

CEU FEATURE

CRACKING THE GREEN BUILDING CODE

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This course was approved by the **USGBC** for one GBCI CE hour for LEED Credential Maintenance.



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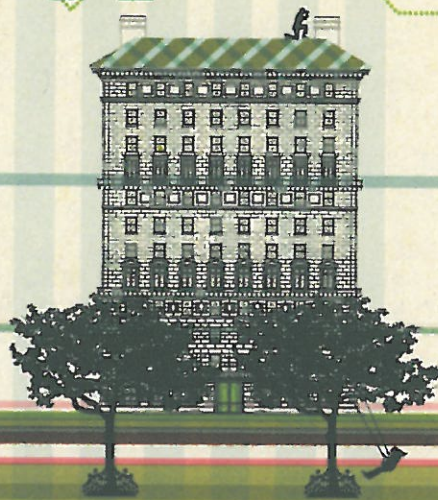
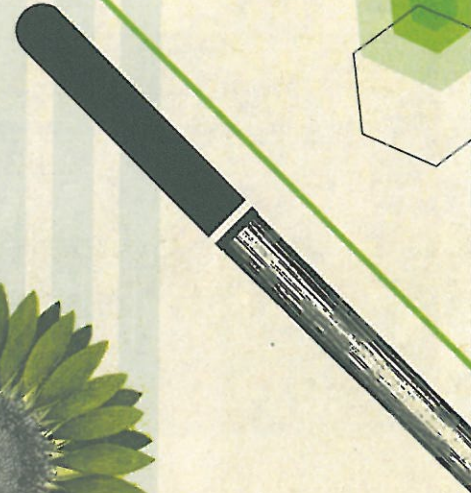
Use the learning objectives below to focus your study while reading "Code Green." After reading this article you should be able to:

- Explain the difference between building codes, standards, and rating systems.
- Understand why we need both green building rating systems and green building codes at this time.
- Discuss several recent efforts to develop green building codes.
- List some of the challenges inherent in developing and implementing green codes.

The CEU quiz for "Code Green" is available online at ce.construction.com at no charge.

