



THE APPRAISAL FOUNDATION

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APPRAISAL PRACTICES BOARD

TO: All Interested Parties

FROM: Rick O. Baumgardner, Chair  
Appraisal Practices Board

RE: **First Exposure Draft – *Valuation of Green Buildings: Background and Core Competency***

DATE: July 15, 2013

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The Appraisal Practices Board (APB) was officially formed by The Appraisal Foundation Board of Trustees on July 1, 2010. The APB has been charged with the responsibility of identifying and issuing voluntary guidance on recognized valuation methods and techniques, which may apply to all disciplines within the appraisal profession. The APB has prioritized topics to offer guidance in areas which appraisers and users of appraisal services feel are the most pressing.

The Board accomplishes its mission through the use of panels of Subject Matter Experts (SMEs), comprised of widely recognized individuals with expertise in the specific topic being considered, who research and identify all pertinent sources of existing information on the given topic. The APB then vets the issue through this public exposure process, with the goal of ultimately adopting guidance, which may include more than one recognized method or technique that addresses the specific topic.

From the APB's perspective, compliance with all guidance issued by the Board is voluntary. However, it is possible that state or federal government agencies, clients and/or user groups of appraisal services, professional appraisal societies, or others may opt on their own volition to mandate compliance with the guidance issued by the APB.

This is the First Exposure Draft representing guidance applicable to the *Valuation of Green Buildings: Background and Core Competency*. The Board is seeking public comment in response to this exposure draft and based on the comments received, may make revisions to the guidance and issue subsequent exposure drafts. Once the Board believes it has received all relevant comment on this topic, it may vote to adopt the material as official guidance from the APB.

The Board is also currently engaged in developing guidance on other topics. It is anticipated that exposure drafts will be forthcoming in the very near future that relate to these other topics. In

addition, subsequent exposure drafts may include multiple topics for consideration simultaneously.

**All interested parties are encouraged to comment in writing to the APB before the deadline of September 20, 2013.** Respondents should be assured that each member of the APB will thoroughly read and consider all comments.

Written comments on this exposure draft can be submitted by mail, email and facsimile.

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**IMPORTANT NOTE: All written comments will be posted for public viewing, exactly as submitted, on the website of The Appraisal Foundation. Names may be redacted upon request.**

**The Appraisal Foundation reserves the right not to post written comments that contain offensive or inappropriate statements.**

If you have any questions regarding the attached exposure draft, please contact Staci Steward, Practices Administrator at The Appraisal Foundation, via e-mail at [staci@appraisalfoundation.org](mailto:staci@appraisalfoundation.org) or by calling (202) 624-3052.

**First Exposure Draft**  
***Valuation of Green Buildings: Background and Core Competency***

**Issued: July 15, 2013**  
**Comment Deadline: September 20, 2013**

When commenting on various aspects of this exposure draft, it is very helpful to reference the line numbers, fully explain the reasons for concern or support, provide examples or illustrations, and suggest any alternatives or additional issues that the APB should consider.



## Appraisal Practices Board

### Voluntary Guidance on Recognized Valuation Methods and Techniques:

## *Valuation of Green Buildings: Background and Core Competency*

This communication is for the purpose of issuing guidance on recognized valuation methods and techniques. Compliance with such guidance is voluntary, unless mandated through applicable law, regulation, or policy.

**Date Issued:** To Be Determined

**Application:** Residential and Non-residential Real Property

**Issue:** As part of its ongoing responsibilities, the Appraisal Practices Board (APB) is tasked with identifying where appraisers and appraisal users believe additional guidance is required. Once such issue identified by the APB is *Valuation of Green Buildings – Background and Core Competency*. The APB established a Subject Matter Expert Panel on Green Building Background and Core Competency for appraisers to address the rapidly evolving influence of green and sustainable building practices in the property valuation profession.

The purpose of this document is to provide guidance to appraisers concerning the necessary background and core competency that is needed to value green, high-performance or sustainable commercial and residential buildings (henceforth referred to as green buildings) as well as existing building stock that is not green (henceforth referred to as brown buildings) yet may have green features or exist in a (local) market that values sustainability and/or green building. This Valuation Advisory is the first in a series of three to be issued by the APB on green buildings. The APB intends to issue additional advisories on the *Valuation of Green Buildings: Residential Properties* and the *Valuation of Green Buildings: Non-Residential Properties*.

In that context, this advisory is to provide guidance as to the background and core competency issues from which the next two advisories will build upon.

# *Valuation of Green Buildings: Background and Core Competency*

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## Executive Summary

1 As green building and sustainable building practices continue to re-shape the construction and  
2 operation of commercial and residential real estate, appraisers in all markets and of all skill and  
3 experience levels are increasingly likely to encounter valuation assignments dealing with these  
4 issues. The purpose of this Advisory is to provide the appraiser with pertinent background and  
5 core competency needed to more fully understand the skills and knowledge needed to adapt to  
6 changes in the marketplace, including the evolution of green and sustainable building practices in  
7 the commercial and residential property sector. The next set of Advisories will specifically  
8 address the *Valuation of Green Buildings-Residential* and *Valuation of Green Buildings-*  
9 *Commercial*.

10 Timely response by appraisers to changing market fundamentals is one of the most basic  
11 expectations of users of appraisal services. Appraiser competency in the valuation of green  
12 buildings is necessary to meet the expectations of the users of appraisal services and to ensure  
13 public trust. The Uniform Standards of Professional Appraisal Practice (USPAP) requires an  
14 appraiser to: (1) be competent to perform the assignment; (2) acquire the necessary competency  
15 to perform the assignment; or (3) decline or withdraw from the assignment.<sup>1</sup>

### 16 ***Green/Energy Efficiency Education***

- 17 • Because of the growth in the green building industry in many markets, appraisers are advised  
18 to familiarize themselves with at least the most common features in property types they  
19 appraise. In such cases, appraisers should expand their knowledge base and skill set to  
20 include familiarity with green building, sustainability, and energy efficiency. The specific  
21 educational path will vary depending on the appraiser's prior experience and expertise in this  
22 area, as well as the market expectations and client requirements.
- 23 • In order to keep up with this rapidly-changing field and changes in the market, appraisers  
24 should endeavor to incorporate green building and energy efficiency into their education  
25 regimen. Paths to competency include, but are not limited to, coursework and self-study, as  
26 well as attendance at professional seminars and presentations (live and online), offered both  
27 by appraisal organizations, as well as organizations like the U.S. Green Building Council  
28 (USGBC) and others that specialize in green building and energy efficiency.
- 29 • Suggested guidelines for competency thresholds can be found in Section Two of this  
30 document under the heading *Expectations for Appraisers/r Core Competency*.

### 31 ***Ensure Appropriate Scope of Work Parameters:***

- 32 • Under USPAP an appraiser must properly identify the assignment elements in order to  
33 determine an appropriate scope of work. This could include identifying relevant property  
34 characteristics such as the following features: energy efficiency, green, sustainable, high-  
35 performance, and on-site energy generation.

[End of **Executive Summary**]

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<sup>1</sup> Uniform Standards of Professional Appraisal Practice (USPAP) – 2012-2013 edition, (Washington, D.C.: The Appraisal Foundation, 2012), U-11.

## Section I: Background

36 Green building awareness, knowledge and expertise is quickly becoming an area where  
37 appraisers may need a higher level of sensitivity to their impact on the market. In some markets,  
38 what was once an esoteric niche is becoming engrained in mainstream building practices,  
39 building codes, and market behaviors. As market participants increasingly express green and  
40 sustainable practices and expectations in their buy/lease decisions, appraisers should consider the  
41 perspective of the relevant market participants, in markets where such change impacts value.  
42 This Valuation Advisory is intended to provide guidance to appraisers and users of valuation  
43 services seeking to determine the necessary knowledge and skills required to competently value  
44 green buildings and existing building stock affected by green building.

45 The growing market adoption of sustainability principles and the changing regulatory  
46 environment are creating a new normal against which buildings are to be judged in some  
47 markets. Building performance and obsolescence potential are emerging as concerns.  
48 Performance is now being measured across a variety of metrics that include resource use  
49 efficiency (energy and materials), water use, indoor environmental quality (air quality, daylight),  
50 worker productivity, and proximity to transit, community services and housing. Class A office  
51 in certain urban area may require LEED certification. New home buyers can choose among  
52 multiple homes with ENERGY STAR or various green labels in a growing number of areas  
53 across the U.S.

