⁶ ARCHITECTURE 2030, MEETING THE 2030 CHALLENGE THROUGH BUILDING CODES 5 (2008), http://www.architecture2030.org/pdfs/2030Challenge_Codes_WP.pdf.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ Mayors Climate Prot. Ctr., List of Participating Mayors, <http://usmayors.org/climateprotection/list.asp> (last visited Aug. 27, 2009).

⁹⁰ Mayors Climate Prot. Ctr., U.S. Conference of Mayors Climate Protection Agreement, <http://usmayors.org/climateprotection/agreement.htm> (last visited Aug. 27, 2009).

⁹¹ BROOKS RAINWATER, AM. INST. OF ARCHITECTS, LOCAL LEADERS IN SUSTAINABILITY: A STUDY OF GREEN BUILDING PROGRAMS IN OUR NATION'S COMMUNITIES 4 (2008), available at <http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aia075288.pdf>.

⁹² See, e.g., EDMUND G. BROWN, JR., OFFICE OF THE CAL. ATTORNEY GEN., GREEN BUILDING ORDINANCES IN CALIFORNIA 1 (2009), available at http://www.ag.ca.gov/globalwarming/pdf/green_building.pdf.

⁹³ See RAINWATER, *supra* note 91, at 18.

⁹⁴ JOHN BAILEY, INST. FOR LOCAL SELF-RELIANCE, LESSONS FROM THE PIONEERS: TACKLING GLOBAL WARMING AT THE LOCAL LEVEL 3 (2007), available at <http://www.newrules.org/de/pioneers.pdf> (the cities chosen for their visibility in the media and their self-described success were Austin, TX; Ann Arbor, MI; Berkeley, CA; Boulder, CO; Cambridge, MA; Minneapolis, MN; Portland, OR; San Francisco, CA; Salt Lake City, UT; and Seattle, WA).

0.7% increase), overall emissions increases ranged from 6.5 to 27% from 1990 baseline levels.⁹⁵

Two recent surveys released at the National Association of Counties Annual Conference (NaCo) gauge the level of green government practices in the nation's counties.⁹⁶ A survey conducted by NaCo and the AIA of the 200 most populous counties found that green programs have quadrupled in the last three years.⁹⁷ The survey found that 19.5% of sample counties (about 1 in 5) have a green building program; however, most of these programs (85%) are aimed at county-funded construction.⁹⁸ In another survey of 147 counties in 40 states, NaCo found that 12% of the counties surveyed own or operate a green-certified building and 12% have a green programs coordinator.⁹⁹ Among the counties that have a green-program coordinator, 69% said the county has authority to adopt building codes, but only 19% of these counties have codes to encourage energy efficiency or green buildings.¹⁰⁰ The survey did not specify whether any counties had adopted mandatory standards.¹⁰¹

D. *Effective Green Building Possible at Minimal Cost*

A growing body of research suggests that the economic barriers to green buildings are surmountable and that green buildings can be a cost effective climate change strategy. In 2005, the Group of Eight world economic leaders (G8) adopted a plan specifically aimed at improving the efficiency of buildings.¹⁰² Arguing for minimum energy performance standards, as well as encouraging maximum energy-efficiency performance for new buildings, the report notes that construction of passive and zero energy buildings is technically and commercially feasible.¹⁰³ According to the report, "passive energy houses" (houses that use 65–80% less energy than a standard house) are often less expensive than those of traditional design, and the costs of "zero energy buildings," although currently more expensive than traditional buildings, are drop-

⁹⁵ *Id.*

⁹⁶ Monica Fritz-Manolio, Nat'l Ass'n of Counties, *NACo's 'Green Government' Survey Results In*, http://www.naco.org/Template.cfm?Section=Environment,_Energy_and_Land_Use&template=/ContentManagement/ContentDisplay.cfm&ContentID=28415 (last visited Feb. 10, 2010).

⁹⁷ *Id.* (citing the NACo and AIA survey, RAINWATER, *supra* note 91).

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.* (citing the NACo County Green Programs Survey, where 60% of respondents were rural counties of a population of 50,000 or less, and 39% were urban counties of a population of more than 50,000).

¹⁰¹ Fritz-Manolio, *supra* note 96.

¹⁰² *Cf.* INT'L ENERGY AGENCY, IN SUPPORT OF THE G8 PLAN OF ACTION: ENERGY EFFICIENCY POLICY RECOMMENDATIONS (OCED/IEA 2008), available at http://www.iea.org/G8/2008/G8_EE_recommendations.pdf.

¹⁰³ *Id.* at 13.

ping.¹⁰⁴ As for existing buildings, according to the G8 report, it would be technically and economically feasible to cut their total energy consumption in half within 30 years.¹⁰⁵ Given the wide variability in cost per square foot of buildings on a regular basis, it can be difficult to evaluate the cost of green buildings.¹⁰⁶ However, available data does suggest that effective measures can be undertaken at minimal cost, and that any additional cost may be more than offset by energy saving benefits.

A 2003 report prepared for the California Sustainable Building Task Force completed an in-depth analysis of the cost to build 33 green buildings (25 office buildings and 8 school buildings) compared to costs that would be incurred for these same buildings if built according to conventional design.¹⁰⁷ The report concluded that the average premium for these green buildings was slightly less than 2% (or \$3–5 a square foot),¹⁰⁸ but that the majority of the cost was due to increased architectural and engineering design time.¹⁰⁹ The report found that the total 20-year present value of financial energy benefits from a typical green building is \$5.79 per square foot.¹¹⁰ The energy savings alone exceeded the average increased cost.¹¹¹ Adding in all the benefits over the lifetime of the buildings, the California report concludes that the total cost savings from reduced energy, water, and waste; lower operations and maintenance costs; and enhanced occupant productivity and health are over ten times the average initial investment required to design and construct a green building.¹¹² The California Energy Commission's 2007 Integrated Energy Policy Report recommended adjusting the state's energy

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ DAVIS LANGDON, COST OF GREEN REVISITED: REEXAMINING THE FEASIBILITY AND COST IMPACT OF SUSTAINABLE DESIGN IN THE LIGHT OF INCREASED MARKET ADOPTION 10 (2007), available at <http://www.davislangdon.com/upload/images/publications/USA/The%20Cost%20of%20Green%20Revisited.pdf> (finding that the wide variation in cost per square foot between buildings on a regular basis contributed to the lack of statistically significant differences between the LEED-seeking and non-LEED buildings in a study of 83 buildings designed with a goal of meeting some level of LEED certification, compared to 138 buildings of similar program types which did not have a goal of sustainable design but may have had some sustainable features).

¹⁰⁷ GREG KATS ET AL., THE COSTS AND FINANCIAL BENEFITS OF GREEN BUILDINGS: A REPORT TO CALIFORNIA'S SUSTAINABLE BUILDING TASK FORCE 14 (Cal. Integrated Waste Mgmt. Bd., 2003), available at <http://www.ciwmb.ca.gov/Greenbuilding/Design/CostBenefit/Report.pdf>.

¹⁰⁸ *Id.* at viii.

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 28.

¹¹¹ *Id.*

¹¹² *Id.* at ix.

standard to require net-zero energy performance in residential buildings by 2020 and in all buildings by 2030.¹¹³

The U.S. Department of Energy (DOE) has been involved with several pilot energy efficiency programs that also demonstrate significant savings at minimal cost.¹¹⁴ One such project in Arizona in 2004, Armory Park del Sol, included one zero-energy home that sold energy back to the grid, as well as other energy efficient homes (generally with 50% less energy use than an average home). The zero-energy home cost about 20% more to build than the other homes.¹¹⁵ Another project included 22 homes built by Habitat for Humanity according to the DOE's Energy Star rating system, which requires that homes are at least 15% more energy efficient than homes built to the 2004 International Residential Code (IRC).¹¹⁶ These homes also included additional energy-saving features that typically made them 20–30% more efficient than standard homes.¹¹⁷ The increased cost on this project was estimated at about \$1,000 on a typical 3 bedroom house.¹¹⁸ Another project in 1999 included 315 homes built in northwest Chicago that used approximately 50% less energy to heat and cool as other houses in the same area, but cost little or no more to build.¹¹⁹ This project highlighted new framing and insulation methods that used 2x6s instead of 2x4s to allow for thicker insulation.¹²⁰ The 2x6s were set at 24, instead of 16 inches apart, which reduced labor costs as 30% fewer pieces had to be assembled. The thicker walls provide 60% more thermal resistance.¹²¹

Another example of low-cost effective measures is the use of passive solar design in both building plans and site planning. Something as simple as the orientation of homes and businesses with thoughtful street and lot layout that places a building's long face on an east-west axis, with a large percentage of its windows on the south side, can reduce

¹¹³ SUSANNE GARFIELD, CAROLYN WALKER & YVONNE NELSON, 2007 INTEGRATED ENERGY POLICY REPORT 5 (Cal. Energy Comm'n 2007), available at <http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.pdf> [hereinafter GARFIELD ET AL.].

¹¹⁴ See, e.g., U.S. Dep't of Energy, Moving Toward Zero Energy Homes: Zero Energy Home Soaks Up the Southwestern Sun (2003), <http://www.nrel.gov/docs/fy04osti/35302.pdf>.

¹¹⁵ *Id.*

¹¹⁶ U.S. Dep't of Energy, Habitat for Humanity: LaGrange, Georgia, 2003 Jimmy Carter Work Project 4 (2003), <http://www.nrel.gov/docs/fy05osti/38173.pdf>.

¹¹⁷ *Id.*

¹¹⁸ *Id.*

¹¹⁹ U.S. Dep't of Energy, Prairie Crossing Homes: Building America Houses That Use Half as Much Energy 1 (1999), http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/26261.pdf.

¹²⁰ *Id.* at 2.

¹²¹ *Id.*

heating fuel consumption by up to 25%.¹²² The City of San Jose has had solar orientation performance guidelines in place for residential and multifamily buildings since the early 1990s and has found that properly orienting a building to the sun has reduced total energy requirements by 11 to 16.5%.¹²³ Adding in passive solar architectural considerations can produce buildings that save up to 40% on space cooling.¹²⁴

In a variety of housing markets and regions, passive solar design has effectively reduced residential energy demand. A development of twenty-three \$70,000 row houses in 1984 in North Philadelphia reduced energy use by 63% at no added cost by combining energy efficiency with passive-solar design.¹²⁵ A 2,530 square foot home constructed in 1995 in Falmouth, Maine, with passive solar design, energy efficiency HVAC, and a rooftop solar-electric system, was built for \$35,000 less than comparable custom homes in the area without these features, while reducing energy use by 82%.¹²⁶ A tract builder in Reno, Nevada, Neuffer Construction, built a residential subdivision with over 400 passive solar homes in a ten year period, culminating in a design that needed no cooling and that reduced heating costs by 50% using passive solar design.¹²⁷ The total extra cost for these homes was about 1% of the sales price, but because of the low energy cost, enhanced mortgage financing was possible, causing the builder to estimate that the potential buyer market for his homes was increased by about 30%.¹²⁸

Considerable progress can be made at minimal cost. Further, if most of the costs of green building, as noted in the California report, are due to increased architectural and engineering design time, significant cost reductions should result from standardization of these practices.¹²⁹ Any increased initial cost should be compared to life cycle costs as a whole. According to the National Institute of Building Services' World Building Design Guide, the initial cost of a building only represents 2% of the life cycle costs.¹³⁰ Operational costs amount to 6%, and occu-

¹²² STEVEN HOYT, LOCAL GOV'T COMM'N, ENERGY CONSERVATION UNDER THE SUN: A RESOURCE BOOK FOR LOCAL GOVERNMENTS 6 (1998), available at <http://www2.lgc.org/bookstore/files/publications/solarbook.pdf>.

