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**GREEN BUILDING:  
PRINCIPLES AND PRACTICE**

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**CONSERVATION CLINIC  
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**INTRODUCTION**

Over the past several months, energy and resource conservation has taken center stage in the national media. With oil and gas prices spiking to levels unseen in years, and California residents experiencing rolling blackouts, Americans have once again begun to focus on the topics of energy conservation and resource efficiency.

While most of the talk of late has centered on changes that need to occur in the automobile industry, the building industry has been quietly addressing issues of sustainability for over a decade. Green building, the concept of constructing resource efficient buildings, which started out as a fringe movement, has taken the building industry by storm.<sup>1</sup> In its most general form, green building can be defined as the resource efficient design, construction, and operation of buildings by employing environmentally sensible construction practices, systems, and materials.<sup>2</sup> If followed properly, green building techniques can provide a building owner with significantly lower operating and maintenance costs, increased comfort and environmental quality, and a higher resale value.<sup>3</sup>

Over the past decade, local municipalities and home builder associations (HBA) have been using green building programs to help promote the principles of sustainability and resource efficiency. In the next few years, the number of green building programs in existence is likely to increase substantially, as members of the building profession and government officials begin to realize the increased benefits that green building can offer.

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<sup>1</sup> *Green Building Trends: Mainstream Builders See Value of Green Building*, TOOLBASE NEWS, Spring 2000, Volume 5 Issue 2 (visited July 7, 2001) <[http://www.nahbrc.org/toolbase/rrr/newsltr/v5i2\\_01.htm](http://www.nahbrc.org/toolbase/rrr/newsltr/v5i2_01.htm)>.

<sup>2</sup> See NAHB RESEARCH CENTER, A GUIDE TO DEVELOPING GREEN BUILDER PROGRAMS 1 (1999).

<sup>3</sup> See *Id.*

## PRINCIPLES OF GREEN BUILDING

The principles of green building are simple: reduce energy consumption, draw on renewable resources where practical, conserve water, promote the best use of building materials, encourage waste management, protect the building site, and focus on health and environmental quality.<sup>4</sup> All green building programs currently in existence focus on these principles to some degree. Thus, before discussing the current and future status of green building, it is important to understand in greater detail these fundamental principles of green building.

### 1. Reducing Energy Consumption

Green building focuses heavily on reducing energy consumption.<sup>5</sup> In some cases, current technologies and practices exist that can easily and affordably reduce energy consumption in buildings by as much as 70%.<sup>6</sup> This reduction in energy consumption clearly translates into real savings for homeowners as far as operating expenses are concerned.<sup>7</sup> It also means that when homeowners attempt to sell their homes, they will likely obtain a higher resale value due to lower documented utility bills.<sup>8</sup> A few of the techniques used in green buildings to help reduce energy consumption are passive solar design, light-colored roofing material, energy efficient appliances, low emissivity windows, improved insulation, efficient lighting, and energy efficient air conditioning and heating systems.<sup>9</sup>

### 2. Drawing on Renewable Resources Where Practical

It is important to understand that green building does not mean resource efficiency at any cost. In fact, it is just the opposite. Green building advocates often take a very common-sense approach to renewable resources, advocating their use only when it is economically feasible to do so.<sup>10</sup> Depending on factors such as tree coverage around the building, it may not be possible to utilize renewable resources, such as the sun, to help provide energy for a building. Where it is possible, the use of photovoltaic panels to provide energy to a home, solar thermal water heaters to heat a home's water, and passive solar design to utilize the sun's positive effects in the winter are all encouraged.<sup>11</sup>

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<sup>4</sup> See generally U.S. Department of Energy, *Green Buildings Introduction* (visited July 7, 2001) <<http://www.sustainable.doe.gov/buildings/gbintro.shtml>> (introducing and discussing some of the principles of green building).

<sup>5</sup> See BION HOWARD, *GREEN BUILDING: A PRIMER FOR BUILDERS, CONSUMERS, AND REALTORS* 4-5 (5<sup>th</sup> Edition 2000) (visited July 7, 2001) <<http://www.energybuilder.com/greenbld.htm#energy-effic>>.

<sup>6</sup> See ED COHEN-ROSENTHAL ET AL., *BUILD IT RIGHT: CLEANER ENERGY FOR BETTER BUILDINGS* 3 (citing studies conducted over the past few years on opportunities for energy savings in new and existing buildings).

