

# Trends in Sustainability Regulation

By Jared Eigerman



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**O**NCE MOTIVATED BY ALTRUISM, the sustainable development and operation of hotels in the United States today is driven increasingly by market conditions and mandated by law. While other contributors to this book examine the business case for sustainability in the hospitality industry, this chapter focuses on regulatory trends regarding sustainability. The most striking current trend in sustainability regulation appears to be its increasing focus on addressing climate change. One conclusion is that proactive hotel owners and operators may wish to consider managing their energy supplies more carefully and increasing the energy performance of their individual assets.

Hotels provide various services in a physical facility that must already comply with regulatory requirements such as zoning ordinances, building codes, health codes, environmental laws, consumer protection laws, and securities regulations. If sustainability regulations cover the same elements, what do they really

add? Perhaps it is a broader and longer viewpoint: regulators often understand sustainability as an overarching policy to manage the interaction of people with their entire environment, not just the natural environment, with a long-term view of the future.

As famously defined in the 1987 United Nations' *Report of the World Commission on Environment and Development*, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability in this sense presumes that human needs in the near term can have lasting effects on human needs in the long term. For example, filling in wetlands to create more developable land in the short term could lead to increased long-term flooding that is not easily reversed. Sustainability regulation thus aims to minimize the long-term harmful impacts of human activity. In the case of the hospitality industry, sustainability regulations require the operators of hotels and resorts to avoid the impacts of travel and lodging on future generations.

## The Impact of Climate Change Legislation on Environmental Regulations

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In recent years, the perceived dangers of climate change have come to dominate regulators' understanding of sustainability. From a regulator's perspective, the general premise is that greenhouse gases (GHG) contribute significantly to unwelcome changes in the world climate; human behavior, especially the burning of fossil fuels, contributes significantly to GHG emissions;<sup>1</sup> and the development and operation of buildings, including heating, cooling, and electricity, contributes significantly to the burning of fossil fuels.<sup>2</sup>

Once that logical sequence regarding climate change is posited, the regulatory consequences to the hospitality industry come into focus. In the future, for all aspects of their businesses, hotel companies should expect laws to discourage their use of fossil fuels and to encourage substitutes, including renewable energy sources and greater energy efficiency. These laws can affect not only bricks and mortar and the delivery of services to guests, but all points on the supply chain.

Mandatory reporting laws may regulate large hotel chains, or at least individual hotels that emit very large quantities of greenhouse gases. The Securities and Exchange Commission recently advised that public companies should disclose risks associated with climate change regulation. In part to better prepare for future regulations, some U.S. companies have been begun asking their suppliers and partners to report their "carbon footprints."

Meanwhile, many major U.S. cities and states and, to some degree, the federal government have adopted policies and laws to promote sustainability. Most notably, they have mandated reductions of GHG emissions. Some of the largest U.S. cities now require new construction and major renovation projects to obtain "green building" certifications of some kind, which may involve not just GHG reductions, but also other aspects of sustainability, such as water management.

While the LEED certification system is the most widely known and used, regulators are already turning to other tools. In a conscious attempt to reduce

fossil fuel consumption, most states have begun tightening their building codes to demand ever-greater energy efficiency in new construction and after major renovation. Some cities, most notably New York, have begun to devise regulations for energy consumption in existing buildings, which typically are grandfathered.

Finally, while the federal government continues to debate major energy and climate change legislation, many northeastern and western states have already set up cap-and-trade regulations for the largest greenhouse emitters, such as power plants and heavy industrial processing. At present, the clearest effect on the hospitality industry is likely to be higher energy prices. Conceptually, “carbon taxes” could be imposed on every type of emitter.

## Three Broad Categories of Regulatory Tools ---

As new information becomes available, the regulatory context for sustainability is expected to continue to evolve. Although climate change issues dominate at present, other issues around sustainability, such as storm water pollution, merit attention and could take on greater relative importance. Today, the range of regulatory tools promoting sustainability can be understood in three broad categories:

1. Reporting and disclosure
2. Development regulations
3. Carbon pricing

Within the space of this chapter, it is possible to outline only the broad trends within each of these three categories. The hope is to give hotel owners and operators enough direction to take the next steps in evaluating the associated risks.

### Reporting and Disclosure

Although climate change is a global issue, municipalities were the first level of government to take it on, soon followed by states, beginning with a commitment to reduce GHG emissions. To meet their goals, governments have begun to require certain business sectors and/or large individual GHG emitters to register and report their emissions. The federal government has hinted that it may require disclosure as well. Because buildings account for a significant proportion of GHG emissions in cities, some localities have also begun to require the owners of larger commercial buildings to measure and report energy consumption at the building level. Apart from regulation, there appears to be growing pressure in the marketplace for companies to voluntarily disclose their total GHG emissions to investors and the public.

**GHG Accounting Protocols.** Hotels, like most commercial real estate operations, are not accustomed to complying with complex air pollution regulations. The first issue, of course, is how to calculate emissions. Although a hotel manager may have ready access to a year’s worth of utility bills, he or she probably has no sense of how many gallons of fuel were burned at the property that year, let alone how many short tons of CO<sub>2</sub>e (carbon dioxide or its equivalents) were emitted as a result.

There is no single government-mandated protocol for calculating GHG emissions. Instead, regulations may rely on a few protocols that have been developed for voluntary registration and reporting. For example, Massachusetts regulations require registrants to use the General Reporting Protocol promulgated by The Climate Registry, a nonprofit collaboration among many U.S. states and Canadian provinces.<sup>3</sup>

Typically, GHG accounting standards seek to measure three mutually exclusive categories of GHG emissions. *Scope 1* covers all direct GHG emissions generated by sources that the reporting entity owns or controls, such as emissions from boilers, furnaces, and vehicles. *Scope 2* covers indirect GHG emissions from the consumption of purchased electricity, heat, or steam. Whereas *Scope 1* emissions occur on-site, *Scope 2* emissions physically occur off-site where the electricity, heat, or steam is produced. *Scope 3* covers all other indirect GHG emissions, including employee business travel and commuting, waste disposal, and the production and transportation of supplies and services.

Because GHG emissions associated with employee travel and lodging may be included in *Scope 3*, hotels that are unable or unwilling to measure and report the GHG emissions may risk losing customers interested in *Scope 3* emissions. Furthermore, this reporting is sometimes required by meeting planners. Therefore, one could expect companies that report their *Scope 3* emissions to choose to do business with the hospitality companies able to report lower GHG emissions than their competitors.

In addition to the costs and effort necessary to reduce GHG emissions—much of which, as discussed later, being likely to be offset by energy-cost savings—compliance with mandatory registration and reporting schemes, like that in Massachusetts, can itself entail significant effort and cost. The General Reporting Protocol, for example, is an intimidating document, weighing in at over 200 pages, plus updates and clarifications.

**Municipal and State Mandates.** In the United States, local governments have taken the lead in addressing climate change. In 2005, the U.S. Conference of Mayors unanimously endorsed a Climate Protection Agreement.<sup>4</sup> Signatories committed to strive to reduce GHG emissions by at least 7 percent below 1990 levels by 2012 through actions ranging from smart growth policies to public information campaigns, and to urge their states and the federal government to enact similar policies and programs. Hundreds of mayors have signed on, and most major U.S. cities have adopted reduction targets beyond what the agreement requires. For example, New York City committed in 2006 to reduce GHG emissions by 30 percent from 2005 levels by the year 2030.<sup>5</sup>

Some U.S. states followed suit, commissioning studies, adopting policies, and passing legislation to require statewide reductions in aggregate GHG emissions over time. California's landmark Global Warming Solutions Act of 2006 (Assembly Bill 32)<sup>6</sup> required the adoption of statewide targets to reduce GHG emissions to 1990 levels by the year 2020. Analogous legislation and/or executive orders have followed in a few states, including New Jersey's Global Warming Response Act of 2007, Massachusetts' Global Warming Solutions Act of 2008, and Maryland's Greenhouse Gas Emissions Reduction Act of 2009.