54 This evolution in some real estate markets may present new challenges that appraisers must  
55 research and analyze as part of their assignment, such as:

- 56 1. ***Market share of green buildings:*** Landlord response to tenant demand, in addition to  
57 code requirements, and how it impact new construction and major renovations to  
58 incorporate green features and pursue green certifications in the commercial sector.
- 59 2. ***Green building codes and mandates for green space:*** With more and more  
60 municipalities instituting or expanding green building codes, and entities such as the  
61 GSA requiring that their buildings conform to green standards, competent valuation  
62 requires an understanding of new building technologies and value implications of the new  
63 building code standards. These new standards affect not only new buildings and retrofits  
64 but also brown buildings that do not comply with current building codes.
- 65 3. ***Prevalence of brown buildings upgrading with green features such as energy-efficient  
66 HVAC systems, solar photovoltaic systems, or water-efficient fixtures:*** These types of  
67 upgrades, even in conventional buildings, could yield value impacts. Appraisers doing  
68 this type work must identify and value such features with market-supported adjustments.
- 69 4. ***Potential for obsolescence, also known as the brown discount, for existing buildings  
70 that don't "green up":*** Just as green buildings that outperform the market may show a  
71 value premium, brown buildings that underperform relative to their market may show a  
72 discount.

## Section II: Core Competency

73 The transition toward green buildings, green building codes and technologies, and the growing  
74 awareness of the relevance of sustainability to the marketplace discussed in the previous section  
75 can be viewed as part of the natural evolution of the real estate industry as it adapts to  
76 environmental, societal, and economic changes. Just as the building sector evolves, so too, must  
77 the skill set of the appraiser in order to accurately see the property through the eyes of the  
78 market, and thus render a competent valuation, based on market-supported conclusions.

### 79 **Key Terms and Concepts**

80 This list of key terms and concepts is meant to be representative of the minimum knowledge base  
81 required of appraisers to meet baseline competency requirements, and is not intended to be  
82 exhaustive.

- 83 • Sustainability
- 84 • Green Building
- 85 • Integration
- 86 • Green Building and Energy-Efficiency Rating Systems
- 87 • Energy Modeling and Auditing
- 88 • Policy Initiatives and Regulations
- 89 • Financing Incentives

### 90 **Sustainability**

91 Sustainability is a very broad concept that lacks a single definition. It is most often defined with  
92 reference to the 1987 United Nations Brundtland Commission Report which defines  
93 sustainability as economic development that meets the needs of the current generation without  
94 compromising the ability of future generations to meet their own needs.

95 When considering the application of this concept to a business setting, Elkington's "triple bottom  
96 line" (TBL) is commonly cited, which states that one must balance the economic, social and  
97 environmental objectives across current and future generations.<sup>2</sup> The TBL concept is also  
98 sometimes framed as "People, Planet, Profit."

99 While neither of these definitions speak specifically to the built environment, the RICS Global  
100 Property Sustainability Survey strongly echoes the TBL concept by "...equat[ing] sustainability  
101 with the goal of balancing economic, environmental and social objectives at global, national and  
102 local levels in order to meet the needs of today without compromising the ability of future  
103 generations to meet their needs."<sup>3</sup>

104 As RREEF's Sustainability Report notes, a definition that pertains to achieving sustainability  
105 within the built environment is still evolving, but that, "Today, the focus is on operating

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<sup>2</sup> Elkington, J, *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* (Stony Creek, CT: New Society Publishers, 1998), 20.

<sup>3</sup> Royal Institution of Chartered Surveyors (RICS) Global Property Sustainability Survey (Q4 2009).

106 efficiency and risk mitigation with a growing emphasis on the environmental impact of  
107 buildings.”<sup>4</sup>

108 ***Relevance to Appraisers***

109 Sustainability’s influence on real estate purchase and lease decisions is clear and growing as  
110 evidenced by a recent survey by CoreNet Global/JLL survey indicating that 92% of real estate  
111 executives consider sustainability criteria in their location decisions.<sup>5</sup> Most notably,  
112 sustainability has been the driving force behind green building and, as will be discussed further  
113 in a subsequent section, the key aspects of the major green building rating systems derive from  
114 the principles of sustainability.

115 In addition, the concept of sustainability presents a set of risks to the market value of real estate.  
116 These risks can be categorized as follows:<sup>6</sup>

- 117 • Resource Use: Operational and Construction/Renovation
- 118 • Obsolescence
- 119 • Transparency & Stakeholder Influence
- 120 • Externalities

121 The exhibit below illustrates examples of each of the above risks and the potential for impacts to  
122 market value.

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<sup>4</sup> RREEF Real Estate 2012 Sustainability Report (2012).

<sup>5</sup> CoreNet Global and Jones Lang LaSalle, “Perspectives on Sustainability: Results of the 2010 CoreNet Global and Jones Lang LaSalle Global Survey on Corporate Real Estate and Sustainability,” Jones Lang LaSalle (March 2011).

<sup>6</sup> Runde, T.P. and S. Thoyre, “Integrating Sustainability and Green Building into the Appraisal Process,” *Journal of Sustainable Real Estate* (2010, 2): 221–48.

RISK CATEGORY	EXAMPLES OF SUSTAINABILITY RISKS	POTENTIAL PROPERTY VALUE IMPACTS	
		Direct	Indirect
RESOURCE USE	<ul style="list-style-type: none"> <li>▪ ↑ global demand for materials vs. fixed supply</li> <li>▪ ↑ energy cost, volatility; ↑ water cost, rationing</li> </ul>	<ul style="list-style-type: none"> <li>▪ ↑ replacement cost; ↑ TI &amp; future renovation costs</li> <li>▪ ↑ operating expenses, ↓ NOI; Energy efficiency becomes paramount</li> </ul>	<ul style="list-style-type: none"> <li>▪ ↑ replacement cost may ↑ market barriers to entry; Renovate preferred over new construction; Life cycle costing</li> </ul>
OBSOLESCENCE	<ul style="list-style-type: none"> <li>▪ Consumption rate ↓, or patterns shift</li> <li>▪ ↑ need for properties to adapt to future uses and users (not yet identified)</li> <li>▪ Increased rate of change expected in future</li> </ul>	<ul style="list-style-type: none"> <li>▪ ↓ demand for retail; change in type/location</li> <li>▪ ↑ rate of depreciation; ↑ TI, cap ex cost for less adaptable properties</li> </ul>	<ul style="list-style-type: none"> <li>▪ ↓ economic growth due to ripple effect of consumer (70% GDP)</li> <li>▪ ↑ risk for special-purpose improvements</li> </ul>
TRANSPARENCY & STAKEHOLDER INFLUENCE	<ul style="list-style-type: none"> <li>▪ ↑ disclosure of energy efficiency</li> <li>▪ Non-financial stakeholders influence investor decisions</li> </ul>	<ul style="list-style-type: none"> <li>▪ GRI reporting that triggers green-up of REIT portfolio; carbon reporting</li> </ul>	<ul style="list-style-type: none"> <li>▪ Stigma for poor performers</li> <li>▪ Supply chain reporting requirements</li> </ul>
EXTERNALITIES	<ul style="list-style-type: none"> <li>▪ Greenhouse gas (GHG) and climate change legislation</li> <li>▪ Community charges back project externalities</li> <li>▪ Poor indoor air quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Carbon taxes, cap &amp; trade; Project GHG emissions used as reason not to allow development</li> <li>▪ Impact fees; assessments</li> <li>▪ Health risk liability</li> </ul>	<ul style="list-style-type: none"> <li>▪ Stigma: ↓ marketability</li> </ul>

Source: Runde, T.P. and S. Thoyre. Integrating Sustainability and Green Building into the Appraisal Process. *Journal of Sustainable Real Estate*, 2010, 2.

123 As a means of achieving a level of core competency, an appraiser should understand the concept  
124 of sustainability as it relates to real estate, and should also be able to both determine the degree  
125 to which the local market has incorporated sustainability principles into the buy/lease decision-  
126 making matrix, and objectively determine the degree to which the subject is affected by  
127 sustainability-related risks.