¹²³ See U.S. DEP'T OF ENERGY, TOMORROW'S ENERGY TODAY FOR CITIES AND COUNTIES: SOLAR ACCESS: A WINNING STRATEGY 3 (1993), available at <http://www.p2pays.org/ref/11/10982.pdf>.

¹²⁴ *Id.*

¹²⁵ DONALD W. AITKEN, UNION OF CONCERNED SCIENTISTS, WHOLE BUILDINGS: AN INTEGRATING R & D AND POLICY FRAMEWORK FOR THE 21ST CENTURY 10 (2008), available at http://www.ucsusa.org/assets/documents/clean_energy/acf8qiehd.pdf.

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ See KATS, *supra* note 107, at 17.

¹³⁰ Holness, *supra* note 56, at 12.

pancy costs account for 92%.¹³¹ Moreover, the costs of global warming itself must be factored into baseline construction costs. According to Sir Nicholas Stern of the Grantham Institute for Climate and the Environment at the London School of Economics, if one factors in all the policies and programs necessary to curb emissions, the world's economic growth rate would be reduced by about 1% a year, but a failure to act could result in environmental consequences that would cause reductions in GDP growth rates by at least 5%, and as much as 20%, per year in the near future.¹³² In addition, any evaluation of costs should also consider that other options to reduce greenhouse gas emissions, like nuclear power, have significant costs of their own.¹³³

E. *State and Local Building Codes are Inadequate*

There is no time to dabble. If the United States is really interested in reducing energy consumption, it needs a national building code. Per capita electricity consumption in the United States increased by nearly 50% over the past 30 years, yet California's per capita electricity use has remained almost flat, due in part to cost-effective building standards.¹³⁴ If the rest of the country were to even just catch up with California's current standards, it would be a tremendous improvement. As a country, we should go even further and strive to achieve Architecture 2030's goals.

The federal government should take decisive action. In 2005, the G8 adopted a plan that specifically noted that "[e]nergy efficiency standards for new buildings should be set by national or state governments and should aim to minimize total costs over a 30-year lifetime."¹³⁵ Cities and counties have started to pave the way, but they alone cannot produce the mandatory across-the-board regulations needed to radically reduce emissions levels. The scientific assessment is that the world must reduce emissions on the order of 50% of 1990 levels, in addition to the cessation of wide scale deforestation, to stabilize the composition of the atmos-

¹³¹ *Id.*

¹³² SIR NICHOLAS STERN, STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE vi (Cambridge University Press 2007).

¹³³ Architecture 2030 estimates that the building code section of H.R. 2454 would achieve more than six times the emissions reductions as 100 nuclear power plants. Edward Mazria, *Oh, Those Sexy Building Codes*, ARCHITECTURE 2030 E-NEWS BULLETIN, July 23, 2009, available at http://www.architecture2030.org/news/news_072209.html.

¹³⁴ See GARFIELD ET AL., *supra* note 113, at 2 (reduction also attributed to appliance efficiency standards and other energy efficiency programs).

¹³⁵ PHILLIP FAIREY & ROBIN VIEIRA, FLA. SOLAR ENERGY CTR., ENERGY EFFICIENCY COST-EFFECTIVENESS TESTS FOR RESIDENTIAL CODE UPDATE PROCESSES 1 (2009), available at <http://www.natresnet.org/hotnews/FSEC-CR-1794-09.pdf> (citing the Gleneagles meeting in 2005 and INT'L ENERGY AGENCY, *supra* note 102).

phere.¹³⁶ The U.S. contributes nearly 25% to total global greenhouse gas emissions,¹³⁷ and the U.S. greenhouse gas emissions from human sources have increased an estimated 16.7% from 1990 levels.¹³⁸

In a matter this important, we should not be relying on private organizations that are not accountable to the people or to the international community to alone draft the model codes, and we cannot rely on the states to take aggressive action. It is amazing that we have come as far as we have with our piecemeal approach, although this is perhaps partly due to the fact that life cycle costs really do make green buildings more economically efficient. Nevertheless, the current approach is unlikely to be effective, and is wholly inefficient. Relying on discretionary local regulation risks the free-rider problem and the tragedy of the commons. A single local government that seeks to address the climate change problem through stricter regulation will absorb all the cost of the effort, but all communities will reap the benefits. Strict local regulation may also turn builders, and the economic benefits that they produce, to neighboring jurisdictions with more lax regulation. Developing ad hoc supplemental code provisions at the municipal level is a significant burden that requires the participation of trained professionals to analyze what is feasible and appropriate, and requires training municipal staff to ensure effective enforcement.¹³⁹ New York City's adoption of its new building code took four years of work by four hundred volunteers.¹⁴⁰ We do not have the time to move forward with incremental city-by-city efforts that may or may not come to fruition. Speed is particularly important in the context of building codes and standards where simple and inexpensive climate friendly options, like solar access site design, or the width of walls for insulation, will not be easily available through retrofitting programs.¹⁴¹

It is not only new standards that are required; we must also remove barriers that interfere with green building, and enact new laws to protect alternative energy sources such as solar access, where appropriate. Many restrictions currently exist to the use of solar systems.¹⁴² For example, until recently, Belle Meade, Tennessee, required all power generating equipment to be installed at ground level (this was intended to regulate

¹³⁶ The Woods Hole Research Center, The Kyoto Protocol, http://www.whrc.org/resources/online_publications/warming_earth/kyoto.htm (last visited Feb. 2, 2010).

¹³⁷ See MARKHAM, *supra* note 4, at 8.

¹³⁸ U.S. DEP'T OF ENERGY, GREENHOUSE GASES 2007, *supra* note 18, at 1.

¹³⁹ Edna Sussman, *Reshaping Municipal and County Laws to Foster Green Building, Energy Efficiency, and Renewable Energy*, 16 N.Y.U. ENVTL. L.J. 1, 14 (2008) (citing Int'l Code Council, *New York City Adopts International Codes to Save Lives and Protect Property*, ICC NEWS RELEASE, July 12, 2007, <http://www.iccsafe.org/news/nr/2007/0712NYC.html>).

¹⁴⁰ *Id.*

¹⁴¹ *Id.* at 8–10.

¹⁴² *See id.* at 30.

back-up generators).¹⁴³ The town amended the code after Al Gore's contractor's initial request for a solar installation, but the process took more than a year.¹⁴⁴ The town now permits rooftop solar power systems, but only "so long as they are not visible from the street or from any adjoining property."¹⁴⁵ Some states have legislated limits on municipal powers relating to solar power systems, but most states have no such legislation.¹⁴⁶

Private restrictions may also interfere with alternative energy systems. Some states, including California, prohibit enforcement of any covenant, restriction, or deed in connection with the transfer of real property that "effectively prohibits or restricts the installation or use of a solar energy system."¹⁴⁷ California also has a Solar Shade Control Act that prohibits a property owner from allowing a tree or shrub to grow on his property which casts a shadow greater than 10% of the absorption area of a previously installed solar collector.¹⁴⁸ Most states, however, have no legislation recognizing the creation of private solar easements.¹⁴⁹

Even when codes are adopted by local jurisdictions, there have been issues with the adequacy of enforcement and institutional support. Although available data is not robust, it does signal a significant and widespread lack of code compliance.¹⁵⁰ According to the Building Codes Assistance Project: "A 2005 review of state compliance studies reported relatively low compliance with energy codes in all states, with the possible exception of those in the Pacific Northwest (Montana, Oregon, and Washington) and California."¹⁵¹ Difficulties identified included a "lack of manpower," insufficient time to spend on project sites, relatively low priority among regulators to ensure energy code compliance as compared to compliance with health and safety codes, and inadequate training time for local enforcement agents.¹⁵² In a large national study, using data from a survey of over 800 U.S. cities, Professors Raymond J. Burby, Peter J. May, and Robert G. Paterson found that the cities with the highest rates of code compliance facilitated compliance with "(1) an adequate number of technically competent staff; (2) strong leadership; (3) ade-

¹⁴³ Erik Schelzig, *Gore's Solar Plans Thwarted by Upscale Neighborhood's Rules*, USA TODAY, Mar. 22, 2007, available at http://www.usatoday.com/weather/climate/globalwarming/2007-03-20-gore-solar_N.htm.

¹⁴⁴ See *id.*

¹⁴⁵ *Id.*

¹⁴⁶ See Sussman, *supra* note 139, at 30–31.

¹⁴⁷ *Id.* at 32.

¹⁴⁸ *Id.* at 32–33 (citing CAL. PUB. RES. CODE § 25982 (West 2007)).

¹⁴⁹ See *id.* at 33.

¹⁵⁰ THE BUILDING CODES ASSISTANCE PROJECT, N. AM. INSULATION MFRS. ASS'N., RESIDENTIAL BUILDING ENERGY CODES—ENFORCEMENT & COMPLIANCE STUDY 4 (2008)

¹⁵¹ *Id.* (citing THE BUILDING CODES ASSISTANCE PROJECT, N. AM. INSULATION MFRS. ASS'N., RESIDENTIAL ENERGY CODE EVALUATIONS—REVIEW AND FUTURE DIRECTIONS (2005)).

¹⁵² *Id.* at 5.

quate legal support; and (4) a consistently strong effort to check building and development plans, inspect building and development sites, and provide technical assistance.”¹⁵³ The researchers found that compliance with codes was most problematic in places where there was economic duress, lack of proficiency in the contractor community, and corruption in the enforcement process.¹⁵⁴

We need national building codes and strong enforcement programs with resources and training programs commensurate with the importance of this sector in the context of climate change. We need to eliminate private restrictions, preempt any state and local laws that significantly interfere with solar or other alternative energy sources, and adopt laws to affirmatively protect solar access.

F. *The AESCA Proposes a Strong Federal Mandate and Program for Strengthening Building Codes*

The American Clean Energy and Security Act¹⁵⁵ moves significantly forward on most fronts. It would amend the Energy Conservation and Production Act¹⁵⁶ to create a national building code subject to efficiency targets.¹⁵⁷ These targets would require buildings to reduce energy use by 30% on the date of enactment, followed by another 50% reduction for residential building by 2014 and commercial building by 2015. The legislation would require an additional 5% reduction every 3 years, starting in 2017 for residential buildings and 2018 for commercial buildings, using the 2006 International Energy Conservation Code (IECC) as the residential baseline and the code published in ASHRAE Standard 90.1-2004 as the commercial baseline.¹⁵⁸ Under the ACESA, the Secretary of Energy would have authority to establish more restrictive targets if “such greater reductions in energy use can be achieved with a code that is life cycle cost-justified and technically feasible.”¹⁵⁹ States would be provided an opportunity to adopt the national code standard (either the targets or the national code itself). If a state failed to do so, the federal government would enforce the national code in that state and the state would be denied certain emission allowances and federal funding.¹⁶⁰

¹⁵³ Raymond J Burby, Peter J. May & Robert G. Paterson, *Improving Compliance with Regulations*, 64 J. AM. PLANNING ASS’N 324, 332 (1998).

¹⁵⁴ *Id.*

¹⁵⁵ H.R. 2454, 111th Cong. (1st Sess. 2009).

¹⁵⁶ 42 U.S.C. § 6833 (2006).

¹⁵⁷ See H.R. 2454, § 210 (amending the Energy Conservation and Production Act (ECPA), § 304, 42 U.S.C. § 6833 (2006)).