At this point, the practical effects of this activity have mainly involved developing plans to achieve ambitious reduction goals and empowering the state governments to require at least the largest emitters to report their GHG emissions regularly to the state. Massachusetts provides a useful example. Beginning in 2009, facilities that emitted more than 5,000 short tons of CO<sub>2</sub>e during 2008 had to register with the state. Beginning in 2010, registrants had to submit annual certified reports of emissions during the previous year. A very large hospitality complex, perhaps over 1.5 million square feet, could conceivably cross the yearly threshold, for example, by burning 83.1 million cubic feet of natural gas or 442,000 gallons of No. 2 fuel oil.<sup>7</sup>

**Federally Mandated Reporting.** Although the federal government has recently become more active in regulating GHG emissions, pending federal regulation is unlikely to affect hospitality facilities directly. The federal government was slow to regulate GHG emissions, largely due to resistance by the administration of President George W. Bush.

In 2009, the U.S. Environmental Protection Agency (EPA) used its authority under the Clean Air Act to require emitters of at least 25,000 metric tons of GHG per year to collect and report data to the federal government.<sup>8</sup> This reporting requirement is expected to cover approximately 10,000 facilities, which together account for 85 percent of GHG emissions in the United States. With such a high threshold, the U.S. EPA's mandatory reporting system is unlikely to capture any hospitality facilities.

Nevertheless, publicly traded hotel companies may be required to report their GHG emissions for a different reason. In February 2010, the Securities and Exchange Commission (SEC) issued guidance in which it applies federal disclosure rules to climate change matters. The SEC reasoned that regulatory and legislative developments regarding climate change could have a significant effect on operating and financial decisions.<sup>9</sup> Even companies not directly affected by climate change regulation, the SEC advised, could be indirectly affected by changing prices for goods or services provided by other companies that are affected.

**Building Benchmarking.** Although energy use in buildings is only one contributor to the overall GHG emissions of any given company, buildings are responsible for large portions of municipalities' total GHG emissions and are therefore the logical target of regulation for municipal regulators. Perhaps at the extreme, New York City—which has nearly one million buildings containing over five billion square feet—has found that buildings account for 70–80 percent of the city's total GHG emissions.<sup>10</sup> Consequently, New York and other jurisdictions have begun to require the auditing and reporting of energy consumption at the building level, often called *benchmarking*.

Adopted with three other energy-related ordinances in December 2009, New York City's Benchmarking Energy and Water Use Ordinance requires annual benchmarking of energy and water use using the EPA's Portfolio Manager tool for, among other classes of buildings, all non-city buildings that exceed 50,000 gross square feet. Covered non-city buildings have until May 1, 2011, to comply.<sup>11</sup> By September 1, 2012, the city will begin posting data on the Internet, starting with 2011 benchmarking data from non-residential buildings.

Portfolio Manager is an interactive energy management tool used to track and assess energy and water consumption online.<sup>12</sup> For many facilities, Portfolio Manager can generate a percentile score of one to 100 on the EPA's national energy performance rating system. The score is based on how the building's performance compares to similar facilities inventoried in the EPA's Commercial Buildings Energy Consumption Survey (CBECS). A score of 75 or higher means the buildings' energy performance surpasses that of 75 percent of comparable facilities and may qualify the building for the ENERGY STAR label, also administered by the EPA.<sup>13</sup>

New York City's ordinance was actually anticipated by statewide legislation passed in California in 2007, commonly known as Assembly Bill 1103.<sup>14</sup> Starting in 2011, the California law requires the owners of nonresidential buildings to release their Portfolio Manager data and ratings for the previous twelve months to parties in any commercial real estate transaction involving the sale, lease, or financing of a whole building.<sup>15</sup> Hotels are treated as non-residential buildings, with compliance deadlines that vary depending on whether they are owner-occupied. Washington State has also adopted a law similar to California's.<sup>16</sup>

As already mentioned, benchmarking energy performance can entail significant costs. Moreover, buildings that consume large amounts of energy will be the logical targets of regulatory mandates in the future. Perhaps most importantly, hotels that report their energy consumption open themselves to unaccustomed scrutiny. Even if the government does not impose penalties on the facilities that perform relatively poorly, appraisers might, thereby affecting the availability and/or cost of equity and debt. Additionally, savvy potential customers might also seek out energy benchmarking data to make their hotel choices.

**Voluntary Disclosure to the Marketplace.** Market pressure appears to be outstripping government reporting and disclosure regulations in the United States. Large companies, including many in the hospitality industry, face a trend in the market toward voluntarily disclosing current emissions and creating "green" strategies. Several non-profit organizations have fostered and led this market, along with powerful individual market actors like Walmart and the federal government. Exhibit 1 illustrates how a number of major hospitality companies are disclosing their emissions and internal green strategies.

An important influence is the U.K.-based Carbon Disclosure Project (CDP), which claims to maintain the largest database of corporate climate change information in the world.<sup>17</sup> CDP obtains its data by sending questionnaires annually to thousands of companies on behalf of 534 institutional investors holding \$64 trillion in assets under management and about sixty large purchasing organizations. Last year, CDP received responses from about 2,500 companies worldwide, including 500 U.S. companies, a ten-fold increase since 2003. More than two-thirds made their reports available to the public.

Similarly, Ceres, a non-profit group dedicated to sustainability issues, announced in March 2010 that investors had filed a record ninety-five climate change resolutions against companies in various sectors, including entertainment giants MGM Mirage and Wynn Resorts. Most were filed by large public pension funds, as well as labor, foundation, religious, and other institutional investors.

## Exhibit 1 Hospitality Company Disclosures

| Company Name                              | Disclosure Activity   |
|---|---|
| Grand Targhee Resort                      | <u>Carbon Registry</u> <ul style="list-style-type: none"> <li>• Member</li> </ul>   |
| InterContinental Hotels Group             | <u>Carbon Disclosure Project</u> <ul style="list-style-type: none"> <li>• Answered questionnaire</li> <li>• Disclosed total and Scope 2 emissions</li> </ul>  |
| Las Vegas Sands Corp.                     | <u>Ceres</u> <ul style="list-style-type: none"> <li>• Disclosed green strategy</li> </ul>   |
| Marriott International, Inc.              | <u>Carbon Disclosure Project</u> <ul style="list-style-type: none"> <li>• Answered questionnaire</li> <li>• Disclosed total, Scope 1, and Scope 2 emissions</li> </ul> <u>Ceres</u> <ul style="list-style-type: none"> <li>• Disclosed Scope 1 and Scope 2 emissions</li> <li>• Disclosed green strategy</li> </ul> |
| MGM Mirage                                | <u>Ceres</u> <ul style="list-style-type: none"> <li>• Disclosed green strategy</li> </ul>   |
| The Rezidor Hotel Group                   | <u>Global Reporting Initiative</u> <ul style="list-style-type: none"> <li>• Published a report on sustainability performance</li> </ul>   |
| Sol Meliá Hotels & Resorts                | <u>Global Reporting Initiative</u> <ul style="list-style-type: none"> <li>• Published a report on sustainability performance</li> </ul>   |
| Starwood Hotels & Resorts Worldwide, Inc. | <u>Carbon Disclosure Project</u> <ul style="list-style-type: none"> <li>• Answered questionnaire, but did not publicly disclose emissions</li> </ul> <u>Ceres</u> <ul style="list-style-type: none"> <li>• Disclosed green strategy</li> </ul>  |
| TUI AG                                    | <u>Global Reporting Initiative</u> <ul style="list-style-type: none"> <li>• Published a report on its sustainability performance</li> </ul>   |
| Disney                                    | <u>Carbon Disclosure Project</u> <ul style="list-style-type: none"> <li>• Answered questionnaire</li> <li>• Disclosed total, Scope 1, and Scope 2 emissions</li> </ul>  |
| Wyndham Worldwide Corp.                   | <u>Carbon Disclosure Project</u> <ul style="list-style-type: none"> <li>• Provided some information but did not complete questionnaire or disclose emissions</li> </ul>   |

Many of the investors are part of the Investor Network on Climate Risk (INCR), an alliance of more than ninety institutional investors with collective assets totaling more than \$9 trillion, formed by Ceres.