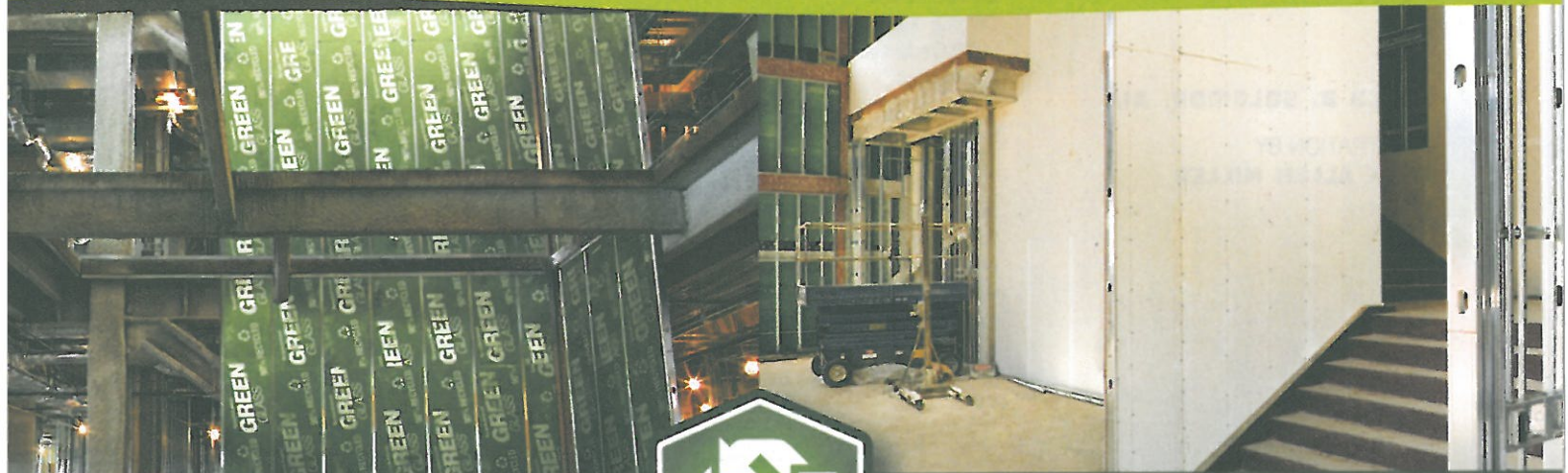
Code Green

CITIES, STATES, AND NATIONAL ORGANIZATIONS ARE WORKING TO ESTABLISH MINIMUM, ENFORCEABLE SUSTAINABLE CONSTRUCTION REQUIREMENTS TO COMPLEMENT—NOT REPLACE—HIGHLY POPULAR ABOVE-CODE INCENTIVE PROGRAMS.