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* (amending ECPA, § 304(a)(3)).

¹⁶⁰ *Id.* (amending ECPA, § 304(c)–(f)) (stating that where local governments establish building codes, the state would have to demonstrate “that local governments representing not less than 80 percent of the State’s urban population have adopted the new national code, or

The state and the federal government would have authority to enforce the code directly against owners and builders.¹⁶¹ Even where state and local governments are implementing the national code or equivalent, the federal government would maintain oversight enforcement authority.¹⁶² In addition to establishing a federal code standard, the ACESA would prohibit any private covenant, contract provision, lease provision, homeowners' association rule or bylaw, or similar restriction that impairs the ability of the owner or lessee of any residential structure designed for occupancy by one family to install, construct, maintain, or use a solar energy system.¹⁶³ However, the bill does not preempt local government from interfering with solar or other alternative energy systems.¹⁶⁴

The ACESA would require the Secretary of Energy to develop standards for a national energy and environmental building retrofit policy.¹⁶⁵ The bill would create an incentive program to encourage implementation by state and local governments and allow for direct expenditures for retrofit improvements.¹⁶⁶ The program would include a certification program for auditors, inspectors, and energy and environmental building retrofit contractors; information on equipment and procedures for testing energy and environmental efficiency; guidelines for program management; a requirement that (where appropriate) building retrofits use roofing materials with high solar energy reflectance; determination of energy savings in building retrofits; and guidance on opportunities for rating and certifying buildings.¹⁶⁷ Although the full scope of what may be included in the Secretary's program is unknown, the ACESA itself does not include prescriptive requirements for an energy audit or improvements at the point of sale as some cities and states have adopted.¹⁶⁸

The ACESA's proposed certification and training program may make a substantial difference in enforcement consistency. However, un-

have adopted local codes that meet or exceed the target met in the new national code to achieve equivalent or greater energy savings").

¹⁶¹ The American Clean Energy and Security Act, H.R. 2454, 111th Cong. § 201 (1st Sess. 2009) (amending ECPA, § 304(d)(5)).

¹⁶² *Id.* (amending ECPA, § 304(f)).

¹⁶³ *Id.* § 209.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* § 202(b).

¹⁶⁶ *Id.* § 202.

¹⁶⁷ The American Clean Energy and Security Act, H.R. 2454, 111th Cong. § 202 (1st Sess. 2009).

¹⁶⁸ *See, e.g.,* Sussman, *supra* note 139, at 21–23 (2008) (discussing the City of San Francisco's point of sale requirements for efficiency measures; the City of Berkeley's requirement, which applies to the sale and to major renovations of commercial buildings; the City of Burlington's requirement for certain energy efficiency standards upon the sale of a building to multi-family residences where the tenant pays the utility bills; and the State of Kansas' requirement that homebuilders and realtors disclose information about energy efficiency prior to purchase, whenever the house is shown, and upon request).

like virtually every major environmental statute enacted since 1970,¹⁶⁹ there is no citizen's suit provision. Most environmental statutes specifically provide for citizen suits to be brought against both regulated parties and government agencies charged with the implementation of the statute.¹⁷⁰ These statutes generally authorize attorney and expert witness fees to citizen plaintiffs that can offset the high costs of suits involving complex statutory questions.¹⁷¹ Citizen suits to force agencies to comply with nondiscretionary duties have made a significant contribution to the implementation of federal environmental statutes.¹⁷² Citizen suits have been used to spur the government into action and overcome administrative enforcement problems that may arise due to insufficient funds, inadequate staff, lack of expertise, and political pressure.¹⁷³ Citizen suits have served to mitigate the tendency toward "agency capture," where the agencies become unduly sympathetic to the interests of the regulated industry.¹⁷⁴ Citizen suits also reduce the government's burden by allowing for direct suits against the regulated industry using private resources, and permit a more efficient administration of legislative policies.¹⁷⁵

Statutory language allowing for citizen suits generally confers "broad authority to any person to bring suit on his own behalf against a private or government entity."¹⁷⁶ However, the standing requirements of Article III of the Constitution must still be satisfied.¹⁷⁷ These require-

¹⁶⁹ See, e.g., Toxic Substances Control Act, 15 U.S.C. §§ 2618, 2619 (2006); Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. § 1365 (2006); Clean Air Act, 42 U.S.C. §§ 7604, 7607 (2006); Ocean Thermal Energy Conversion Act, 42 U.S.C. § 9124 (2006); Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9659 (2006).

¹⁷⁰ See Robert L. Glicksman, *The Value of Agency-Forcing Citizen Suits to Enforce Non-discretionary Duties*, 10 WIDENER L. REV. 353, 353 (2004).

¹⁷¹ Michael I. Jeffery, QC, *Intervenor Funding as the Key to Effective Citizen Participation in Environmental Decision-Making: Putting the People Back into the Picture*, 19 ARIZ. J. INT'L & COMP. L. 643, 658 (2002) ("Depending on the specific statute and court interpretations, fees and awards also may include the reasonable cost of any study, analysis, engineering report, test, or project found to be necessary for the preparation of the party's case."); see also *Natural Res. Def. Council, Inc. v. EPA*, 512 F.2d 1351, 1357 (D.C. Cir. 1975) (discussing the importance of citizen suit attorney fee provision in the Clean Air Act); Mathew Burrows, Note, *The Clean Air Act: Citizen Suits, Attorneys' Fees, and the Separate Public Interest Requirement*, 36 B.C. ENVTL. AFF. L. REV. 103, 103-04 (2009).

¹⁷² Glicksman, *supra* note 170, at 392.

¹⁷³ Kerry D. Florio, *Attorneys' Fees in Environmental Citizen Suits: Should Prevailing Defendants Recover?*, 27 B.C. ENVTL. AFF. L. REV. 707, 709-10 (2000).

¹⁷⁴ See Glicksman, *supra* note 170, at 382.

¹⁷⁵ Florio *supra* note 173, at 708.

¹⁷⁶ Burrows, *supra* note 171, at 105 (citing DANIEL RIESEL, ENVIRONMENTAL ENFORCEMENT: CIVIL AND CRIMINAL § 15.02[2] (Law Journal Press 2007)); see also *Alyeska Pipeline Serv. Co. v. Wilderness Soc'y*, 421 U.S. 240, 247 (1975) (finding that citizen suit attorney fee provisions are a departure from the traditional "American Rule" where the prevailing litigant ordinarily is not entitled to collect attorneys' fees from the losing party).

¹⁷⁷ See Peter A. Alpert, Comment, *Citizen Suits Under the Clean Air Act: Universal Standing for the Uninjured Private*, 16 B.C. ENVTL. AFF. L. REV. 283, 285 (1988) (arguing

ments are difficult, but are not impossible to meet where the injury is the incremental addition of greenhouse gas emissions. In *Massachusetts v. EPA*, the Supreme Court ruled against the EPA's argument "that because greenhouse gas emissions inflict widespread harm, the doctrine of standing presents an insuperable jurisdictional obstacle."¹⁷⁸ The Court defined the standing requirement of Article III as follows:

Article III of the Constitution limits federal-court jurisdiction to "Cases" and "Controversies." . . . Congress has the power to define injuries and articulate chains of causation that will give rise to a case or controversy where none existed before, however, Congress must identify the injury it seeks to vindicate and relate the injury to the class of persons entitled to bring suit. . . . A litigant must demonstrate that it has suffered a concrete and particularized injury that is either actual or imminent, that the injury is fairly traceable to the defendant, and that it is likely that a favorable decision will redress that injury.¹⁷⁹

The Court granted standing to review a petition by Massachusetts, other states, local governments, and private organizations to challenge the EPA's decision not to regulate greenhouse gas emissions from new motor vehicles under the Clean Air Act.¹⁸⁰ The Court reasoned that the EPA's refusal "to regulate greenhouse gas emissions presents a risk of harm to Massachusetts that is both 'actual' and 'imminent'."¹⁸¹ The EPA argued "that its decision not to regulate greenhouse gas emissions from new motor vehicles contributes so insignificantly to petitioners' injuries that the agency cannot be haled into federal court to answer for them."¹⁸² While noting that reducing domestic automobile emissions (6% of worldwide carbon dioxide emissions) is not a tentative step, the Court reasoned that the EPA's argument rested "on the erroneous assumption that a small incremental step, because it is incremental, can never be attacked in a federal judicial forum."¹⁸³ The Court found that

that the constitutional requirements for standing must be met "no matter how compelling the congressional reason for adopting broad statutory definitions of standing").

¹⁷⁸ *Massachusetts v. EPA* 549 U.S. 497, 517 (2007).

¹⁷⁹ *Id.* (but noting that where Congress has accorded a procedural right to challenge an agency action unlawfully withheld, it is not necessary to meet all the normal standards for redressibility and immediacy, that a litigant has standing if there is some possibility that the requested relief will prompt the injury-causing party to reconsider the decision, not that the substantive result would necessarily have been altered).

¹⁸⁰ *See id.* at 505.

¹⁸¹ *Id.* at 523.

¹⁸² *Id.* at 524.

¹⁸³ *Id.* at 526.

the rise in sea levels associated with global warming has already harmed and will continue to harm Massachusetts, that the remote risk of catastrophic harm is real, and that risk would be reduced to some extent if petitioners received the relief they sought.¹⁸⁴ The Court also reasoned that Massachusetts was entitled to special solicitude in the standing analysis given that Congress had recognized a procedural right to challenge the rejection of its rulemaking petition and Massachusetts' stake in protecting its quasi-sovereign interests.¹⁸⁵

The ACESA would be stronger with a citizen suit provision. Standing requirements would be difficult, but not impossible to satisfy. However, in the absence of a specific citizen suit provision, lawsuits against government agencies could still be brought pursuant to the Administrative Procedure Act (APA),¹⁸⁶ and attorney fees may be awarded pursuant to the Equal Access to Justice Act (EAJA).¹⁸⁷ The APA provides a right to judicial review of all "final agency action for which there is no other adequate remedy in a court,"¹⁸⁸ and applies universally "except to the extent that (1) statutes preclude judicial review; or (2) agency action is committed to agency discretion by law."¹⁸⁹ However, in citizen suits brought pursuant to the APA, the plaintiff must demonstrate prudential standing in addition to the Article III standing requirements.¹⁹⁰ The plaintiff must show that the interest that the plaintiff seeks to protect is within the zone of interests to be protected or regulated by the statute.¹⁹¹ For plaintiffs seeking government enforcement of rules intended to reduce greenhouse gas emissions, that is, suits within the "zone of interest" of the ACESA, this should not be a significant barrier. The APA and the EAJA may thus suffice as an alternative route for citizen plaintiffs to combat recalcitrant governmental entities. However, without a citizen suit provision in the ACESA, there is no vehicle for citizen suits against the regulated industry. The American Clean Energy and Security Act would be stronger with a citizen suit provision that created a private right of action against both the governmental agencies charged with its implementation and against the regulated industry.

¹⁸⁴ See *Massachusetts v. EPA*, 549 U.S. 497, 526 (2007).

¹⁸⁵ See *id.* at 520.

¹⁸⁶ 5 U.S.C. § 706 (2006).

¹⁸⁷ 28 U.S.C. § 2412(d)(1)(A) (2006) (allowing for recovery of attorneys fees and other expenses in cases brought by or against the United States, including proceedings for judicial review of agency action, unless the position of the United States in the litigation was substantially justified, or special circumstances make an award unjust).

¹⁸⁸ 5 U.S.C. § 704.

¹⁸⁹ *Id.* at § 701(a).