<sup>7</sup> See HOWARD, *supra* note 5, at 5.

<sup>8</sup> See NAHB RESEARCH CENTER, *supra* note 2, at 1.

<sup>9</sup> See *Id.* at 24-63 (for a general discussion on energy efficient issues and techniques used in green building).

<sup>10</sup> See HOWARD, *supra* note 5, at 7.

<sup>11</sup> See generally PUBLIC TECHNOLOGY, INC. & U.S. GREEN BUILDING COUNCIL, *SUSTAINABLE BUILDING TECHNICAL MANUAL* 110-122 (1996) (for a discussion on renewable energy and cost-effective techniques used in green building).

Additional technologies that draw on renewable resources, such as ground source heat pumps, are also encouraged through green building.<sup>12</sup>

### 3. Conserving Water

Another major principle of green building is water conservation. Depending on what area of the country one lives, this may be an important topic of concern. In Florida, many parts of the state are approaching critical levels of water usage and are already facing some very tough decisions about future water allocation. To combat such problems, green building promotes water conservation by employing techniques such as the installation of low-flow fixtures and toilets.<sup>13</sup> It also advocates the use of greywater systems and rainwater harvesting systems where possible.<sup>14</sup> Finally, it addresses the problem of outdoor irrigation by encouraging the use of native plant species, xeriscaping, and “smart” irrigation systems.<sup>15</sup>

### 4. Promoting the Best Use of Building Materials

Green building encourages builders to use the best materials available for the job. This often involves the use of recycled content material such as recycled content carpet, padding, insulation, and roofing material.<sup>16</sup> It also involves the use of engineered lumber products, such as laminated wood, and the use of regionally produced products, such as lumber and concrete.<sup>17</sup>

### 5. Encouraging Waste Management

The amount of waste produced by the construction industry constitutes a major source of all landfill materials. A 1998 report on construction and demolition (C&D) waste produced for the Environmental Protection Agency reported that such waste totaled over 136 million tons per year.<sup>18</sup> Green building encourages waste management on the job site by encouraging job-site recycling plans and the reuse, donation, and selling of excess materials.<sup>19</sup> Green building also emphasizes waste management by the eventual homeowner. Builders are encouraged to install outdoor composting stations and built-in kitchen recycling centers.<sup>20</sup>

### 6. Protecting the Building Site

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<sup>12</sup> *See id.*

<sup>13</sup> *See generally* NAHB RESEARCH CENTER, *supra* note 2, at 89-92 (for a discussion of indoor water conservation issues and techniques used in green building).

<sup>14</sup> *See id.* at 93-98 (for a discussion of outdoor water conservation issues and techniques used in green building).

<sup>15</sup> *See id.*

<sup>16</sup> *See id.* at 65-72 (for a discussion of resource efficient materials used in green building).

<sup>17</sup> *See id.*

<sup>18</sup> *See* FRANKLIN ASSOCIATES, CHARACTERIZATION OF BUILDING-RELATED CONSTRUCTION AND DEMOLITION DEBRIS IN THE UNITED STATES ES-2 (1998).

<sup>19</sup> *See generally* NAHB RESEARCH CENTER, *supra* note 2, at 83-85 (for a discussion of waste management issue and techniques used in green building).

<sup>20</sup> *See id.* at 102.

Part of resource efficiency is conserving the outdoor environment. Green building encourages the use of erosion control site plans and promotes the protection of existing trees.<sup>21</sup> For any given site, green building also encourages the saving and reusing of topsoil, the maximization of the overall amount of pervious surface, and the replanting or donating of removed vegetation.<sup>22</sup>

### 7. Focusing on Health and Environmental Quality

A healthy indoor environment is just as important as a healthy outdoor environment. Green building principles seek to not only increase the comfort level in the home, but also to help contribute to a healthy overall environment through the selection and use of environmentally sensible materials, such as low VOC paints and solvent free, low toxic finishes.<sup>23</sup> Other techniques are also encouraged, including moisture control measures, radon mitigation, the installation of exhaust fans in garages, and central vacuum systems that vent to the exterior.<sup>24</sup>

### CURRENT COMPOSITION OF LOCAL GREEN BUILDING PROGRAMS

With an understanding of the fundamental principles of green building, it is possible to distinguish the characteristics of one green building program from another. Even so, it is difficult to refer to any one green building program as “typical”. Essentially all of the programs provide substantial benefits to their communities, but each is organized in a slightly different manner.