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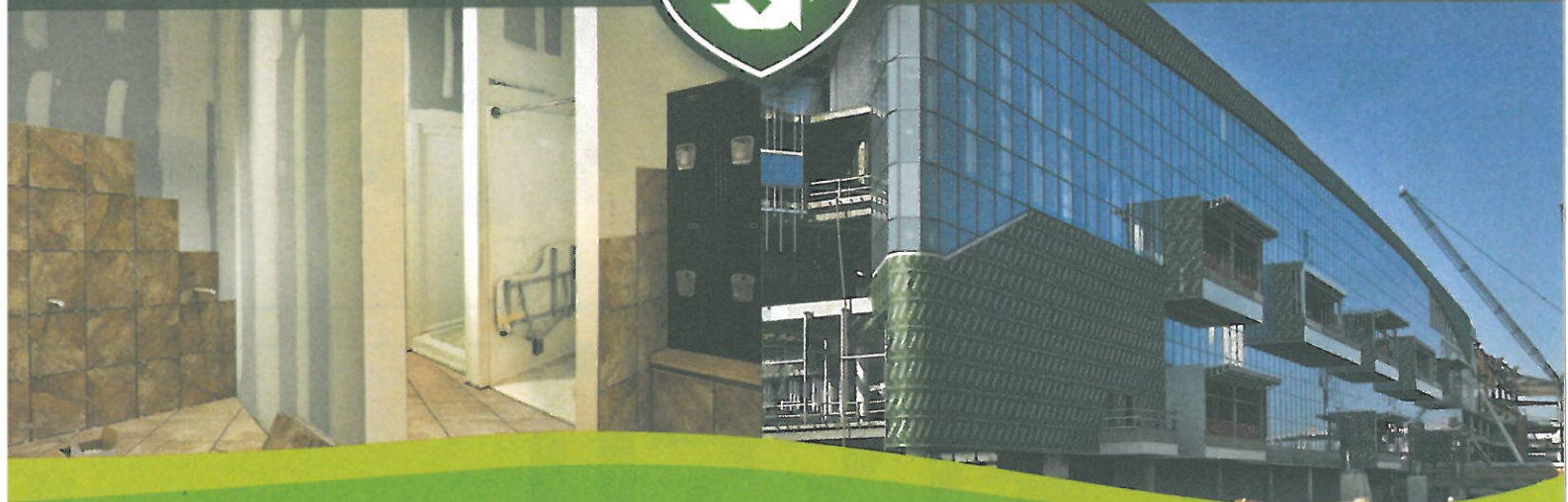
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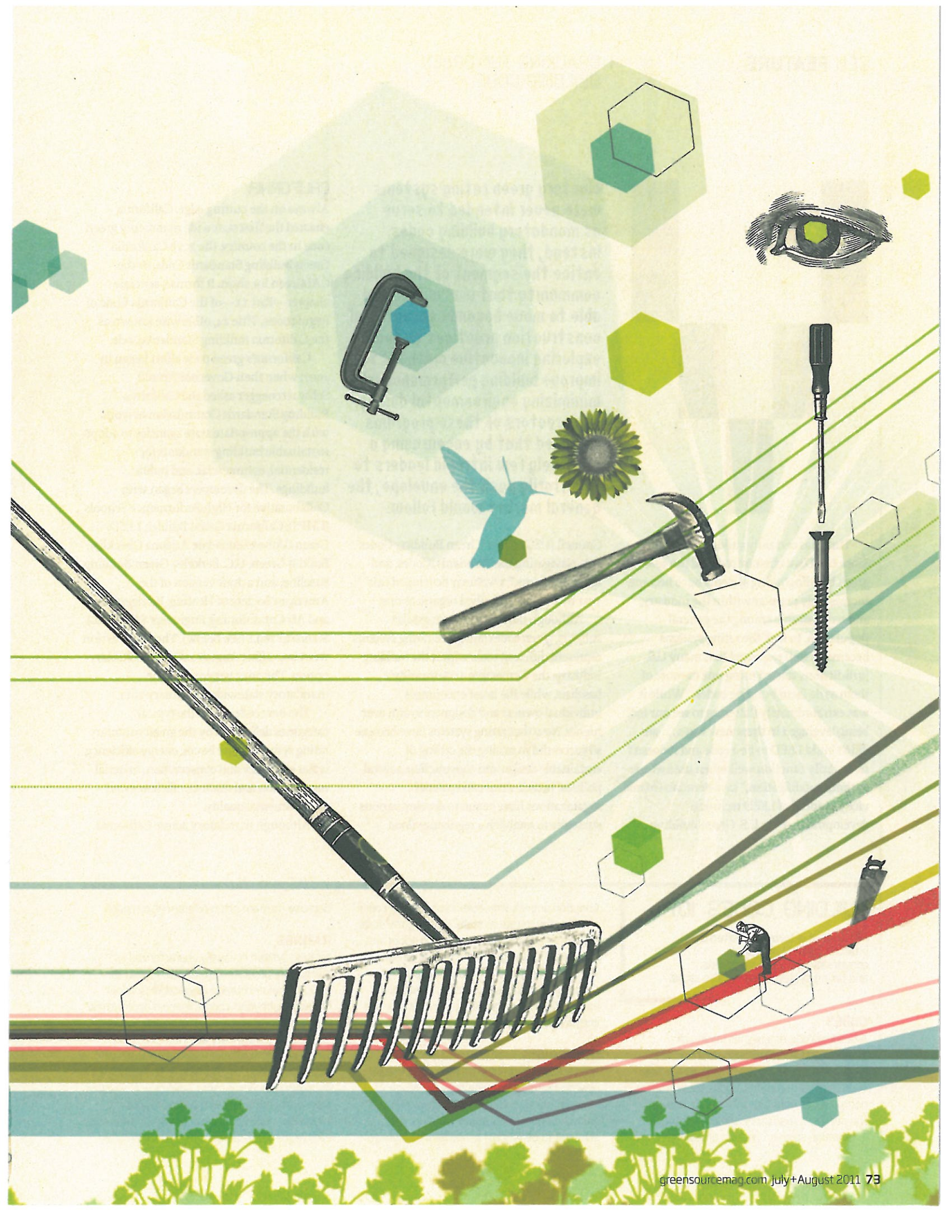
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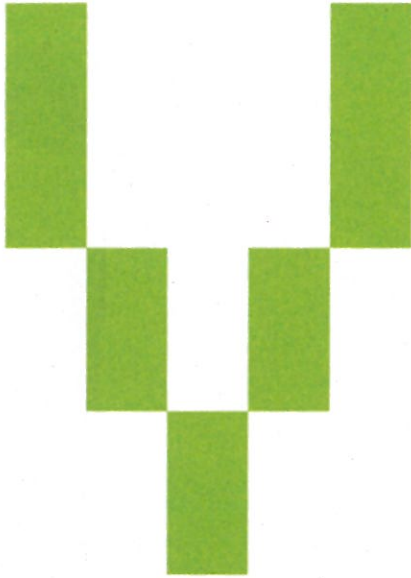
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Tough as Expected. Green as it Gets.