¹⁹⁰ See *Nat'l Credit Union Admin. v. First Nat'l Bank & Trust Co.*, 522 U.S. 479, 488 (1988).

¹⁹¹ See *id.* at 488.

III. SMART GROWTH STRATEGIES: LAND USE AND TRANSPORTATION

A. *Enormous Potential for Change through Smart Growth*

The transportation sector in the United States accounts for one-third of all U.S. end-use CO₂ emissions and, based on current projections, that share will rise to 36% by 2020.¹⁹² The EPA reports that “transportation is the fastest-growing source of [greenhouse gas] emissions in the U.S., accounting for 47% of the net increase in total U.S. emissions since 1990.”¹⁹³ Roadway travel accounts for about 80% of total transportation emissions with the largest contributions coming from automobiles (30%), light duty trucks (27%), and freight trucking (20%).¹⁹⁴ Since 1990, the transportation sector CO₂ emissions have risen by 21.1%—1.1% per year.¹⁹⁵

If the U.S. is to be on a path to a CO₂ reduction of 60 to 80% by 2050, it must sharply reduce the growth in vehicle miles traveled (VMT).¹⁹⁶ Between 1980 and 2005, the number of miles Americans drove grew three times faster than the U.S. population, and almost twice as fast as vehicle registrations.¹⁹⁷ The DOE’s Energy Information Administration (EIA) forecasts a 48% increase in driving between 2005 and 2030, outpacing the projected 23% increase in population.¹⁹⁸ According to a 2008 analysis by the Center for Clean Air Policy (CCAP), the growth in VMT is expected to overwhelm the planned improvements in vehicle efficiency and fuel reformulations from the Energy Independence and Security Act of 2007.¹⁹⁹ According to CCAP, even after improvements in passenger vehicle fuel economy standards to at least 35 miles per gallon (mpg) for new passenger vehicles by 2020, and planned renewable fuel requirements, CO₂ emissions from cars and light trucks would remain at 2005 levels, or 26% above 1990 levels in 2030.²⁰⁰

¹⁹² DAVID L. GREENE & ANDREAS SCHAFER, PEW CENTER FOR CLIMATE CHANGE, REDUCING GREENHOUSE GAS EMISSIONS FROM U.S. TRANSPORTATION iii (2003), available at www.pewclimate.org/docUploads/ustransp.pdf.

¹⁹³ U.S. Envtl. Prot. Agency, Transp. and Climate: Basic Information, <http://www.epa.gov/OMS/climate/basicinfo.htm> (last visited Nov. 12, 2009).

¹⁹⁴ MARILYN A. BROWN, FRANK SOUTHWORTH & ANDREA SARZYNSKI, METRO. POL’Y PROGRAM AT BROOKINGS, SHRINKING THE CARBON FOOTPRINT OF METROPOLITAN AMERICA 8 (2008), available at http://www.brookings.edu/~media/Files/rc/reports/2008/05_carbon_footprint_sarzynski/carbonfootprint_report.pdf [hereinafter BROWN ET AL.].

¹⁹⁵ DEP’T OF ENERGY, 2008 *FLASH* ESTIMATE, *supra* note 53, at 8.

¹⁹⁶ EWING ET AL., *supra* note 39, at 4.

¹⁹⁷ Smart Growth America, The Link to Energy Security and Climate Change, <http://www.smartgrowthamerica.org/factsheets/climate.pdf>.

¹⁹⁸ *Id.*

¹⁹⁹ *Climate Change and VMT: Why How Much We Drive Matters a Lot: Hearing Before the H. Comm. on Energy Independence and Global Warming*, 110th Cong. (2008) (statement of Steve Winkleman, Director of Transportation and Adaptation Programs, Center for Clear Air Policy), available at www.ccap.org/index.php?component=news&id=117.

²⁰⁰ *Id.*

However, if growth in car and light truck VMT could be held in check, all the other measures (e.g., CAFE standards and fuel reformulations) would reduce CO₂ emissions to 20% below 1990 levels in 2030.²⁰¹

A growing body of research suggests that the only way significant VMT reduction will be accomplished is with much stronger coordination of land use development and transportation infrastructure investments in urbanizing parts of the U.S.²⁰² These smart growth strategies aim to reduce vehicle trips (e.g., mode shifting—transit, bike, and pedestrian travel, and ride sharing) and vehicle trip lengths (e.g., through land use strategies such as greater mixing of land uses, higher street connectivity, denser residential and employment development, and better jobs-housing and retail-housing balance among other strategies).²⁰³ Again, government mandates are likely to be essential. The market alone, even with higher gas prices, is unlikely to drive the most efficient urban form given that increased fuel costs could be offset by increasing automobile fuel efficiency or reducing gasoline taxes, and that other factors like housing costs, size, quality, neighborhood amenities, and schools may dominate housing location decisions.²⁰⁴

There is a growing body of research that supports the importance of smart growth strategies to reducing greenhouse gas emissions. A number of early studies reported statistically significant relationships between VMT reduction and employment density, population density, land-use mix, transit service availability, and bike and pedestrian commuting quality.²⁰⁵ Many of these studies were criticized for failing to disentangle the influence of self-selection from the analysis (i.e., low travel type households “self-select” or move to denser, mixed-use, transit-supported

²⁰¹ *Id.*

²⁰² See, e.g., TODD LITMAN, VICTORIA TRANSP. INST., EVALUATING CRITICISM OF SMART GROWTH 8 (2009), available at <http://www.vtpi.org/sgcritics.pdf>; BENNET HEART & JENNIFER BIRINGER, THE SMART GROWTH - CLIMATE CHANGE CONNECTION 7 (The Conservation Law Found. 2000), available at <http://www.clf.org/resources/reports/docs/The%20Smart%20Growth%20Climate%20Change%20Connection.pdf>.

²⁰³ MARY JEAN BÜRER, DAVID GOLDSTEIN & JOHN HOLTZCLAW, NATURAL RESOURCES DEFENSE COUNCIL, LOCATION EFFICIENCY AS THE MISSING PIECE OF THE ENERGY PUZZLE: HOW SMART GROWTH CAN UNLOCK TRILLION DOLLAR CONSUMER COST SAVINGS 9–17 (2004), available at http://docs.nrdc.org/air/files/air_06031001a.pdf [hereinafter BÜRER ET AL.].

²⁰⁴ Alice Kaswan, *Climate Change, Consumption and Cities*, 36 *FORDHAM URB. L.J.* 253, 272 (2009).

²⁰⁵ See, e.g., LAWRENCE D. FRANK & GARY PIVO, RELATIONSHIPS BETWEEN LAND USE AND TRAVEL BEHAVIOR IN THE PUGET SOUND REGION 1 (Washington Department of Transportation 1994), available at <http://www.u.arizona.edu/~gpivo/LU%20and%20TBehavior.pdf>; John Holtzclaw, Robert Clear, Hank Dittmar, David Goldstein & Peter Haas, *Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use—Studies in Chicago, Los Angeles and San Francisco*, 25 *TRANSPORTATION PLANNING AND TECHNOL.* 1, 1–27 (2002); see also ROBERT T. DUNPHY & KIMBERLY FISHER, *TRANSPORTATION, CONGESTION, AND DENSITY: NEW INSIGHTS* 89–96 (Transp. Res. Bd. 1996).

neighborhoods as opposed to compact urban form and neighborhood characteristics changing travel behavior).²⁰⁶ However, a more recent survey of the land use travel literature concluded that virtually every quantitative study that did control for self-selection (through one of several approaches) still found statistically significant influences of one or more built environment measures on travel behavior.²⁰⁷

In 2008, University of California-Irvine researchers Golob and Brownstone estimated the impact of land use density on annual VMT and fuel usage by analyzing census data and travel survey data from 69,000 California households surveyed in the 2001 National Household Transportation Survey.²⁰⁸ They found, while statistically controlling for self-selection and missing data biases, that a household located in a denser residential areas (1,000 housing units per square mile denser than its counterpart) will drive about 1,200 fewer miles per year and consume 65 fewer gallons of fuel per year than its counterpart in a less dense area.²⁰⁹ Assuming that this density-VMT relationship is held constant across the U.S. and that the average U.S. household travels about 12,000 miles per year per passenger vehicle,²¹⁰ a residential densification strategy might yield about an 8% reduction in VMT annually from new residential areas (and comparable gains might be realized in existing residential areas with successful infill and transit strategies).

Project-level studies also suggest significant reductions in VMT can be realized with “infill” smart growth strategies. For example, University of Maryland Professor Reid Ewing and colleagues point to VMT reductions projected for the Atlantic Steel brownfield site in downtown Atlanta, Georgia.²¹¹ In a simulation study that compared the redeveloped brownfield site as a mixed-use, transit-accessible, dense project in contrast to spreading the equivalent commercial space and housing units across three conventional suburban locations, the researchers reported 36% less driving by the average brownfield resident compared to the average resident of the outlying comparison sites.²¹² The actual VMT

²⁰⁶ Susan Handy, *Methodologies for Exploring the Link between Urban Form and Travel Behavior*, 1 *TRANSP. RES. PART D* 151, 151–65 (1996).

²⁰⁷ Xinyu Cao, Patricia L. Mokhtarian & Susan L. Handy, *Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings*, 29 *TRANSPORT REVS.* 359, 389 (2009).

²⁰⁸ David Brownstone & Thomas F. Golob, *The Impact of Residential Density on Vehicle Usage and Energy Consumption* (Inst. of Transp. Studies & Univ. of California Irvine, Working Paper No. UCI-ITS-WP-05-1, 2008), available at <http://www.economics.uci.edu/~dbrownst/JUESprawIV3final.pdf>.

²⁰⁹ *Id.*

²¹⁰ U.S. Dep’t of Energy, Energy Info. Agency, Vehicle Miles Traveled, <http://www.eia.doe.gov/emeu/rtecs/chapter3.html> (last visited Feb. 10, 2010).

²¹¹ Reid Ewing, Keith Bartholomew, Steve Winkelman, Jerry Walters & Geoffrey Anderson, *Urban Development and Climate Change*, 1 *J. OF URBANISM* 201, 201–16 (2008).

²¹² *Id.* at 209–10.

reductions were better in reality than the simulation models predicted. Follow up travel surveys of Atlantic Station's actual residents and employees revealed an average of 8 VMT per day for residents, and 11 VMT per day for employees compared with the Atlanta regional averages of 32 VMT per person per day.²¹³

Another simulation study by Ewing and colleagues suggests that smart growth strategies have the potential to reduce nationwide VMT per capita by up to 40%.²¹⁴ If between 60 and 90% of the projected new developments nationwide between 2010 and 2050 were compact as opposed to conventional sprawl, the total benefit would be on the order of a 10% reduction in U.S. CO₂ emissions.²¹⁵ Another simulation study undertaken by researchers from the Natural Resource Defense Council and the Sierra Club suggests that if all housing were to be built in the U.S. like smart growth prototype developments, then the resulting reduction of greenhouse gas emissions nationwide would be 10% of total U.S. greenhouse gas emissions from 2001.²¹⁶ A third simulation analysis completed by the Sacramento Area Council of Governments as part of its Sacramento Regional Blueprint Visioning process suggests that if Sacramento successfully implements its Preferred Blueprint Scenario, which emphasizes infill development and transportation investments, VMT would be reduced by 26% and greenhouse gas emissions would be reduced by 15% by 2050 over the status quo growth scenario.²¹⁷ In short, smart growth strategies that connect denser mixed land uses and transportation infrastructure clearly offer a significant opportunity to reduce greenhouse gas emissions nationwide.

