# LEGISLATIVE UPDATE

## Climate Change Is Heating Up the Construction Industry

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One cannot turn on the television or go to the movies without hearing about global warming or efforts to "go green." From the Academy Awards to the Nobel Prize, everyone seems focused on climate change and energy conservation.

The overwhelming majority of scientists agree that man-made emissions of greenhouse gases are contributing to climate change. They also acknowledge that predictions of the degree of future impacts are inherently uncertain. The U.S. Supreme Court recently rejected the EPA's determination that global warming science is too uncertain to justify regulation of carbon dioxide emissions under the Clean Air Act.[1] Many state and local governments are promulgating mandatory climate change regulations, and others are encouraging voluntary compliance by providing various incentives. Further, several "global warming" bills have been proposed in Congress that seek to regulate emissions. Action on any of these bills will affect industrial projects as well as any industry that depends on transportation for shipping of supplies and products.

The construction industry is directly tied to most sectors that are the focus of climate change initiatives, including transportation, power generation, residential and commercial building, manufacturing, forestry, and waste management.[2]

This article discusses some of the impacts of climate change initiatives on the construction industry by discussing: (1) building code modifications and other factors that call for green building measures such as life-cycle assessments; (2) federal, regional, and local legislative initiatives to encourage or mandate energy and resource conservation; (3) recent case law developments; and (4) potential grounds for, and barriers to, global-warming litigation.

### Life-Cycle Assessments and Other "Green Building" Measures

Some building codes have been modified to require or encourage a life-cycle assessment (LCA) to reduce environmental impacts associated with the construction, operation, and maintenance of buildings and facilities.[3] In the absence of such building code provisions, many owners are requiring LCAs to be carried out on their projects. Such measures are properly seen as immediate consequences of concerns about climate change on the construction industry.

The goal of an LCA is to achieve sustainable construction by considering the entire life cycle of the construction project: planning, design, construction, operation, renovation and retrofit, and the end-of-life fate of materials.[4] This comprehensive approach looks not only to the building, but also to the overall environmental impact of the project, from design, to excavation, to building, to maintaining, to recycling, and to renovating the building.[5]

LCAs are not without criticism. The Healthy Building Network notes gaps and biases in the currently available data and has found that use of the LCA radically distorts results, overemphasizes some impacts, and hides other critical impacts.[6] LCAs also have been criticized as having crucial flaws that make them not ready for use by building designers.[7] The Center for Life Cycle Analysis[8] notes that LCAs are based entirely on material and energy flows; they ignore the external costs and risks related to water and land use, fuel depletion, energy security, and accidents in fuel mining, transportation, use, and disposal.[9]

Despite the criticism, LCA remains the current trend in going green. An example of LCA construction is Freedom Tower. The tower is to be a sign of forward-looking hope as a legacy and reminder of the tragedies of September 11, 2001. The Freedom Tower will implement green standards from the very foundation of the building to the tallest point of the tower.[10] The tower began with blasting designed to reduce the pollution and energy used in excavation of bedrock for the foundation.[11] The tower's design boasts more open space for the public, more natural light, glass that conserves energy by blocking heat and uninhibiting light, excellent indoor air quality through the use of a high-efficiency filtration system, steam to electricity turbine generators, variable speed fans, harvesting of rainwater for reuse in the cooling system and for irrigating the park, waste reduction through diversion of more than 75 percent of construction waste, and use of recycled content materials.[12]

#### *Building Code Energy Efficiency Standards*

Most regulations have not kept pace with the push for LCA.[13] The major player in shaping a building's environmental impact is the U.S. Green Building Council (USGBC), "a nonprofit composed of leaders from every sector of the building industry" whose goal is to promote "buildings that are environmentally responsible, profitable and healthy places to live and work."[14]

The USGBC operates independently as a certification body for the Leadership in Energy and Environmental Design (LEED) rating system, a voluntary rating system that awards points to buildings based on how green a building's impact is on the environment.[15] Under the system, a "green building" is one that "seeks to maximize energy efficiency, minimize resource use and waste production, reduce or eliminate

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Published in *Construction Lawyer*, Volume 28, Number 1, Winter 2008  

toxic materials in building components, and reduce the overall impact of the building on the environment."[16]

The LEED certification program falls short of addressing the total life cycle due to its failure to address building site locations, building maintenance, and building removal.[17] Despite LEED's limitations, LEED is the most widely recognized green building certification in the United States and the majority of state and municipal green building regulations are based upon or utilize LEED.[18]

Currently, most building codes do not address energy and water issues, material waste, impact on construction sites, and other environmental concerns.[19] In fact, some building codes are so outdated that they restrict advances in green building. Many local entities are amending building codes to allow for those green building designs that currently would violate local building codes or land use ordinances.[20]

Presently, green building standards and designs are mostly voluntary.[21] Many state and local governments are enacting general policies encouraging sustainable development; others are setting the example themselves by requiring government buildings to comply with green and sustainable building practices.[22]