## 128 **Green Building**

129 The term, green building, can be used to mean both a noun (a structure with sustainability-related  
130 features) and a verb (constructing or remodeling a structure with sustainability-related features).

131 There are wide-ranging definitions for the term and to date, no single agreed-upon definition.  
132 The Green Act, introduced by the U.S. House of Representative as HR 2336 in 2010, defined  
133 "...green building standards [to mean] standards to require use of sustainable design principles to  
134 reduce the use of nonrenewable resources, encourage energy-efficient construction and  
135 rehabilitation and the use of renewable energy resources, minimize the impact of development on  
136 the environment, and improve indoor air quality." This definition aligns closely with the leading  
137 green building rating systems, such as LEED and most of the major residential green labels, and

138 may be a useful description of the essential attributes of a green building and the goals of green  
139 building design.

140 An important feature of green buildings is that the essential attributes described above are based  
141 in the principles of sustainability, and therefore, encompass more than just energy-efficiency  
142 features. This distinction proves salient to the appraiser and, despite the fact that the terms  
143 “green” and “energy-efficient” are often incorrectly used as synonyms, they reflect different  
144 building attributes. In practice, a green building will have features that address more than just  
145 energy use such as water efficiency, sustainable site selection, indoor environmental quality, and  
146 material selection, use and waste disposal. A building that is said to be “energy-efficient” may  
147 not be a green building if the only distinguishing characteristic of the building is that it uses less  
148 energy than a comparable building. Likewise, one cannot assume that a green building will  
149 necessarily be more energy efficient than a conventional building.

### 150 ***Relevance to Appraisers***

151 Green buildings, or brown buildings with green features, can contain special materials or  
152 equipment, can have design advantages and can be less (or more) expensive to operate. Such  
153 buildings may have unique technologies (solar panels, high-efficiency HVAC, BMS/BAS  
154 system) or qualities (siting, passive heating and cooling, a green certification) that may have  
155 additional value in the market. These features may affect the value of the property due to the  
156 initial cost as well as the potential impact on operating costs, lower risk, improved marketability  
157 or higher rental income.

158 As green building codes continue to proliferate, and as existing (brown) buildings incorporate  
159 green technologies, the distinction between what is a green building and what is not will likely  
160 become more difficult to pinpoint. This is not to say that a given market may not value a green  
161 label, but the overriding concern to the appraiser should be to accurately identify the specific  
162 features and attributes of a given property and properly gauge the effect on market value. By  
163 focusing too much on the potential value impacts of green building labels/certifications,  
164 appraisers may miss the value impacts of green building design concepts that have been  
165 incorporated into existing brown buildings, such as the case where a conventional building  
166 upgrades its HVAC system with energy-efficient equipment or makes water-efficiency upgrades  
167 to its plumbing systems. The upgraded property may lack a certification or label, and may not  
168 technically be considered a “green building” but the green upgrades likely have a discernible  
169 effect on market value and as such, need to be noted and appropriately valued. As with any  
170 property characteristic, knowledgeable appraisers would be expected to remain focused on the  
171 characteristics, performance and risk profile of a given property, and the degree to which the  
172 market values those characteristics, when analyzing the effect on market value.

173 Appraisers should also be aware that green and energy efficient are not synonymous. Energy-  
174 efficient buildings are not necessarily green. While green buildings are typically expected to be  
175 more energy efficient than their conventional counterparts, it is incumbent upon the appraiser to  
176 verify whether or not a green building is in fact more energy efficient than its peers, and  
177 appropriately consider the implications of modeled versus actual energy performance.

### 178 **Integration**

179 The concept of integration is central to green building and encompasses both a new approach to  
 180 building design and construction, referred to as the integrated design process (IDP), as well as  
 181 the concept of creating synergies that improve the function of a building on a variety of levels.

182 IDP is a departure from the conventional “Design-Bid-Build” model. IDP incorporates key  
 183 stakeholders from various disciplines working collaboratively from the outset of the design  
 184 process through the completion phase. Rather than thinking about a building as discrete parts, an  
 185 integrated design approach encourages the view of a building as a whole system; hence, it is  
 186 sometimes referred to as “whole building design” or “whole house approach” for residential  
 187 buildings.

188 The table below, produced for the British Columbia (Canada) Green Building Roundtable,  
 189 summarizes the key differences between IDP and the conventional Design-Bid-Build model.<sup>7</sup>

<b>Integrated Design Process</b>		<b>Conventional Design Process</b>
Inclusive from the outset	vs	Involves team members only when essential
Front-loaded — time and energy invested early	vs	Less time, energy, and collaboration exhibited in early stages
Decisions influenced by broad team	vs	More decisions made by fewer people
Iterative process	vs	Linear process
Whole-systems thinking	vs	Systems often considered in isolation
Allows for full optimization	vs	Limited to constrained optimization
Seeks synergies	vs	Diminished opportunity for synergies
Life-cycle costing	vs	Emphasis on up-front costs
Process continues through post-occupancy	vs	Typically finished when construction is complete

Source: Developed for the BC Green Building Roundtable 2007 by Busby, Perkins & Will.

190 By viewing the building as a system and by involving a wide range of viewpoints and skills on  
 191 the design team, integrated design can achieve synergies between the building components. For  
 192 example, installing water-efficient plumbing fixtures not only saves water, but saves energy  
 193 because as less water is used, less energy is used to heat and move the water throughout the  
 194 building. A vegetative (green) roof can both reduce storm water runoff and decrease the heat  
 195 island effect of a building which can affect heating/cooling requirements of a building. In a  
 196 commercial building, different window design utilizing overhang or specialty glazing can be  
 197 used to take full advantage of passive solar heating while also reducing unwanted solar heat gain,  
 198 and possibly reducing artificial lighting requirements. Done properly, this design element can  
 199 reduce energy used for heating, cooling and lighting. Further, reduced lighting, or changing to a  
 200 light source that generates less heat, can further reduce cooling needs. These elements have  
 201 measurable initial (first) cost impacts, as well as ongoing operational cost impacts due to reduced  
 202 energy use and maintenance.

<sup>7</sup> Busby, Perkins + Will, “Roadmap for the Integrated Design Process,” developed for the BC (Canada) Green Building Roundtable (2007).

203 ***Relevance to Appraisers***

204 These types of design and operational synergies may generate measurable construction and/or  
205 operating cost savings, yet may be virtually invisible, even to those familiar with sustainable  
206 building practices. Appraisers may need assistance from the design team in identifying and  
207 describing integrated design strategies and the resulting synergies. In some cases, the cost  
208 savings can be substantial. For example, in the proposed renovation of a 45,000 square foot  
209 office/flex building to net-zero status, the integration of a ground-source heat pump system with  
210 passive ventilation and BMS-controlled mechanical windows eliminated the need for \$600,000  
211 of duct work. Additional operational savings will likely accrue by eliminating the need for fans  
212 to move the air through the building for heating, cooling and ventilation. In this case, the  
213 integrated design had implications in the Cost, Sales Comparison, and Income Approaches.

214 **Green Building and Energy-Efficiency Rating Systems**

215 Green building rating systems are intended to both set a baseline for meeting new construction,  
216 retrofitting and operational requirements and also serve as a means of distinguishing buildings  
217 that have received certification from those that have not. Green building rating systems are  
218 distinguished from energy-efficiency scores and labels (such as ENERGY STAR or HERS) in  
219 that the latter focus solely on energy efficiency, while green building ratings systems are  
220 intended to rate a building's design and/or performance across the full spectrum of sustainability  
221 criteria (i.e., the triple bottom line).

222 There are several widely acknowledged green building rating standards for commercial buildings  
223 in the U.S., and a larger number for residential properties. The residential standards are more  
224 plentiful and with few exceptions, tend to be more regionally specific.