Increased transit infrastructure investment with supportive land use densities is also an important element of a smart growth strategy to reduce greenhouse gas emissions. According to a recent study by the American Public Transport Association, substituting one household's daily use of a single low occupancy vehicle with public transit use would reduce the household's carbon footprint between 25–30%.²¹⁸ European cities have invested in walkable, bikeable, transit-supportive urban forms for many decades and have established travel transit mode shares that are

²¹³ *Id.* at 210.

²¹⁴ *See* EWING ET AL., *supra* note 39.

²¹⁵ *Id.* at 10.

²¹⁶ BÜRER ET AL., *supra* note 203, at 7.

²¹⁷ SACRAMENTO AREA COUNCIL OF GOVERNMENTS, SPECIAL REPORT: PREFERRED BLUEPRINT ALTERNATIVE 9 (2005), available at http://www.sacreregionblueprint.org/sacreregion-blueprint/the_project/BP_Insert_JUN_2007.pdf.

²¹⁸ TODD DAVIS & MONICA HALE, SCIENCE APPLICATIONS INT'L CORP., PUBLIC TRANSPORTATION'S CONTRIBUTION TO U.S. GREENHOUSE GAS REDUCTION 2 (2007), available at http://postcarboncities.net/files/climate_change.pdf (noting that the carbon footprint of a typical U.S. household is about 22 metric tons per year).

the envy of virtually every major U.S. city.²¹⁹ Munich's transit modal split is 32% using public transport for the public at large (most U.S. cities average about 3% at best) and 80% using public transport during peak travel within the city center.²²⁰ Its bicycle and walking mode splits are 12% and 15% respectively—more than double the U.S. averages.²²¹ Network density, network coverage, and short headways, all of which make transit comparable to autos in travel time, are key predictors of transit usage.²²² As the United States lags behind Europe in all these categories,²²³ it will take decades to catch up with our European counterparts, but with an anticipated growth of 200 million new residents between 2006 and 2050,²²⁴ actions to narrow the gap are warranted and needed now.

A denser, compact, mixed-use urban form offers additional greenhouse gas emission reductions beyond those attributable to reduced VMT. Energy demand declines with a greater percentage of smaller homes, shorter transmission line distance, and increased use of district heating and cooling and co-generation power plants, which are only feasible in more densely populated residential and employment activity centers.²²⁵ According to a recent Brookings Institute report, households living in multi-unit residential buildings with shared walls and generally smaller square footage consume only 38% of the energy of households in single-family homes.²²⁶ Researchers Ewing and Rong, in an exploratory multivariate hierarchical analysis of U.S. household energy use and urban form measures, reported that households living in multi-family units, compared with otherwise comparable households living in single-family detached units, consume 54% less energy for space heating and 26% less

219 TRANSIT COOP. RES. PROGRAM, RESEARCH RESULTS DIGEST 89 2 (Transp. Research Bd. of the Nat'l Acads., 2009), available at http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rtd_89.pdf.

220 *Id.* at 6.

221 *Id.*

222 GERARD WALTERS & ROBERT CERVERO, FORECASTING TRANSIT DEMAND IN A FAST GROWING CORRIDOR: THE DIRECT-RIDERSHIP MODEL APPROACH 5 (2003), available at <http://www.ce.berkeley.edu/~yuli/ce259/reader/Direct%20Ridership%20Forcast.pdf>.

223 See generally TRANSP. RES. BD., MAKING TRANSIT WORK: INSIGHT FROM WESTERN EUROPE, CANADA AND THE U.S. SPECIAL REPORT 257 (National Academy Press 2001), available at <http://onlinepubs.trb.org/onlinepubs/sr/sr257.pdf> (A report from a two year study investigating European public transportation).

224 ARTHUR C. NELSON, METRO. RESEARCH CTR., BUILDING THE NEW DAMASCUS 2 (2009), available at <http://www.oregon.gov/LCD/TGM/docs/nelsondamascus5709revb.pdf>.

225 INT'L ENERGY AGENCY, COMBINED HEAT AND POWER: EVALUATING THE BENEFITS OF GREATER GLOBAL INVESTMENT (IEA Publications, 2008), available at http://www.recep.org/file_upload/9_tmpphplkyuzj.pdf (reporting that 2/3 of the fuel used to produce power is wasted while CHP systems can more than double this efficiency).

226 BROWN ET AL., *supra* note 194, at 12.

energy for space cooling.²²⁷ Compared with a household living in a 1,000-square-foot house, an otherwise comparable household living in a 2,000-square-foot house consumes 16% more energy for space heating and 13% more energy for space cooling.²²⁸ In sum, Ewing and Rong assert that compact development reduces transportation energy use and emissions by 20 to 40% relative to sprawl, and will have a comparable impact on residential energy use and emissions.²²⁹

The evidence presented in this section points to the critical importance of smart growth strategies to help reduce U.S. greenhouse gas emissions as the country adds 200 million more residents and builds billions of square feet of new commercial and industrial development in the next 50 years.²³⁰ To be effective, however, smart growth strategies must be vigorously applied across all 50 states and all units of local government where land development occurs. One way that the states have begun to incorporate smart growth strategies has been through state climate action plans. More than half of the 30 state climate action plans that exist today have goals and policies focused specifically on smart growth strategies to reduce greenhouse gas emissions.²³¹ A recent Lincoln Institute for Land Policy study of smart growth strategies in western state climate action plans reveals anticipated CO₂ emission reductions on the order of 17 to 25% (this includes, in many cases, green building code and distributed generation aspects of smart growth).²³² The following section reviews the status of current state climate action plan efforts to use land use and transportation planning to reduce greenhouse gas emissions, but finds the current approach lacking.

B. *State Climate Action Plans and Smart Growth Practices*

There is not much to be optimistic about in regards to state climate action plans. First, most state climate action plans lack performance tracking systems and fall well short on implementation details.²³³ Sec-

²²⁷ Reid Ewing & Fang Rong, *The Impact of Urban Form on U.S. Residential Energy Use*, 19 HOUSING POLICY DEBATE 1, 1–30 (2008).

²²⁸ *Id.* at 20.

²²⁹ *Id.* at 23.

²³⁰ NELSON, *supra* note 224, at 2.

²³¹ Robert Paterson & Rachael Rawlins, State Climate Action Plan Summary Worksheet (Nov. 13, 2009) (unpublished research file, on file with authors).

²³² Rebecca Carter, *Land Use Planning and the Changing Climate of the West* 1–82 (Lincoln Inst. of Land Policy, Working Paper No. WP08RC2, 2008), available at http://www.lincolninstitute.edu/pubs/download.asp?doc_id=773&pub_id=1547.

²³³ *Id.* As planning scholar William Baer has noted that “[m]ost plans are intended to do something,” ideally they would have sections dealing with such matters as: priorities for implementation, cost of implementation vs. non-implementation, time span for plan implementation (i.e., deadlines), scheduling and coordinating of implementation proposals, and identification of the agency(s) or person(s) responsible for implementation. William C. Baer,

ond, coverage is spotty—approximately 20 states still lack climate action plans.²³⁴ Third, without some kind of federal hammer, commitment to climate action plan implementation is likely to be episodic with the changing political winds and party turnover in governorships and legislatures. Consider the recent Florida experience: just one year after signing the Florida Green Building Act that strengthened the requirements for localities to consider climate change mitigation in land use and transportation planning, Florida Governor Crist signed the Florida Community Renewal Act, which exempts many projects from the state's land use and adequate transportation facilities planning "concurrency" requirement and Development of Regional Impact review.²³⁵ On its face, the Florida Community Renewal Act is supposed to encourage infill development by providing for exemptions from transportation concurrency and Development of Regional Impact review in "dense urban land areas"; however, "the legislation defines 1,000 people/square mile as 'dense urban land areas,'" which includes areas with less than one dwelling unit per acre and automatically qualifies 245 cities and significant portions of eight of Florida's largest counties to pursue sprawling development patterns—not infill development.²³⁶

In 2002, researchers were cautiously optimistic about the potential of states as effective climate change agents—especially in light of the limited attention that climate change policy was receiving at the federal level.²³⁷ Indeed, since then, the states have been quite busy, with the number of states with greenhouse gas emissions inventories climbing to 44, and the number of states that have adopted or updated older state climate action plans (or mitigation strategies) nearly doubling in the past eight years.²³⁸ Over 80% of the states have now adopted greenhouse gas emission targets through those inventories, and over half require leadership by example with requirements for state government buildings to meet the LEED rating system levels or other high energy efficiency performance requirements.²³⁹ However, in the first thorough assessment of

General Plan Evaluation Criteria: An Approach to Making Better Plans, 63 J. AM. PLAN. ASS'N 329, 338 (1997).

²³⁴ See Stephen M. Wheeler, *State and Municipal Climate Change Plans: The First Generation*, 74 J. AM. PLAN. ASS'N 481, 486 (2008).

²³⁵ See H.J. 01883, 2009 Leg., Reg. Sess. (Fla. 2009), available at <http://www.fl-senate.gov/data/session/2009/Senate/bills/billtext/pdf/s0360er.pdf>.

²³⁶ 1000 Friends of Fla., 2009 Legislative Session: Summary of Concerns about SB 360 (2009), <http://www.1000friendsofflorida.org/reform/09session.asp> (last visited Feb. 10, 2010).

²³⁷ See generally BARRY G. RABE, PEW CTR. ON GLOBAL CLIMATE CHANGE, GREENHOUSE AND STATEHOUSE: THE EVOLVING STATE GOVERNMENT ROLE IN CLIMATE CHANGE (2002), available at http://www.pewclimate.org/docUploads/states_greenhouse.pdf. (finding increasing state activity surrounding the issue of climate change).

²³⁸ See Wheeler, *supra* note 234, at 491.

²³⁹ *Id.* at 492.

the 29 state climate action plans that were adopted by the end of 2008, University of California-Davis Professor Stephen Wheeler noted that 12 states had no mandatory monitoring or reporting requirements, many had set emissions targets too low to be effective, the range of mitigation strategies were limited, and that implementation was problematic.²⁴⁰

The empirical research on state efforts to rein in sprawl and promote denser, more compact, transit-supportive urban forms suggests that state efforts to date have largely failed with the notable exception of efforts in Oregon.²⁴¹ U.S. Department of Housing and Urban Development economist John Carruthers reports that his findings from a multivariate statistical analysis of urban areas in Florida, California, Georgia, Washington, and Oregon revealed that only the Oregon system of managing land use and transportation is meeting the challenge of curbing sprawl.²⁴² Oregon has created a more dense urban form that is transit-supportive by virtue of its requirements for regional urban growth boundaries, minimum density zoning, and vertical and horizontal consistency requirements in the comprehensive planning process with strong enforcement mechanisms.²⁴³ Another report by Professor Robert Wassmer found that the greatest reductions in sprawl are accomplished in states with growth management acts that require consistency between state and local plans and the plans of adjoining jurisdictions, as well as localities with strict urban containment provisions (such as Oregon).²⁴⁴ Finally, the Lincoln Institute for Land Policy recently completed a multi-state evaluation comparing state smart growth and growth management programs from four states—Florida, Oregon, Maryland, and New Jersey—against the experience in four non-smart growth states—Colorado, Indiana, Texas, and Virginia.²⁴⁵ The investigators noted that Oregon’s commitment to urban containment (especially in the Portland Metropolitan Statistical Areas) was able to reduce farmland loss (a carbon sink), increase density, and led to significant VMT reduction with increases in transit, biking, and walking.²⁴⁶

Indeed, the Portland, Oregon, metropolitan region stands out as a national model for complementary land use and transportation policies

²⁴⁰ *Id.* at 486–88, 491.

