Green Residential Appraisals in the United States Context: Challenges and Opportunities

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Abstract: Rigorous consideration of green and high-performance attributes is rarely included in the residential property valuation process. Drawing upon the literature and interviews of property valuation professionals, in this I identify key barriers to scale-up of this emerging practice and opportunities for overcoming them. Key categories of opportunities include elevating the competency of appraisers, developing better information resources, improving benchmarking and rating tools, better characterizing and managing performance risk, integrating disaster resilience and sustainability considerations, mitigating the problem of additional time/cost for performing assignments, enhancing demand for improved appraisals, and engaging a greater diversity of market participants.

Many studies have offered new techniques for incorporating consideration of green and high-performance (“green/HP”) features in the building appraisal process (e.g., Muldavin, 2010; Austin, 2012; Curry et al., 2016). While most previous work focuses on specific techniques or data analyses, in this article I focus on the frictions caused by gaps and barriers in the deployment and scale-up of improved practices together with engagement of key parties outside the valuation profession. I discuss the many challenges, not only within the appraisal process but also in the surrounding “ecosystem” where other actors (building owners, lenders, real estate professionals, building performance experts, and well-intended policymakers) are also ill equipped to participate fully in the process. The discussion begins with a brief overview of the market context in which appraisals take place, and some of the overarching issues of relevance to residential green/HP assessments. Related historical activities are then outlined, along with reflections on the adequacy and effectiveness of efforts to date. Seven key barriers to mainstreaming better practices are presented, followed by a series of opportunities and recommendations for overcoming these challenges. Extensive literature was reviewed in conjunction with interviews of leading practitioners of green/HP valuation and other experts (Mills, 2015).

In response to market demands and a range of policies and voluntary programs, residential buildings are increasingly incorporating green/HP attributes with the overarching goals of achieving reduced operating costs (more efficient use of utilities and on-site power production), improved indoor environmental quality,
and use of materials with a reduced environmental footprint. The appraiser has a key role to play in assessing the impact of these developments on housing demand and values as a function of green/HP attributes and corresponding performance and operating cost outcomes.

While only a small subset of green/HP building stock by floor area bears a formal third-party label or rating, all buildings have some level of green/HP features or operational practices. Variations in the level of performance from averages can either positively or negatively influence performance and thus value. However, few residential appraisers possess the competency to fully assess and value green/HP features. Industry efforts to develop the necessary supporting techniques and data have been limited and piecemeal.

Virtually every stakeholder in the real estate ecosystem seeks to see properties properly valued. Whether an owner or builder desiring to recover their investment and appreciation, a lender taking care to keep property value safely above its mortgage amount, a realtor wanting transactions to move forward, or an insurer properly quantifying replacement cost or professional liability risk exposure, proper valuation is a shared goal. Buyers and sellers, and others facilitating the transaction must have the motivation to mobilize the information needed to enable the value to emerge. It is incumbent on third-party providers of green/HP products and services as well as policymakers seeking to improve the building stock to demonstrate that their recommendations enhance value. Awareness of co-benefits associated with green/HP features (disaster resilience, avoidance of adverse indoor environmental quality problems, etc.) can also influence value perception. This broader context must be kept in mind when the role of an appraisal is considered.

The Appraisal Foundation’s Uniform Standards of Professional Appraisal Practice (USPAP) compel appraisers to consider all influences on a property’s value. Indeed, appraisers are ethically and legally bound to provide accurate, unbiased information. In essence, they are required to be competent to perform their assignment. They are also required to properly identify the material characteristics of the property (irrespective of whether they impact value) and be able to substantiate their findings. Gathering increasingly diverse information about a subject property requires dependence on third parties, including owners, builders, and specialists (Stukel, 2013) and on data sources that are traditionally not used by appraisers.

Particularly in the residential sector, appraisers are also often faulted for volatility in the broader real estate markets (Andriotis, 2014). It is argued that this reflects a misunderstanding of the very process of appraisal, in particular that it observes and codifies rather than drives market behavior and outcomes (Bunton, 2014). In any event, these concerns serve to make appraisers apprehensive about scrutiny of any new sort of valuation increment awarded, including those attributed to green/HP features. In contrast to concerns about appraisers contributing to housing price spikes, the National Association of Home Builders (NAHB) has taken appraisers to task for undervaluing homes, particularly green/HP ones. Risk perception is thus an important crosscutting factor in the appraisal process.
The Emergence of ‘‘Green’’ Appraisal Practices in the United States

Reflections on the history of efforts to advance green/HP appraisals helps identify strategies that have been tried, types of entities that have been engaged, and the nature of remaining gaps. While much progress has been made, it has not yet been sufficient to enable significant improvements in appraisal practice at a meaningful scale. However, conditions bode well for continued progress going forward.

This history has unfolded in parallel with turbulent periods in the real estate markets for which appraisers and their customers were deemed to share responsibility, followed by cycles of regulations, siloing of appraisers in the name of professional integrity, and commoditization of the valuation process itself. This pattern has important ramifications for aspirations that appraisers engage more fully in identifying and valuing the green/HP characteristics of homes. On the one hand, it is legally and ethically incumbent on appraisers to do so, yet on the other hand it is perceived by some as a risky avenue to follow. Risks arise where findings can be challenged as either over- or under-stating value, together with a market environment in which the complexity of their assignments increases despite downward pressure on appraiser fees.

There have been many efforts to advance the practice of green/HP property valuation in the United States, centering primarily on training, case-study development, and development of data-gathering instruments. Many players have engaged in the process, both from within and outside of the appraisal community. These include appraisal professional organizations, the Colorado Energy Office, Earth Advantage, EcoBroker, Elevate Energy, Fannie Mae, Federal Housing Administration, Home Innovation Research Labs, The Institute for Market Transformation, Northwest Energy Efficiency Alliance (NEEA), National Association of Homebuilders (NAHB), National Association of Realtors (NAR), National Association of State Energy Officials, RESNET, U.S. Environmental Protection Agency, U.S. Department of Energy (DOE) and its National Laboratories, the U.S. Green Buildings Council, and the Vermont Green Homes Alliance. The Appraisal Institute has developed a portfolio of green/HP activities and member offerings, with earliest publications dating to 2010, including its Green and Energy Efficiency Addendum for residential buildings.