There are several reasons for the differences that exist between current green building programs, ranging from unlike climates to differences in community opinion. Despite these differences, there are several organizations, such as the U.S. Green Building Council (USGBC) and the National Association of Home Builders (NAHB), that are attempting to create consistency and uniformity within the green building movement.

As mentioned, though, there is substantial variation in the structure of existing green building programs. Thus, in order to understand why existing green building programs differ slightly from one another, it is important to first understand what makes up a “typical” green building program.

#### A “Typical” Green Building Program

All of the green building programs in existence follow a similar basic structure when it comes to the process of satisfying program requirements. First, they all have a number of green building standards or requirements organized into various content areas.<sup>25</sup> Second, green building programs all require a builder to satisfy a certain number

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<sup>21</sup> See generally PUBLIC TECHNOLOGY, INC. & U.S. GREEN BUILDING COUNCIL, *supra* note 11, at 44-52 (for a discussion of site planning and outdoor environmental issues and techniques used in green building).

<sup>22</sup> See *id.*

<sup>23</sup> See generally HOWARD, *supra* note 5, at 6-7 (for a discussion of indoor air quality issues and techniques used in green building).

<sup>24</sup> See generally NAHB RESEARCH CENTER, *supra* note 2, at 73-82 (for a discussion of indoor air quality issue and techniques used in green building).

<sup>25</sup> See, e.g., City of Boulder, Colorado, *Green Points for New Homes and Large Additions* (visited July 7, 2001) <[http://www.ci.boulder.co.us/environmentalaffairs/green\\_points/gp\\_nh\\_options.htm](http://www.ci.boulder.co.us/environmentalaffairs/green_points/gp_nh_options.htm)>, (detailing

of standards, or, if a program assigns various point-values to its standards, require a builder to attain a certain number of points.<sup>26</sup> Finally, they all contain a process of certification to ensure that their green building standards have been properly met.<sup>27</sup>

It is unfortunate, from a standpoint of uniformity, that once one looks past these basic common elements of existing green building programs, the similarities end and the differences begin. However, such variations should not be regarded as a problem since the unique nature of each green building program is merely a natural reflection of the differences from one municipality to the next. This means, quite simply, that green building programs should be tailored to the communities for which they are intended to benefit. To do so, it is necessary to analyze existing green building programs in order to draw on the positive variations between them.

### Variations on Green Building Programs

Green building programs come in all shapes and sizes. Each green building program is unique in some way from the next one, just as the composition and priorities of each municipality are unique from one another. A brief summary of the major substantive differences among the programs is as follows:

#### 1. Program Administrators and Partners

The first green building program in the nation, located in Austin, Texas, was a municipally run program that partnered with the local publicly owned utility company.<sup>28</sup> Since then, roughly half of the two dozen programs have been set up by the municipal government while the remainder are run by local area home builder associations (HBA's).<sup>29</sup> In theory, just about any organization, from a local environmental group to a local university, could set up and administer a green building program. Additionally, there is a number of different organizations, such as a local utility company, that could be included as program partners for the administration of a green building program.<sup>30</sup>

#### 2. Voluntary v. Mandatory Participation

The majority of green building programs in existence are voluntary, market-driven programs designed to encourage builder and homeowner participation.<sup>31</sup> There is a number of local governments, however, that have opted to make green building mandatory. Boulder, Colorado, and Frisco, Texas, are two examples of municipalities

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Boulder, Colorado's Green Point Program content areas and standards, number of points required to satisfy the program, and method of certification).

<sup>26</sup> See *id.*

<sup>27</sup> See *id.*

<sup>28</sup> See City of Austin, Texas, *In the Beginning...* (visited July 7, 2001)

<<http://www.ci.austin.tx.us/greenbuilder/history1.htm>> (detailing the history of Austin's green building program).

<sup>29</sup> See generally U.S. Department of Energy, *Community Green Building Programs* (visited July 7, 2001)

<<http://www.sustainable.doe.gov/buildings/gbprogrm.shtml>> (summarizing several local green builder programs around the country).