²⁴¹ See, e.g., John I. Carruthers, *The Impacts of State Growth Management Programmes: A Comparative Analysis*, 39 URB. STUD. 1959, 1977 (2002).

²⁴² *Id.*

²⁴³ See *id.* at 1976.

²⁴⁴ Robert W. Wassmer, *The Influence of Local Urban Containment and Statewide Growth Management Policies on the Size of United States Urban Areas* 20–21 (Cal. State Univ., 2005), available at www.csus.edu/indiv/w/wassmert/mgmtcontainment.pdf.

²⁴⁵ GREGORY K. INGRAM ET AL., LINCOLN INST. OF LAND POLICY, SMART GROWTH POLICIES: AN EVALUATION OF PROGRAMS AND OUTCOMES ix (2009), available at https://www.lincolninst.edu/pubs/dl/1571_855_Web%20Chapter.pdf.

²⁴⁶ *Id.* at 195.

that reduce VMT as well as policies that have served to reduce the city's overall carbon footprint. Portland was the first U.S. city to adopt a CO₂ reduction strategy in 1993 and an action plan in 2001.²⁴⁷ Since 1990, only 8% of the region's housing had gone beyond its urban containment boundary.²⁴⁸ Since 1990, the region added 48 miles of new light rail and streetcar lines, quadrupled its frequent bus routes from 4 to 16, and heavily invested in an over 40% increase in bicycle boulevards, routes, and lanes. As a result, Portland has seen a 90% increase in transit use, and a five-fold increase in cycling, such that Portland now has a higher percentage of bicycle commuters than any other major U.S. city (a rate 8 times the national average).²⁴⁹ While nationally VMT per capita grew by 8% between 1990 and 2007, in the Portland area VMT per capita fell by 8–10%.²⁵⁰ Portland managed to reduce its greenhouse gas emissions to 1% above 1990 levels by 2008, while its population grew by 14%.²⁵¹

The foundation of Oregon's program is its nineteen state goals (generally accompanied by guidelines) that cities and counties must satisfy in their comprehensive land use plans.²⁵² Among other objectives, goal 12 requires that transportation plans "consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian, that they conserve energy, and that they conform with local and regional comprehensive land use plans."²⁵³ Local comprehensive plans are reviewed for consistency with the statewide planning goals by the state's Land Conservation and Development Commission.²⁵⁴ Also important in Oregon are the urban growth boundaries. Each city or metropolitan area in the state has an urban growth boundary that separates urban land from rural land and reduces sprawl by concentrating infrastructure and development in the urban core.²⁵⁵

²⁴⁷ Reid Ewing, Professor, Coll. of Architecture and Planning, Univ. of Utah, *Growing Cooler: The Evidence on Urban Development and Climate Change*, Presentation to the Florida Department of Community Affairs (June 25–26, 2009), available at <http://www.dca.state.fl.us/fdcp/dcp/gmw/2009/Ewing.pdf>.

²⁴⁸ STEVE WINKELMAN ET AL., CTR. FOR CLEAN AIR POLICY, *COST-EFFECTIVE GHG REDUCTIONS THROUGH SMART GROWTH & IMPROVED TRANSPORTATION CHOICES 16* (2009), available at http://www.ccap.org/docs/resources/677/CCAP%20Smart%20Growth%20-%20per%20ton%20CO2%20_June%202009_%20FINAL.pdf.

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ *Id.*

²⁵² Or. Dep't of Land Conservation and Dev., *Statewide Planning Goals* <http://www.lcd.state.or.us/LCD/goals.shtml> (last visited Feb. 10, 2010).

²⁵³ OR. ADMIN. R. 660-015-0000(12) (2008), available at <http://www.lcd.state.or.us/LCD/docs/goals/goal12.pdf>.

²⁵⁴ Or. Dep't of Land Conservation and Dev., *supra* note 252.

²⁵⁵ Metro, *Urban Growth Boundaries*, <http://www.oregonmetro.gov/index.cfm/go/by.web/id=277> (last visited Feb. 10, 2010).

In Oregon, there must be coordination between land use and transportation planning with the goal of reducing VMT.²⁵⁶ The Transportation Planning Rule specifically anticipates “that metropolitan areas will accomplish reduced reliance [on the automobile] by changing land use patterns and transportation systems so that walking, cycling, and use of transit are highly convenient and so that, on balance, people need to and are likely to drive less than they do today.”²⁵⁷ The coordination between land use and transportation planning in Oregon is such that the Oregon Department of Transportation (ODOT) has commented on specific land use proposals, and ODOT staff members have testified in opposition to development projects that were otherwise unopposed.²⁵⁸

Not only does Oregon coordinate its transportation and land use planning, but strict consistency requirements extend all the way to the level of property specific rezoning actions. As noted by Oregon practitioners Timothy Ramis and Andrew Stamp, it is “the procedural safeguards provided under Oregon law that may leave the most lasting mark on the law of planning.”²⁵⁹ Consistency requirements stem from the Standard Zoning Enabling Act’s requirement that zoning be “in accordance with a comprehensive plan.”²⁶⁰ Some state courts have interpreted their state consistency requirements to mean nothing more than that zoning laws be reasonable, finding even that the plan may be found in the zoning ordinance itself.²⁶¹ Thus, zoning may be easily changed at the request of land owners without having to strictly follow any sort of land use plan. In most states, rezoning is shielded from full scrutiny as a legislative decision and is thereby entitled to a presumption of validity.²⁶² In Oregon, however, zoning is not so easily changed.²⁶³ Applying administrative law principals to their state consistency requirement, the Oregon courts consider rezoning to be a quasi-judicial action where the change must be supported by proof that it is in conformance with the comprehensive plan.²⁶⁴ Comprehensive plans that meet state standards

²⁵⁶ Or. Dep’t of Land Conservation and Dev., *supra* note 252.

²⁵⁷ OR. ADMIN. R. 660-012-0035(4) (2008).

²⁵⁸ Timothy V. Ramis & Andrew H. Stamp, *Integrating Procedural Aspects of Transportation and Growth Management in Oregon: A Critical Look at the Oregon Department of Transportation’s Role as a Growth Management Agency*, 77 OR. L. REV. 845, 855–56 (1998).

²⁵⁹ *Id.* at 848.

²⁶⁰ DAVID L. CALLIES, ROBERT H. FREILICH & THOMAS E. ROBERTS, *CASES AND MATERIALS ON LAND USE* 463 (4th ed. West, 2004) [hereinafter CALLIES ET AL.].

²⁶¹ *Id.*

²⁶² *See, e.g.*, *Fasano v. Bd. of County Comm’rs of Wash. County*, 507 P.2d 23, 26 (Or. 1973), *overruled by Neuberger v. City of Portland*, 607 P.2d 722 (Or. 1980).

²⁶³ Oregon is not the only state to have strengthened consistency requirements, but it is a leader. *See* CALLIES ET AL., *supra* note 260, at 463–64 (identifying California and Florida).

²⁶⁴ *See Fasano*, 507 P.2d at 29. The Oregon Supreme Court explained:

The more drastic the change, the greater will be the burden of showing that it is in conformance with the comprehensive plan as implemented by the ordinance, that

and coordinate land use and transportation policy are an integral part of the land development process in Oregon.

In sum, although many states have adopted state climate action plans, we cannot rely on states to meet our international responsibility to control greenhouse gas emissions. Many states have no plan, and many others have inadequate plans lacking clear enforcement measures and implementation mechanisms. Smart growth policies are vulnerable to the winds of the political landscape, and, even where clear plans may exist, states are often lacking the legal and administrative structure that would ensure plan implementation. Given Oregon's success, we know that it is possible for states to ensure effective use of smart growth strategies at regional and local levels to better govern land use and transportation planning, but some prodding at the federal level undoubtedly will be required to encourage change.

C. *Land Use and Transportation Planning: The ACESA is Not Strong Enough*

The American Clean Energy and Security Act would increase and strengthen the requirements for land use and transportation planning that are currently required for federal funding, but it may not go far enough to ensure meaningful substantive change.²⁶⁵ The ACESA builds on the current program and may lead to better planning, but we need a stronger system to ensure enforcement and implementation.

The federal government has required transportation planning as a condition of receiving federal funds since the Federal Highway Act of 1962.²⁶⁶ In 1991, the federal government enacted the Intermodal Surface Transportation Efficiency Act (ISTEA), which allowed for greater flexibility in how federal transportation funds could be used, and required consideration of transportation investments, development patterns, and the consistency of transportation plans with land use and development plans.²⁶⁷ Many of these requirements were carried forward into the Transportation Equity Act for the 21st Century, and then into the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Leg-

there is a public need for the kind of change in question, and that the need is best met by the proposal under consideration. As the degree of change increases, the burden of showing that the potential impact upon the area in question was carefully considered and weighed will also increase.

Id.

²⁶⁵ The American Clean Energy and Security Act, H.R. 2454, 111th Cong. § 841(a) (1st Sess. 2009).

²⁶⁶ Federal Aid Highway Act of 1962, Pub. L. No. 87-866, § 1, 76 Stat. 1145 (1962).

²⁶⁷ Keith Bartholomew, *Cities and Accessibility: The Potential for Carbon Reductions and the Need for National Leadership*, 36 *FORDHAM URB. L.J.* 159, 192 (2009).

acy for Users (SAFETEA-LU).²⁶⁸ However, the required planning considerations in SAFETEA-LU are only procedural requirements that cannot be challenged in court, and have been criticized for insufficient implementation in practice.²⁶⁹

The ACESA moves in the direction of creating a degree of standardization and goal setting that might lead to real progress towards plan implementation. The ACESA would require the Secretary of Transportation to adopt regulations to establish national transportation-related greenhouse gas emissions reduction goals, to develop standardized models and methodologies for use in developing surface transportation-related greenhouse gas emissions reduction targets, and to develop methods for collection of data on transportation-related greenhouse gas emissions.²⁷⁰ In order to attain certification related to federal funding, the ACESA would require states and metropolitan planning organizations (MPOs) to develop surface transportation-related greenhouse gas emission reduction targets as well as strategies to meet those targets.²⁷¹ The targets and strategies would be required to include efforts to increase walking, bicycling, and other forms of non-motorized transportation.²⁷² The Act would also require states and MPOs to demonstrate “progress” in stabilizing and reducing transportation-related greenhouse gas emissions.²⁷³

Although a step in the right direction, the ACESA does not go far enough. There is no clear definition of the “progress” that states must demonstrate, and the enforcement section focuses only on procedural requirements. The Secretary is prohibited from certifying that the standards are met only if a state has failed to develop, submit, or publish its emission reduction targets and strategies.²⁷⁴ Without an enforceable definition and standards to define progress, any success may fall short of the radical action required to meet greenhouse gas reduction goals. Also problematic is that there is no system proposed to coordinate the work of the states, MPOs, and local governments. States should have to demonstrate how they are going to ensure implementation of plans created by MPOs. States have generally delegated land use regulation to local governments. MPOs are regional transportation planning entities that are

²⁶⁸ *Id.*

²⁶⁹ *Id.* at 195 (citing 23 U.S.C. § 134(h)(2) (2006)).

²⁷⁰ H.R. 2454, § 841(a).

²⁷¹ The American Clean Energy and Security Act, H.R. 2454, 111th Cong. § 841(b)–(c) (1st Sess. 2009).