Various federal entities have engaged as well. Under a multi-year (2011–2016) memorandum of agreement, the Appraisal Foundation and the DOE have developed documents on competency and best-practice recommendations for residential and commercial valuations (Briggs et al., 2015; Curry et al., 2016; Finlay et al., 2016). Other activities include mobilization of information and educational materials for appraisers, and exposure of various tools and databases from the DOE establishment to the appraisal community. DOE has also partnered with the Appraisal Institute and the NAR to improve the availability of information on energy-efficient homes that can be used in valuation. Fannie Mae has encouraged consideration of green/HP features in appraisals, and FHA and Fannie
Mae have given particular attention to the handling of solar PV systems (Fannie Mae, 2015), with DOE research conducted to explore the veracity of media reports of leased solar systems having adverse effects on value (Arreola and Treadwell, 2015).

NAHB has worked to enable homebuilders to more effectively convey relevant information to appraisers (NAHB no date) and encourages builders to request revisions of appraisals that fail to consider these attributes. They have also expressed concern about the undervaluation of green/HP homes.

Green/HP advocacy and professional groups have also engaged. Vermont Green Homes Alliance—a collaborative of state trade groups including builders, mortgage bankers, appraisers, real estate agents, and multiple listing services (MLSs)—focused on efforts to ensure that qualified appraisers are assigned to green/HP projects (CNT and NHPC, 2013). The Northwest Energy Efficiency Alliance and National Association of Appraisers released a “Cost Addendum for High-performance Homes” to help cope with the common lack of comparable home sales data used in the Sales Comparison appraisal method.

While there have been many notable efforts, they have been largely uncoordinated and piecemeal. There remains negligible awareness or competency of green/HP issues within the mainstream valuation community, and few appraisers have integrated recommended practices into their assignments. Lack of a strategic plan and long-term commitment on the part of the energy/environmental policy community is also a hindrance. Isolated workshops, studies, and memoranda of understanding will not independently have much impact, and do not address deeper structural challenges. Expectations of appraisers from within the energy/environmental policy community are often unrealistic and not attentive to real constraints faced by appraisers. In sum, it is unlikely that continuation of the historical approach will achieve much unless followed with more coordinated and persistent efforts.

These challenges notwithstanding, the environment for moving forward has improved. There are better data today, including ongoing efforts to add “green” information to real estate listing directories; improved and more pervasive building energy codes, building rating, and labeling initiatives; and a host of federal, state, and local policies that have collectively brought green/HP practices much more into the mainstream. Meanwhile, a renewed focus on professional standards of care and competency for assessing green/HP homes make it increasingly important for appraisers to consider these factors in their assignments.

The increased prevalence of green/HP practices combined with a gap in appraiser competency regarding the assessment of these practices are compelling the industry to adapt their traditional techniques to this new driver of value (Bently, Glick, and Strong, 2015). It behooves appraisers to enhance their competency on green/HP topics so that they need not recuse themselves from assessing this increasingly prominent set of properties. A corollary impetus for improved practices is to avoid contested appraisals, which raises costs to the owner and prolongs and complicates the transaction. Properly assessing green/HP features
the first time is one way to reduce this risk. Towards these ends, the Appraisal Foundation’s Appraisal Practices Board released a Valuation Advisory on the determinants of competency for appraisers of green/HP buildings (Briggs et al., 2015). The competent appraiser is still faced with many additional barriers.

**Barriers to Valuing Green and High-performance Attributes**

A reasonably finite number of barriers impact the process of incorporating green/HP considerations into real estate appraisals. However, the challenges are far-reaching and require fuller interaction among the appraisal and green/HP buildings communities and associated policymakers.

**Time/Budget Pressure & Process Commoditization**

Industry observers point out that despite higher stakes and increased complexity, the time allowed for performing appraisals has shortened as have the fees paid (down by 30% between the 1980s and mid-2000s), thanks in part to the institution of competitive bidding for these assignments (Hudgins, 2007). The issue is most acute for residential appraisers, approximately 80% of whom reported dropping fees in 2015 (Alltera Group, 2015). Meanwhile, profits have been divided among an increasingly diverse set of market players.

One residential appraiser estimated that they can justify allocating only 1% to 8% of appraisal time to examining green/HP issues. National average appraisal fees today of just over $300 (only half of which typically goes to the appraiser), afford vanishingly small resources for this aspect of the assignment.

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and its Truth in Lending and Interagency Guidelines called for the use of Automated Valuation Models, with the intention of reducing the risk of tampering or undue subjectivity and saving time, but this also tied the hands of appraisers when confronted with atypical buildings. These models were not built with green/HP considerations in mind. This is compounded by more automated collateral underwriter software control systems set to detect any “outliers” for a second round of review (imposing increased time requirements).

In 2009, the Home Valuation Code of Conduct (HVCC) was launched with the intention of fostering more objectivity and separation between appraisers and the lenders who commission their work and have real or apparent conflicts of interest in the outcome. Lenders began to turn to clearinghouses (often called appraisal management companies, AMCs) to obtain appraisers. Some have characterized AMCs as overly focused on lowest cost and fast turnaround, as well as succumbing to the same pressures from banks once placed directly on the appraisers (CNT and NHPC, 2013; Andriotis, 2014). Moreover, AMCs retain approximately half the appraisal fee. These changes inadvertently created barriers to recruiting appraisers known to be adept at appraising green/HP homes and
made it even more difficult to allocate time to assess special situations such as green/HP features (CNT and NHPC, 2013).