<sup>30</sup> See NAHB RESEARCH CENTER, *supra* note 2, at 7-8 (for a discussion and list of possible program partners).

<sup>31</sup> See generally U.S. Department of Energy, *supra* note 29.

that require new residential construction to satisfy specific requirements of their municipality's green building program before a building permit can be issued.<sup>32</sup>

This seems to be the trend as technologies related to green building become more readily available. However, since some aspects of green building provide direct economic benefits to the consumer, such as those related to energy conservation, there is arguably no need to force a building community to follow green building practices, absent lacking marketing and consumer education. Moreover, since such economically beneficial aspects to green building exist, it is possible for some requirements of a program to be mandatory while others remain voluntary in nature.

### 3. Program Coverage

A green building program could conceivably cover a wide range of construction activities, from new residential construction and remodeling to commercial and high-rise offices. Most of the programs in existence at this time, however, limit themselves to only new residential construction and residential remodeling.<sup>33</sup> A majority of programs, determining that it is too difficult to certify remodeling projects, have chosen to cover only new residential construction.<sup>34</sup> The most likely reason for limiting program coverage to residential construction has to do with the complexity of commercial, industrial, and office development.<sup>35</sup> However, in the future, as the techniques of green building become more widely adopted and municipalities become more experienced in green building initiatives, it is very likely that green building programs will evolve to address these other types of construction, as well as a wide range of planning issues, including design and land development.<sup>36</sup>

### 4. Content Areas and Standards

As mentioned above, the existence of content areas and clearly defined standards is the backbone of any green building program. Variations on the content area topics and the number and type of standards, as well as the total number of standards or points that must be met in order to satisfy the requirements of a program, varies from program to program.<sup>37</sup>

For example, Austin has five content areas with approximately 170 different standards divided among these content areas.<sup>38</sup> Of those 170 different standards,

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<sup>32</sup> See, e.g., City of Boulder, Colorado, *supra* note 25.

<sup>33</sup> But see City of Austin, Texas, *Commercial Green Building Program* (visited July 7, 2001) <[http://www.ci.austin.tx.us/greenbuilder/comm\\_overview.htm](http://www.ci.austin.tx.us/greenbuilder/comm_overview.htm)> (for an example of a municipality that has a commercial green building program).

<sup>34</sup> See NAHB RESEARCH CENTER, *supra* note 2, at 8.

<sup>35</sup> See COHEN-ROSENTHAL, *supra* note 6, at 6 (for a comparison of the building process between commercial and residential buildings).

<sup>36</sup> See, e.g., City of Austin, Texas, *Smart Growth Initiatives: Planning, Environmental & Conservation Services* (visited July 7, 2001) <<http://www.ci.austin.tx.us/smartgrowth/default.htm>> (for an overview of Austin's Smart Growth Initiative).

<sup>37</sup> Compare NAHB RESEARCH CENTER, *supra* note 2, at Appendix C 5-9, with Florida Green Building Coalition, *Florida Green Home Designation Standard of the Florida Green Building Coalition* (visited July 7, 2001) <[http://floridagreenbuilding.org/draftStd\\_03a.pdf](http://floridagreenbuilding.org/draftStd_03a.pdf)>.

<sup>38</sup> See NAHB RESEARCH CENTER, *supra* note 2, at Appendix C 5-9.

approximately 18 are “minimum program requirements” that must be met.<sup>39</sup> The builder must then satisfy a predetermined number of the remaining standards, thus giving the builder some flexibility in determining exactly how to build a “green building.” The Florida Green Building Coalition’s standards, on the other hand, have eight content areas and approximately 210 standards, each with a point value assigned to it.<sup>40</sup> There are no “required standards” that builders must meet to qualify for the program, but there are minimum point totals in each content area that must be attained in order to achieve green status.<sup>41</sup> This technique helps to ensure that all areas of green building are addressed in the construction process.

##### 5. Certification Process

As mentioned, all of the green building programs have some type of certification process to ensure that program requirements have been met. Early green building programs relied on self-certification by the builders to determine if the program requirements had been met.<sup>42</sup> Although many of the programs in existence continue to allow this, most of the new green building programs, and many of the older ones, have begun requiring certification by either the program administrator or a third-party.<sup>43</sup> As green building has become more mainstream, it has become easier for program administrators and third parties to learn the techniques and requirements of green building and thus accomplish the certification process without having to rely on self-certification by builders. This administrator or third-party certification lends much more credibility to a green building program than does self-certification by builders.