²⁷² *Id.*

²⁷³ *Id.*

²⁷⁴ *Id.* at § 841(c)(9)(E).

generally unelected and have no land use regulatory authority.²⁷⁵ Oregon again is an exception: Metro, an elected regional governmental entity, manages the Portland Metropolitan region's urban growth boundary.²⁷⁶ The ACESA should adopt clear standards to define "progress" and encourage states to follow Oregon's lead by withholding funding unless states demonstrate that they have the institutional framework necessary to guarantee plan implementation.

IV. REGULATING GREENHOUSE GASES UNDER THE CLEAN AIR ACT

A. *Another Option to Force Change in the Building, Land Use, and Transportation Sectors*

An alternate path, one that would be bypassed were the ACESA to become law,²⁷⁷ would be to regulate greenhouse gas emissions under the Clean Air Act (CAA). In 2007, the Supreme Court ruled against the Bush Administration EPA, holding that greenhouse gases are air pollutants subject to consideration under Section 202 of the CAA.²⁷⁸ Given the nearly identical language in other sections of the CAA, this decision may lead to the establishment of National Ambient Air Quality Standards (NAAQS), state implementation plans (SIPs), new source performance standards, and other regulatory mechanisms of the CAA.²⁷⁹ The Court held that the EPA Administrator must determine under Section 202 whether or not greenhouse gases emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.²⁸⁰ On December 7, 2009, the Obama Administration answered in the affirmative by signing two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-

²⁷⁵ 23 U.S.C. §134 (2006) (defining MPOs); *see also* Bill Hudnut, *Wake the Giants*, THE URB. LAND INST., Aug. 5, 2009, available at <http://www.uli.org/sitecore/content/ULI2Home/News/ULI%20in%20the%20News/August%202009/Content/Articles/5%20August%20The%20Reporter.aspx>.

²⁷⁶ Metro, Planning and Conservation, Transportation, <http://www.oregonmetro.gov/index.cfm/go/by.web/id=118> (last visited Feb. 10, 2010).

²⁷⁷ Among other limitations, the ACESA would halt any possible greenhouse gas reduction scheme under Section 108 of the CAA (establishment of criteria pollutants for which NAAQS would be established), and any requirements under the CAA for state implementation plans for new source performance standards. *See* The American Clean Energy and Security Act, H.R. 2454, 111th Cong. §§ 831–34 (1st Sess. 2009).

²⁷⁸ *See* Massachusetts v. EPA, 549 U.S. 497, 528–30 (2007).

²⁷⁹ *See* Thomas D. Peterson et al., *Developing a Comprehensive Approach to Climate Change Policy in the United States that Fully Integrates Levels of Government and Economic Sectors*, 26 VA. ENVTL. L.J. 227, 228 (2008).

²⁸⁰ Massachusetts v. EPA, 549 U.S. at 533–35.

mixed greenhouse gases—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)—in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.²⁸¹

The “endangerment” and “cause or contribute” findings open the door to the possibility that federal regulations under the CAA could be used to effectively force state regulation of building, land use, and transportation planning through the CAA’s National Ambient Air Quality Standards and state implementation planning process. Under the CAA, the EPA is also required to establish NAAQS for pollutants that “cause or contribute to air pollution which may reasonably be anticipated to endanger public health.”²⁸² The statute then gives states flexibility to adopt a State Implementation Plan (SIP) that will be capable of achieving and maintaining the NAAQS.²⁸³ Although the states have flexibility to choose the industries to regulate, given the importance of the building and transportation sectors to the generation of greenhouse gases, any standards set for greenhouse gases may drive regulation in these areas. The EPA must disapprove a SIP if it finds that the plan as written will not achieve the NAAQS.²⁸⁴ If the state fails to correct the problem it may lose federal highway funding and face two-for-one offset requirements as a condition of permitting new stationary sources.²⁸⁵ If a state still fails to produce an acceptable SIP, the EPA may impose a Federal Implementation Plan (FIP).²⁸⁶

In some ways, the CAA may be an awkward fit for the regulation of greenhouse gases, but effective regulation under it may still be possible. NAAQS must be set at levels adequate to protect public health and wel-

²⁸¹ U.S. Env’t Prot. Agency, Endangerment and Cause or Contribute Findings For Greenhouse Gases under Clean Air Act, <http://epa.gov/climatechange/endangerment.html> (last visited Jan. 28, 2010).

²⁸² 42 U.S.C. § 7408(a)(1)(A) (2006).

²⁸³ *See id.* § 7410(a).

²⁸⁴ Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act’s Cooperative Federalism Framework is Useful for Addressing Global Warming*, 50 *Ariz. L. Rev.* 799, 818 (2008).

²⁸⁵ *See id.*

²⁸⁶ *See* 42 U.S.C § 7410(c)(1).

fare, regardless of costs.²⁸⁷ Some scholars have noted that this may be difficult in the context of greenhouse gases where the effects are indirect, and “the likelihood [is] that we are already committed to a level of warming that will significantly affect public health and welfare.”²⁸⁸ Also problematic is that SIPs have been focused on regulation aimed at achieving or maintaining local air pollutant concentrations based on modeling and monitoring of ambient air quality.²⁸⁹ This approach would have to be adjusted for greenhouse gas emission reduction targets, with enforced modeling instead of sampling, as greenhouse gases have a relatively uniform concentration throughout the atmosphere.²⁹⁰ The states could then choose to achieve reductions through building standards or land use and transportation planning to reduce vehicle miles traveled. Some aspects of the SIP process could be delegated to the local level, followed by state consolidation of state and local efforts into a state implementation plan subject to federal oversight. This approach would avoid completely stripping local governments of historical powers,²⁹¹ but may nevertheless create a sufficient constraint on that power to create political opposition.

In the early 1970s, there was a politically unpopular and failed effort to regulate land use and transportation planning through the CAA. The 1970 CAA specifically anticipated the use of land use and transportation controls in the SIP process.²⁹² However, when the EPA attempted to directly order states to take specified regulatory and other actions, it was challenged on both Tenth Amendment federalism principals and the lack of clear statutory authority.²⁹³ Given limited discussion at the congressional level, the political imperative at the time was unclear, and the

²⁸⁷ See *id.* § 7409(b); *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 486 (2001) (holding that because the CAA does not authorize a cost analysis, the EPA “may not consider implementation costs in setting primary and secondary NAAQS under § 109(b) of the CAA”).

²⁸⁸ Doremus & Hanemann, *supra* note 284, at 821–22.

²⁸⁹ See Peterson et al., *supra* note 279, at 257.

²⁹⁰ See *id.* at 257–61 (concluding that such an emissions-based approach to SIP's could be accommodated within the current structure of the CAA, but noting that although there is sufficient flexibility in the CAA to allow emission reduction goals to be established by administrative regulation, an approach with greater political legitimacy would be for those targets to be established by Congress, and concluding that this approach would avoid potential litigation delays and administrative inertia).

²⁹¹ See Kaswan, *supra* note 204, at 298–99 (concluding that local governments required to meet local emission reduction goals could appreciate the flexibility of choosing from an array of land use and building strategies).

²⁹² See Clean Air Amendments of 1970, Pub. L. No. 91-640, § 110(a)(2)(B), 84 Stat. 1676, 1680 (1970), amended by Pub. L. No. 101-549, Title VIII, § 805, 104 Stat. 2689 (1990) (current version at 42 U.S.C. § 7431 (2006) (replacing the 1970 version of the Clean Air Act that specifically anticipated the use of “land use and transportation controls”).

²⁹³ See John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1199–1208 (1995) (discussing the troubled history of land use and transportation controls under the CAA).

EPA lacked the administrative resources, expertise, and necessary technical information to adopt specific criteria for land use and transportation controls.²⁹⁴ The CAA was changed in 1977 to include a specific prohibition of any “infringement on the existing authority of counties and cities to plan or control land use.”²⁹⁵

The federal government today still has some leverage to encourage land use and transportation planning through the requirements for federally funded or approved highway projects. Once the EPA approves a SIP, federal agencies may not take, approve, or fund any activity that does not conform to the SIP.²⁹⁶ Likewise, MPOs may not approve any project, program, or plan that does not conform to the SIP.²⁹⁷ The EPA has adopted detailed requirements including the use of land use forecasts and travel models that include land development scenarios for conformity analysis for federally funded or approved highway projects in non-attainment areas.²⁹⁸ This conformity requirement can encourage local transportation authorities to shift funding from highway expansion to transit, bicycle, and pedestrian facilities.²⁹⁹ However, this approach has had little success, perhaps due in part to the CAA’s specific prohibition on federal interference with local land use authority.³⁰⁰

B. *Despite Past Performance, The CAA Could be an Effective Vehicle to Force Regulation of Land Use and Transportation Planning*

The Clean Air Act could be an effective vehicle to regulate greenhouse gases. The CAA has a well developed and effective enforcement program. The CAA requires that SIPs include monitoring and enforcement programs,³⁰¹ and that the states demonstrate that they have adequate personnel, funding, and legal authority to put them into effect.³⁰²

²⁹⁴ See *id.* at 1207. Dwyer explains:

Congress’s foray into land use and transportation controls faced many difficulties, the central one being that Congress had not evaluated the problem politically or technically. . . . By giving the states inadequate time to address the difficult political and technical problems, and then by forcing an ill-prepared EPA to shoulder the administrative burdens through FIPs (which EPA tried to foist on state agencies), Congress alienated the states.

Id.

²⁹⁵ 42 U.S.C. § 7431 (2006).

²⁹⁶ *Id.* § 7506(c).

²⁹⁷ *Id.*

²⁹⁸ See, e.g., 40 C.F.R. pt. 93

²⁹⁹ See JAMES E. MCCARTHY, TRANSPORTATION CONFORMITY UNDER THE CLEAN AIR ACT: IN NEED OF REFORM? CRS-6 (Cong. Res. Serv. 2004), available at <http://www.ncseonline.org/NLE/CRSreports/04apr/RL32106.pdf>.

³⁰⁰ See Bartholomew, *supra* note 267, at 196–97.

³⁰¹ 42 U.S.C. §§ 7410(a)(2)(B)–(C) (2006).

³⁰² *Id.* § 7410(a)(2)(E).

Once a SIP is approved by the EPA,³⁰³ it becomes enforceable as a matter of federal, as well as state law,³⁰⁴ and must be revised periodically.³⁰⁵ The CAA authorizes citizen participation in CAA enforcement and implementation. Citizen suits may be brought directly against CAA violators, and against the EPA for failing to comply with the CAA.³⁰⁶ The reviewing court may award attorneys' fees to a citizen litigant whenever it determines that such award is "appropriate,"³⁰⁷ and there is some degree of success on the merits.³⁰⁸

The CAA has successfully curtailed many air pollutants. Although almost half the U.S. population still lives in areas that fail to meet the NAAQS (non-attainment areas), the number of households exposed to violations of multiple criteria pollutants that exceed the NAAQS has dropped significantly.³⁰⁹ From 1990 to 2007, nationwide air quality conditions for the six criteria pollutants have improved significantly: ozone (8 hour standard) was reduced by 9%; particulate pollution, both small (PM10) and extra fine (PM2.5) standards, was reduced by 11% and 28%, respectively; lead was reduced by 80%; nitrogen dioxide was reduced by 35%; carbon monoxide (8 hour standard) was reduced by 67%; and, sulfur dioxide was reduced by 54%.³¹⁰ The National Conference of State Legislatures, using data from the EPA analysis of the CAA, found that "the act produced major reductions in pollution that causes illness and disease, smog, acid rain, haze, and damage to the environment."³¹¹

Past failures in using the CAA as a means to regulate land use and transportation planning to meet greenhouse gas reduction targets should not deter renewed efforts. The political environment has changed. Global warming has created a crisis that cannot be ignored. The availability and sophistication of land use and transportation modeling programs has also changed since 1970.³¹² Today, regional scenario planning has become a common best practice,³¹³ and, although its efforts are only advisory, the EPA has sponsored research and created specific

³⁰³ *Id.* § 7410(a)(1).