Nevertheless, while the numbers climb, the relative share of real estate companies reporting their energy consumption, let alone their GHG emissions, remains relatively low. A recent survey of publicly traded and private real estate funds and companies worldwide, conducted on behalf of three major European pension investors, found that just 19 percent of respondents report their energy consumption; 16 percent report water consumption; and 14 percent report GHG emissions. Respondents based in Australia and Europe (especially in Sweden and the United Kingdom) were much more likely to report than U.S.-based respondents. Two strong performers in the United States, in terms of both disclosing emissions and implementing green policies, included Normandy Real Estate Partners and USAA Real Estate Company, both of which hold hotels.<sup>18</sup>

Some individual actors are having significant effects on the marketplace. Wal-Mart Stores, Inc., for example—which controls 8,416 retail units in fifteen different countries, employs more than 2.1 million people worldwide, and reported sales in fiscal year 2010 of \$405 billion—has formally committed to be supplied entirely by renewable energy, to create zero waste, and to sell products that sustain people and the environment.<sup>19</sup> In February 2010, Wal-Mart pledged to eliminate 20 million metric tons of GHG emissions from its global supply chain in five years. To serve its sustainability goals, Wal-Mart has not only been measuring and acting to reduce its own GHG emission, but has also been making efforts to influence its own vendors to reduce their greenhouse gas emissions.

The federal government plays a similarly influential role. The federal government owns approximately 445,000 buildings with a total floor space of over three billion square feet, and it leases another 57,000 buildings with approximately 374 million square feet. It is also the single largest energy consumer in the United States, having spent more than \$24.5 billion on electricity and fuel in 2008 alone. The federal government has an untold number of suppliers.

In October 2009, President Barack Obama issued Executive Order 13514 to establish an integrated strategy toward sustainability within the federal government itself and specifically to prioritize the reduction of GHG emissions by federal agencies.<sup>20</sup> Various deadlines under the order have now passed, and noticeable effects on commercial real estate can be expected to take hold soon. Among other things, the order requires that each federal agency undertaking new construction or major renovation building projects must comply with five “guiding principles” of sustainability, including optimizing energy performance.

By the end of 2010, the order affected all federal vendors and contractors. By early June 2010, all federal agencies were required to submit their targets to reduce Scope 3 GHG emissions by 2020. Again, Scope 3 includes indirect emissions, not covered by Scope 2, from sources not owned or directly controlled by a federal agency but related to agency activities, such as vendor supply, delivery services, and employee travel and commuting. Mandates for federal employees will affect the hotel industry, as federal employees’ Scope 3 emissions will include the emissions of hotels where federal employees choose to stay.

## Development Regulations

Development regulations, which typically take the form of zoning and building codes and mandatory reviews of the environmental impacts of new developments, may directly affect where and how hotels are built and how they are operated. New regulation, for example, may favor new hotel construction near existing infrastructure, or require the use of certain materials and systems within hotel buildings. New regulations can also affect how hotels are operated, and require the minimization or optimization of certain inputs, like fuel oil or potable water, or outputs, like solid waste and wastewater.

In the past several years, many major U.S. cities have come to require green building certification as a condition of project approval under their planning or zoning codes.<sup>21</sup> Currently, while planning and zoning codes are largely administered by planning staff and commissions acting in their discretion through public hearings, non-governmental third parties certify green buildings, although this unusual regulatory approach to ensure sustainable development may soon change. Green building certification may also exert market pressure on the hospitality industry to “green” their operations, as private certification organizations, as well as the federal government, seek to promote green hotels.

So-called green building codes are an alternative to certification, as they can address the same broad range of sustainability issues covered by third-party green building certification systems. Unlike certification systems, however, green building codes are applied during the review of a building permit application, which typically comes after the project has been conceptually approved under the planning and zoning codes, and without the involvement of third-party certification bodies.

Smart growth policies may incentivize mixed-use, higher-density development near existing public transportation infrastructure. Nevertheless, the stronger trend in the United States currently is to address buildings individually, rather than to mandate compact development patterns.

**Green Building Certification.** The dominant U.S. player in green building certification is Leadership in Energy and Environmental Design (LEED), which the U.S. Green Building Council (USGBC) created in 1993 in anticipation of sustainability regulation. The LEED Green Building Rating System has become the de facto market standard for a project developed with sustainable principles. According to USGBC, as of this writing more than 25,000 projects are currently registered for LEED certification.

LEED is a scoring system in which achieving a minimum number of “credits” entitles a project to different levels (silver, gold, etc.) of certification. There are six different categories of LEED credits, from the generally quantitative Energy and Atmosphere to the more subjective Innovation in Design. After project completion, a USGBC affiliate reviews documentation from the project proponent before deciding whether to grant certification, and at what level.

The LEED system does not mandate or offer credits that are directly tied to the reduction of GHG emissions. USGBC, however, echoes the importance placed by regulators on the problem of climate change, asserting that “the green building

movement has an unprecedented opportunity to make a major contribution to new global carbon reduction targets.”<sup>22</sup> In March 2009, the USGBC signed a memorandum of understanding with many of the largest green building organizations worldwide, including the BRE Trust, to develop a “common carbon metric.”<sup>23</sup>

Outside the United States, there are dozens of green building certification systems that dominate specific countries, including BRE’s Environmental Assessment Method (BREEAM) in the United Kingdom and CASBEE in Japan. USGBC’s LEED system is the best known in the United States. In the last few years, local ordinances in several major hotel markets, such as Boston, New York, and Washington, D.C., have required new developments and major renovations to obtain LEED certification as a condition of project approval. There is no current or proposed LEED standard specific to hospitality uses as there are for other types of development. Some competing standards *are* specific to lodging, including Green Globes’ Green Building Initiative and Audubon International’s Audubon Green Leaf Eco-Rating Program. Others, such as Green Seal, are tailored to food service.

The Green Leaf Eco-Rating Program audits members’ facilities to determine which ones exhibit environmental best practices in the areas of energy efficiency, environmental management, pollution prevention, and resource conservation. Green Leaf-rated facilities then may enter into a licensing agreement to display the Green Leaf seal on their promotional materials.<sup>24</sup> The group iStayGreen, an online travel website similar to Orbitz.com, features Green Leaf-rated hotels and allows customers to search only hotels that have received Green Leaf certification. Many hotels have sought this certification, including a dozen in the Orlando area alone.<sup>25</sup>

Likewise, the EPA has publicly encouraged travelers to stay in hotels that have received an ENERGY STAR label.<sup>26</sup> ENERGY STAR, which is administered by the EPA, is a relative, rather than an absolute, rating. Whereas LEED and Green Leaf rate each building individually to determine whether it is sufficiently “green,” the EPA’s system tracks the energy performance of hotels in its Commercial Buildings Energy Consumption Survey (CBECS) database, and awards the ENERGY STAR label to those in the top quartile. LEED standards can become more stringent as USGBC changes its standards, while ENERGY STAR can only become more stringent as hotels improve overall.