#### **LOCAL GREEN BUILDING PROGRAMS AROUND THE COUNTRY**

One of the main reasons for the differences among the green building programs in existence is the rapidly developing nature of green building itself.<sup>44</sup> It is still a field that is very much in its infancy, and new technology and techniques are constantly emerging which improve the quality and efficiency of buildings.<sup>45</sup> No one can say for sure which of the existing green building programs is actually the “best” one. One day that question may be answered, but it will not be until the quality and efficiency of the buildings is able to be objectively determined over a substantial period of time. Just because a green building program certifies twice as many houses as another program does not mean that it

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<sup>39</sup> See *id.* at C-5.

<sup>40</sup> See Florida Green Building Coalition, *Florida Green Home Designation Standard of the Florida Green Building Coalition* (visited July 7, 2001) <[http://floridagreenbuilding.org/draftStd\\_03a.pdf](http://floridagreenbuilding.org/draftStd_03a.pdf)>.

<sup>41</sup> See *id.*

<sup>42</sup> See NAHB RESEARCH CENTER, *supra* note 2, at 10-12.

<sup>43</sup> See, e.g., EarthCraft House, *What is the EarthCraft House program?* (visited July 7, 2001) <[http://www.southface.org/home/ech/whatis\\_ech.htm](http://www.southface.org/home/ech/whatis_ech.htm)> (requiring certification by the program administrator). See also, e.g., Florida Green Building Coalition, *supra* note 40 (requiring certification by a third party).

<sup>44</sup> See Dr. Malcolm Lewis, *Green Buildings – The Growing Emphasis on Building Performance and Occupant Health* (visited July 7, 2001) <<http://www.ctg-net.com/Publications/green-buildings-article-OCAIA.htm>> (for a discussion of the rapid growth of the green building movement).

<sup>45</sup> See *id.*

is more successful. It could simply be that the requirements of such a program are much easier to achieve when compared to another program in which compliance is illusory. On the other hand, programs that are voluntary but are too difficult to comply with may never get used. Such programs are no better than ones in which the standards are too easily met.

The challenge thus far, then, has been to design a program that will be most effective and make a lasting impact on the community and on the local building industry. If the program is voluntary, it must be designed to encourage participation from builders and homeowners, yet not be so demanding that compliance is not economically feasible. On the other hand, if a program is mandatory, it must be careful not to discourage growth in the community or raise the price of a new home past acceptable levels. A brief view of some existing programs best illustrates the balance necessary to operate a successful green building program.

### The Voluntary Models

The first and most well known green building program in existence also happens to be one that continues to evolve and address a wide range of sustainability issues. Austin, Texas, is home to a voluntary, municipally run green building program that focuses heavily on new residential construction. Austin certifies homes on a scale of one to four stars, depending on how “green” a new home is. Austin has five content areas: Energy, Materials, Water, Health and Safety, and Community. They have approximately 170 different standards arranged by content area and about 18 “minimum program requirements.”<sup>46</sup>

Austin spends approximately \$150,000 per year on marketing for the program.<sup>47</sup> It uses that money to educate consumers about the benefits of building green, to provide marketing for participating builders, and to offer training and technical support to the builders.<sup>48</sup> In 2000, Austin certified approximately 600 homes under its green building program.<sup>49</sup>

Another voluntary program that may serve as a model for future green building programs is the Atlanta HBA’s EarthCraft House Program. The program is unique because it was the first green building program designed using the National Association of Home Builder’s “Guide to Developing Green Builder Programs,” a 120-page manual designed for use by local HBA chapters and municipalities. The manual, which came out in the spring of 1999, is a step-by-step guide to developing a green building program. It was first used by the Atlanta HBA as a guide for developing its green building program.

The EarthCraft Program is a voluntary, HBA-run program that provides builders in the greater Atlanta area with training, technical assistance, marketing materials, and direct referrals.<sup>50</sup> The program has 12 content areas with 235 different standards of

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<sup>46</sup> See NAHB RESEARCH CENTER, *supra* note 2, at Appendix C 5-9.