Portland, Oregon, for example, set the standard by requiring all city-owned facilities to comply with LEED Silver certifications.[23] Arlington County, Virginia, requires that LEED checklists be included with site plan applications for commercial projects, even if the project sponsors are not planning to seek LEED certification.[24] Many other governing bodies are adopting similar green standards. For instance, Salt Lake City has initiated the installation of energy-efficient traffic signals, the use of energy-efficient lighting in the City/County Building, the use of biodiesel fuel for airport ground service equipment, and the purchase of wind power and has plans to convert city fleets to 100 percent alternative fuel vehicles.[25] Legal requirements mandating green building will grow as industry and public expectations demand green building standards.[26]

### *Tax and Other Economic Incentives to Go Green*

Private building owners can save money by conserving energy and resources. For example, natural gas heating costs could be reduced by 34 percent in low-income housing by retrofitting existing buildings with weatherization, adding insulation to attics, replacing older windows, sealing heating and cooling ventilation ducts, upgrading heating and cooling systems, replacing lighting, and installing automatic heating and cooling controls.[27]

Despite such opportunities to save, only five percent of commercial buildings are green buildings because of the increased costs of green construction.[28] To encourage private developers and building owners to implement sustainable development, many state governments are providing tax incentives, grants, or streamlined permit requirements.[29] Such incentives include the following:

- North Carolina offers a maximum tax credit of $2.5M for solar, wind, hydro, and biomass applications in commercial and industrial facilities;
- Maryland offers tax credits for building or rehabilitating a commercial or multifamily building as long as the structure is located in a priority funding area or qualified Brownfield site;
- Florida offers exemptions from sales and use taxes for solar energy systems on buildings;
- Georgia offers sales and use tax exemptions for biomass products; and
- Alabama offers interest subsidy payments to defray the interest expense on loans to install approved biomass projects.[30]

The trend toward sustainable design and energy conservation is not confined to the United States. Two fifty-story sail-shaped towers in Bahrain are connected by three long bridges that each supports a wind turbine that will generate up to 15 percent of the electricity for the towers.[31] In Spain, a thirty-story tower is Europe's first solar-powered commercial generating facility.[32] And the Spanish government has committed to producing 12 percent of its total energy from renewable resources by 2010.[33]

### *Waste Disposal: Recycle and Reuse*

Changes in requirements for waste disposal also will impact the construction industry, especially demolition work. The statistics on waste produced by the U.S. construction industry are staggering:

- The construction industry consumes and incorporates nearly 40 percent of all raw material extracted from the earth;[34]
- Estimates are that this accumulation of materials equals nearly 90 percent of all materials extracted in the United States;[35]
- The construction industry is responsible for an estimated one-third of all materials sent to landfills;[36]
- The majority results from demolition of existing construction;[37]
- The current reuse and recycle rates for construction waste are only 10 percent;[38] and
- "More than 30% of human-related methane emissions come from municipal solid waste landfills."[39]

To limit the total waste contributions to landfills, states are passing regulations governing the quantity and types of waste material being deposited in landfills. These regulations in part are intended to limit the methane gas, water pollution, and polluted land use associated with landfills.

Recent efforts to recycle and reuse waste from construction and demolition for use as aggregates for road construction have been successful.[40] In fact, in several countries, 85 percent of demolition waste is recycled as aggregates. Some communities are requiring the construction industry to manage the use and disposal of waste products from construction.

One proposed method used by other countries is to impose taxes on the use of virgin materials and provide subsidies for use of recycled materials.[41] For example, the United Kingdom has imposed a landfill tax to encourage local businesses to minimize waste and seek alternative waste reduction strategies.[42]

Climate change initiatives are often based on a preference for renovation and maintenance work instead of demolition in order to reduce resource consumption.[43] Some cities are already implementing such requirements. For example, Portland, Oregon, requires businesses to develop plans for recycling at least 50 percent of waste, resulting in a diversion of 54 percent of the city's total waste from landfills.[44] All city-owned construction projects require at least 75 percent of construction and demolition waste to be recycled.[45] Similarly, Chicago requires contractors to recycle debris generated during construction and demolition.[46]

### *Suppliers and Materials*

The regulatory trend in favor of green construction not only influences building codes and life-cycle analyses, but also the materials and natural resources used in construction, particularly cement, lumber,

appliances, and shipping.

The cement industry is an obvious target of environmental regulations. The cement sector alone accounts for 5 percent of global man-made $CO_2$ emissions.[47] The IIGCC seeks to reduce the environmental impact of cement production by the following: (1) changing production methods; (2) increasing fuel efficiency of the production process; and (3) using alternative fuels in producing cement.[48]

The forest and lumber industry is another target of regulation. Portland, Oregon, has passed regulations requiring the city to plant new trees in addition to developing policies to reduce old-growth timber consumption.[49] Likewise, in an effort to reduce deforestation, Jersey City, New Jersey, passed an ordinance prohibiting the purchase or use of products containing wood obtained from unsustainable harvesting of tropical or temperate rain forests.[50] The total square feet of green roofs is increasing approximately 125 percent per year across the United States, and companies are now looking at the possibility of constructing green walls—hanging plants on vertical panels.[51]