Time has certainly validated this tactic. Since LEED was first introduced in 1998, green building rating systems have become increasingly popular within the industry, and recognizable among the general population. In fact, the rating systems became so well respected that many U.S. jurisdictions started using one or more of them as de facto building codes. “While it was extraordinarily flattering to see our tool being leveraged in these new ways . . . we didn’t build LEED to be a code and it doesn’t necessarily function well when used as one without modification,” says Brendan Owens, vice president of LEED technical development at the U.S. Green Building

voluntary green rating systems were never intended to serve as mandatory building codes. Instead, they were designed to entice the segment of the building community that was willing and able to move beyond conventional construction practices to begin exploring innovative methods to improve building performance while minimizing environmental damage. The creators of these programs assumed that by encouraging a relatively few intrepid leaders to voluntarily push the envelope, the general market would follow.

Council (USGBC), in “Green Building Codes 101: Navigating the Standards, Codes, and Rating Systems,” a webinar developed this year by USGBC and allied organizations.

Although they may address similar subjects, green codes and green rating systems represent different tools within the building industry: the former sets a community’s baseline, while the latter encourages individual owners and designers to aim ever higher. Now that rating systems have become so successful in raising the ceiling of sustainable design and construction, several political jurisdictions and national organizations have begun to develop various strategies to establish a regulatory floor.

CALIFORNIA

Always on the cutting edge, California enacted the first statewide mandatory green code in the country, the 2010 California Green Building Standards Code, or the CALGreen for short. It forms a separate chapter—Part 11—of the California Code of Regulations, Title 24, otherwise known as the California Building Standards Code.

California’s green-code effort began in 2007, when then-Governor Arnold Schwarzenegger asked the California Building Standards Commission to work with the appropriate state agencies to adopt sustainable building standards for residential, commercial, and public buildings. The developers began with Collaborative for High Performance Schools (CHPS); California Green Builder; LEED; Green Globes; Scottsdale Arizona Checklist; Build It Green; U.C. Berkeley Green Building Baseline; and a draft version of the American Society of Heating, Refrigerating and Air Conditioning Engineers’ (ASHRAE) Standard 189.1 (see below). The 2008 version went into effect August 2009 as a voluntary option. The 2010 version became mandatory statewide on January 2011.

The new code covers the typical categories delineated by the green voluntary rating systems—site issues, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.

Although mandatory across California

BUILDING CODES 101

Although the terms are often used interchangeably in casual conversation, codes, standards, and rating systems are not the same.

CODES

A building code establishes minimum requirements for a building within a given jurisdiction to ensure the health, safety, and welfare of its occupants. Codes are written in normative, or mandatory, language and with the pertinent regulatory and administrative information so that officials can enforce them.

Adoption and implementation of building codes can vary from state to state. In some, the state legislature and regulatory agencies adopt and implement building codes across all jurisdictions statewide. In others, city councils, town councils, county boards, and pertinent local agencies are responsible for the adoption and implementation of their own codes.