<sup>47</sup> Interview with Richard Morgan, Program Director of the Austin Green Builder Program (May 1, 2001).

<sup>48</sup> *See id.*

<sup>49</sup> *See id.*

<sup>50</sup> *See EarthCraft House, supra* note 43.

varying points.<sup>51</sup> To qualify for the program, a builder must be a member of the Atlanta HBA, join the EarthCraft House program, and complete a short training program.<sup>52</sup> Each house must get a minimum of 150 points by satisfying the number of standards that equal that point level.<sup>53</sup> The EarthCraft Program, and in particular the NAHB's guide, will most likely help other local HBAs and municipalities with the often complex and time consuming task of establishing green building programs.

#### The Mandatory Models

The Boulder, Colorado, green building program is perhaps the best-known mandatory green building program in the country. Started in the mid-nineties, the program is municipally run and regulates all new residential construction and remodeling over 500 square feet.<sup>54</sup> Builders must submit a Green Points Application when applying for their building permit. The application must show that the builder has complied with the requirements of the green building program. The program has eight content areas: Land Use, Framing, Plumbing, Electrical, Insulation, HVAC, Solar and Indoor Air Quality.<sup>55</sup> New homes under 2,500 square feet must earn a minimum of 25 points by satisfying any of the 59 different standards organized under the eight content areas.<sup>56</sup> The standards all have different points assigned to them based on the importance of the particular standard to the municipality. The number of points a builder must earn goes up incrementally by a fixed percentage for homes greater than 2,500 square feet.<sup>57</sup>

The latest mandatory program to emerge is the Green Building Program of Frisco, Texas. The program is a mandatory, municipally run program adopted in May of 2001. By enacting this program, Frisco became the first municipality in the country to adopt the EPA's Energy Star program requirements as minimum building standards for new homes.<sup>58</sup> By adopting the Energy Star program as mandatory, Frisco is ensuring that new homes in its area will be at least 30% more energy efficient than the 1993 Model Energy Code.<sup>59</sup> The Frisco program also addresses areas of waste management, water conservation, and indoor air quality in its green building program.<sup>60</sup>

The Frisco program is quite possibly the latest trend in green building ordinances and programs. By combining nationally recognized and standardized programs to satisfy the energy requirement of its green building program, Frisco has taken a huge step toward declaring to the rest of the country the permanent arrival of green building principles and techniques in residential building.

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<sup>51</sup> See EarthCraft House, *Final Worksheet* (visited July 7, 2001) <[http://www.southface.org/home/ech/ech%20worksheet\\_11\\_00.pdf](http://www.southface.org/home/ech/ech%20worksheet_11_00.pdf)>.

<sup>52</sup> See EarthCraft House, *supra* note 43.

<sup>53</sup> See EarthCraft House, *supra* note 51, at 1.

<sup>54</sup> See City of Boulder, Colorado, *supra* note 25.

<sup>55</sup> See *id.*

<sup>56</sup> See *id.*

<sup>57</sup> See *id.*

<sup>58</sup> See Frisco, Tex., Ordinance NO. 01-05-39 (May 1, 2001).

<sup>59</sup> See U.S. Environmental Protection Agency, *What are Energy Star Labeled Homes?* (visited July 7, 2001) <<http://yosemite1.epa.gov/estar/homes.nsf/content/WhatAreESLHs.htm>>.

<sup>60</sup> See City of Frisco, Texas, *supra* note 58.

## NATIONAL AND REGIONAL EFFORTS TO SUPPORT GREEN BUILDING

There have been several major efforts by organizations over the past decade to promote sustainability and energy conservation and to establish green building codes and standards. The U.S. Congress, the U.S. Green Building Council, the U.S. Department of Energy, Fannie Mae, the National Association of Home Builders, the Florida Green Building Coalition, and the State of Florida are just a few of the major organizations that have thrown their support behind the green building movement.

### The Smith-Feinstein Bill

In January of 2001, Senator Bob Smith introduced S. 207, a bipartisan-supported bill that would offer incentives to help introduce new technologies to reduce energy consumption in buildings.<sup>61</sup> Among other things, the bill would offer tax credits of \$750 to \$2,000 for the construction of new homes that are 30% to 50% more energy efficient than the minimum requirements of the 2000 International Energy Conservation Code.<sup>62</sup> The bill would also offer homeowners up to \$1000 for installing solar hot water systems and up to \$6,000 for installing photovoltaic systems.<sup>63</sup> A companion bill has been introduced in the House, and both bills are currently in committee at the time of this report.