Regulations and initiatives also seek more energy-efficient appliances.[52] Eighty-five percent of residential energy consumption is from the use of furnaces, boilers, air conditioners, heat pumps, refrigerators, water heaters, washers and dryers, ranges, and dishwashers.[53] In an attempt to reduce dependence on traditional fuels, the EPA has instituted the Energy Star program, which identifies the consumer products that have met the energy-efficient guidelines set by the EPA.[54] The Energy Star program has voluntary efficiency standards for lighting, computers, commercial and industrial buildings, homes, residential heating, ventilation and air conditioning, exit signs, and transformers.[55]

Additional legislation setting appliances' efficiency standards is sure to come. Many appliances are purchased by developers or landlords that may have no economic interest in selecting appliances that will save energy.[56] Likewise, third-party buyers of property usually focus on the initial purchase price with little consideration of operating costs or efficiency.[57]

## Proposed Legislation

### *Multiple Bills Before Congress*

In 2007, seven bills were proposed in Congress that would establish "cap-and-trade" programs.[58] Each of these proposals would set a cap on total GHGs from particular sectors of the economy (such as energy generation, refining, etc.). The bills would allow businesses to trade accumulated credits or allowances for emitting GHGs in amounts lower or higher than the established cap.[59]

The Senate's Environment and Public Works Committee is expected to use the most recent proposal, the Lieberman-Warner bill. The Lieberman-Warner bill proposes to regulate GHG emissions from U.S. electric power, transportation, and manufacturing sources that account for 75 percent of all U.S. GHG emissions.[60] The bill would establish, effective 2012, a cap on GHG emissions from these sources at 2005 emission levels and would lower the cap year-by-year at a constant, gradual rate with a goal to reach the 1990 emissions level (15 percent below the 2005 emissions level) by 2020. The bill would control compliance costs by allowing companies to trade, save, and borrow emissions allowances and by allowing them to generate credits when they induce noncovered businesses, farms, and others to reduce their GHG emissions. In addition, the Lieberman-Warner bill seeks to strengthen energy efficient standards for appliances in buildings in order to address commercial and residential-sector emissions that are not covered by the cap.[61]

### *State Programs*

Many states are developing and implementing programs and strategies to reduce GHGs, improve air quality, enhance economic development, and increase security. More than 30 states and Puerto Rico have completed or are working on action plans to identify reducing GHG emissions, enhancing GHG gas capture, or sequestration. Some states are seeking to make aspects of their voluntary programs mandatory.[62]

### *Regional Initiatives*

States in particular regions have banded together to form their own action plans. The most notable regional initiatives are the Western Climate Initiative (WCI) in the West and the Regional Greenhouse Gas Initiative (RGGI) in the Northeast, both of which seek to create cap-and-trade programs.

WCI is a partnership formed by the governors of Washington, Oregon, Arizona, New Mexico, California, and Utah. In 2007, the governors of these states agreed to collaborate in identifying, evaluating, and implementing ways to reduce GHG emissions.[63] In August 2007, the WCI partners endorsed a regional goal to reduce emissions by 15 percent below the 2005 GHG emission level by the year 2020. In October 2007, the WCI announced its intent to develop design recommendations for a regional cap-and-trade program by August 2008 to reduce GHG emissions in each state and help other states achieve overall GHG emission goals.[64]

RGGI is composed of nine northeast and mid-Atlantic states that have formed a cooperative effort to control GHGs and implement a multistate cap-and-trade program with a market-based emissions trading system. Among other features, the proposed program will require electric-powered generators in participating states to reduce carbon-dioxide emissions.[65]

## Recent Case Law Developments

Climate change has been generating activity in the courts. Lawsuits include those brought under various tort theories and those interpreting statutes relating to emissions of GHGs. Even though many of the tort suits have been dismissed on standing or justifiability grounds, the recent activity is just the leading edge of a new wave of litigation. The most significant of the recent cases are summarized below. While many of the cases focus on carbon-dioxide emissions that do not directly relate to the construction industry, they merit close attention because success in any such case will have significant implications for construction activities that result in emissions of GHGs.

### *Regulation of Emissions*—Massachusetts v. EPA

In April 2007, a 5–4 majority of the U.S. Supreme Court held that carbon dioxide is an "air pollutant" under the Clean Air Act for purposes of vehicle tailpipe emissions. The Court also heard that the EPA must regulate $CO_2$ emissions if it finds that such emissions cause or contribute to air pollution.[66]

The Court found that environmental interest organizations and states had standing to challenge the EPA's decision not to regulate $CO_2$. The Court also ruled that although the EPA has discretion not to regulate $CO_2$, the only factor the EPA can consider in exercising its discretion is whether there is a danger to the public's health and welfare. The Court rejected the EPA's finding that global warming science is too uncertain

to justify regulation and found that the EPA's analysis in failing to consider effects of emissions was not adequate under the Clean Air Act.