225 Virtually all of the sustainability-based rating systems (i.e., excluding ENERGY STAR and  
226 HERS/HERS II) award cumulative points across a range of common sustainability metrics that  
227 include five core categories:

- 228 • Energy Efficiency
- 229 • Materials and Resource
- 230 • Water Efficiency
- 231 • Indoor Environmental Quality (IEQ/IAQ)
- 232 • Site Efficiency/Community

233 Some green building rating systems include additional categories as well. Points are typically  
234 awarded in a cumulative fashion across all categories. Most green building rating systems  
235 incorporate energy efficiency at a minimum threshold for certification. For example, in some  
236 green building programs, the energy efficiency category may provide performance thresholds  
237 such as ENERGY STAR Benchmarking or a obtaining a minimum HERS Rating for homes.

238 The following discussions summarize some of the characteristics of the various standards and  
239 how these may or may not impact market value analyses and conclusions.

240 ***Commercial Green Building Rating Systems***

241 There are numerous green building rating systems in use worldwide. The two leading rating  
242 systems used in the United States are discussed below.

243 **LEED**

244 The Leadership in Energy and Environmental Design (LEED) rating system is currently the most  
245 widely utilized comprehensive green building rating system in the U.S. It is a voluntary rating  
246 system that requires third-party verification for certification, which sign-off is provided by the  
247 Green Building Certification Institute (GBCI). Version 1.0 of the standard was launched by the  
248 U.S. Green Building Council (USGBC) at its Membership Summit in August of 1998. After  
249 extensive modifications, Version 2.0 was released in 2000. LEED Version 3.0 was released in  
250 2009 and is set to be replaced by Version 4.0 in 2013. The rigor required to achieve certification  
251 increases with each version, as does the focus on energy efficiency and by extension, carbon  
252 pollution.

253 Certification for the standard is based on a point system and is awarded for basic LEED  
254 certification, as well as LEED Silver, LEED Gold and LEED Platinum, with each ascending  
255 level of certification requiring a higher number of points. Points can be earned in the following  
256 five core categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and  
257 Resources, Indoor Environmental Quality, plus two additional categories: Innovation and Design  
258 Process and Regional Priority Credits. LEED offers a variety of tracks for certification of  
259 various property types, including New Construction (NC), Core and Shell (CS), Healthcare,  
260 homes, and Existing Buildings Operations & Maintenance (EBOM), among others. Only the  
261 Existing Building track (EBOM) measures actual performance of the building. All the other  
262 tracks rate design, not actual performance. Each track has both common and unique credit  
263 categories, making direct comparisons between tracks difficult. Further, since each track offers  
264 alternate paths to achieve credits, and the credit totals are cumulative, properties that achieve  
265 similar points and certification levels cannot be directly compared in a meaningful way for  
266 valuation purposes.

267 **Green Globes**

268 Green Globes is the second most recognized comprehensive green rating system for commercial  
269 buildings in the U.S. and has gained momentum in recent years due to its adoption by several  
270 federal agencies, including Veterans Affairs and the State Department. Growth in the rating's  
271 level of adoption has been credited to the fact that Green Globes became the first green building  
272 program to achieve accreditation as a standards developer by the American National Standards  
273 Institute (ANSI).

274 It was originally designed as a self-certifying standard, but moved to third-party certification to  
275 enhance credibility and gain wider market acceptance. Green Globes awards cumulative points  
276 in categories including Energy, Water, Resources, Indoor Environment, Emissions,  
277 Project/Environmental Management, and Site. Green Globes offers only two tracks: New  
278 Construction and Existing Buildings.

279 **Energy-Efficiency Rating Systems**

280 These systems are designed to rate buildings solely on energy efficiency as opposed to green  
281 building rating systems which rate a building across multiple aspects of sustainability-related  
282 criteria. The two most well-known systems are ENERGY STAR and HERS.

283 ENERGY STAR is the Environmental Protection Agency's (EPA's) voluntary rating system  
284 created to promote energy efficiency and reduce greenhouse gas emissions (GHGs). Unlike  
285 LEED and Green Globes, which focus on multiple aspects of building construction and

286 performance, the ENERGY STAR program focuses solely on the energy performance  
287 characteristics of a property and how efficiency can be improved and maximized.

288 ENERGY STAR has been widely adopted across both the commercial and residential sectors in  
289 the U.S. and extends well beyond real estate into a variety of other products (residential and  
290 office equipment, heating and cooling systems and others). LEED utilizes the Energy Star rating  
291 and the portfolio manager software to award points in the Existing Building Operation and  
292 Maintenance track.

293 There are some important differences between ENERGY STAR for commercial properties and  
294 ENERGY STAR for homes. An ENERGY STAR score for a commercial building differs from  
295 an ENERGY STAR rating of a home. ENERGY STAR for commercial properties rates actual  
296 energy usage relative to a building's peers, adjusted for climate and occupancy use. ENERGY  
297 STAR for homes uses an energy modeling program that produces a HERS Index Rating and  
298 estimates projected energy use. ENERGY STAR for commercial properties is only available for  
299 existing buildings whereas ENERGY STAR for homes is only available for new construction.

### 300 ***Residential Green Building Rating Systems***

301 The rating systems for residential development are more numerous than those for commercial  
302 properties, making consistent comparisons across systems challenging. Residential green  
303 building rating systems tend to be more geographically diverse, though there are several national  
304 programs, such as the one developed by the National Association of Homebuilders. The table  
305 below includes a number of the better known residential green building and energy-efficiency  
306 rating systems. It is intended to be illustrative rather than comprehensive.

<b>Program</b>	<b>Sponsor</b>	<b>What it Rates</b>	<b>Where Prevalent</b>
ENERGY STAR	U.S. EPA	Energy Efficiency	Nationwide
HERS / HERS II	RESNET	Energy Efficiency	Nationwide/ (CA –HERS II)
National Green Building Standard (NGBS)	NAHB	Sustainability	Nationwide
LEED- Homes	USGBC	Sustainability	Nationwide
GreenPoint Rated	BuildItGreen	Sustainability	CA (primarily)
Earth Advantage	Earth Advantage Institute	Sustainability	Portland, OR
Built Green	Master Builders Association	Sustainability	Seattle Area
Earthcraft	Greater Atlanta Builders & Southface	Sustainability	Southeast
GreenBuilt Texas	Home Builder Ass'n of Greater Dallas	Sustainability	Texas

307 Each program varies in its minimum category requirements, rigor, requirements for performance  
308 testing, pre-drywall inspection, third-party or self-certification, and whether the program applies  
309 to new or existing houses.

310 ***Relevance to Appraisers***

311 Green building rating systems are designed to offer market participants an easy to understand  
312 label that purports to convey a building’s sustainability attributes. In simple terms, these rating  
313 systems seek to answer the question: is this a green building or not? The appraiser should  
314 attempt to determine if the local market in fact recognizes a particular label, score, or rating in  
315 this way, and if, in fact, there may be value added by a particular label. In many cases, the  
316 green-label sensitivity of market participants may be uncertain and/or difficult to substantiate. In  
317 such cases, the various rating systems are best used as a framework to assist the appraiser in  
318 understanding how the green or energy efficient building is different from the comparables.

319 In most cases, appraisers will not be able to make direct comparisons between buildings that are  
320 rated or not, nor between similar buildings rated at different levels (LEED Silver versus LEED  
321 Gold, for example). Indeed, due to the cumulative nature of the point system, two buildings at  
322 the same rating level (LEED Silver, for example) may have different value-impacting  
323 characteristics from an appraisal standpoint.

324 Each strategy should be assessed on the basis of whether or not it could create a differential to  
325 the operational, overall performance and/or risk characteristics of the property being analyzed  
326 and whether this differential constitutes a market advantage/disadvantage for a building  
327 incorporating more sustainable design, systems and protocols. This analysis should include  
328 analysis of the design intent of the various strategies, and the degree to which these goals are in  
329 line with the needs and desires of relevant market participants.

330 Properties rated by market-recognized, third-party certified standards have generally been  
331 subjected to a more rigorous level of scrutiny, and are therefore, likely to reflect a higher overall  
332 asset quality than unrated buildings. For example, properties certified under LEED typically  
333 require at least a basic third-party commissioning of the mechanical systems, meaning that an  
334 outside engineer verifies that the mechanical systems are operating as designed. Likewise,  
335 residential rating systems that mandate a pre-drywall inspection for thermal bridging and quality  
336 insulation installation reflect an added level of third-party review of the construction, over and  
337 above basic code-compliance building inspections.