### Leadership in Energy and Environmental Design (LEED)

The U.S. Green Building Council was formed in 1993 to promote buildings that are “environmentally responsible, profitable, and healthy places to live and work.”<sup>64</sup> The Council is composed of over 800 leading international organizations, working together to promote green buildings. It has recently finished its second version of LEED, a voluntary, market-driven rating system used to rate the environmental performance of commercial, institutional, and high-rise residential buildings.

The LEED Green Building Rating System has become the standard for rating commercial buildings, and the Council is currently working on a set of standards for rating single-family residential homes.<sup>65</sup> If the Council is successful, the residential LEED standards could once again transform the face of local green building programs and bring some uniformity to the green building movement.

### Energy Star Program

The U.S. Department of Energy (DOE) established Home Energy Rating Systems (HERS) programs in 1992. HERS programs rate the energy efficiency of new and existing homes (an important component of green building programs) and make

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<sup>61</sup> See S. 207, 107<sup>th</sup> Cong. (2001).

<sup>62</sup> See Florida Green Building Coalition, *Breaking News ...Cunningham-Markey Introduce House Companion to S. 207 into 107th Congress* (visited July 7, 2001) <<http://floridagreenbuilding.org/news.htm>> (for a summary of some of the major provisions of S. 207).

<sup>63</sup> See *id.*

<sup>64</sup> U.S. Green Building Council, *Mission Statement of USGBC* (visited July 7, 2001) <<http://www.usgbc.org/aboutus/index.htm>>.

<sup>65</sup> See *id.* (for a description of the goals of the USGBC with regard to the development of the LEED Residential Standards).

recommendations for energy improvements.<sup>66</sup> The HERS programs started out in 17 states in 1993, and are now in all 50 states. These programs rate homes on a scale of 0-100, with a score of 86 qualifying a house as an Energy Star Home.<sup>67</sup>

#### Energy Efficient Mortgages (EEM)

Another popular tool for promoting green building has been the lending industry's use of EEMs. An EEM is essentially any mortgage for which the underwriting guidelines have been relaxed for certain energy-efficient features, or for which some type of financial incentive is offered for energy efficiency.<sup>68</sup> Over the past several years, EEMs have become increasingly popular tools to help borrowers to afford the increased cost of building an energy efficient home.<sup>69</sup> Among the most common incentives offered by lenders are providing cash back at closing, increasing a borrower's debt-to-income ratio by up to two percentage points (thus allowing the borrower to borrow more money), and reducing certain fees, such as the amount of money due at closing.<sup>70</sup>

Organizations such as Fannie Mae have been underwriting EEMs since 1992. However, before they will purchase an EEM from a primary lender, the lender must comply with all of Fannie Mae's loan requirements. One such requirement is that a borrower's home must be certified and evaluated by a certified energy-rating provider, such as the National HERS Council, and that the borrower's home must be 30% more energy efficient than the ratings contained in the 1992 Model Energy Code.<sup>71</sup> Thus, a HERS score of 86 out of 100, in addition to qualifying a home as an Energy Star Home, will also qualify a home for an EEM from lenders and will allow Fannie Mae to purchase that loan in the secondary market.

#### "A Guide To Developing Green Builder Programs"

The National Association of Home Builders (NAHB) has written a 120-page manual for local HBAs and municipalities to use in developing a green building program. The manual, "A Guide to Developing Green Builder Programs," has already been used by the Atlanta HBA to develop their EarthCraft House Program. The manual is a step-by-step guide for developing a green builder program. It is currently the closest thing to a standardized format for green building programs that exist nationally.<sup>72</sup> If the U.S. Green Building Council ever finishes its LEED Residential Program, it may challenge the NAHB's manual for dominance in this fast-growing new field.

#### The Florida Green Building Coalition (FGBC)

The FGBC is a non-profit corporation composed of academics and building professionals from around the State of Florida. Its mission is to "provide a statewide

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<sup>66</sup> See U.S. Department of Energy, *Green Buildings Energy Rating Systems* (visited July 7, 2001) <<http://www.sustainable.doe.gov/buildings/hers.shtml>>.