In a 2011 regulation, Fannie Mae mandated that appraisers use the Uniform Appraisal Dataset (UAD) as part of their reporting. Part of the goal was to further standardize descriptions of the quality and condition of the subject property and comparable sales. Some parties saw this as a new source of liability for appraisers, preferring “vaguely stating” the information. This view runs at cross-purposes to discerning green/HP features.

The aforementioned barriers increase the effort to process this additional layer of information. This barrier rears its head, for example, in the case of the Appraisal Foundation’s Green and Energy Efficient Addendum for residential buildings. Gathering many of the inputs are well beyond both most appraisers’ competence and time availability. Anecdotal reports from the field suggest that few appraisers are able to afford the time to utilize this tool. It is thus critical to engage other parties in marshaling this information on behalf of appraisers, as is the intent of the Addendum’s developers.

**Lack of Awareness, Interest, or Skeptical Predisposition Towards “Green”**

As is the case for many actors in the real estate marketplace, Bentley, Glick, and Strong (2015) found that a significant proportion of appraisers had no particular awareness of green property issues or had not acquired the skills necessary to assess them. In a survey conducted in the Pacific Northwest, only 5% of residential builders believed that appraisers were able to recognize the value of green features (Griffin, Kaufman, and Hamilton, 2009).

An undercurrent of skepticism colors some appraisers’ view of green/HP factors. For appraisers with a long history of practice, this is perhaps rooted in earlier times when the science and practice of sustainable building practices was less established. Information deficiency and lack of competency can reinforce knee-jerk reactions. The Appraisal Foundation’s recent Valuation Advisory on core competency cautions against this sort of bias (Briggs et al., 2015).

Real estate agents are key to adequate information flow to appraisers (Desmarais, Desmarais, Butler, and Baldridge, 2015). Importantly, the real estate industry in general, and the NAR in particular, has been largely opposed to any sort of mandatory rating, labeling, or disclosure efforts (CNT and NHPC, 2013). Bond (2015) attempted to survey Florida-based real estate agents regarding green property, and upon receiving only nine responses the effort was dropped. Subsequently sending an invitation to 5,000 real estate agents in California yielded only 110 responses. The survey found that few respondents had experienced demand for green/HP homes and had a distorted view of the cost of energy-efficient measures.

**Competency Deficiency**

For those who do seek to engage, Runde and Thoyre (2010) aptly note two high-level hurdles that are “stalling the evolution of the appraisal industry: (1) lack of
systematic, conceptual approach to valuing green buildings and (2) lack of well-defined terminology." Per the latter point, Exhibit 1 provides a sampling of how some key appraisal terminology maps to buildings’ energy terminology, although the ability for practicing appraisers to crosswalk between their familiar language and the rather foreign language of building performance remains an impediment to assimilating material from building performance practitioners.

Under-informed appraisers can easily make the error of viewing green/HP as a single feature or reducing performance to a single metric (e.g., a rating) expected to either be present or not present in a subject property, rather than manifesting as a continuum such that every building’s performance becomes a legitimate consideration.

Another consequence of limited competency is that energy considerations may be appended, at best, to a traditional appraisal rather than treated in a more integral fashion. A related consequence is the pessimistic assumption that entirely new appraisal methods will be needed to address green/HP issues, when in fact the existing methods (sales comparisons, discounted cash flow, and cost basis) can

<table>
<thead>
<tr>
<th>Appraisal Terminology</th>
<th>Analogous Buildings Energy Terminology</th>
</tr>
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<tbody>
<tr>
<td>Asset (property)</td>
<td>Asset (an energy-using feature that is integral to the building, such as windows, as distinct from features that are not, such as computers).</td>
</tr>
<tr>
<td>Competent management</td>
<td>Strong energy management culture.</td>
</tr>
<tr>
<td>Contributory value</td>
<td>Portion of a green/HP measure cost and or engineering-economic value of operating cost savings that is actually reflected in the valuation. Incremental value minus whatever discounting the “imperfect” market ascribes.</td>
</tr>
<tr>
<td>Deferred capital expense</td>
<td>Retrofit candidate.</td>
</tr>
<tr>
<td>Deferred maintenance</td>
<td>Building out of tune.</td>
</tr>
<tr>
<td>Habitability</td>
<td>Thermal comfort, indoor environmental quality, disaster resilience</td>
</tr>
<tr>
<td>Highest and best use: new construction</td>
<td>Compliant with green/HP building codes and ordinances.</td>
</tr>
<tr>
<td>Market value</td>
<td>Market failure to adequately value energy-efficiency.</td>
</tr>
<tr>
<td>Obsolescence: External</td>
<td>Impeded solar access, energy price volatility; poor outdoor air quality (out of control of owner)—curable/incurable.</td>
</tr>
<tr>
<td>Obsolescence: Functional</td>
<td>Energy inefficient; overbuilt—curable/incurable.</td>
</tr>
<tr>
<td>Operational (expense)</td>
<td>Operational (behaviorally or decision-driven energy or other resource use (e.g., temperatures, schedules).</td>
</tr>
<tr>
<td>Risk management</td>
<td>Commissioning and performance tracking/persistence.</td>
</tr>
<tr>
<td>Stabilized utility expenses</td>
<td>Post-retrofit energy costs.</td>
</tr>
<tr>
<td>Superadequacy</td>
<td>Not cost effective (e.g., oversized PV).</td>
</tr>
<tr>
<td>Third-party documentation</td>
<td>Energy audits, commissioning reports, benchmarks and ratings.</td>
</tr>
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</table>
fully accommodate these issues as long as appropriate data are gathered and considered (Austin, 2012; Black et al., 2015). According to one report, “the AMC typically selects an appraiser from a pre-approved list with little to no regard for areas of expertise or competency” (Doyle and Bhargava, 2012). While appraisers are adept at tracking traditional market indicators, key factors applicable to green/HP (e.g., performance labels or ratings, energy codes, energy incentives) can be unfamiliar.