In the absence of a common regulatory standard for “green building,” several major U.S. cities, including Boston and San Francisco, have incorporated LEED by reference in their zoning or building codes.<sup>27</sup> However, completing the LEED certification process, or even just completing a LEED checklist as Boston requires, can be expensive and time-consuming. Despite severe economic pressure and skepticism about climate change, 92 percent of respondents to the 2010 Green Building Survey felt that it is worth the time and effort to build green projects. Yet, only 62 percent thought that LEED certification was worth the time and effort, down from 77 percent two years ago.

**Energy Codes.** Another way for regulators to ensure that new construction is designed to operate sustainably is to adopt mandatory energy codes. For example, state building codes commonly incorporate by reference the International Energy Conservation Code (IECC), which is promulgated by the non-profit International

Code Council (ICC). Model codes promulgated by the ICC, such as the International Building Code (IBC), are used in most states as well as the District of Columbia.

The IECC affects the building shell; windows and doors; heating, ventilation, and air-conditioning; and electrical power and lighting systems. The IECC is updated every three years and becomes stricter each time. Compliance with the 2009 IECC is expected to improve energy performance by approximately 12–15 percent compared to the 2006 edition. Commercial buildings also have the option to comply with the 2009 IECC by complying with Standard 90.1 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).<sup>28</sup>

The federal government has been using a combination of carrots and sticks to encourage states to adopt the latest editions of the IECC (2009) and ASHRAE 90.1 (2007), which are both updated every three years. Under Section 410 of the American Recovery and Reinvestment Act of 2009 (ARRA), for example, a state established its eligibility to accept certain grants from the U.S. Department of Energy (DOE) by giving written assurance that it would, among other things, adopt a commercial building energy code that met or exceeded Standard 90.1-2007.<sup>29</sup>

All fifty states submitted the required letters to the DOE and are well on their way to adopting the latest editions of the IECC and/or ASHRAE 90.1, or their equivalent, even if they had not used those model codes before. For example, new construction codes for the District of Columbia based on ASHRAE 90.1-2007 and exceeding the 2006 IECC by about 30 percent took effect in late December 2009.<sup>30</sup> Likewise, the State of New York has begun procedures to adopt the 2009 IECC and ASHRAE 90.1 in 2010.

Although building codes tend to be uniform statewide, some states have enabling statutes that allow local jurisdictions the option of adopting more stringent energy performance requirements, called *stretch codes*, than the base energy code. Since 2009, for example, Massachusetts cities and towns have been allowed to adopt a stretch code that requires commercial buildings to perform about 20 percent better than under the IECC.<sup>31</sup> Because the IECC and ASHRAE 90.1 become more stringent every three years, the stretch code essentially moves up the timetable.

The incremental cost of compliance with stricter energy codes is unsettled. Some studies suggest that it is relatively small,<sup>32</sup> but their accuracy and particular relevance to hotels is not clear.

Based on the prevailing climate change science, regulators generally accept that there is a finite period, perhaps a few decades, in which the reduction of GHG emissions can make a difference.<sup>33</sup> Because new construction accounts for only about 2 percent of U.S. commercial building stock in any one year,<sup>34</sup> it is necessary to address existing buildings. For example, New York City has projected that approximately 85 percent of the city's energy consumption in 2030, one of its target years for GHG reductions, will come from buildings that exist today.<sup>35</sup> Therefore, in December 2009, New York City adopted ordinances to regulate *existing* buildings, and other cities have taken note.

Under the New York City Energy Conservation Code (NYCECC), all existing buildings must now comply fully with the Energy Conservation Construction Code of New York State (ECCCNYS) for those portions of a building or building

system being added, altered, renovated, or repaired. The ECCCNYC would otherwise only apply to existing buildings when an alteration leads to the replacement within a twelve-month period of at least 50 percent of a building system.<sup>36</sup>

A second New York City ordinance requires private buildings that exceed 50,000 gross square feet<sup>37</sup> to conduct energy audits of the “base building” every ten years, and to recalibrate, or “retro-commission,” building systems for optimal performance.<sup>38</sup> Energy efficiency reports based on decennial audits and retro-commissioning will be phased in over a period of ten years, beginning in 2013. Some deferrals are available for newer buildings, for renovated buildings that meet the new NYCECC, and based on financial hardship.

In a nod to third-party certification systems, New York’s audit and retro-commissioning ordinance also exempts from mandatory audits those buildings that have carried the EPA’s ENERGY STAR label for at least two of the previous three years, or that are certified under the LEED for Existing Buildings: Operations & Maintenance (LEED-EB:O&M) system. Likewise, retro-commissioning is not required for buildings that have been certified LEED-EB:O&M within two years of filing the building’s energy efficiency report.<sup>39</sup>

As originally proposed, the audits and retro-commissioning bill would have required energy retrofits with a five-year payback at privately owned buildings. Strong opposition from owners fearful of capital costs in an era of uncertain financing led to the amendment of this provision to require reasonable capital improvements with a seven-year payback only at city-owned buildings. Even without it, the ordinances represent the most aggressive requirements applicable to existing buildings in the United States. While other regulators continue to study mandatory energy and water audits and re-commissioning, New York City—the largest U.S. market—has them in place.

A third New York City ordinance requires, with limited exceptions, non-residential buildings that are subject to the auditing and retro-commissioning ordinance to meet the NYCECC by upgrading their lighting systems at the time of renovation, and, in any case, by January 1, 2025. This ordinance also requires building owners to sub-meter for electrical use all floors larger than 10,000 gross square feet with at least one tenant space and all tenant spaces (on one or more floors) larger than 10,000 gross square feet, both excluding dwelling units.

**Green Building Codes.** By definition, energy codes address only that one aspect of green building. Early in 2010, the International Code Council (ICC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) each published model “green building codes” that set objective standards on the broader front addressed by green building certification systems.

The ICC’s new International Green Construction Code (IGCC)<sup>40</sup> meshes with the ICC’s other model codes, including the previously discussed IECC. While the IECC regulates energy issues, the IGCC, like the LEED green building certification systems, addresses non-energy issues, such as the use of water, indoor environment quality, and reduction in greenhouse gas emissions.

Just as one path to compliance with the IECC is through adherence to ASHRAE’s Standard 90.1, compliance with the IGCC is also possible by adhering

to an ASHRAE model code, Standard for the Design of High-Performance, Green Buildings (Standard 189.1),<sup>41</sup> which was released by ASHRAE shortly before the release of the IGCC.

No jurisdictions so far appear to have adopted the IGCC or ASHRAE Standard 189.1. California, however, has incorporated similar green building standards in its building code effective 2011 through adoption of the 2010 California Green Building Standards Code (CALGreen). In addition to regulating energy performance, CALGreen requires a 20 percent reduction in indoor water use, a diversion of at least half of construction waste from landfills, and the use of low pollutant-emitting interior finish materials.<sup>42</sup> In this way, while it is less exacting than the IGCC and ASHRAE Standard 189.1, CALGreen is nearly as broad.

ASHRAE, the ICC, and the USGBC worked together to develop both the IGCC and ASHRAE Standard 189.1, and the USGBC already uses ASHRAE standards in LEED. All three groups assert that the new green building codes will complement the LEED systems, not compete with them. For their part, USGBC officials describe the IGCC as setting a higher regulatory “floor” for green buildings that allows USGBC to continue to raise the “ceiling” through LEED.<sup>43</sup>

Hospitality companies may come to welcome the advent of green building codes. Permit-approving agencies may find them to be sufficiently strict to take the place of requiring projects, such as hotels, to achieve LEED certification, which can be costly. Moreover, with a code in place, agencies and applicants alike can apply objective, enforceable standards adopted and administered through governmental processes, rather than relying on private third parties like USGBC, which are not subject to due process requirements. Finally, postponing detailed review of a project for its “green” credentials until the building permit phase could avoid costs for projects that are rejected at the conceptual stage during planning and zoning review.<sup>44</sup>

On the other hand, the new green building codes could impose heavier burdens and requirements on hotel developers and owners than do LEED or the Green Leaf Eco-Rating Program. Although major cities already reference LEED for major project approvals, on either a mandatory or elective basis, until California’s adoption of CALGreen there had been no requirements imposed statewide. Just as the incremental costs to hotels from stricter energy costs remains unclear, so too do the costs from CALGreen, the IGCC, and ASHRAE 189.1.