***Katrina Litigation*—Comer v. Murphy Oil**

A lingering Katrina litigation case was dismissed in August 2006 for lack of standing and for raising an unjustifiable political question.[67] In *Comer v. Murphy Oil*, family members of Hurricane Katrina victims sought to recover from major producers of GHGs, alleging that such producers contributed to global warming, thereby allegedly intensifying the effects of Hurricane Katrina. The Court determined that the plaintiffs did not have standing to bring the claims and that the claims were barred by the "political question" doctrine.[68]

***Suburban Sprawl*—Brown v. County of San Bernardino**

The California Attorney General filed an action against the largest county in California to hold the county accountable for GHG emissions caused by poorly planned suburban sprawl.[69] The lawsuit alleged that San Bernardino County failed to account for emissions when updating its twenty-five-year blueprint for growth by not adequately analyzing the effects of development on global warming and did not identify ways to mitigate emissions related to development.[70] Conservation groups filed a similar action alleging that the county's plan violated the California Environmental Quality Act for failing to consider the impacts of the plan on climate change.[71] The lawsuit was settled in August 2007.[72] Under the settlement agreement, San Bernardino County agreed to embark on a thirty-month public project aimed at cutting GHGs related to land-use decisions and county government operations.[73]

***Auto Emissions Cases*—California v. General Motors Corp.**

California filed suit against six automaker defendants alleging that they were creating and contributing to a public nuisance—global warming.[74] The U.S. District Court for the Northern District of California rejected the state's claims and dismissed the action for lack of subject matter jurisdiction.[75] The Court agreed with the defendants that adjudicating the state's claim would require the Court to create a "quotient or standard" of what is unreasonable in the context of $CO_2$ emissions and that such a determination raises complex public and foreign policy questions better suited to the legislative branch of government.[76]

***Power Plants as Public Nuisance*—Connecticut v. American Elec. Power Co.**

A group of plaintiffs (including eight states and New York City) filed suit against owners of power plants that emit $CO_2$.[77] The petitioners argue that the contribution of the emitted $CO_2$ to global warming creates a public nuisance. A U.S. district court dismissed the action and found that the question of $CO_2$ emissions is properly decided by the legislation. The court's ruling has been appealed to the Court of Appeals for the Second Circuit.

***Climate Change Plans*—Center for Biological Diversity v. Brennan**

Several conservation groups in California filed suit against various defendants, including the acting director of the U.S. Climate Change Science Program, seeking declaratory and injunctive relief, primarily to declare the defendants in violation of the Global Change Research Act[78] and to compel the defendants to issue a revised research plan and science assessment as directed by the statute.[79] The Global Climate Change Research Act of 1990 requires the federal government to make various climate assessments including preparing a new and revised climate change research plan and scientific assessment every four years.[80] The plaintiffs claimed that the federal government had failed to prepare a plan in accordance with the time frames established by the statute. The defendants asserted that they "initiated the process for producing a revised plan" and that they "are in the process of issuing 21 assessment and synthesis reports that will fulfill the requirement."[81]

The U.S. District Court for the Northern District for California granted summary judgment to the plaintiffs.[82] The district court concluded that the plaintiffs had standing to bring the claims and agreed that the federal government had failed to prepare a revised climate plan and scientific assessment as required by the statute. The court ordered the federal government to issue a new revised research plan and scientific assessment in accordance with the act and retained jurisdiction over the action to enforce its order.[83]

***Challenges to Permits for Power Plants***

In addition to the recent regulation and litigation, both states and Congress have been reacting to concerns over global warming by challenging proposed construction of and permitting for power plants.

In October 2007, the Kansas Department of Health and Environment became the first government agency in the United States to deny an air permit for a proposed coal-fired electricity generating plant on the grounds that the plant would emit unacceptable levels of $CO_2$ emissions.[84]

Similarly, Congress has launched an investigation into the EPA's decision to issue a permit authorizing the construction of an additional coal-fired boiler at the Bonanza Power Plant in eastern Utah.[85] The Bonanza permit was the first coal-fired power plant air permit issued by the EPA after the Supreme Court's decision in *Massachusetts v. EPA*.[86] Though states normally issue air-quality permits for power plants, the Bonanza plant is under federal jurisdiction because it is on land classified as "Indian country" subject to the jurisdiction of the Ute tribe for certain purposes.[87] In issuing the permit, the EPA concluded that it was not required to consider the impact of $CO_2$ and other GHG emissions in setting the permit's pollution control requirements. Three conservation groups are appealing the federal permit issued for the project.[88]

**Pursuing Civil Remedies for Global Warming—Barriers and Grounds**

Civil plaintiffs face significant barriers in the effort to bring suits based on climate change. Four of the largest such barriers are lack of standing, the political question doctrine, causation issues, and preemption.