**Information Deficiency**

Timely availability, accessibility, and usability of green/HP information are barriers that vex the entire domain of high-performance buildings. This is a challenge for even the most competent appraisers. For example, due to privacy concerns, some key data, such as ENERGY STAR and Home Energy Score home details, are not readily available.

Appraisers are adversely impacted by information deficiencies, as they must be able to substantiate and defend their analyses. The problem manifests in two broad ways. First, obtaining and making sense of often highly technical information produced by other professions is no small feat. However, the appraiser needs only to understand (not verify or certify) the findings of specialists. Certain transaction structures imply additional inertia (e.g., firewalls that are erected between lenders and appraisers). Second, green/HP information is rarely assembled with the appraiser in mind, and is often far more or less granular than the appraiser requires. For example, the detail and jargon in an energy audit, commissioning report, or indoor-environmental quality inspection can be daunting to the appraiser, and locating the relevant information therein is not easy. Compounding the problem, much of the “generic” information in the energy field (e.g., typical energy savings for particular measures) and studies and claims about how this translates into asset value is either too highly generalized (perhaps using national averages) or pertains to a specific market not relevant to that where a given appraiser is practicing. Traditional appraiser training has not emphasized these considerations.

Lack of information also impedes an owner’s ability to compel an appraiser to consider their property’s green/HP features and performance. Foremost among the information needed by the appraiser is a quantitative estimate of energy savings that the subject building achieves compared to a standard building. This requires recordkeeping and specialized analysis.

In the words of one appraiser after conducting dozens of residential green/HP valuations: “Standardized documentation about energy efficiency appears to be in its infancy; thus, during this study and the valuation process, we ran into many challenges related to information gathering and sharing. For example, performance reports were not attached to MLS listings, incorrect verbiage was used in reference to energy-efficient features or ratings, we aroused suspicions when we requested certain information, and municipal building departments routinely discarded data, such as HERS reports” (Desmarais, Desmarais, Butler, and Baldridge, 2015).
Professional Differences between Appraisers and Green/HP Professionals

Those who design, build, or otherwise promote the development of markets for green/HP buildings view themselves as agents of change and advocates of improved practices. Appraisers do not tend to view themselves in this way. They do not drive value or actively shape markets, but, rather, observe and codify homebuyer preferences and perceptions of value. In other words, appraisers are the messengers of how markets function, whereas energy advocates and policymakers project how markets will behave if they function according to idealized theory where costs and benefits are fully optimized. Lack of appreciation for these differences in posture towards this issue can thwart well-intended efforts to unify these two communities. This distinction notwithstanding, appraisers are certainly influential and play an important role in educating market participants about drivers of value (Bently, Glick, and Strong, 2015).

Emblematic of the divide is the familiar use of the language and concept of “cost-effective” measures as determined by engineering analyses. This abstract form of economics has little bearing on “sub-optimal” values buyers may place on building attributes. Both methodologies have legitimate but largely non-overlapping applications. In appraisal parlance, the “contributory value” of a green/HP measure may be far less or far greater than the cost of that measure or the engineering-economic value of any operating savings it generates. Moreover, the degree to which the intrinsic value of green/HP features emerges depends highly on the factors unique to each local market. For example, it is probable that a net-zero straw-bale home would have negative marketability or value if located among historically designated, non-energy efficient seaside cottages. Conversely, other market areas may have strong demand for homes with notable green features and sustainable building materials, with homes lacking these green features suffering from obsolescence.

Risk Aversion

While a central aspect of the appraisal assignment is to identify risks, risk abounds in the appraisal process itself. Appraisers are understandably adverse to this second type of risk, as their reputations and profits rest upon it. Undertaking an assignment for which the appraiser is not competent one a key risk. Some appraisers are aware of the insufficiency of their knowledge and access to essential information (Bently, Glick, and Strong, 2015). This, in turn, invites the risk of over- or under-valuing the property and being taken to task (in the review process or even in post-assignment litigation). Running afoul of appraisal standards, including any appearance of bias or undue influence, also places appraisers at risk.

A particularly important risk arises in appraising recently retrofitted properties given that utility expenses are typically substantiated by analyzing historical data. Very robust savings projections are needed to defend stipulated “stabilized” post-retrofit utility expenses. Assumptions about often complex utility tariffs are yet another variable. By using third-party reports, risk is largely transferred from the appraiser to the third-party expert.
Contrary to an oft-stated desire for more information, some observers protest the trend toward increased disclosure as inviting new risks (Davis, 2013). While these liabilities have not yet manifested in litigation among appraisers (e.g., one long-standing appraisal law blog has no occurrences of the terms “green,” “green buildings,” or “energy efficiency”11), the risk remains (Austin, 2012). An illustration in the case of completing the Appraisal Institute’s Green and Energy Efficient Addendum, the president of Capital City Bank in Gainesville, Florida, states that “appraisers either don’t want to learn it or they aren’t comfortable filling it out because they don’t want to take on the liability.”

A more pragmatic risk is obtaining an insufficient fee as a result of underestimating the effort that may be entailed in performing an appraisal. Although lowest-bidder pressures reinforce this risk, enhanced competency helps mitigate unintended bidding errors.

**Public Policy Vacuum**

Efforts by environmental policymakers and regulators to foster collaboration between the appraisal and green/HP buildings communities have been piecemeal, short-lived, and thus of limited effectiveness. A wide cognitive and technical void separates these communities, resulting in a lack of mutual understanding. Appraisers often feel “dictated to” and over-sold by policymakers, rather than engaged in a two-way dialogue and joint problem-solving process.

Appraisers see the policymaking community as having a poor grasp of the valuation process and standards of care. Appraisers must temper their analyses with considerations of internal and external obsolescence, superadequacy, etc. Appraisers are also wary of the consistently glowing characterization of green/HP proffered by public agencies—they know there can be downsides, but see those being ignored or downplayed. While the policy community has great expectations for the use of labeling and rating programs (LEED, ENERGY STAR, etc.) in the valuation process, practicing appraisers express doubt about their practical applicability. Moreover, some appraisers are deterred from engagement with public agency initiatives by a perception of a siloed and uncoordinated approach towards green appraisals, and lack of staying power regarding challenges that require patience and tenacity over long periods of time.