**Environmental Impact Review.** U.S. jurisdictions began mandating environmental impact reviews of private development in the 1970s, after the federal government adopted the National Environmental Policy Act of 1970 (NEPA).<sup>45</sup> The development or major renovation of hospitality facilities, like all significant development, is likely to require environmental impact review at some level of government.

NEPA and its state analogues, such as the California Environmental Quality Act (CEQA), actually regulate permit-approving agencies, not permit applicants, by requiring government decision-makers to become fully informed of the potential environmental effects resulting from permit approval. Although such laws normally require the reviewing agency to impose mitigation or make special findings on projects expected to lead to significant environmental affects, permit approval is generally still allowed.

Environmental laws are increasingly requiring specific review of issues regarding climate change, with a particular emphasis on greenhouse gas emissions. For example, CEQA has provisionally required such analysis for several years, and, after an extensive comment process, comprehensive amendments to the CEQA regulations to account for climate change and GHG emissions went into effect in March 2010.<sup>46</sup> In February 2010, the federal government issued draft NEPA guidance directing federal agencies to consider climate change issues, at least for those projects reasonably anticipated to cause direct emissions of at least 25,000 metric tons of CO<sub>2</sub>e annually.<sup>47</sup>

**Smart Growth.** Years before the terms *sustainability* and *climate change* found their way into zoning codes and state law, government regulators had been promoting *smart growth*. Smart growth is an urban planning approach that favors compact, mixed-use development proximate to existing urbanized areas, often including affordable housing, in place of the dispersed, auto-oriented development patterns commonly known as urban sprawl.<sup>48</sup>

Smart growth policies endure in many major states and cities, and the Obama Administration has embraced them at the federal level.<sup>49</sup> The apparent trend, however, is for smart growth to enjoy lesser emphasis than building-by-building regulations. Smart growth regulations can take many forms, including locally imposed urban growth boundaries beyond which non-commercial development or utility service will not be provided,<sup>50</sup> and statutes that incentivize redevelopment within existing urban cores.<sup>51</sup> Carrots are more common than sticks.<sup>52</sup>

Smart growth relates to climate change, too. Roughly one-third of GHG emissions come from transportation, mostly in the form of tailpipe emissions from private automobiles. Dense, transit-oriented development tends to reduce automobile trips. For example, New York City's per capita GHG emissions are less than one-third of the U.S. average,<sup>53</sup> and they account for only 22 percent of citywide emissions. More than 60 percent of New York City commuters use public transit or walk, a far higher proportion than in most U.S. cities.<sup>54</sup> Also, extending electrical service to areas far from generation leads to increased GHG emissions because some power is inevitably lost when transmitted over lines.<sup>55</sup> More compact development minimizes "line loss."

California is thought to have the most aggressive smart growth policies tied to climate change. Adopted in 2008, Senate Bill 375 requires the California's Air Resources Board (ARB) to set regional targets for 2020 and 2035 for automobile emissions, in order to help the state achieve its goals under Assembly Bill 32, described previously.<sup>56</sup> To hit those vehicle emissions goals, Senate Bill 375 requires metropolitan planning organizations, in conjunction with the ARB, to make planning and funding choices to reduce vehicle trips. The law has had few real results so far.<sup>57</sup>

Some green building certification systems also tackle smart growth. In 2009, USGBC, the Congress for the New Urbanism, and the Natural Resources Defense Council introduced LEED for Neighborhood Development (LEED-ND). LEED-ND integrates principles of green building, the New Urbanist design movement, and smart growth.<sup>58</sup> Likewise, the new green building codes require "greenfield" development to be proximate to transit and/or services.<sup>59</sup>

Smart growth policies can be a positive or a negative for a hospitality company, depending on its particular strategy. For example, government aid may be available to construct or redevelop hotels located in downtown neighborhoods, where other complementary uses likely already exist and where transit density is likely to be highest. On the other hand, hotel chains that emphasize outlying locations may find it more difficult to obtain land use approvals in jurisdictions with smart growth policies. Likewise, lodging that taps convention business benefits from agglomerations; isolated resorts (including ecotourism, ironically) do not.

## Carbon Pricing

An obvious way for regulators to discourage GHG emissions is to increase the cost associated with them, often called *carbon pricing*. So far, carbon pricing regulations have targeted only the very largest emitters. Hotels are unlikely to experience carbon pricing directly; rather, the likely effect on the hospitality industry from carbon pricing is an increase in the cost of energy.

**Carbon Tax.** Some economists argue that the most economically efficient approach to carbon pricing would be to impose a tax on the emission of each unit at a value equal to the harm it does to the climate.<sup>60</sup> In this perfect world of internalized costs, buying a gallon of gasoline, for example, would entail paying a tax on the amount of CO<sub>2</sub>e associated with its production and consumption. To date, governments in the United States have not attempted carbon taxation meaningfully. Nevertheless, carbon taxes remain part of policy debates.

**Cap and Trade.** Carbon pricing does exist in the form of *cap-and-trade* systems. Currently, the largest carbon trading system in the world is the European Union's Emission Trading System (EU ETS), started in 2005. EU ETS covers more than 10,000 installations in the energy and industrial sectors, which are collectively responsible for almost 40 percent of its total GHG emissions.<sup>61</sup>

Under cap-and-trade, the government sets a total cap on GHG emissions by all regulated emitters for a given period of time.<sup>62</sup> It then allocates *allowances* for the trading period to each regulated facility. At the end of the period, each facility must surrender allowances equivalent to its actual emissions during that period. The government can influence the system by manipulating the cap and the allowances, both of which decrease over time.

To keep their emissions balanced with allowances, facilities subject to cap-and-trade regulations may reduce their emissions, perhaps by investing in more efficient technology or using less carbon-intensive energy sources, and/or buying extra allowances on the regulated market. A facility with fewer emissions than allowances can sell (trade) its excess on a regulated market.

For decades, the United States has used a cap-and-trade system to regulate air pollutants that contribute to acid rain, such as sodium dioxide.<sup>63</sup> In summer 2009, the U.S. House of Representatives passed a bill that would create a national cap-and-trade system for other greenhouse gases, including carbon dioxide.<sup>64</sup> As of this writing, the U.S. Senate is considering the matter.

Several U.S. states also have cap-and-trade systems in place. Formed in 2007, the Western Climate Initiative includes seven U.S. states (including California)

and four Canadian provinces.<sup>65</sup> The Regional Greenhouse Gas Initiative (RGGI), involving ten northeastern and mid-Atlantic states (including New York) and three Canadian provinces, led to the first auction of allowances in member states during September 2008.<sup>66</sup>

Neither the existing regional cap-and-trade systems nor the various federal proposals affect individual hotels. Rather, the required participants have been the biggest GHG emitters, such as power companies and certain industrial concerns like cement manufacturers. A cap-and-trade system could be designed and implemented to include a much broader set of companies.

In April 2010, the United Kingdom began its new Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. The scheme is compulsory for organizations that consumed over 6,000 mWh of half-hourly metered electricity during 2008, which equates to a yearly electricity bill of approximately \$750,000. It is thought that this will capture approximately 5,000 of the United Kingdom's largest organizations, including supermarkets, banks, property management companies, government departments, hotel groups, food retail chains, and local authorities.