***Standing***

Standing is based on the "case and controversy" limitation on judicial power set forth in Article Three of the U.S. Constitution.[89] To have standing, a plaintiff is required to make a threefold showing: (1) that the plaintiff has suffered an "injury in fact" that is concrete and particularized, not conjectural or hypothesized; (2) that the injury is fairly traceable to the challenged action of the defendant; and (3) that it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision.[90]

Each part of the standing test poses difficulties to a plaintiff in a global warming suit. First, are the alleged injuries suffered by global warming concrete injuries in fact or are they too speculative and uncertain?[91] Next, is the scientific evidence sufficient to demonstrate that rising sea waters, wildfires, increasingly violent hurricanes, and other effects are actually caused by global warming? Finally, does a federal or state court have the ability to redress the problem of global warming through a favorable decision in the action?[92]

Notwithstanding these challenges, standing based upon harm from climate change was granted to plaintiffs in *Massachusetts v. EPA* and to the Sierra Club in a Utah Supreme Court decision in 2006.[93]

### *Political-Question Doctrine*

The political-question doctrine poses a hurdle to plaintiffs even if they do meet the three-part standing test. Under the political question doctrine, a court can dismiss if the suit would raise "general prudential concerns 'about proper-and properly limited-role of the courts in a democratic society.' "[94] The Supreme Court has previously held, "We have declined to grant standing where the harm asserted amounts only to a generalized grievance shared by a large number of citizens in a substantially equal measure."[95]

### *Causation*

In climate change litigation, a plaintiff may be able to show generic causation—that global warming contributed to an injury—but it is difficult to prove specific causation: that a specific entity being sued caused the GHG emissions that actually caused the specific injury for which the plaintiff is seeking to recover.[96]

### *Preemption*

Another potential barrier to a plaintiff's ability to recover in a global-warming action is preemption by federal regulations such as the Clean Air Act or the Energy Policy and Conservation Act. While the CAA and EPCA do not preempt claims for damage, they likely preempt efforts to get courts to order emitting defendants to do something that is within the jurisdiction of those acts. The question has not been uniformly resolved by courts.[97] Preemption challenges by defendants will likely be more difficult after the Supreme Court's decision in *Massachusetts v. EPA.*

### *Common-Law Torts*

Public nuisance and product liability are potential, but difficult, avenues of tort recovery for global-warming plaintiffs. A public nuisance suit would address pollution or climate change affecting the public at large.[98] The widely followed RESTATEMENT (SECOND) OF TORTS' definition says that a public nuisance is "an unreasonable interference with a right common to the general public."[99] Recent global warming cases illustrate the difficulty of public nuisance as a basis for damages.[100]

A product liability theory would require the plaintiff to show that a product has a defect that makes it unreasonably dangerous, that the defect existed when the product left defendant's control, and that the defect proximately caused plaintiff's injuries.[101] Some law professors suggest that a plaintiff could bring a product liability suit against a transportation manufacturer or utility alleging that products using fossil fuels are defectively designed and that the manufacturers had a duty to warn the public about the risks of GHGs from these products.[102] Such actions would face challenges to prove defects or causation.

### *National Environmental Policy Act*

Projects that require federal permits prior to construction face potential challenges based on the National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare environmental impact statements (EIS) if a project has "significant" environmental impacts.[103] Judicial review of agency action is limited to whether or not the agency adequately followed its own procedural requirements. Courts do not have the substantive ability to determine that the agency's decision to build a project was unwise.[104]

NEPA has long been a tool that conservation groups have used to challenge projects that could affect the habitat of a protected species. Academics anticipate that conservation groups may seek to use NEPA to challenge projects that will add additional GHG emissions, on the grounds that such projects may affect the habitat of Arctic species.[105]

## Concerns for Construction

The construction industry is at the forefront of developments in legislation and case law resulting from concerns over global climate change. Construction lawyers can be sure that their clients and practices will continue to be impacted by these developments.

## Endnotes

1. Massachusetts v. EPA, 549 U.S. 1438 (2007).

2. GLOBAL CLIMATE CHANGE AND U.S. LAW 353 (Michael B. Gerrard ed. 2007) [hereinafter GLOBAL CLIMATE CHANGE].

3. Confederation of International Contractor's Association, *Industry as a Partner for Sustainable Development* 22 (2002), *at* www.uneptie.org/outreach/wssd/docs/sectors/final/construction.pdf [hereinafter *CICA Construction Report*] (stating that "It is important that life cycle approaches to improving environmental performances are adopted not only for products, but for construction works as well.").

4. Charles J. Kibert, *Policy Instruments for a Sustainable Built Environment*, 17 J. LAND USE & ENVTL. L. 379, 383 (2002).

5. The ISO 14000 are a series of international standards on environmental management that exist to help organizations minimize how their operations negatively affect the environment (cause adverse changes to air, water, or land) and comply with applicable laws, regulations, and other environmentally oriented requirements. *See* International Standards Organization (ISO), *Environmental Manage- ment—Life Cycle Assessment—Requirements and Guidelines* and ISO, *Principles and Framework*, Geneva, Switzerland, 1997. The procedures of LCA have been incorporated into a series of international standards on environmental management, the ISO 14000 environmental management standards: ISO 14040:2006 and 14044:2006.

6. Mark Rossi, *Reaching the Limits of Quantitative Life Cycle Assessment: A Critical Review of Life Cycle Assessment of PVC and of Principal Competing Materials*, a report commissioned by the European Commission, authored by a consortium led by PE Europe GmbH, Apr. 2004, *at* www.healthybuilding.net/pvc/CPA_EC_ LCA_Critique.html.