STANDARDS

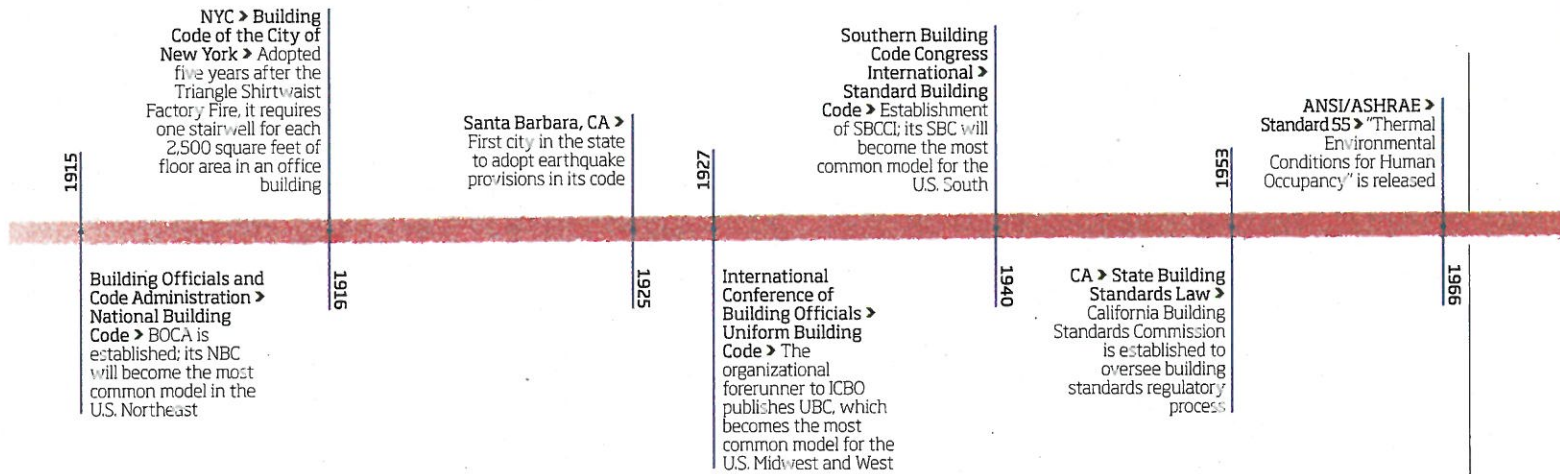
A standard offers “how-to” guidelines that describe current best practices. Although more technical in nature, and without as much enforcement and legislative wording, they still tend to be written in normative language

because they are often referenced by codes.

RATINGS

A rating system is usually characterized as a voluntary program with a high number of options that encourage developers to adopt innovative, beyond-code-minimum approaches. Rating systems are not written in normative language because they are intended as an “engagement tool” to encourage dialogue and experimentation, says Jeremy Sigmon, USGBC’s manager of building codes advocacy. A qualified third-party inspector—not a code official—evaluates a building project to determine if it is eligible for certification under such a program.

A BRIEF HISTORY



for all new construction, CALGreen is far from monolithic. It actually consists of three levels: the base code is required but individual jurisdictions can implement more stringent strategies by adopting tier 1 or, the most demanding, tier 2. If a jurisdiction selects one of these tiers, the project must satisfy prerequisite measures for the specified tier, any additional measures within that tier that the jurisdiction deems necessary due to local conditions, and a specified number of elective measures associated with that tier.

Design professionals who have already been applying green strategies to meet one of the voluntary rating systems in California do not appear concerned about fulfilling CALGreen's technical requirements. "If you are accustomed to designing to LEED, it is business as usual," reports Marsha Maytum, principal of Leddy Maytum Stacy Architects in San Francisco.

The biggest challenge green-building-savvy design professionals currently seem to have regarding the new code is determining what options a particular jurisdiction has selected. "This is still evolving," says Marc J. Cohen, director of sustainable design at MVE Institutional in Irvine, California.

Enforcement is also still a work in progress. Like design and building professionals, building inspectors have been receiving training on the new requirements. Cohen anticipates that there will need to be a "bit more of a partnership between the building officials and the design and

construction side" as code officials figure out how to inspect the first wave of projects falling under the new regulations.

MASSACHUSETTS

On the other side of the country, Massachusetts has taken a more incremental approach. Instead of trying to create a mandatory, comprehensive green code all at once for the entire state, it is focusing on energy for now, and giving individual municipal jurisdictions the choice of adopting requirements that are more stringent than those mandated statewide.

This optional code—formally titled 780 CMR Appendix 120.AA, but better known as the Massachusetts Stretch Energy Code because it stretches beyond current requirements—was adopted in 2009 by the Massachusetts Board of Building Regulations and Standards, making Massachusetts the first state in the nation to adopt an above-code appendix to its "base" building energy code.

In 2008, officials in Massachusetts Governor Deval Patrick's Executive Office of Energy and Environmental Affairs asked Lexington, Massachusetts-based Northeast Energy Efficiency Partnerships (NEEP) to work with them—along with utility companies and other stakeholders—to develop this appendix.