**Opportunities for More Rigorous Valuations**

Each of the preceding broad categories of barriers reflects opportunities, a number of which are outlined below. Most opportunities address multiple barriers (Exhibit 2). Various actors and processes can be better aligned to address the gaps and disconnects outlined above. These findings are consistent with other reviews (e.g., CNT and NHPC, 2013), although this discussion attempts to take a broader view in addressing deeper underlying market barriers and frictions and suggesting engagement with other stakeholders not previously associated with green/HP appraisals. Doyle and Bhargava (2012) focus primarily on the case of homeowners
### Exhibit 2 | Barriers and Opportunities

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Barriers</th>
<th>Awareness, Interest, Skeptical Predisposition</th>
<th>Competency Deficiency</th>
<th>Information Deficiency</th>
<th>Time / Budget Pressure &amp; Process Commoditization</th>
<th>Professional Differences between Appraisers and Sustainability Professionals</th>
<th>Risk Aversion</th>
<th>Public Policy Vacuum</th>
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<tbody>
<tr>
<td>Elevating the Competency of Appraisers</td>
<td>Professional standards of care</td>
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<td>Enhancing training and professional development</td>
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<td>Developing Better Information Resources</td>
<td>Research</td>
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<td>Property-specific information</td>
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<td>Green market activity</td>
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<td>Improved Energy Benchmarking and Rating Tools</td>
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<td>Better Characterizing &amp; Managing Risk</td>
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<td>Integrating Disaster Resilience and Sustainability</td>
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<td>Mitigating the Problem of Additional Time / Cost for Performing Assignments</td>
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<td>Enhancing Demand for Improved Appraisals</td>
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<td>Engaging New Market Participants</td>
<td>Utilities</td>
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attempting to finance retrofits. They echo the current finding that homeowners and lenders need to be proactive and engage appraisers.

Elevating the Competency of Appraisers

Professional Standards of Care. I am not aware of national surveys that have been conducted to characterize the level of knowledge and competency among appraisers, or the obstacles to enhancing their practice. This would be a natural place to start in order to inform efforts to set baselines, establish goals, and track progress. Modest localized efforts have demonstrated that appraisers can be successfully polled and their awareness of and engagement in green/HP appraisals measured (Bently, Glick, and Strong, 2015).

Recent public domain work by the Appraisal Foundation (Briggs et al., 2015) together with publications of the Appraisal Institute lays important groundwork for more systematically incorporating green/HP considerations in the standards of care for valuation professionals. There is room for more elaboration and training to build competency, particularly in such a rapidly changing field. Contemporary examples of areas needing attention is the trend towards net zero energy buildings, which invokes some particularly special considerations for appraisers (Runde, 2015), and technologies enabling real-time demand response by “smart” buildings.

While the forthcoming Appraisal Foundation advisories on green/HP practices will be voluntary, state regulators may adopt elements of these guidelines and make them required for appraisers in local markets. Interested parties may seek to work with localities towards this end. The Appraisal Foundation also manages the Uniform Standards of Professional Appraisal Practice (USPAP). These guidelines currently allow for an appraiser to identify competency gaps and to acquire that competency during the course of the relevant assignment. Requiring competency before an assignment is accepted would be a more effective way to safeguard the process. By analogy, following concerns about competency and ethics in the over-valuation of conservation easements, some jurisdictions now require that the appraiser sign an affidavit that they possess the education/experience required for these assignments.

Training and Professional Development. Training and other forms of professional development can address multiple barriers, and enable appraisers and other participants in the process to obtain sufficient competency. The DOE identified appraiser education as a leading policy goal (USDOE, 2014). They noted that state energy offices can provide financial inducements to defray training costs, and that Alabama and Colorado have subsidized appraiser education on green buildings. However, training efforts have thus far been largely piecemeal and their availability limited with no particular training on green/HP issues acquired as part of an appraiser’s education. Increased access to training deployment is needed. For example, training offered by a given professional society is generally only available to its members.

A series of courses is offered by the Appraisal Institute (covering an introduction to “green,” case studies for residential and commercial buildings, solar valuation,
and residential green description). The DOE’s Guidelines for Building Science Education are aimed at appraisers. In 2011, the NAR incorporated an introduction to energy efficiency in its General Accredited Appraiser training program (Doyle and Bhargava, 2012).

Training uptake is quite limited. The Appraisal Institute is reported to have had 257 appraisers complete one or more courses in their sustainability program as of 2014, about 1% of membership (McGraw Hill, 2014). According to one account, only 14 residential appraisers in California (a particularly advanced state concerning green/HP buildings) had completed the Appraisal Institute’s training series (California Energy Commission, 2015). This compares poorly with the 11,000 licensed appraisers in California as of January 2015. A multi-state grant supported some appraiser training in Alabama, Massachusetts, Virginia, and Washington (Cadmus, 2014), but no information was provided on numbers of appraisers reached.

Improved depth can no doubt be offered on topics such identifying third-party experts and how to vet them and incorporate their conclusions into the valuation process, codes and standards, market data, finding and judging various energy models and data sources, and how to evaluate a solar lease or power purchase agreement. DOE is currently developing appraiser training in benchmarking and rating tools and its “Building America Building Science Translator” is a resource that could be promulgated more widely in the appraisal community (USDOE, 2015).

The use of case studies is a long-standing teaching methodology. Many case studies have been performed for individual buildings, although not many have made their way into training. Future case study work and associated training should also focus on whether under-performing buildings received below-average valuations (the so-called “brown discount”).