7. National Association of Home Builders Research Center, Inc., *Life Cycle Assessment Tools to Measure Environmental Impacts: Assessing Their Applicability to the Home Building Industry*, *at* www.toolbase.org/PDF/CaseStudies/life_cycle_assessment_tools.pdf (Dec. 2001); Tom Lent, *Toxic Data Bias and the Challenges of Using LCA in the Design Community* (Nov. 2003) (in-depth description of how LCAs miss health issues and can result in damaging assessments); *The New Summer Blockbuster: European PVC Life Cycle Assessment—A Prequel*, HEALTHY BUILDING NEWS, June 15, 2004; *Life Cycle Analysis & Green Building: Credibility at the Crossroads*, HEALTHY BUILDING NEWS, Sept. 16, 2004.

8. The Center for Life Cycle Analysis (LCA) of Columbia University was formed in the spring of 2006 with the objective of conducting comprehensive

LCAs of energy systems. The mission of the Center is to guide technology and energy policy decisions with data-based, well-balanced, and transparent descriptions of the environmental profiles of energy systems.

9. V.M. Fthenakis & H.C. Kim, *Quantifying the Life-Cycle Environmental Profile of Photovoltaics and Comparisons with Other Electricity-Generating Technologies*, IEEE 4th World Convention on Photovoltaic Conversion, Hawaii (May 2006), *at* www.clca.columbia.edu/papers/Ammonix_High_Concentrator-IEEE_2006.pdf.

10. *See* Stephanie A. Lewis, *New York's Freedom Tower Raises Green Building to New Heights*, CONSTRUCTIONMONTHLY.COM, *at* www.constructionmonthly.com/feature_01_05082007.html (last visited Aug. 28, 2007) [hereinafter Lewis, *Freedom Tower*].

11. *Id.*

12. *Id.*

13. *CICA Construction Report*, *supra* note 3, at 23.

14. U.S. Green Building Council, About Us Page, *at* www.usgbc.org/DisplayPage.aspx?CategoryID=1.

15. Theodore C. Taub, *Materials for Discussion Regarding Green Buildings*, SM004 ALI-ABA 399, 402, 407 (2006); Christopher P. Perzan, *What You Should Know About Green Building*, CHI. BAR ASS'N, Nov. 2006, at 39.

16. Perzan, *supra* note 15, at 39.

17. Taub, *supra* note 15, at 409.

18. *Id.*

19. Nancy J. King & Brian J. King, *Creating Incentives for Sustainable Buildings: A Comparative Law Approach Featuring the United States and the European Union*, 23 VA. ENVTL. L.J. 397, 409 (2005); Charles J. Kibert, *Green Buildings: An Overview of Progress*, 19 J. LAND USE & ENVTL. L. 491, 494 (2004).

20. David G. Mandelbaum, *Corporate Sustainability Strategies*, 26 TEMP. J. SCI. TECH. & ENVTL. L. 27, 39 (2007); Perzan, *supra* note 15, at 42.

21. Perzan, *supra* note 15, at 41.

22. King & King, *supra* note 19, at 416.

23. Wendie L. Kellington, *Green Development*, SL005 ALI-ABA 453, 650 (2005). Many other cities are adopting similar green standards: Seattle, Washington—LEED silver; San Francisco, California—LEED silver; Vancouver, British Columbia, Canada—LEED gold; Scottsdale, Arizona—LEED gold. *See id.* at 656–57.

24. Michael Tubridy, *Green Building Legislation*, RETAIL LAW STRATEGIST (Jan. 2007).

25. EPA, 2003 Climate Protection Award Winners, www.epa.gov/cpd/awards/climatesummaries3-6-03.pdf.

26. Perzan, *supra* note 15, at 43.

27. Richard L. Ottinger, *Energy-Efficiency: The Best Option for a Secure, Clean, Healthy Future*, 19 NAT. RESOURCES & ENV'T 50, 51 (Winter 2005).

28. Taub, *supra* note 15, at 406.

29. King & King, *supra* note 19, at 419, 425. *See also* the Energy Policy Act of 2005, which permits owners and designers of commercial buildings to claim a tax deduction for structures that save at least 50 percent of the heating and energy costs by meeting specified efficiency standards.

30. Tubridy, *supra* note 24.

31. Catherine A. Cardno, *Sustainable Design: Sail-Shaped Office Towers Support Wind Turbines*, CIVIL ENGINEERING (Oct. 2007).

32. Gonzalo Garcia-Sobrinos, Ignasi Salvador-Villa, ICCP, and Jesus Serrailla-Echarri, *Tower of Power*, CIVIL ENGINEERING (Oct. 2007).

33. *Id.*

34. Charles J. Kibert, *Policy Instruments for a Sustainable Built Environment*, 17 J. LAND USE & ENVTL. L. 379, 380 (2002).

35. *Id.*

36. *Id.* at 381.

37. *Id.* at 381, 392.

38. Concrete remains the primary recycled product because of the high economic value of its content. *Id.* at 382.

39. J. Kevin Healy, *Municipal Efforts to Control Climate Change*, SM106 ALI-ABA 151, 159 (2007). LEED standards encourage the reuse of existing structural elements and diversion of waste from disposal by recycling. *See CICA Construction Report*, *supra* note 3, at 23. The EPA estimates that using landfill gas to produce energy in the United States would result in the same reduction of greenhouse gas emissions as reducing the number of cars on the road by 13 million for an entire year. *Id.*

40. *CICA Construction Report*, *supra* note 3, at 23.