338 Given the wide variety of residential standards, the appraiser's responsibility is to familiarize  
339 him/herself with the specifics of the relevant standards in their respective markets and to  
340 objectively analyze whether, or not, these factors create potential differentials in market value for  
341 higher performing properties. This analysis would consider market factors and trends regarding  
342 these standards and whether, or not, a particular market recognizes the standards (and strategies  
343 incorporated) as creating a benefit for properties adopting them. Key differences among the  
344 programs that might impact value include the sponsor (the home building industry vs. an  
345 independent organization for example), whether third-party certification is mandatory, and  
346 whether third-party pre-drywall inspection and/or performance testing is mandatory.

347 These examples demonstrate the potential impact that various green strategies and practices  
348 might have on the market value analysis. If the valuation professional completing an assignment  
349 on a green building does not make the effort to understand and analyze the various green  
350 strategies employed, then they very likely have not performed an accurate or competent analysis  
351 of the property.

## 352 **Energy Modeling and Auditing**

### 353 ***Energy Modeling***

354 Energy modeling is similar to cash flow modeling used in appraisal, but instead of modeling cash  
355 flows, engineers, designers, and energy auditors use a computer program to model energy flows  
356 within and throughout a structure. Energy models consist of a computer program that requires a  
357 variety of inputs pertaining to the building envelope, construction materials, climate, occupancy  
358 and use. The output of an energy model is a prediction of the energy use of a building, and the  
359 reliability of the output is highly dependent on the quality of the inputs, the sophistication of the  
360 software, and the skill of the operator. Therefore, energy models typically require some level of  
361 specialized training in order to use and understand properly. The more advanced models such as  
362 those used in the commercial sector may require more advanced training and/or degrees in  
363 engineering or similar disciplines.

364 Energy models are widely used in new construction for code compliance with energy codes and  
365 to comply with energy ratings like ENERGY STAR and voluntary green building rating systems  
366 such as LEED. Energy models are also used in existing homes and commercial buildings to

367 identify opportunities for energy-efficiency upgrades and to estimate potential energy savings  
368 from a proposed retrofit or energy-efficiency upgrades. In residential homes this is sometimes  
369 called an asset rating, as it predicts the performance of the building with limited input on  
370 occupant behavior. Examples of asset rating in residential buildings include the HERS Index  
371 Rating and the Dept. of Energy’s Home Energy Score. Energy modeling can be performed on  
372 any type of building, including both green and non-green buildings.

373 ***Relevance to Appraisers***

374 Use of energy modeling data in the valuation process requires the appraiser to be aware of the  
375 predictive limitations of energy modeling, as well as how an energy model differs from an  
376 energy audit. Just as with car mileage, actual results rarely match modeled predictions, and in the  
377 built environment, occupant behavior can significantly impact actual energy use. Further, as the  
378 sophistication of the energy model increases, so do the required inputs, inputs which may or may  
379 not be reliably known or supportable. The skill level and experience of the energy modeler also  
380 must be consistent with the sophistication of the software and the complexity of the building.  
381 While most appraisers lack the specialized training necessary to perform energy modeling,  
382 appraisers may be expected to review and understand reports that result from energy modeling,  
383 which will typically require an understanding of basic energy modeling concepts and  
384 terminology such as energy use intensity (EUI) as well as what kWh and kBtu measure, and  
385 how to convert between the two measures. Basic knowledge of energy modeling concepts,  
386 practices and terminology by the appraiser is required in order to effectively interact with the  
387 professionals responsible for creating the energy model and/or the report, and to incorporate the  
388 results, as appropriate, into the appraisal. Appraisers should further be aware of the USPAP  
389 requirements relating to relying on the work of others when contemplating the use of energy  
390 modeling analysis in valuation settings. (See Lines 908-915 in the Comment to Standards Rule  
391 2-3)<sup>8</sup>

392 ***Energy Audits***

393 An energy audit, also sometimes referred to as a building performance assessment, can include a  
394 variety of activities as well as define the report that specifies the results of those activities. An  
395 energy audit differs from energy modeling because it measures how a building is actually  
396 performing, not how it is intended to perform. Typically, an energy audit involves, at a  
397 minimum, a walk-through inspection of the building by a trained inspector, or rater, a basic  
398 equipment assessment, and the report will include an analysis of utility usage and energy-  
399 efficiency upgrade recommendations. More advanced audits may include building envelope  
400 testing (blower door test) and/ or energy modeling. Examples of energy audits in the residential  
401 sector include a Building Performance Assessment (BPA), or a compressive audit combined with  
402 a HERS rating. In the commercial sector, the typical standard is an ASHRAE Level, 1, 2 or 3  
403 energy audit, progressing from a Level 1 walk-through inspection with upgrade  
404 recommendations, to an “investment grade” Level 3 report that may include advanced energy  
405 modeling and analysis of systems interactions. Energy audits are routinely performed on all  
406 types of properties, including both green and non-green buildings.

407 ***Relevance to Appraisers***

408 Potential applications of energy audits by appraisers and underwriters include comparing similar  
409 properties based on their predicted energy use as well as for ranking or assessing proposed

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<sup>8</sup> Uniform Standards of Professional Appraisal Practice (USPAP) – 2012-2013 edition, (Washington, D.C.: The Appraisal Foundation, 2012), U-29.

410 energy efficiency upgrades or retrofits. HERS ratings may be used to adjust residential  
411 comparables for predicted energy use. Energy audits in the commercial sector may point the  
412 user to areas of potential cost-effective upgrades as well as identify areas where the subject  
413 property differs, positively or negatively, from the comparables. In both residential and  
414 commercial settings, the basic equipment assessment can provide meaningful insight to the  
415 appraiser as to the anticipated performance and remaining useful life of the components.

416 As with energy modeling, most appraisers lack the specialized training required to perform an  
417 energy audit. However, appraisers should review and understand energy audit reports, such as a  
418 HERS report, or a Building Performance Assessment. A basic understanding of energy audit  
419 concepts, practices and terminology is also required in order to effectively interact with the  
420 professionals responsible for creating the energy audit report. For example, a residential  
421 appraiser should be able to discern whether a lower HERS score correlates with lower or higher  
422 energy use, and should be able to understand what a blower door test is measuring. Commercial  
423 appraisers would be expected to understand whether an ENERGY STAR rating is positively or  
424 negatively correlated with energy use, and know whether the rating is based on actual or  
425 predicted (modeled) energy use. Clients may also require the appraiser to review and understand  
426 a basic ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers)  
427 audit. As with energy modeling, appraisers should be aware of the USPAP requirements relating  
428 to relying on the work of others when contemplating the use of energy audits/performance  
429 assessments in valuation settings.

#### 430 **Policy Initiatives & Regulation**

431 Government policy and regulations concerning green building have proliferated in recent years.  
432 Policy is generally broad in nature while regulations target specific market segments and  
433 behaviors. Both serve to shape market behaviors in ways the market would not otherwise  
434 address.

435 Policy and regulations concerning green building can come from the local, state and federal  
436 levels. Local green building codes and state-mandated renewal portfolio standards (RPS) that  
437 specify how much of a state's electricity must be derived from renewable sources, are examples  
438 of regulations at the local and state levels. The federal Government has a variety of policies  
439 relating to sustainability, including the 2009 Executive Order (EO13423 "Strengthening federal  
440 Environmental, Energy, and Transportation Management"), requiring that agencies must buy  
441 products that contain low or no toxic or hazardous constituents, contain the highest percentage of  
442 recovered materials practicable, use energy-efficient products, and reduce indoor and outdoor  
443 water use, among other requirements.

444 Another example of federal policy is the 2010 Green Act. Although it died in committee, this  
445 legislation would have amended FIRREA to require appraisals to include energy-efficient  
446 features and renewable energy sources.

447 Appraisers should be aware of and familiar with green building policies and regulations, so that  
448 they can differentiate between market-driven demand and policy-driven demand. For example,  
449 for an appraiser unfamiliar with local green building codes, the widespread use of energy  
450 efficiency technologies might be interpreted as market-driven green building demand, due to the  
451 market participants' embrace of sustainability principles. While this market-driven demand may  
452 be a factor, the appraiser also should consider the possible role of increasingly stringent energy  
453 portions of local or state building codes in generating demand for energy efficient technologies.