<sup>67</sup> See U.S. Environmental Protection Agency, *supra* note 59.

<sup>68</sup> See PATRICIA C. PLYMPTON, TECHNICAL REPORT: NATIONAL STATUS REPORT HOME ENERGY RATING SYSTEMS AND ENERGY-EFFICIENT MORTGAGES 1 (2000).

<sup>69</sup> See *generally id.* at 11-22 (for an account of the growing popularity of EEMs).

<sup>70</sup> See *id.* at 21-22.

<sup>71</sup> See *id.* at 19.

<sup>72</sup> See *generally* NAHB RESEARCH CENTER, *supra* note 2.

green building program with environmental and economic benefits.”<sup>73</sup> The organization is currently putting the finishing touches on the third draft of its green building standards, and hopes to start certifying homes in Florida by the end of the summer. Unlike the NAHB’s guide, the FGBC is only concerned with developing a uniform set of green building standards and a certification process. It still leaves local municipalities with the ability to structure their green building programs as they deem appropriate while simply incorporating the standards and certification process of the FGBC into their programs. The ultimate goal of the FGBC is to have all homes in Florida certified under the same set of standards, thus ensuring uniformity in green building throughout the state.

#### Florida Energy Efficient Code for Building Construction

Chapter 13 of the new Florida Building Code (set to go into effect on October 1, 2001) provides a statewide uniform standard for energy efficiency in the design and operation of all buildings in the State of Florida. The energy code was designed to exceed the 1995 Model Energy Code.<sup>74</sup> The energy code is uniform throughout the State and cannot be made more lenient or stringent by local government regulation.<sup>75</sup> This does not mean, however, that a voluntary green building program could not exist along with the code.<sup>76</sup>

#### **FUTURE DIRECTION OF GREEN BUILDING**

The future for green building in this country is very bright<sup>77</sup>. Despite the fact that green building programs are still relatively young and may undergo some additional changes before settling on the “right” type of model, it is clear that green building is the future of building, not only in America, but in the rest of the world as well.<sup>78</sup> Although it may have started out as a fringe movement, green building techniques are now becoming more mainstream every day. And as technology and marketing increase, it will only serve to make these techniques easier to accomplish and more affordable to incorporate into the buildings, structures, and homes of every local community.

Efforts to bring about national or regional standards by organizations such as the NAHB, the USGBC, and the FGBC will continue to push green building to the forefront of political debate in this country and will likely lead to the adoption of more stringent

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<sup>73</sup> Florida Green Building Coalition, *Welcome to the Florida Green Building Coalition (FGBC)* (visited July 7, 2001) <<http://floridagreenbuilding.org/>>.

<sup>74</sup> See U.S. Department of Energy, Office of Building Technology, State and Community Programs, *Florida—DOE Status of State Energy Codes* (visited July 7, 2001) <[http://www.eren.doe.gov/buildings/codes\\_standards/buildings/states/status\\_fl.html](http://www.eren.doe.gov/buildings/codes_standards/buildings/states/status_fl.html)> (summarizing some of the main provisions of the new Florida Energy Code).

<sup>75</sup> FL BUILDING CODE, CHAPTER 13 THE FLORIDA ENERGY EFFICIENCY CODE FOR BUILDING CONSTRUCTION, § 101.0 SCOPE (forthcoming 2001) (at 13.4, available on the Florida Department of Community Affairs Web site) (visited July 7, 2001) <<http://www.sbcci.org/Florida%20Building%20Code/btocib.htm>>.

<sup>76</sup> Interview with ....

<sup>77</sup> See generally Lewis, *supra* note 44.

<sup>78</sup> See *Green Building Trends: Mainstream Builders See Value of Green Building*, *supra* note 1 (quoting Charlie Ruma, immediate past president of the NAHB, declaring that “the future of home building is green building.”).

building codes in all U.S. states. Until the technology and techniques associated with building a green home become more affordable, incentives available from the use of EEMs and bills such as the Smith-Feinstein Bill will allow more Americans to offset the extra costs that come with constructing a green home. In addition, the inevitable decline in the cost of these green technologies that will come with economies of scale and further technological advancements will further bring green building into people's homes. It is a bright future with positive goals, all of which is colored green.