41. Kibert, *supra* note 4, at 391, 393.

42. King & King, *supra* note 19, at 445.

43. *CICA Construction Report*, *supra* note 3, at 7.

44. Kellington, *supra* note 23, at 623.

45. *Id.* at 650.

46. Perzan, *supra* note 15, at 41.

47. Claudia Kruse, IIGC Briefing Note, *Climate Change and the Construction Sector* 1 (2004), *at* www.iigcc.org/docs/PDF/Public/ConstructionSector_2004.pdf (last visited Aug. 29, 2007).

48. *Id.* at 3.

49. Kellington, *supra* note 23, at 623.

50. Healy, *supra* note 39, at 159–60.

51. Christine S. Wigginton, CIT, *Renewable Resources*, THE NAWIC IMAGE (July/Aug./Sept. 2007).

52. Ottinger, *supra* note 27, at 51.

53. *Id.*

54. *See* Energy Star, *at* www.energystar.gov/ (outlining energy star program) (last visited Aug. 29, 2007); Kimberly C. Cavanaugh, *It's a Lorax Kind of Market! But Is It a Sneetches Kind of Solution?: A Critical Review of Current Laissez-Faire Environmental Marketing Regulation*, 9 VILL. ENVTL. L.J. 133, 167–68 (1998).

55. Ralph C. Cavanaugh, *Least-Cost Planning Imperatives for Electric Utilities and Their Regulators*, 10 HARV. ENVTL. L. REV. 299, 340 (1986) (citing U.S. EPA, *Green Lights Program: The Green Lights Program* (EPA-430-F-97-042) (Mar. 1997); U.S. EPA, *Energy Star Office Equipment: Introducing Energy Star Labeled Office Equipment* (EPA 430-F-95-129) (Feb. 1997); EPA, *Computer Manufacturers Launch Program to Introduce Energy Efficient Personal Computers* (EPA 92-R-125); U.S. EPA, *Energy Star Buildings: Introduction: The Energy Star Buildings Program* (EPA 430-F-97-042) (Mar. 1997)).

56. Healy, *supra* note 39, at 51; Cavanaugh, *supra* note 55, at 320.

57. Cavanaugh, *supra* note 55, at 319.

58. S. 2191, 110th Cong. (October 18, 2007) (Lieberman-Warner, America's Climate Security Act); S. 1766, 110th Cong. (July 11, 2007) (Bingaman-Specter, Low Carbon Economy Act); S. 208, 110th Cong. (Jan. 12, 2007) (McCain-Lieberman, Climate Stewardship and Innovation Act); S. 309, 110th Cong. (Jan. 16, 2007) (Sanders-Boxer, Global Warming Pollution Reduction Act); S. 485, 110th Cong. (Feb. 1, 2007) (Kerry-Snowe, Global Warming Reduction Act); H.R. 620, 110th Cong. (Jan. 22, 2007) (Olver-Gilchrest, Climate Stewardship Act); H.R. 1590, 110th Cong. (Mar. 20, 2007) (Waxman, Safe Climate Act of 2007).

59. www.pewclimate.org.

60. S. 2191, 110th Cong. (Oct. 18, 2007). The reader is encouraged to confirm the current status of the legislation.

61. *Id.*

62. Climate Change—State and Local Governments, *available at* www.epa.gov/climatechange/wycd/ stateandlocalgov/local.html.

63. www.westernclimateiniative.org.

64. www.westernclimateiniative.org/ewebeditpro/items/O104F12775.pdf.

65. www.rggi.org.

66. Massachusetts v. EPA, 549 U.S. 1438 (2007).

67. Comer v. Murphy Oil USA, Inc., No. 1:05-CV-436-LG-RHW, Order (Aug. 30, 2007) (granting defendants' motion to dismiss).

68. *Id.*

69. Brown v. Cty. of San Bernardino, No. 07-CV-329 (N.D. Cal. 2007).

70. John Ritter, *Calif. Sees Sprawl as Warming Culprit*, USA TODAY (June 5, 2007).

71. Ctr. for Biological Diversity v. Cty. of San Bernardino, No. 07-CV-0295 (N.D. Cal., filed Apr. 11, 2007). In addition to the global-warming challenges, the Center for Biological Diversity alleged that the General Plan update failed to protect communities from wildfires and protect natural resources. Those claims are still pending. Imran Ghori, *S.B. County Sued over Growth Plan*, PRESS-ENTERPRISE (Apr. 11, 2007).

72. Brown v. Cty. of San Bernardino, No. 07-CV-00329 (order regarding settlement agreement) (N.D. Cal. Aug. 28, 2007); *San Bernardino Global Warming Plan Settles California Lawsuit*, ENV'T NEWS SERVICE (Aug. 21,

2007).