³⁰⁴ *Id.* § 7413.

³⁰⁵ *Id.* § 7410(a)(2)(H).

³⁰⁶ *Id.* §§ 7604(a), 7607(d).

³⁰⁷ 42 U.S.C. §§ 7404(d), 7607(f) (2006).

³⁰⁸ *See Ruckelshaus v. Sierra Club*, 463 U.S. 680, 682 (1983).

³⁰⁹ U.S. Env'tl. Prot. Agency, Air Quality Summary Through 2005, http://www.epa.gov/airtrends/2006/aq_summary_2005.html (last visited Feb. 10, 2010).

³¹⁰ U.S. ENVTL. PROT. AGENCY, NATIONAL AIR QUALITY: STATUS AND TRENDS THROUGH 2007 10 (2008), available at <http://www.epa.gov/airtrends/2008/report/SixCommonPollutants.pdf>.

³¹¹ Libraryindex.com, Air Quality - The Clean Air Act (CAA) - A Huge Success, <http://www.libraryindex.com/pages/1124/Air-Quality-CLEAN-AIR-ACT-CAA-HUGE-SUCCESS.html> (last visited Feb. 10, 2010).

³¹² *See Bartholomew*, *supra* note 267, at 184.

³¹³ *See id.* at 185.

guidance on how land use policies might fit into air quality planning and conformity analyses.³¹⁴

Given Tenth Amendment concerns, the EPA must avoid directly ordering the states to take prescribed legislative actions. However, with appropriate statutory changes, the EPA should today be able to require states to use modeling to demonstrate attainment of greenhouse gas reduction targets, even if it may not directly order the states to regulate land use and transportation planning. The choice as to the means to meet the targets would be that of the state. However, given the need for drastic reductions, and the importance of transportation related emissions, there would likely be little choice but for the states to move forward on all fronts, including land use and transportation management. Although the Supreme Court has recognized that the regulation of land use is a function traditionally performed by local governments,³¹⁵ it is clear today that the Tenth Amendment does not limit congressional power to pre-empt or displace state regulation of private activities affecting interstate commerce.³¹⁶ It is plainly within Congress's power to regulate greenhouse gas emissions just as it regulates other pollutants under the CAA. Courts have consistently upheld Congress's authority to regulate private activities in order to protect the environment.³¹⁷ As a practical matter, federal enforcement in the areas of land use and transportation will be more difficult than in some other areas, but may still be effective. It would be difficult for the EPA to encourage compliance through the threat of overriding a SIP with a federal implementation plan given that the institutional and regulatory structure of land use controls has developed solely at the local level, but sanctions such as offsetting requirements or the loss of certain intergovernmental revenues may be effective. The Clean Air Act could be an effective vehicle to encourage states to effectively regulate land use and transportation to minimize greenhouse gas emissions.

V. A PLAN TO MOVE FORWARD

To reduce greenhouse gas emission to 33% below 1990 levels by 2030 and meet a CO₂ reduction target of 60 to 80% by 2050, the U.S.

³¹⁴ See *id.* at 197–98.

³¹⁵ *Hess v. Port Auth. Trans-Hudson Corp.*, 513 U.S. 30, 40 (1994) (“[R]egulation of land use [is] a function traditionally performed by local governments.”).

³¹⁶ See *Hodel v. Va. Surface Mining & Reclamation Ass’n*, 452 U.S. 264, 289–90 (1981) (upholding against a Commerce Clause challenge the Surface Mining Control and Reclamation Act that prescribes federal minimum standards governing surface coal mining, which a State may either implement itself or else yield to a federally administered regulatory program); see also *Wickard v. Filburn*, 317 U.S. 111, 128–29 (1942).

³¹⁷ See *Gibbs v. Babbitt*, 214 F.3d 483, 500 (4th Cir. 2000); see also *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 690–92 (1995).

must take drastic measures. The American Clean Energy and Security Act is strong, but does not go quite far enough to ensure success in meeting these targets.

A. *The Building Sector*

In the building context, the ACESA is strong in proposing federal building codes, creating a training and certification program, and prohibiting private restrictions that interfere with the use of solar energy systems. However, to achieve maximum benefit the bill needs to include federal laws to affirmatively protect solar access and access to other alternative energy sources. Ideally, the bill should include federal requirements for energy audits or improvements that apply at the time of sale for existing buildings. Additionally, the ACESA could be improved with stronger enforcement mechanisms.

There may be advantages to working instead within the existing framework established by the Clean Air Act that has a strong and established regulatory structure for enforcement. However, there are also issues with expediency and administrative burden in trying to move forward under the existing structure of the CAA. Under the Obama administration, the EPA may be willing to take regulatory action without additional legislative action by Congress. However, it will still take some time for the EPA to gather information, formulate draft regulations, provide an opportunity for public notice and comment, and defend possible challenges at the courthouse.³¹⁸ More effective and efficient progress could be made with direct congressional action. One proposal to expedite implementation is to work within the existing structure of the CAA, but create congressionally defined action deadlines.³¹⁹ While this would help, state-by-state implementation and approval through the SIP process would still be time consuming.

Clear mandates for building codes, as in the ACESA, are better than relying on the CAA's SIP process alone. State and local building codes have generally followed a model code with some degree of federal participation.³²⁰ Local flexibility is of course important, but flexible performance standards are possible in a national system, and a variance scheme to allow for adjustments for local conditions could also be devised where prescriptive standards might generally be preferred. However, considering our history of progress to date, a strong enforcement regime is crucial to success. Given the gravity and urgency of the situa-

³¹⁸ See Peterson et al., *supra* note 279, at 254 (identifying obstacles and proposing that the CAA be amended to incorporate specific directives and deadlines).

³¹⁹ *Id.* at 261 (also noting that congressional action will add political legitimacy).

³²⁰ See Kaswan, *supra* note 204, at 300 (noting that political issues would be less of a concern in the context of building codes than land use planning and control).

tion, it would be prudent to proceed simultaneously through federal building standards and state implementation plans under the CAA where there is a strong enforcement program with clear citizen suit provisions, including the possibility of direct suits against the regulated industry for violations of an emission standard or limitation under a SIP.³²¹

Another possible option for building codes would be to modify Section 111 of the CAA, which applies new source performance standards to new and modified stationary sources.³²² Under this section, the EPA sets performance standards that reflect “the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.”³²³ Each state must then develop and submit an acceptable procedure in order to receive a delegation of federal authority to implement and enforce the standards.³²⁴ Litigation to apply Section 111 to greenhouse gas emission sources has already been initiated.³²⁵ However, as currently written, Section 111 does not apply to building construction. Section 111 applies only to stationary sources that are defined as “any building, structure, facility, or installation which emits or may emit any air pollutant.” A possible approach would be for Congress to modify section 111 or create another section to apply a similar regulatory system to building construction.

B. *Land Use and Transportation Sectors*

For the land use and transportation sectors, which are both more difficult to standardize and have historically been the domain of state and local governments, proceeding through the SIP process may be the best approach. It would allow for local flexibility, but also create standards that are more enforceable than the ACESA’s approach of proceeding under SAFETEA-LU. SAFETEA-LU has a weak enforcement history, and no citizen suit provisions. Whether proceeding through amendments to SAFETEA-LU or through the CAA, clearly prescribed federal goals and performance standards, as well as some way to ensure compliance,

³²¹ 42 U.S.C. §§ 7604–07 (2006).

³²² *Id.* § 7411.

³²³ *Id.* § 7411(a)(1).

³²⁴ *Id.* § 7411(c).

³²⁵ Kevin Haroff & Jacqueline Hartis, *Climate Change and the Courts: Litigating the Causes and Consequences of Global Warming*, 22 NAT. RESOURCES & ENVTL. 50, 50–51 (2008) (noting that “ten states, two cities, and three environmental groups challenged EPA’s refusal to regulate CO₂ emissions from power plants” under the new source performance standards and that “petitioners had asked EPA to promulgate standards for GHG emissions as part of the 2006 rulemaking, but EPA refused to do so, prompting litigation over the final rule”).

are needed in any future action plan. Professor Bartholomew, in proposing amendments to SAFETEA-LU, stresses that state and MPO long range plans and transportation improvement programs, project level environmental impact statements, and MPO certifications should demonstrate compliance with target standards³²⁶ He also rightly asserts that a federal agency should be put in charge of reviewing planning documents for goal compliance and should be given the enforcement tools necessary to guarantee compliance.³²⁷ As for enforcement tools, however, consideration must be paid to the fact that land use and transportation planning implementation must be carried all the way through to the local level. The states should be required to demonstrate that they have put in place procedural safeguards that will ensure planning implementation. Like Oregon, other states must also have a system where there are clear goals, where both horizontal and vertical consistency requirements mandate coordination of planning and zoning between governmental entities, and where there is a regulatory system that assures that land use and transportation plans will not be easily degraded by piecemeal rezoning.

In order to reduce VMT, state and regional plans approved at the federal level must be implemented and enforced through local zoning and land development regulation. Although local governments may participate in the development of state and regional plans, local governments would ultimately need to comply with strict consistency requirements for land use and transportation planning for greenhouse gases. That is not to say that there could not be considerable flexibility. Performance standards for VMT based on specified modeling programs and benchmarks to demonstrate progress should be required. However, this proposal would ultimately affect many community design concerns including net density, street connectivity, and the mixing of land uses. It would affect zoning, land development, and subdivision regulations. State and federal land use standards may be a hard sell in some parts of the country. Governor Rick Perry of Texas recently vetoed state legislation that would have created a new governmental body and inter-agency work group on “smart growth” policy. Governor Perry explained:

Decisions about the growth of communities should be made by local governments closest to the people living and working in these areas. Local governments can already adopt “smart growth” policies . . . without a state-led effort that endorses such planning. This legislation

³²⁶ See Bartholomew, *supra* note 267, at 208–09.

³²⁷ See *id.* (Professor Bartholomew notes that this is the model used by California in the recently passed Senate Bill 375, which requires the state’s MPOs to include as part of their long-range transportation plans a “sustainable communities strategy” that is designed to meet greenhouse gas reduction targets set by the state Air Resources Board.).

would promote a one-size-fits-all approach to land use and planning that would not work across a state as large and diverse as Texas.³²⁸

Governor Perry's political perspective is understandable, but, given the importance of building and land development in the context of global warming, local control needs to take a back seat to state and national standards. We have a national and international responsibility to reduce greenhouse gases. The task is enormous, and our current approach wholly inadequate.

CONCLUSION

Given our ever increasing greenhouse gas emissions, our lackluster performance to date, and the likely time lags that will accrue until full implementation, this Article calls for a multifaceted approach that brings the strongest federal prescriptive standards, intergovernmental revenue sharing requirements, and enforcement provisions to bear on state and local governments. The window of opportunity for federal leadership is now open. Hopefully the Obama administration and Congress will recognize this critical juncture in history, and act decisively to coordinate federal, state, and local efforts for greenhouse gas reductions in an effective and expedient manner.

³²⁸ Jay Blazek Crossley, *Governor Perry Vetoes Smart Growth Bill Passed Unanimously in Senate*, HOUSTON TOMORROW, June 22, 2009, <http://www.houstontomorrow.org/livability/story/governor-perry-vetoes-smart-growth-bill/>.