454 Changing policies and regulations concerning the energy use and performance of buildings can  
455 also have implications in the adjustment process of older comparables constructed to less  
456 rigorous code standards. Energy codes might also affect the level at which energy costs are  
457 stabilized for purposes of direct capitalization.

### 458 **Financing Incentives**

459 While mandates like building codes and regulations are the “stick” used to implement policy,  
460 incentives are the “carrot” meant to motivate behaviors consistent with policy. Incentives are  
461 available at the federal, state and local level, primarily from government entities, but also from  
462 regional and local utilities. The incentives include preferential tax treatment such as credits and  
463 deductions, financing products, and direct rebates. Each of these incentives is targeted to  
464 encourage a particular policy, and/or incorporation of specific building practices, protocols  
465 and/or characteristics. The program funding availability and qualifications may change over  
466 time, and the state and local incentives vary widely in their availability and nature based on the  
467 particular location.

468 Some of the various incentives at the federal state and local level are summarized below:

- 469 • The federal government offers a 30 percent investment tax credit for installation of  
470 renewable energy generation systems such as solar, geothermal and wind.
- 471 • Mortgage financing products tailored to energy efficiency and/or renewable energy, such as  
472 Energy Efficiency Mortgages or EEM offered by FHA, and the HUD Powersaver.
- 473 • At the state level, direct rebates for energy efficiency renovations and/or solar and renewable  
474 energy generating installations are available.
- 475 • Local and regional utility companies, charged with increasing the proportion of energy from  
476 renewable sources, may offer direct rebates to customers who install solar PV or solar  
477 thermal systems. In many cases, these incentives decline over time, in an effort to offset the  
478 higher initial cost to early adopters, and mirror the typical price declines in new technology  
479 as it increases in scale.
- 480 • Some counties (Los Angeles, San Francisco and Sonoma Counties in California, to name a  
481 few) are experimenting with financing solar PV and other distributed renewable energy  
482 sources with PACE (Property Assessed Clean Energy) programs. These programs function  
483 much like a bond assessment where the property owner pays the cost of the renewable energy  
484 improvements over time, as a special assessment added to the property tax bill.

### 485 ***Relevance to Appraisers***

486 For appraisers engaged in typical lender appraisals, tax benefits may have limited relevance.  
487 Rebates and incentives will affect initial cost, and therefore should be considered for new  
488 construction and renovations. Appraisers who work with specialized financing products like  
489 EEMs or Powersavers will need to be familiar with these programs and the scope of work should  
490 detail how the assignment differs from an appraisal for conventional financing. PACE program  
491 characteristics vary by the local jurisdiction, and how they affect the appraisal process will be  
492 determined by the scope of work. Rebates and incentives are expended at the time of the  
493 installation of the system, so they are typically not value-affecting after completion, whether  
494 installed new or as part of an energy-efficiency upgrade. However, they may be relevant to  
495 appraisers when estimating replacement cost new in the valuation process.

496 Tax benefits typically are outside the consideration of a typical market value appraisal as well,  
497 since they accrue to the property owner, not the real estate, and their value is dependent on the  
498 tax situation of the owner. However, for appraisers providing consulting services including  
499 feasibility analysis for renewable energy or payback/ROI analysis for upgrades and retrofits, tax  
500 benefits and rebates may be relevant depending on the particular assignment. Appraisers  
501 engaging in this area of work should seek the advice of outside professionals when needed,  
502 particularly with respect to tax implications that might be outside the appraiser's expertise.

### 503 ***Current USPAP Rules and Standards***

504 All sections of the Uniform Standards of Professional Appraisal Practice (USPAP) that are  
505 relevant to the valuation of green and/or energy-efficient buildings should be considered.

506 The relevance of the concepts emphasized in the COMPETENCY RULE is looked at in the  
507 context of the appraisal of green building in the following bullet points:

508 • ***Properly identify the problem to be addressed:*** Appraisers should be able to recognize green  
509 buildings and green features in brown buildings in order to determine and perform the  
510 appropriate scope of work, conduct relevant market research, and use appropriate valuation  
511 methodologies. Green buildings and features are sometimes difficult to distinguish from  
512 conventional buildings. Appraisers must have enough basic competency to know whether or  
513 not the property being appraised requires specialized knowledge of green buildings.

514 • ***Knowledge and experience to complete the assignment competently:*** When appraising green  
515 buildings, appraisers must possess or take steps to gain the necessary knowledge and  
516 experience required to competently value green buildings and brown buildings with green  
517 and/or energy-efficient features.

518 • ***Competency may apply to factors such as...familiarity with a specific type of property or***  
519 ***asset,...special laws and regulations or an analytical method:*** Like any other property type  
520 or property characteristic, competence mandates that the appraiser be adequately familiar  
521 with the asset type/features, as well as the appropriate and most widely-used valuation  
522 techniques for the particular property/features.

523 Potential scenarios where appraisers may encounter difficulty can be broken down into these  
524 major categories:

525 • Insufficient knowledge and experience leading to value conclusions that is not credible.  
526 Influence of bias (green and brown), unintentional or otherwise, on the value conclusion.

527 • Having adequate knowledge and experience but not applying them correctly.

### 528 ***Insufficient knowledge and experience***

529 USPAP addresses the development and communication of the appraisal; if the development  
530 process is performed according to Standards, the results should be credible. The following are  
531 examples of potential issues in the valuation of green buildings:

532 • *Assigning value, or no value, to green components without market support.*

533 • *Impacts on value must be market-supported.* Appraisers unfamiliar with green building  
534 concepts, features and practices may incorrectly assume that value impacts will be obvious in  
535 the comparable data, when, in fact, most data service providers do not specifically cull out  
536 green features or labels. For example, most data service providers do not specifically  
537 identify green labels, or features, such as solar photovoltaic systems (solar PV), and if they  
538 do, it may not be reported consistently.

539 Value impacting green characteristics, including physical features, as well as less obvious  
540 characteristics such as integrated design may also require different metrics of comparison,  
541 such as HERS Index Rating for homes or ENERGY STAR score for commercial buildings,  
542 or energy use intensity (EUI). Such metrics may not only be unfamiliar to most appraisers,  
543 but may also require accessing alternate data sources like the EPA ENERGY STAR  
544 database, or utilizing alternative analytical approaches. Single-family residential appraisers,  
545 who normally do not use income-based valuation models such as a DCF in their regular  
546 practice, may need to do so in order to competently value a solar PV installation.

547 • *Overlooking green features.* Appraisers may fail to note green features in the appraisal  
548 because they either do not know how to address them, or simply fail to note their existence,  
549 potentially resulting in an error of omission. Many green characteristics are virtually  
550 invisible on a typical inspection, such as high-performance glazing, above-standard  
551 insulation, energy efficient lighting, motion- and daylight-responsive lighting controls, or an  
552 advanced building automation/management system (BAS/BMS). Competent appraisers can  
553 be expected to know what to look for and what questions to ask to avoid missing relevant  
554 features.

555 If the market places a greater emphasis on green characteristics like energy efficiency, or  
556 quality of the interior environment, the potential impact on the existing, non-green buildings  
557 is obsolescence – the brown discount. Further, green features like solar PV, low-flow  
558 fixtures, and energy efficient lighting are often incorporated, by choice or by code, into major  
559 retrofit projects. Unless appraisers have a fundamental understanding of green building  
560 concepts and practices, and study market behavior relating to these features, appraisers risk  
561 missing or misapplying important adjustments to the comparables and the subject that may  
562 result in potentially providing inaccurate, and/or misleading results.

563 Given the degree to which green building features and sustainable building practices have  
564 been adopted by the building and design industry, and incorporated into building codes and  
565 government policy, in some markets, some level of green building knowledge and facility  
566 could be needed by real property appraisers, both commercial and residential, that appraise  
567 green or brown buildings in their practice.

568 • *Unsupported or Inappropriate Adjustments.* As with any other building feature, green  
569 building features, labels, certifications require market support, which may be derived from  
570 conventional paired-sales/rent analysis, or from other sources including market interviews  
571 and/or applicable secondary data sources such as studies and third-party research. However,  
572 appraisers applying an across-the-board adjustment to the comparable properties based on a  
573 dollar amount not market-derived, or random/unsupported percentage adjustments for green  
574 features and characteristics face the same competency risk as do appraisers who apply  
575 unsupported or inappropriate adjustments for other, non-green features.