The United Kingdom's new scheme is consciously designed to regulate low energy-intensive emitters of greenhouse gases that are not captured by the EU ETS. In the United States, federal and state regulators are watching the CRC with interest, and hospitality companies should as well. In addition to compelling large emitters of GHG gases to report their emissions to the federal government, the EPA has asserted its authority under the Clean Air Act to regulate such emissions, perhaps under a cap-and-trade system. To date, the EPA has taken extraordinary steps to ensure that only the very largest emitters will be covered.<sup>67</sup>

**Voluntary Markets.** As with the disclosure of sustainability practices, especially GHG emissions, the private market is somewhat ahead of the regulators in the field of carbon pricing. Founded in 2003, two years before the EU ETS, the voluntary Chicago Climate Exchange (CCX) is today the largest market for trading carbon allowances in North America.<sup>68</sup> CCX members make voluntary but legally binding commitments to meet annual GHG emission reduction targets. As in any cap-and-trade regime, emitters who reduce emissions below their targets have surplus allowances to sell or bank. Those who emit more than their targets must buy tradeable packages of allowances and offsets. Some CCX members are involved in hospitality, including the Aspen Skiing Company.

## Conclusion

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Sustainability is about more than just mitigating climate change. Meeting “the needs of the present without compromising the ability of future generations to meet their own needs” can also require regulating economic activity to ensure a host of other public goods, such as clean air and water, adequate food supply, and even social equity. Nevertheless, what is most remarkable about sustainability *regulation* in the United States is its central concern with climate change. Moreover, regulators tend to favor addressing climate change by focusing on greenhouse emissions.

For now, carbon pricing tools, like cap-and-trade, and government mandates to report greenhouse emissions have yet to target hospitality companies or hotel assets. Nevertheless, there is a significant risk of indirect effects on the industry from carbon pricing in the form of increased energy costs. Also, larger (especially publicly traded) hospitality companies are likely to feel pressure to disclose their GHG emissions voluntarily, especially if a significant share of their guests are employed by companies that disclose their emissions.

Meanwhile, agencies regulating major markets, including California and New York City, have begun to require the owners of large commercial properties, including hotels, to measure and report their energy consumption. Some laws require energy consumption data to be collected and made public at regular intervals. Others require owners to disclose the information to prospective buyers, investors, lenders, and occupants.

This trend can be expected to continue, especially as the market becomes more sophisticated in terms of evaluating energy consumption at buildings to predict operational costs, GHG emissions, and, eventually, asset value. The presumption is that buildings that consume comparatively less energy are not only less costly to owners and occupants, but have less of an impact on the environment because they have fewer GHG emissions, and so are more sustainable.

Development regulations have direct effects on the hospitality industry, just as they do on all real estate sectors. Virtually every populous state in the United States has already or will soon adopt stricter energy performance codes, usually the International Energy Conservation Code and/or ASHRAE Standard 90.1, both of which become more exacting every three years. Again, the goal is to reduce energy consumption, thereby minimizing GHG emissions. More aggressive jurisdictions may adopt comprehensive “green building codes,” such as the IGCC or ASHRAE 189.1

To protect against the risks posed by sustainability regulation, the most obvious action for hospitality companies is to investigate measurement and tracking of the energy consumption and greenhouse gas emissions associated with their businesses. Regardless of the business case for improving energy efficiency and reducing GHG emissions, regulatory trends appear to make these efforts worth the time and expense.



## Endnotes

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1. In 2008, over 85 percent of energy consumed in the United States came from petroleum, natural gas, or coal. See U.S. Energy Information Agency, *Renewable Energy Consumption and Electricity 2008 Preliminary Statistics*, Table 1: U.S. Energy Consumption by Energy Source, 2004-2008 (July 2009), available at [www.eia.doe.gov/cneaf/alternate/page/renew\\_energy\\_consump/rea\\_prereport.html](http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/rea_prereport.html).
2. Worldwide, buildings consume approximately 30–40 percent of final energy use, and they account for approximately 40 percent of GHG emissions. See World Business Council for Sustainable Development, *Transforming the Market: Energy Efficiency in Buildings* (2009), 16, available at [www.wbcsd.org/DocRoot/HtQXNjP1wUMPVlnQD-mDx/91719\\_EEBReport\\_WEB.pdf](http://www.wbcsd.org/DocRoot/HtQXNjP1wUMPVlnQD-mDx/91719_EEBReport_WEB.pdf). “Final energy use” means consumptions by end users. In New York City, buildings are responsible for approximately 75 percent of

GHG emissions. See PlaNYC, *Inventory of New York City Greenhouse Gas Emissions: September 2009* (Sept. 2009), available at [www.nyc.gov/html/planyc2030/downloads/pdf/greenhousegas\\_2009.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/greenhousegas_2009.pdf).

3. 310 C.M.R. 7.71(5)(c). See The Climate Registry, <http://www.theclimateregistry.org/>. In turn, The Climate Registry's protocol draws from the World Resources Institute and the World Business Council for Sustainable Development's Greenhouse Gas Protocol. The Climate Registry, *General Reporting Protocol 32* (May 2008), available at [www.theclimateregistry.org/downloads/GRP.pdf](http://www.theclimateregistry.org/downloads/GRP.pdf).
4. *The U.S. Mayors Climate Protection Agreement* (Chicago: 2005), available at <http://usmayors.org/climateprotection/documents/mcpAgreement.pdf>.
5. See PlaNYC's "Greenhouse Gas Emissions Inventory" at [www.nyc.gov/html/planyc2030/html/emissions/emissions.shtml](http://www.nyc.gov/html/planyc2030/html/emissions/emissions.shtml).
6. The full text of Assembly Bill No. 32 is available at [www.arb.ca.gov/cc/docs/ab32text.pdf](http://www.arb.ca.gov/cc/docs/ab32text.pdf).
7. See the Massachusetts Department of Environmental Protection's "Mandatory Reporting of Greenhouse Gas Emissions to a Regional Registry" (Dec. 29, 2008), available at [www.mass.gov/dep/service/regulations/771tsd.pdf](http://www.mass.gov/dep/service/regulations/771tsd.pdf).
8. See the Environmental Protection Agency's *Mandatory Reporting of Greenhouse Gases; Final Rule 74*, no. 209 (Oct. 30, 2009).
9. Securities and Exchange Commission, *Commission Guidance Regarding Disclosure Related to Climate Change 75* (Feb. 8, 2010).
10. PlaNYC, *Inventory of New York City Greenhouse Gas Emissions: September 2009* (Sept. 2009), available at [www.nyc.gov/html/planyc2030/downloads/pdf/greenhouse-gas\\_2009.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/greenhouse-gas_2009.pdf).
11. Where a non-residential rental space is separately metered, the building owner must ask for and the tenant must provide annual energy use data for the rented space.
12. See Energy Star's "Portfolio Manager Overview" at [www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager). Many hotel companies participate in the ENERGY STAR program. See also the EPA's *ENERGY STAR® Building Manual*, Chapter 12: Facility Type: Hotels and Motels.
13. See "The Energy Star for Buildings & Manufacturing Plants" at [www.energystar.gov/index.cfm?c=business.bus\\_bldgs](http://www.energystar.gov/index.cfm?c=business.bus_bldgs).
14. California Public Resources Code §25402.10 (2007).
15. Assembly Bill 531 (2009) charged the California Energy Commission to establish the deadline. See the California Energy Commission's *Draft Regulations Implementing AB 1103 (2007)* (2009), accessed at [www.energy.ca.gov/2009publications/CEC-400-2009-011/CEC-400-2009-011-SD.pdf](http://www.energy.ca.gov/2009publications/CEC-400-2009-011/CEC-400-2009-011-SD.pdf).
16. See Chapter 423, Washington Laws of 2009 (Senate Bill 5854), available at <http://apps.leg.wa.gov/documents/WSLdocs/2009-10/Pdf/Bills/Session%20Law%202009/5854-S2.SL.pdf>. The statute also bars state agencies from entering into a new lease or lease renewal for a building with a National Energy Performance Rating System score below 75 unless a preliminary audit has been conducted within the last two years, and the owner agrees to perform an investment grade audit and implement cost-effective energy conservation measures within the first two years of the lease agreement. (ibid. §8(7).)