According to Carolyn Sarno, senior program manager at NEEP, the stretch code emphasizes performance over prescriptive requirements, and is designed to deliver "cost-effective construction that is at least 20

percent more energy-efficient" than can be expected from the baseline Massachusetts Building Energy Code.

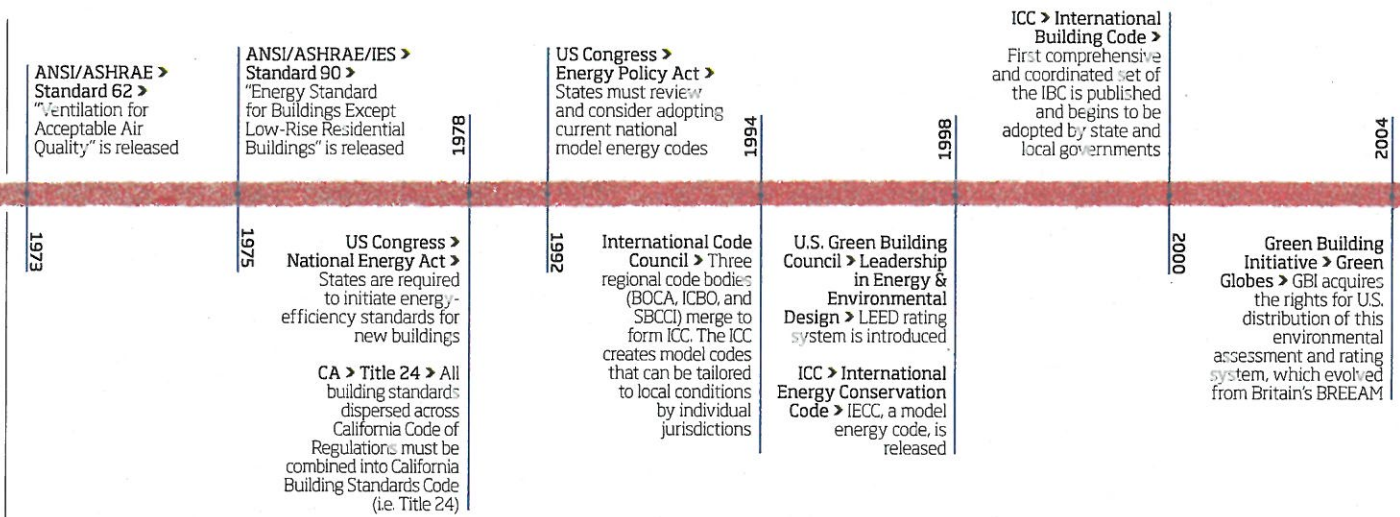
A strong motivation for creating this optional code came from the local jurisdictions themselves, many of which expressed interest in an energy code more stringent than that of the state. Sarno explains that, rather than allowing cities and towns to write their own disparate regulations, Massachusetts sought "one equally vetted code that communities could adopt."

More than 70 communities have adopted the stretch code to date, making the appendix mandatory within those jurisdictions for all residential new construction, renovations, and additions, and for all commercial new construction and additions. Historic buildings and houses in historic districts are exempt from the stretch code.

Although adopting the above-code appendix is optional, doing so is one of five conditions a municipality must meet before it can be designated a Green Community, at which point it becomes eligible for state grants to fund energy-efficiency and other clean-energy projects.

NEW YORK CITY

Yet another approach has been taken by New York City. In 2008 Mayor Michael R. Bloomberg and City Council Speaker Christine C. Quinn requested that the New York chapter of USGBC, Urban Green Council, establish a task force to review the existing building code and recommend to the city changes that would advance



sustainable construction practices.

The subsequent effort was notably different from that of California, explains Russell Unger, executive director of Urban Green Council: Because the recommendations were coming from a task force to a legislative body and mayoralty, rather than from the agency that implements the regulations, "We could not set the bar as high."