Training is also needed for other affiliated parties, such as appraisal reviewers, lenders, builders, property managers, and policymakers. Of note, the administrative staffs to whom appraisal requests are handed within lending institutions are typically less familiar with the project in question and also have less training than the presiding loan officer. Training focused on these individuals could thus be particularly valuable. Reciprocal training is also needed for those in the green/HP community (e.g., program designers, code officials) who seek to engage constructively with appraisers. CNT and the National Home Performance Council (2013) offer additional insights into training strategy.

**Developing Better Information Resources**

Many information gaps exist, and what is available does not flow easily to potential users. Even with good information, no professional organization provides a single turnkey pathway for reaching all practicing appraisers. Appraisal association membership is very fragmented, the top three being the Appraisal Institute, with membership representing about 43% of the those being members of any association, followed by state coalitions (~25%), NAR (~20%), and
NAIFA (~15%). Two-thirds of appraisers do not belong to any trade association. This complicates outreach efforts. An appropriate third party may be able to provide the needed clearinghouse role. The DOE has initiated an effort along these lines in the Information Atlas for Appraising Green and High Performance Buildings.14

**Research.** New green/HP research is published on a regular basis, but has little visibility or effect in mainstream appraisal circles. Most of the research is too technical and specialized to be readily usable by appraisers. Policymakers may seek to mount a sustained effort to make the products of this research more accessible to appraisers.

There is a need to improve the design and quality control of valuation research and methodologies as applied to green/HP buildings. Given the methodological flaws in some past studies (Laquatra, Dacquisto, Emrath, and Laitner, 2002), efforts should be made to produce more useful analyses. Interested parties could attempt to work with the Appraisal Foundation to help improve hedonic methods already utilized in the USPAP. Irrespective of methodology, care must be taken not to generalize findings into over-simplified rules of thumb. For completeness, researchers should also test the hypothesis that sub-average performance (sometimes referred to as “brown discount”) erodes property value.

**Property-specific Information.** Assertions of performance are not very defensible without robust data and detailed descriptions of the physical characteristics to which performance is being attributed. Appraiser reliance on stipulated or “default” values can understate value when the subject building is high-performing. To fully access the required information, it may be necessary for appraisers to tap third-party experts. Data and tools are needed to help identify the energy codes to which a subject home and sales comparisons are constructed. LEED point lists are also convenient sources of information.

The problem is far more difficult for less tangible factors such as indoor environmental quality (IEQ), which appraisers would characterize under the rubric of “habitability.” Connections between abstract notions of IEQ and issues that are more tangible to building owners (health, safety, moisture damage) are often not presented effectively. Equipping consumers and appraisers with actionable information on the indoor environment is an important step towards valuation. The Green and Efficient Addendum for residential and commercial buildings could be enhanced to capture more useful information of this sort, and appraisers could be empowered to extract more of this information from home inspections and associated measurements and mitigations. Certain IEQ attributes do not require expert assessment, and existing appraisal methods accommodate the consideration of the costs to cure deficiencies.15 Indeed, appraisers already address issues such as pet odors, mold and moisture problems, local radon mitigation requirements, and proximity to sources of unhealthy outdoor air.

As previously noted, owners/developers are a key source of information and more efforts could be made to support them in conveying useful information about green/HP features to appraisers.
Green Market Activity. In an ideal world, databases of property sales would provide all the information necessary for appraisers to conduct sales comparisons for green/HP homes. Some providers (e.g., CoStar, Loopnet, and Xciligent) report having achieved this for commercial properties, yet practicing appraisers note concerns about completeness and quality control on the underlying data. Multidisciplinary efforts could improve the rigor and availability of these kinds of databases and associated analyses. The Green MLS project is the leading effort in this regard for residential buildings, but has low data density.

The green/HP community has stood up various databases of high-performance buildings. Some are program specific (e.g., ENERGY STAR) while others aggregate databases (e.g., the Green Building Information Gateway). For applications to the valuation process, these efforts are lacking in two respects. Firstly, the databases do not contain sales information and thus are not directly useful in sales comparison studies. Secondly, these focus on ostensibly exemplary buildings, whereas appraisers must consider the entire performance spectrum. The Building Performance Database (BPD) is an important effort in this direction (including buildings irrespective of their level of energy use), but is not paired with real estate sales data and is not intended to be representative of the overall building stock or of green/HP buildings in particular. Furthermore, the BPD anonymizes the property data, and thus cannot be used to “look up” an individual building.

Valid comparisons must encompass energy data, physical characteristics, and operational factors. RES.NET has opened up its home registry, making HERS Scores for homes rated in 2012 or later available for potential correlation with home sales. Participants in green/HP programs should be enabled to archive key documentation in a way that can be readily accessed by appraisers. Data gathered under such programs (e.g., ENERGY STAR, Home Energy Score, etc.) and software (e.g., PV Value) should be better mobilized to the Green MLS, the Appraisal Institute’s Green and Energy Efficient Addendum, and into local market analyses, while preserving consumer privacy—an opt-in system could be offered in this regard. About 60% of appraisers report being willing to contribute to a shared database if they were paid for their effort (Alltera Group, 2015).

Aside from individual building characteristics, appraisers require data on prevailing conditions and contextual factors such as climate, energy prices, building codes, policies, and buyer attitudes. Examples such as CBRE’s Green Building Adoption Index exist for commercial buildings, but none are yet available for residential properties (Kok and Holtermans, 2014).

Improving Green/HP Benchmarking and Rating Tools

The tools and software for green/HP buildings assessment is bewildering at best and unknown to most appraisers at worst. The language is foreign and the subject matter knowledge required to use and interpret results is out of reach.

Leading rating and benchmarking tools have limited utility for appraisers, which is not surprising given that they were not developed with appraisers in mind. Some
(e.g., the Building Performance Database or the Home Energy Score) do not provide essential baseline energy expenses. The vintage of the data within these tools is not always specified or filterable, leaving the appraiser uncertain as to whether a given view is representative of current market conditions.