576 When considering adjustments to the comparables in the valuation process, appraisers must  
577 subject green feature adjustments to the same rigor of analysis as any other adjustment.  
578 Adjustments must remain consistent with appraisal theory, and must be supportable by  
579 observations of market behavior including, but not limited to, sale and lease comparable data.  
580 The following are examples of unsupported or inappropriate adjustments:

- 581 ○ Using a multiplier for energy efficiency savings without adequate market research and  
582 support;
- 583 ○ Applying a fixed percent premium for green certification, based solely on the industry-  
584 reported cost premium over a code-built structure, without independently investigating if  
585 the cost premium is accurate and relevant to the specific market, and whether or not  
586 market participants are using this as a basis of comparison/adjustment;
- 587 ○ Assuming the market reaction, if any, to green or energy efficiency features is the same  
588 for different geographic areas (e.g., Northeast vs. West Coast, Central California vs.  
589 Coastal, urban versus suburban) or different market segments (e.g., commercial versus  
590 residential, high-end residential versus entry level, Class A office vs. Class B office);
- 591 ○ Using methods and/or analytical approaches that are inconsistent with established  
592 appraisal theory and practice would raise competency concerns, just as they would if  
593 applied to non-green features; and
- 594 ○ Assuming that the market will react the same way it did the last time the appraiser  
595 worked in that market. Market reactions to green building can evolve more rapidly than  
596 appraisers may be accustomed to, and competent valuation requires the appraiser to stay  
597 informed and aware of all relevant market trends.

### 598 *Influence of Bias*

599 Good ethical business practice and an appraiser’s professional reputation are centered on the  
600 assumption of objectivity: i.e., that the appraiser will render an objective value opinion free of  
601 bias. Further, performing an assignment with bias is a clear violation of the USPAP ETHICS  
602 RULE,<sup>9</sup> which states, in part:

603 “An appraiser must not perform an assignment with bias.” USPAP defines bias as: “a  
604 preference or inclination that precludes an appraiser’s impartiality, independence, or  
605 objectivity in an assignment.”<sup>10</sup>

606 “Green” bias is evident when an appraiser assumes green buildings or properties with green  
607 features are inherently worth more than non-green properties, without conducting adequate  
608 research to support that opinion.

609 “Brown” bias is evident where an appraiser dismisses any potential value impact of green  
610 buildings or properties with green features without first conducting the necessary research to  
611 support the contention that the market does not attribute value to those features.

612 Some level of skepticism and resistance to new concepts and market influences is normal and a  
613 healthy part of the valuation process when dealing with new property types and market

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<sup>9</sup> Uniform Standards of Professional Appraisal Practice (USPAP) – 2012-2013 edition, (Washington, D.C.: The Appraisal Foundation, 2012), U-7.

<sup>10</sup> Ibid, U-2.

614 influences. However, when resistance to new ideas or approaches persists, the appraiser's  
615 objectivity may become compromised, resulting in an unacceptable bias. Examples of bias  
616 include:

- 617 • *Assuming the market doesn't care, so why should the appraiser (brown bias)?* Appraisers  
618 may misjudge, intentionally, or because they have not conducted necessary market research  
619 to render an appropriate judgment, the degree to which the market has incorporated  
620 sustainability into its market value decision matrix, and therefore, miss the value the market  
621 may assign to green labels, energy-efficiency ratings, green features and sustainable building  
622 practices. Ignoring the green certification because the appraiser was "waiting for the green  
623 sales job" from the borrower is a clear example of not completing adequate due diligence that  
624 is expected of a competent appraiser.
- 625 • *Assuming that all green building benefits accrue to the public or environment, and therefore,*  
626 *the only potential impact to the subject property's market value is an economic cost (brown*  
627 *bias).* Green buildings and green features often have positive non-economic impacts, but  
628 they also often have positive economic impacts as well. Energy savings, water savings, and  
629 the potential for higher rents are examples of direct impacts that may positively impact the  
630 economic bottom line. Indirect impacts on the property might include improvement to the  
631 quality of the interior environment (air quality, daylight) that can improve productivity and  
632 tenant satisfaction, which can lead to improved tenant retention and therefore, lower turnover  
633 costs. Green-certified houses are often subjected to added inspections and performance  
634 testing, with greater attention to durability and resistance to pests and decay.
- 635 • *Assuming green characteristics and/or certifications always add value (green bias).*  
636 Appraisers may alternately adopt a bias, unintentional or otherwise, that all green buildings  
637 and green building features add value, without adequately analyzing the full spectrum of  
638 value impacts or conducting adequate market research to support that contention.

### 639 ***Expectations for appraisers/thresholds for competence***

640 This topic is of prime relevance to appraisers because subject-matter and geographic competency  
641 are fundamental requirements of any appraisal assignment. Determining the minimum threshold  
642 for core competency will depend to some degree on property type, geography, time, and the  
643 intended use of the appraisal opinions and conclusions.

644 However, while the level of rigor expected of an appraiser may vary, the basic criteria to judge  
645 competency for a green property follow the same steps that apply to any appraisal assignment:  
646 problem definition and identification, research and analysis, and development and reporting of  
647 the value.

648 For example, in an assignment to appraise a residential or commercial green building, an energy-  
649 efficient property or a brown property with green/energy-efficient features, the appraiser's  
650 competency for the particular assignment may be determined based on the appraiser's ability to  
651 accurately:

- 652 • identify the subject property's characteristics that would cause it to be classified as green or  
653 energy-efficient (applies to both green buildings and brown buildings with green features);
- 654 • verify these characteristics through documentation and information available for the type of  
655 characteristic with an emphasis on third-party verification;
- 656 • analyze the market to determine if these characteristics contribute to market value; and

657 • develop and report an opinion of market value of the subject property.

658 The following section provides specific examples of suggested minimum thresholds of  
659 competence for both residential and commercial appraisers performing assignments that include  
660 valuing green buildings, energy-efficient buildings, brown buildings with green or energy-  
661 efficient features and brown buildings in predominantly green markets. This list is not meant to  
662 be exhaustive but rather illustrative of the specific types of knowledge and skills required of  
663 today's appraiser.

664 • Recognize, capture, and analyze relevant green and energy-efficient characteristics from data  
665 services (such as MLS, CoStar, Loopnet) related to the subject property and comparable sales  
666 while recognizing that such data services may not specifically note green features,  
667 certifications, labels, and energy scores. Appraisers will likely be required to move beyond  
668 traditional data sources like MLS for information on certifications, labels, third-party  
669 verifications, and specific green/energy efficient features.

670 • Understand the difference between an energy-efficiency score (ENERGY STAR for  
671 commercial buildings or HERS for homes) and a sustainability-based green building  
672 certification/label (such as LEED, NAHB (National Association of Home Builders) National  
673 Green Building Standard), and the implications for valuation.

674 • Understand the dominant green building rating system for the market and property type being  
675 appraised. Be aware of the differences between the various green building rating systems in  
676 terms of metrics (what it measures), rigor (how it measures), whether it is self- or third-party  
677 certified, and whether it is performance/operations-based (such as LEED Existing Buildings  
678 Operations and Maintenance, or EBOM) or design/asset based (LEED Core & Shell, LEED  
679 New Construction, etc.).

680 • Recognize that green building certifications and energy scores are time sensitive, and the  
681 relevance/reliability of a rating or certification may diminish as time passes. Properties may  
682 need to be re-certified or re-rated due to changes in: 1) the rating system, 2) the structure,  
683 and/or 3) the occupancy or manner in which it is used or operated.

684 • Explain, describe and cite the relevance, if any, to market value of any green  
685 labels/certifications and/or energy efficiency score/labels as well as energy-efficient or green  
686 building features in the appraisal report.

687 • Appropriately analyze, discuss and report the degree of value impact, if any, of the label,  
688 certification or green and energy-efficient characteristics of the property (includes green or  
689 energy-efficient features in brown buildings).

690 • Read, analyze and appropriately consider in the valuation the impact, if any, of any building  
691 performance assessments, audits, or energy-efficiency reports available for the property.