17. See the Carbon Disclosure Project's website at [www.cdproject.net/en-US/Pages/HomePage.aspx](http://www.cdproject.net/en-US/Pages/HomePage.aspx).
18. N. Kok, P. Eichholtz, R. Bauer, and P. Peneda, "Environmental Performance: A Global Perspective on Commercial Real Estate" (Maastricht University, Netherlands: 2010), available at [www.uss.co.uk/Documents/Launch%20of%20Report%20PPT%20NK%20\(2\).pdf](http://www.uss.co.uk/Documents/Launch%20of%20Report%20PPT%20NK%20(2).pdf). One hundred ninety-eight funds and companies responded out of 700 surveyed. Author Professor Nils Kok has acknowledged that the percentages might have been even lower with a higher response rate. (*Investments & Pensions Europe*, Jan. 22, 2010.)
19. See Wal-mart's website at <http://walmartstores.com/AboutUs/>.
20. See "Federal Leadership in Environmental, Energy, and Economic Performance" *Federal Register* 74 no. 194 (Oct. 5, 2009), available at <http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf>.
21. For a survey of this trend nationwide, including case studies, see the American Institute of Architects' *Local Leaders in Sustainability: Green Building Policy in a Changing Economic Environment* (2009), available at [www.aia.org/aiaucmp/groups/aia/documents/document/aiab081614.pdf](http://www.aia.org/aiaucmp/groups/aia/documents/document/aiab081614.pdf).
22. The USGBC elaborates on its blog: "As the built environment accounts for 40 percent of global carbon emissions, the green building movement has an unprecedented opportunity to make a major contribution to new global carbon reduction targets. USGBC will continue to be actively involved with government delegations and non-government organizations to better understand how we can work together to show that green building represents one of the most direct, immediate and cost-effective opportunities to help tackle climate change." From the entry "COP 15 - United Nations Climate Change Conference; Dec. 7-18; Copenhagen, Denmark," *Buildings & Climate Change International Blog*, [www.usgbc.org/DisplayPage.aspx?CMSPageID=2124](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=2124).
23. The USGBC's November 11, 2009, press release is available at [www.usgbc.org/News/PressReleaseDetails.aspx?ID=4237](http://www.usgbc.org/News/PressReleaseDetails.aspx?ID=4237).
24. See Audubon International's website at <http://greenleaf.auduboninternational.org/>.
25. See "12 Hotels in Orlando Have Now Been Awarded the Prestigious Green Eco-Leaf Rating," *The Earth Times* (May 26, 2010), [www.earthtimes.org/articles/show/12-hotels-in-orlando-have,1317011.shtml](http://www.earthtimes.org/articles/show/12-hotels-in-orlando-have,1317011.shtml).
26. See ENERGY STAR, Buildings & Plants News Room, accessed May 2010 at [www.energystar.gov/index.cfm?c=news.nr\\_news&news\\_id=http://www.energystar.gov/cms/default/index.cfm?LinkServID=E77FB9F2-96D9-EAAD-6B3C6ECF0D9E4808#\\_CAE9217A-1EC9-2E06-C1F262079566962E](http://www.energystar.gov/index.cfm?c=news.nr_news&news_id=http://www.energystar.gov/cms/default/index.cfm?LinkServID=E77FB9F2-96D9-EAAD-6B3C6ECF0D9E4808#_CAE9217A-1EC9-2E06-C1F262079566962E).
27. See Boston Zoning Code, Article 37 (Green Buildings), [www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article37.pdf](http://www.bostonredevelopmentauthority.org/pdf/ZoningCode/Article37.pdf), and San Francisco Building Code, Chapter 13C (Green Building Requirements), [www.amlegal.com/library/ca/sanfrancisco.shtml](http://www.amlegal.com/library/ca/sanfrancisco.shtml).
28. For a detailed comparison, see D. Conover, R. Bartlett, and M. Halverson, *Comparison of Standard 90.1-2007 and the 2009 IECC with Respect to Commercial Buildings* (December 2009), available at [www.energycodes.gov/publications/research/documents/codes/90-1\\_iecc\\_comparison\\_final\\_12-16-2009.pdf](http://www.energycodes.gov/publications/research/documents/codes/90-1_iecc_comparison_final_12-16-2009.pdf).
29. See ARRA Funding Opportunity Number DE-FOA-0000052 (2009).

30. See 55 D.C. Register 013094–013493 (Dec. 26, 2008), available at <http://newsroom.dc.gov/show.aspx/agency/os/section/37/release/15772/year/2008/month/12>.
31. See 780 CMR Appendix 120 AA “Stretch Energy Code,” available at [www.mass.gov/Eeops/docs/dps/inf/appendix\\_120\\_aa\\_jul09\\_09\\_final.pdf](http://www.mass.gov/Eeops/docs/dps/inf/appendix_120_aa_jul09_09_final.pdf).
32. One example is the Southwest Energy Efficiency Project; *Increasing Energy Efficiency in New Buildings in the Southwest* (August 2003) is available at [www.swenergy.org/publications/ieenb/](http://www.swenergy.org/publications/ieenb/).
33. For an example, see the United Nations Environment Programme’s *UNEP Year Book: New Science and Developments in Our Changing Environment* (2009), available at [www.unep.org/yearbook/2009/PDF/UNEP\\_Year\\_Book\\_2008\\_EN\\_Full.pdf](http://www.unep.org/yearbook/2009/PDF/UNEP_Year_Book_2008_EN_Full.pdf).
34. G. V. R. Holness, “Improving Energy Efficiency in Existing Buildings,” *ASHRAE Journal* (Jan. 2008), available at [http://findarticles.com/p/articles/mi\\_m5PRB/is\\_1\\_50/ai\\_n25376330/](http://findarticles.com/p/articles/mi_m5PRB/is_1_50/ai_n25376330/).
35. PlaNYC, *A Greener, Greater New York* (April 22, 2007): 106, available at [www.nyc.gov/html/planyc2030/downloads/pdf/full\\_report.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/full_report.pdf).
36. A copy and description of this and the other New York City ordinances described in this section is available on the PlaNYC website at [www.nyc.gov/html/planyc2030/html/news/news.shtml](http://www.nyc.gov/html/planyc2030/html/news/news.shtml).
37. Approximately 2 percent of the buildings in New York City (22,000) exceed 50,000 gross square feet, but together they account for nearly half of total floor space, approximately 45 percent of energy consumption, and a correspondingly high share of city-wide GHG emissions. See PlaNYC, “Greener, Greater Buildings Plan” (Dec. 2009): 4, available at [www.nyc.gov/html/planyc2030/downloads/pdf/greener\\_greater\\_buildings\\_final.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/greener_greater_buildings_final.pdf).
38. The base building excludes systems owned or maintained by tenants (other than very long-term lessees); condominium unit owners or cooperative unit shareholders, or a system for which a tenant bears maintenance responsibility; and that is within and/or exclusively serves the tenant’s leased space.
39. The EPA maintains a list of state and local policies that leverage the ENERGYSTAR tool at [www.energystar.gov/ia/business/government/State\\_Local\\_Govts\\_Leveraging\\_ES.pdf](http://www.energystar.gov/ia/business/government/State_Local_Govts_Leveraging_ES.pdf).
40. See the “International Green Construction Code” at [www.iccsafe.org/cs/igcc/pages/default.aspx](http://www.iccsafe.org/cs/igcc/pages/default.aspx).
41. See [www.ashrae.org/publications/page/927](http://www.ashrae.org/publications/page/927).
42. The energy-related provisions are strict, too. For example, similar to regulations in the European Union, CALGreen mandates inspections of energy systems for nonresidential buildings over 10,000 square feet to ensure they are operating at their maximum capacity according to their design efficiencies. See “Draft 2010 California Green Buildings Standard Code,” available at [www.documents.dgs.ca.gov/bsc/documents/2010/Draft-2010-CALGreenCode.pdf](http://www.documents.dgs.ca.gov/bsc/documents/2010/Draft-2010-CALGreenCode.pdf).
43. “Standard 189 Integrated into New Green Construction Code,” (April 1, 2010), [www.buildinggreen.com/auth/article.cfm/2010/3/15/Standard-189-Integrated-into-New-Green-Construction-Code/](http://www.buildinggreen.com/auth/article.cfm/2010/3/15/Standard-189-Integrated-into-New-Green-Construction-Code/).
44. Naturally, some green building code provisions have to be considered during conceptual design, most notably site selection.