These tools do have value in providing descriptive information on green/HP features and metrics and ratings with contextual value for the population of reference buildings being benchmarked. The advent of asset scoring removes important uncertainties in the estimation of standardized energy use independent of user behavioral drivers, geography, and year-to-year weather variations.

As many of these tools and datasets have application programming interfaces (APIs), an effort could be made to collaborate with appraisal software vendors to pull relevant data fields into their tools and apply them in a context and format more familiar to appraisers. Recent efforts to enable residential energy audit software to automatically populate the Appraisal Institute’s Residential Green and Energy Efficient Addendum serves as an example. Traditional valuation software can also be improved by better modeling of cost and risk factors. For example, utility costs are often stipulated as national or regional averages, which impedes consideration of higher performance.

**Better Characterizing and Managing Performance Risk**

A key function of the appraisal process is assessing the risks and uncertainties associated with a subject property. Indeed, as noted in the Appraisal Foundation’s advisory on competency for green/HP buildings, there is risk in insufficient knowledge or experience that results in “assigning value, or no value, to green components without market support” (Briggs et al., 2015).

Energy use and savings persistence is likely foremost among these risks. Appraisers must understand the techniques used to characterize and reduce this uncertainty, energy savings tracking, regular maintenance, and application of well-validated simulation models for rigorous savings estimation (Parker et al., 2012). On the up side, green/HP buildings are intrinsically subject to reduced utility price volatility.

Green/HP buildings can mitigate certain physical risks (e.g., indoor air pollution), but can also present their own unique risks, such as water damage from vegetated roofs or solar panels on rooftops posing a hazard and impediment to firefighters, etc.

**Integrating Disaster Resilience and Sustainability Considerations**

Natural hazards are a contextual factor that appraisers are implicitly expected to consider in the valuation process. Appraisers and building owners alike are arguably more attuned to natural hazards and the vulnerability of properties than they are to green/HP issues. That green/HP properties can be more disaster resilient merits consideration as appraisers assess what is known as “functional utility” (Mills, 2002). Some building professionals assert that a high-performance...
building cannot be deemed truly green or sustainable if it is not durable in the face of extreme events or every-day factors that stand to degrade the facility.

Natural disasters and associated economic costs continue to rise, impacting property value through proxies such as rising insurance premiums and fortification costs. As recognized by the Institute for Business and Home Safety (IBHS), the U.S. Green Buildings Council, the DOE, and others, certain sustainability attributes enhance a property’s everyday durability and ability to endure or adapt following natural disasters. Examples include the water damage resilience of closed-cell foam insulation or the fire-resistant properties of multi-pane windows. Sustainability attributes can shorten or even eliminate disruptions following a power outage due to backup generators or on-site energy storage. The correction of defects often translates into enhanced equipment life, improved occupant comfort, avoided premature equipment failure, and early detection of fire hazards.

**Mitigating the Problem of Additional Time/Cost for Performing Assignments**

The additional time and cost to identify and evaluate green/HP features stands as a critical problem for appraisers. LEED building checklists provide convenient data on relevant building characteristics. Newer tools such as the Appraisal Institute’s Green and Energy Efficiency Addendum help structure the collection and presentation of relevant data, although a user guide is much needed.

Mobilizing more and better data on sales and market characteristics (energy prices, building codes, etc.) in a form appraisers can use would also make the process more time-efficient. A public goods, open-access directory would be a welcome resource for the industry. Widespread existing efforts to compel disclosure and public access to utility data (focusing thus far only on commercial buildings) are an example of pooled data that is readily accessible by appraisers.

Third-party incentives or financing of the costs of information acquisition may be feasible (e.g., by utilities, as mentioned below, or other stakeholders). Incentives to defray green/HP training costs would also be of value.

**Enhancing Demand for Improved Appraisals**

In the absence of demand for green appraisals (from owners and those who order appraisals), the incentive to make the added effort and investment building competency and gathering data will remain limited.

 Owners improving their property clearly have an interest in recovering their investment during the holding period and upon sale. Lenders need to fully understand this value and associated performance risks. Third-party stakeholders such as insurers and green/HP program implementers have aligned objectives, and policymakers seek to remove market failures resulting from non-valuation of green/HP elements of the building stock.
To support thorough appraisals, owners of green/HP buildings should compile relevant information and insist that it be considered. It is critical that expectations are articulated and key information is disclosed at the outset, identifying the collateral as a green/HP building, noting that specific features should be considered in the valuation assignment, and stating the expectation that the appraiser have competency in line with the assignment complexity. This process could be supported by an owner-completed standardized disclosure of building features and available supporting documentation, analysis, and reports. The Appraisal Institute has promulgated model statement of work language for residential appraisals, which calls for competency in green/HP as well as citing a national “Green Value Score” upon which appraisers can rely. AMCs could be an effective intermediary between banks/clients and appraisers for deploying improved methodologies, although their reputation is to oversimplify the process rather than to improve it.

Builders can also provide key information. In one example, a builder of high-efficiency homes introduced the following language into guidance to lenders to help identify qualified appraisers. “This home is being built/renovated/updated to nationally recognized standards above prevailing code. It is designed and constructed with unique features and materials and with high efficient equipment and in accordance with high efficiency standards. The Lender shall choose an Appraiser educated and knowledgeable in this type of valuation of these specialized Homes, preferably an appraiser who holds a professional appraisal designation that requires advanced education on such issues as the valuation of sustainable buildings (e.g., MAI or SRA designations from the Appraisal Institute). The appraiser shall provide verification of green valuation education of 14 hours or more from a qualified educational provider and knowledge to be permitted to conduct the appraisal for this project.”

Another opportunity arises near the conclusion of the appraisal assignment, when the draft report is reviewed. Such reviews rarely consider green/HP factors. A new level of arms-length technical review could be created (e.g., by interested utilities, state energy offices, or universities). Clients may elect to contest an appraisal that they feel does not adequately address the property’s green/HP features.

Legislating better practices for appraisers at the federal level or as augmentations to federal minimum requirements at the state level could be explored. Recent efforts to do so indicate the need for further refinement.