692 • Have access to and appropriately employ the "green section" of popular building costs  
693 estimator services. Understand that in areas with green building codes, the marginal cost of  
694 green and energy-efficient buildings should already be embedded in the manuals' standard  
695 cost estimates for new construction, but may not be included for component costs.

696 • Be aware of the cost/value implications of integrated design and integrated systems.  
697 Integrated design and systems integration (synergies) can result in cost savings that may  
698 offset added costs of green features. These cost interactions are typically not embedded in  
699 the published cost manuals.

- 700 • Possess baseline knowledge of energy efficiency, green building and sustainability concepts,  
701 technologies, and building features sufficient to differentiate between properties that are  
702 considered green, and/or energy efficient and those that are not.
- 703 • Be aware of, and monitor, market behaviors and attitudes relating to sustainability, green  
704 building and energy efficiency, which may include primary research (observation,  
705 interviews, surveys) as well as secondary research (publications, studies, published research).
- 706 • Conduct an appropriate level of market research and analysis to support the market’s  
707 willingness to pay for energy efficiency and other green building features.
- 708 • Develop an appropriate scope of work to address the green, energy efficient, or sustainable  
709 features in the subject property, in the context of the market attitudes, client requirements,  
710 and intended use/user of the report.
- 711 • In addition, residential appraisers would also be expected to:
- 712 ○ Understand the HERS Index Rating or similar energy efficiency scoring metric that is  
713 dominant in the market and know where to obtain this data for the subject and  
714 comparable properties.
- 715 ○ Report any energy efficient or green features and the methods used to analyze value in  
716 that particular market, within the appraisal report.
- 717 ○ Appropriately consider energy savings from energy-efficiency upgrades in the valuation  
718 process. Conduct adequate market research to support the use of gross rent multiplier  
719 (GRM), discounted cash flow (DCF) or similar income-based valuation techniques.

720 In order to meet the above criteria, appraisers who accept these types of assignments may need to  
721 more fully understand the meaning and implications of selected key terms and concepts, outlined  
722 in the following section, “Key Terms and Concepts.” Where there are differences between  
723 residential and commercial appraisers, those distinctions are noted within the specific topic. In  
724 addition to these terms and concepts, appraisers are expected to understand the meaning and  
725 implications of green building terms and concepts used by the typical local market participant in  
726 the decision-making process. For example, if an appraiser is working in an area where solar  
727 panel installations are not uncommon, it is incumbent upon the appraiser to have a firm  
728 understanding of the various types of solar panel systems (such as solar PV vs. solar thermal)  
729 and how to determine the value impact of a solar array. Likewise, a commercial appraiser  
730 appraising commercial office buildings may be required to understand and value additional new  
731 building technologies such as building automation/management systems (BAS/BMS), among  
732 others.

## Addendum: Selected Resources

### 733 **Internet Resources**

#### 734 **Energy Efficiency Scores, Ratings Labels & Tools**

- 735 • EPA Energy Star (Energy Star for Homes and EPA Portfolio Manager for Commercial):  
736 <http://www.energystar.gov/>

- 737 • Energy Information Administration (EIA): <http://www.eia.gov/consumption/commercial/>

- 738 • Office of Energy Efficiency and Renewable Energy (DOE): <http://www.eere.energy.gov/>

#### 739 **Residential Green Ratings, Labels and Tools**

- 740 • Appraisal Institute Residential Green and Energy Efficient tax credit (Form 820.03):  
741 [http://www.appraisalinstitute.org/education/downloads/ai\\_82003\\_reslgreenenergyeffaddendum.pdf](http://www.appraisalinstitute.org/education/downloads/ai_82003_reslgreenenergyeffaddendum.pdf)

- 742 • National Association of Homebuilders (NAHBGreen aka National Green Building Standard):  
743 <http://www.nahbgreen.org/>

- 744 • RESNET/Home Energy Rating System (HERS): <http://resnet.us/> and  
745 <http://www.energy.ca.gov/HERS/>

- 746 • Home Energy Score (HES): [http://www1.eere.energy.gov/buildings/residential/hes\\_index.html](http://www1.eere.energy.gov/buildings/residential/hes_index.html)

- 747 • Build it Green (GreenPoint Rated): <http://www.builditgreen.org/greenpoint-rated/> Fannie Mae Green  
748 Initiative (especially Green Initiatives Resources): [https://www.fanniemae.com/multifamily/green-](https://www.fanniemae.com/multifamily/green-initiative)  
749 [initiative](https://www.fanniemae.com/multifamily/green-initiative)

#### 750 **Commercial Green Ratings, Labels & Tools**

- 751 • U.S. Green Building Council(LEED): <http://usgbc.org> (especially Resources), also <http://gbig.org>

- 752 • Green Building Institute (Green Globes): <http://www.greenbuildinginstitute.org/>

- 753 • New Buildings Institute: <http://newbuildings.org/>

#### 754 **Building Codes**

- 755 • International Green Construction Code(IgCC): <http://www.iccsafe.org/cs/igcc/pages/default.aspx>

- 756 • ASHRAE Green Standard 189.1 (Standard for the Design of High-Performance, Green Buildings):  
757 <https://www.ashrae.org/resources--publications/bookstore/standard-189-1>

### 758 **Publications**

- 759 • Journal of Sustainable Real Estate (JOSRE)[www.costar.com/josre/](http://www.costar.com/josre/)

- 760 • Journal of Green Building <http://www.collegepublishing.us/journal.htm>

- 761 • Green Builder magazine (residential) <http://www.greenbuildermag.com/>

- 762 • Hoen, B., R. Wiser, P. Cappers and Mark Thayer, An Analysis of the Effects of Residential  
763 Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National  
764 Laboratory Environmental Energy Technologies Division, April 2011  
765 <http://eetd.lbl.gov/ea/emp/reports/lbnl-4476e.pdf>

- 766 • Muldaven, Scott, Value Beyond Cost Savings, Green Building Finance Consortium:  
767 <http://www.greenbuildingfc.com/>

- 768 • Pivo, G. and J. Fisher. Investment Returns from Responsible Property Investments: Energy Efficient,  
769 Transit-oriented and Urban Regeneration Office Properties in the U.S. from 1998– 2008. Working  
770 Paper, Responsible Property Investing Center, Boston College, University of Arizona Benecki Center  
771 for Real Estate Studies, Indiana University, October 11, 2008, revised March 3, 2009  
772 [www.uic.edu/cba/mare/CureEvents/InvestmentReturns.pdf](http://www.uic.edu/cba/mare/CureEvents/InvestmentReturns.pdf)
- 773 • Runde, Timothy and Thoyre, Stacey, Integrating Sustainability and Green Building into the  
774 Appraisal Process, Journal of Sustainable Real Estate (JOSRE) Vol 2, No. 1, 2010.  
775 [http://www.costar.com/uploadedFiles/JOSRE/JournalPdfs/11.221\\_248.pdf](http://www.costar.com/uploadedFiles/JOSRE/JournalPdfs/11.221_248.pdf)
- 776 • Wright-Chappell, T. and B. Smith. High Performance Green Building: What's it Worth? Cascadia  
777 Region Green Building Council, May 2009.  
778 [http://living-future.org/sites/default/files/HighPerfGB\\_ValuationStudy.pdf](http://living-future.org/sites/default/files/HighPerfGB_ValuationStudy.pdf)

### 779 **Educational Resources**

- 780 • Appraisal Institute Courses: <http://www.appraisalinstitute.org/education/green/>
- 781     ○ Introduction to Green Buildings: Principles & Concepts
- 782     ○ Case Studies in Appraising Green Residential Buildings
- 783     ○ Case Studies in Appraising Green Commercial Buildings
- 784     ○ Residential and Commercial Valuation of Solar
- 785 • Appraisal Institute's *Valuation of Sustainable Buildings* Professional Development Program:  
786 <http://www.appraisalinstitute.org/education/green/downloads/green-faqs.pdf>
- 787 • Webinar: *Is Green the New Brown for Appraisers? 5 Lessons from the Field*. Appraisal Institute  
788 Northern California Chapter, December 2010:  
789 <https://dl.dropbox.com/u/14128443/Webinar.wmv>