45. See 42 U.S.C. §§4321 et seq at [www.apfo.usda.gov/Internet/FSA\\_File/nepa\\_statute.pdf](http://www.apfo.usda.gov/Internet/FSA_File/nepa_statute.pdf).
46. The updated regulations, Title 14, § 15000 et seq are available at [www.ceres.ca.gov/ceqa/docs/FINAL\\_Text\\_of\\_Proposed\\_Amendments.pdf](http://www.ceres.ca.gov/ceqa/docs/FINAL_Text_of_Proposed_Amendments.pdf). Massachusetts is another innovator amongst the states. The Greenhouse Gas Emissions Policy and Protocol dates from 2007, when the state determined that “damage to the environment” regulated under the Massachusetts Environmental Policy Act (MEPA) includes GHG emissions caused by projects subject to MEPA review. The protocol is available at [www.env.state.ma.us/mepa/downloads/GHG%20Policy%20FINAL.pdf](http://www.env.state.ma.us/mepa/downloads/GHG%20Policy%20FINAL.pdf).
47. Nancy H. Sutley, Chair, U.S. Council on Environmental Quality, “Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions” (Feb. 18, 2010), available at [http://ceq.hss.doe.gov/nepa/regs/Consideration\\_of\\_Effects\\_of\\_GHG\\_Draft\\_NEPA\\_Guidance\\_FINAL\\_02182010.pdf](http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf).
48. See “Smart Growth Principles,” at [www.epa.gov/smartgrowth/about\\_sg.htm](http://www.epa.gov/smartgrowth/about_sg.htm).
49. See the “HUD-DOT-EPA Partnership for Sustainable Communities,” at [www.epa.gov/dced/partnership/index.html](http://www.epa.gov/dced/partnership/index.html)
50. One of the best known examples of an urban growth boundary is administered by the regional government for metropolitan Portland, Oregon. See “Urban Growth Boundary,” at [www.oregonmetro.gov/index.cfm/go/by.web/id=277](http://www.oregonmetro.gov/index.cfm/go/by.web/id=277).
51. For example, see M.G.L. Chapter 40R (adopted 2004) and Chapter 40S (adopted 2005) at [www.mass.gov/?pageID=eheadterminal&L=3&L0=Home&L1=Community+Development&L2=Community+Planning&sid=Ehead&b=terminalcontent&f=hcd\\_cd\\_ch40s\\_ch40s&csid=Ehead](http://www.mass.gov/?pageID=eheadterminal&L=3&L0=Home&L1=Community+Development&L2=Community+Planning&sid=Ehead&b=terminalcontent&f=hcd_cd_ch40s_ch40s&csid=Ehead).
52. For a useful critique of Maryland’s carrot-based approach since 1997, see R. Lewis, G.J. Knapp, and J. Sohn, “Managing Growth with Priority Funding Areas: A Good Idea Whose Time Has Yet to Come,” *Journal of the American Planning Association* 75, no. 4 (2009). In 2009, Maryland adopted stronger smart growth legislation; see S. Olivetti Martin, “Maryland’s Second Generation of Smart Growth,” *Planning* (March 2010).
53. “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007,” (April 2009), available at [www.epa.gov/climatechange/emissions/downloads09/InventoryUS-GHG1990-2007.pdf](http://www.epa.gov/climatechange/emissions/downloads09/InventoryUS-GHG1990-2007.pdf). These figures exclude GHG emissions from aviation and shipping.
54. PlaNYC, *Inventory of New York City Greenhouse Gas Emissions: September 2009* (Sept. 2009), available at [www.nyc.gov/html/planyc2030/downloads/pdf/greenhouse-gas\\_2009.pdf](http://www.nyc.gov/html/planyc2030/downloads/pdf/greenhouse-gas_2009.pdf).
55. See “High Temperature Superconductivity,” *National Transmission Grid Study* (May 2002): 63, available at [www.ferc.gov/industries/electric/indus-act/transmission-grid.pdf](http://www.ferc.gov/industries/electric/indus-act/transmission-grid.pdf).
56. See California Senate Bill No. 375, Chapter 728, at [www.calapa.org/attachments/wysiwyg/5360/SB375final.pdf](http://www.calapa.org/attachments/wysiwyg/5360/SB375final.pdf).
57. See W. Fulton, “SB 375 is Only the Beginning,” *California Planning & Development Report* (Aug. 26, 2008), available at <http://www.cp-dr.com/node/2106>; and M. Altmaier, E. Barbour, C. Eggleton, J. Gage, J. Hayter, and A. Zahner, “Make it Work: Implementing Senate Bill 375” (Berkeley: University of California, Oct. 4, 2009), available at <http://sustainablecalifornia.berkeley.edu/pubs/SB375-FULL-REPORT.pdf>.
58. U.S. Green Building Council, *LEED For Neighborhood Development*, [www.usgbc.org/DisplayPage.aspx?CMSPageID=148](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148).

59. For example, see CALGreen §A5.103 at [www.documents.dgs.ca.gov/bsc/documents/2010/Draft-2010-CALGreenCode.pdf](http://www.documents.dgs.ca.gov/bsc/documents/2010/Draft-2010-CALGreenCode.pdf); IGCC §401 at [www.iccsafe.org/cs/SBTC/Documents/drafts/IgCC\\_First\\_draft-v5.pdf](http://www.iccsafe.org/cs/SBTC/Documents/drafts/IgCC_First_draft-v5.pdf); and ASHRAE Standard 189.1 §5.3.1 at [www.ashrae.org/publications/page/927](http://www.ashrae.org/publications/page/927).
60. For example, see the Congressional Budget Office's *Policy Options for Reducing CO<sub>2</sub> Emissions* (Feb. 2008), available at [www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf](http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf).
61. See [http://ec.europa.eu/environment/climat/emission/index\\_en.htm](http://ec.europa.eu/environment/climat/emission/index_en.htm).
62. Ibid.
63. See Clean Air Act Amendments of 1990, §§ 401–16, 42 U.S.C. §§ 7651–51o, available at [www.epa.gov/oar/caa/title4.html](http://www.epa.gov/oar/caa/title4.html).
64. H.R. 2454, 111th Cong. (2009). See <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:H.R.2454>.
65. See the Western Climate Initiative website at [www.westernclimateinitiative.org/](http://www.westernclimateinitiative.org/).
66. See the Regional Greenhouse Gas Initiative website at [www.rggi.org/home](http://www.rggi.org/home). The clearing price per allowances has dropped by about 50 percent since the first auction, but the participating states have realized \$600 million through the seventh auction on March 10, 2010.
67. See "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule" *Federal Register* 74 no. 206 (Oct. 27, 2009)
68. See the Chicago Climate Exchange website at [www.chicagoclimatex.com/index.jsf](http://www.chicagoclimatex.com/index.jsf).