Furthermore, the task force was charged with proposing green modifications to existing regulations and policies, rather than with creating a separate chapter or stand-alone code that dealt exclusively with sustainable issues.

And, finally, the New York task force looked not only at building codes but other types of city ordinances, such as health codes and consumer affairs regulations, to coordinate all policies affecting the built environment. For example, while recommending certain water-efficient fixtures be required in the code's plumbing section, the task force also suggested that the city's consumer affairs department prohibit the selling of other, water-inefficient fixtures. Making the noncompliant fixtures less readily available "helps with enforcement," says Unger.

The New York task force looked for changes that would not be too difficult or costly for the design and construction community but, when done citywide, would have a measurable improvement to the

environment. Unger says about 17 percent of the proposals address peculiarities, or "impediments," in the existing city code that unnecessarily interfere with desirable green-building strategies.

Nineteen of the 111 recommendations have been enacted by the New York City Council to date. According to Unger, one no-cost enactment was particularly "monumental" because it actually expanded the stated role of the building code. Traditionally, the code has three purposes—protecting people's health, safety, and welfare. Now, in New York City, it also has a fourth—protecting the environment.

ASHRAE STANDARD 189.1

While some individual cities and states have been trying to address green code issues on their own, several organizations have been tackling the problem nationally. The first edition of the "Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings," or ASHRAE Standard 189.1, was published in 2009. Developed collaboratively by ASHRAE, USGBC, and the Illuminating Engineering Society (IES), it is the first nationwide minimum green standard for commercial buildings. It applies to new construction, additions, and renovations.

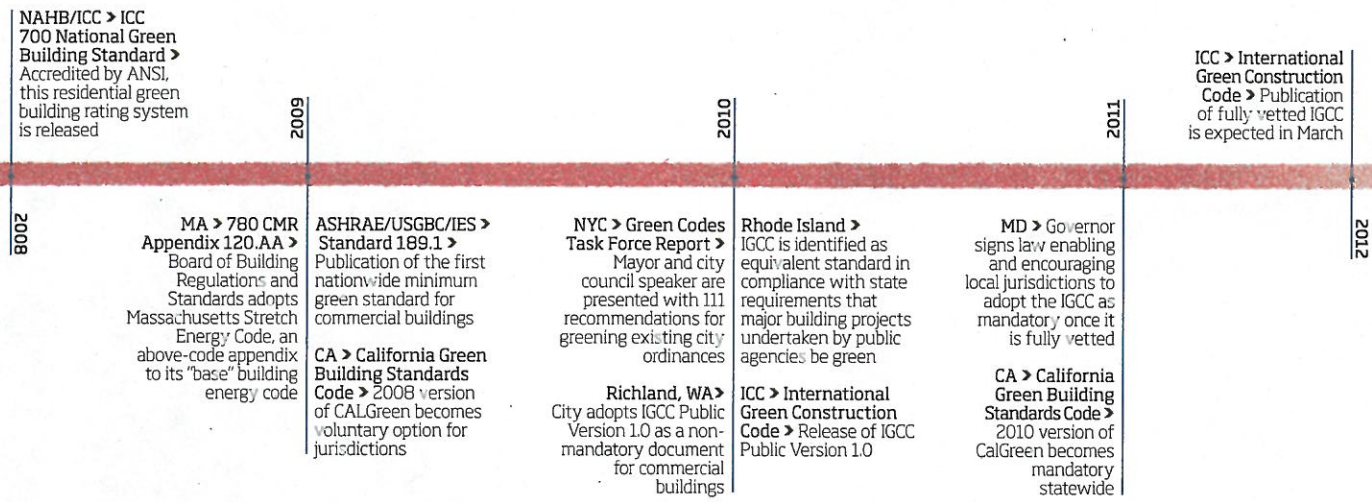
Although called a "standard," many view Standard 189.1 as a template that jurisdictions can use to write their own code

because ASHRAE standards are written with minimum requirements and normative language and go through a thorough, multi-stage process of development and review.