73. *Cty. of San Bernardino*, No. 07-CV-00329 (order regarding settlement agreement). Among other things, the settlement requires the County to inventory known and discoverable sources of GHG admissions in the County; inventory GHG emissions level in 1990, the current level, and the projected level for 2020; and set a target for GHG reduction. The conservation groups declined to dismiss their action based on the settlement with the attorney general. While not decided on its merits, *Cty. of San Bernardino* will put pressure on municipalities to avoid suburban sprawl by more carefully considering new development plans and sets a precedent for potential actions to combat suburban sprawl. Attorney General Brown also has announced an intent to take similar action on other California jurisdictions and encourage similar action on the national level. Andy Furillo, *Brown to Look at Green Impact of Placer Project*, SACRAMENTO BEE (Aug. 22, 2007).

74. California v. Gen. Motors Corp., No. 06-CV-05755 (N.D. Cal., filed Sept. 20, 2006).

75. California v. Gen. Motors Corp., No. 06-CV-05755 (Order Granting Defendants' Motion to Dismiss) (N.D. Cal. Sept. 17, 2007).

76. *Id.*

77. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265 (S.D.N.Y. 2005).

78. 15 U.S.C. §§ 2931–2938 (1990).

79. Ctr. for Biological Diversity v. Brennan, No. 06-CV-7062 (N.D. Cal., filed Nov. 14, 2006).

80. 15 U.S.C. §§ 2933, 2936(3).

81. Ctr. for Biological Diversity v. Brennan, No. 06-CV-7062 (order granting plaintiff's motion for summary judgment and denying defendants' motion to dismiss) (N.D. Cal. Aug. 21, 2007).

82. *Id.*

83. *Id.*

84. Gov. Kathleen Sebelius, News Release, *Governor Encouraged with Decision to Deny Two Coal Plants* (Aug. 18, 2007).

85. Patty Henetz, *Congress Probing EPA Approval of Uintah County Coal-Fired Power Plant*, SALT LAKE TRIB. (Sept. 21, 2007).

86. *Id.*

87. *Id.*

88. Patty Henetz, *Eco-Groups Appeal Permit for Coal-Fired Plant*, SALT LAKE TRIB. (Oct. 8, 2007).

89. U.S. CONST. Art. 3, § 2, cl. 1.

90. Lujan v. Defenders of Wildlife, 504 U.S. 555, 560–61 (1992).

91. *See*, *e.g.*, Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293, 296–97 (2005).

92. This issue is further complicated by the fact that the United States produces less than a quarter of the world's GHG emissions. *Id.* at 297–98.

93. Utah Chptr. of the Sierra Club v. Utah Air Quality Bd., 148 P.3d 975 (Utah 2006) (holding that because the organization's members showed injuries, conservation group had standing to challenge permit's issuance in air quality dispute arising out of permit issued to power company to build power plant).

94. Duke Power Co. v. Carolina Envtl. Study Group, Inc., 438 U.S. 59, 80 (1978) (quoting Warth v. Seldin, 422 U.S. 490, 498 (1975)).

95. *Id.*

96. Benjamin P. Harper, Note: *Climate Change Litigation, The Federal Common Law of Interstate Nuisance and Federalism Concerns*, 40 GA. L. REV. 661, 684–85 (2006).

97. New Eng. Legal Found. v. Costell, 666 F.2d 30, 32 (2d Cir. 1991) (holding that the Clean Air Act preempted a common law claim based on air pollution from a facility with a Clean Air Act permit but withholding judgment on whether the Clean Air Act totally preempts federal common law nuisance actions); Reeger v. Mill Serv., Inc., 593 F. Supp. 360 (W.D. Pa. 1984); United States v. Kin-buc, Inc., 532 F. Supp. 699 (D.N.J. 1982) (finding that the Clean Air Act was a comprehensive statute and that any common law actions were displaced by the statute). *But see* Green Mountain Chrysler-Plymouth-Dodge v. Crombie, No. 05-CV-302 (D. Vt. Sept. 12, 2007) (rejecting defendant automakers' challenge to $CO_2$ regulations based on the fact that such regulations were preempted by the Energy Policy and Conservation Act).

98. David J. Grossman, *Warming Up to a Not-So-Radical Idea: Tort Based Climate Change Litigation*, 28 COLUM. J. ENVTL. L. 1, 53–57 (2005).

99. RESTATEMENT (SECOND) OF TORTS, § 431, at 821b, cmt. a (1965).

100. *See* Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265 (S.D.N.Y. 2005); California v. Gen. Motors Corp., No. 3:06-CV-05755 (N.D. Cal., filed Sept. 20, 2006).

101. Grossman, *supra* note 98, at 58–59.

102. *Id.* at 39–42; RESTATEMENT (THIRD) OF PRODUCTS LIABILITY, § 2b (1998); GLOBAL CLIMATE CHANGE, *supra* note 2, at 14–15.

103. 40 C.F.R. § 1501.4 (2004).

104. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989) ("NEPA itself does not mandate particular results, but simply prescribes the necessary process.").

105. The basis for such a challenge is already coming to fruition through efforts of conservation groups to declare the Arctic polar bear as a protected species. Dep't of Interior, U.S. Fish & Wildlife Services (FWS), *Endangered and Threatened Wildlife and Plants: Petition to List the Polar Bear as Threatened*, 71 Fed. Reg. 28,653–28,654 (2006).