After the initial introductory and administrative sections, the document is organized by chapters according to sustainable criteria similar to that used by LEED and other rating systems: site sustainability, water-use efficiency, energy efficiency, indoor environmental quality, and the building's impact on the atmosphere, materials, and resources. In addition, the standard includes a section that spells out requirements for commissioning, energy-use reporting, and other construction and operation protocols. To comply with Standard 189.1, a project must meet all mandatory provisions and either the prescriptive or performance options listed under each section.

INTERNATIONAL GREEN CONSTRUCTION CODE

In the same year that ASHRAE Standard 189.1 was published, International Code Council (ICC) began developing the International Green Construction Code (IGCC) to create a comprehensive national model building code that would address green building design and performance for the construction, alteration, or addition to commercial and high-rise residential buildings, which would be consistent with



ICC's family of building codes and standards, known collectively as the I-Codes. The American Institute of Architects (AIA) and ASTM International, in addition to the organizations behind Standard 189.1—USGBC, IES, and ASHRAE—are cooperating sponsors of this model code.

According to Mark Wills, AIA's manager of codes advocacy, CALGreen served as the base document for the initial draft of IGCC. As it currently stands, IGCC consists primarily of a baseline of mandatory requirements across all the usual sustainable categories—from site development and land use to building operation, maintenance, and owner education. In addition, however, the model code offers a table of jurisdictional requirements, which are other measures that individual jurisdictions can choose to enforce as they pertain to their specific regions. Furthermore, the code asks individual jurisdictions to identify a number (from one to 14) of project electives that must be complied with on each building. Electives can vary from project to project, as they are selected by the owner and design team from a second table containing a list of over 50 electives.

Standard 189.1 is offered as a "Jurisdictional Compliance Option" within IGCC. "They are two different approaches to get to the same goal: a far-improved and greener baseline for commercial buildings," says Sigmon, who

indicates that the ASHRAE standard has more thoroughly defined methods that typically appeal to engineers, while IGCC provides a "plain English" approach that speaks the language of policy makers and code officials.

IGCC's Public Version 1.0 was released in March 2010 and Public Version 2.0 in November 2010. While the code is still in development (final publication of the fully vetted code is not expected until March 2012), several jurisdictions have already adopted a reference to one of these public versions in part, as an "optional code," or as an alternative compliance path for certain buildings.

In a recent post to his USGBC blog, however, Sigmon applauds the approach of one state in particular in supporting the still-evolving IGCC: Through House Bill 972, which was signed into law by Governor Martin O'Malley on May 10, 2011, Maryland enabled and encouraged the state's Department of Housing and Community Development and all local jurisdictions to "consider mandatory adoption of the fully vetted 2012 version of the IGCC."

STAY TUNED

Clearly, the consensus within the green building community is that the time has come for building codes to establish a minimum regulatory floor for all aspects of sustainability. "We are beyond just doing lots of pilot programs. Everyone should buy VOC-free carpet and Energy Star appliances

at this point," says Unger. "LEED is about encouraging the leading edge, which will continue to move forward as innovative practices become standard. Meanwhile, codification of standard practices will bring up the laggards."

But how sustainable practices are codified is still a matter of debate and experimentation. Some are concerned that the mixing of base and optional levels blurs the distinction between mandatory codes and voluntary ratings. Others weigh the pros and cons of inserting all green criteria within a single, identifiable volume of the code, as was done in California, versus embedding it in the pertinent locations across the entire document, as New York City is attempting. Yet others are wondering how enforcement will be carried out, in part due to budget crises facing states like California and in part due to the fact that building inspectors have traditionally been trained to examine structural and fire-safety issues, not environmental criteria.

Yet despite these and other questions, many are optimistic. "This is a wonderful time of fervent creativity," says Unger. He, like most everyone else in the sustainability movement, is keeping an eager eye on the various green-code efforts to see which strategies hold the most promise. **GS**

Nancy B. Solomon, AIA, editor of *Architecture: Celebrating the Past, Designing the Future*, writes frequently about architecture, planning, and sustainable design.



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