**Engaging a Greater Diversity of Market Participants**

While the real estate valuation “ecosystem” is already a busy landscape, certain potentially valuable trades and professions with bearing on green/HP are absent or only peripherally engaged. Utilities and insurance companies are key examples. **Energy and Water Utilities.** To the extent that utilities are compelled to support the improvement of energy and water efficiency within their customers’ homes, they may align themselves with efforts to ensure that appraisals capture the value.
Conversely, property owners eager to see their green/HP investment recouped will be more likely to participate in utility programs.

In a rare effort on the part of utilities to survey and assess the role that real estate appraisers could play in their programs (Roper Starch Worldwide, 2003), residential appraisers were found to have limited awareness of utility or federal energy efficiency activities, and few addressed it in their work. Utilities and appraisers should be polled more frequently (and at national scale) to determine whether other efforts have been made, lessons learned, and new opportunities.

Numerous U.S. utilities have offered free or discounted energy education to appraisers. These include Georgia Power, Duke Energy, Arizona Public Service, the Salt River Project, and others. There is a much broader array of ways that utilities can engage.

In addition to an educational role, utilities could help mitigate the “lowest-bidder” syndrome through provision of financial incentives to qualified appraisers to defray the costs of the additional time spent incorporating green/HP analysis into the traditional appraisal. Alternatively, utilities could underwrite the costs of third-party experts to facilitate data gathering, analysis, review, etc. Where utilities interoperate with lenders (e.g., through energy efficiency upgrade financing programs), they can insist on the careful application of competency criteria during the appraiser selection process. A key caution in any new form of third-party engagement is to avoid any real or perceived conflict of interest or potential to introduce bias into the process.

**Insurance Industry.** Insurers and appraisers have a variety of overlapping goals and interests, yet insurers have not thus far been engaged in the green/HP appraisal discussion. For example, appraisers are sometimes commissioned to prepare an “insurance value” appraisal, which is a variant on full valuations insofar as certain items (e.g., land or excluded features) are not included. Where applicable, green/HP features should be part of such an assignment.

The insurance industry is already engaging efforts to promote resilience, incentives for disaster-resilient practices, and adjusting premiums to reflect building code quality and enforcement. The Institute for Business and Home Safety offers guidelines on disaster-resilient buildings; some insurers assess lower premiums to these buildings, which could be of relevance to the appraisal process. Conversely, insurance premiums may be adversely impacted by sub-par ratings within the insurance industry’s Building Code Effectiveness Rating Scale.

Insurers and appraisers alike are concerned about associated (inadvertent) downside technical risk in green/HP properties, ranging from energy savings persistence to health and safety factors. Existing energy-saving insurance products coupled with engineering oversight to help address performance risk (Mills, 2003). Collaboration on identifying and managing these risks could be mutually advantageous.

Appraisers typically carry errors and omissions liability insurance, which has the potential of being triggered if there are disagreements around the handling of
green/HP issues. It has been suggested that appraisers may even share in liability underachievement of promised energy savings (Austin, 2012). This is more of a prospective than current issue in the industry, but analogous litigation has been seen involving architects and engineers. In particular, appraisers assume legal, reputational, and ethical risks by overlooking green features, utilizing unsupported or inappropriate adjustments to value, or having any real or perceived bias toward or against green/HP (Briggs et al., 2015). Liability claims can arise, for example, if the appraisal is contested for inadequately treating green or high-performance features or overestimating value. Undervaluing green/HP features could result in an appraisal coming in below a contracted selling price, which could in turn scuttle a transaction and create disputes. Insurers thus have an interest in proactively enhancing appraiser competency and quality assurance during the appraisal process and in tailoring their products and services to recognize these risks and reward best practices through policy terms and conditions. Insurers are proponents of risk management and loss prevention, illustrated by the benefit of Green MLS in reducing liability associated with undocumented claims about property attributes (NAR, 2014).

Conclusion

A variety of largely uncoordinated strategies have attempted to improve the process of valuing green/HP residential properties. These are overlain onto a tumultuous market and regulatory environment faced by appraisers, characterized by questions of appraisal ethics and independence from lender interests. This juxtaposition is an important one, as it impedes any outcome that assigns higher values for special conditions. The regulatory changes made after past financial crises have impacted the appraisal profession’s structure and how appraisals are conducted, while adding substantial transactional costs.

Nonetheless, huge scope exists for elevating appraisal practices to more routinely include green/HP considerations. Addressing barriers and capturing opportunities can be achieved more effectively through collective engagement and input from multiple stakeholders. It is not only the appraiser that needs to be involved. Homeowners, builders, lenders, utilities, and insurance companies should also collaborate and provide input on how green/HP factors impact property valuations and ways to accurately reflect these considerations in appraisals and real estate transactions more broadly.

The domain of risk assessment and management is perhaps the most dominant and crosscutting barrier-opportunity nexus. Appraisers are ill-equipped to quantify uncertainties in the potential upside benefits of green/HP on expenses. It is also challenging for appraisers to determine whether a property will perform as advertised or whether it is under-built (“obsolescent”) or overbuilt (“superadequate”) for a particular market. Meanwhile, many green/HP attributes bear hidden risk-reducing benefits in terms of improved indoor environmental quality and disaster resilience. In wading into these new areas of analysis, appraisers themselves face competency risk and associated reputational risks. But they also face equal risk in ignoring these emerging facets of buildings. Better
data, understanding, tools, and perhaps even innovative insurance products can help to manage downside concerns while better resolving the relations between green/HP and investment risks.

Increased owner engagement is another key need. Owners are commonly uninformed (and arguably un-empowered) about their role in gathering/sharing relevant information with the client and appraiser, and are yet in an ideal position to do so. Lack of this information contributes to an ineffective scope of work at project inception, thereby hobbling the entire process. Meanwhile, appraisal review is a final opportunity to affirm that best practices were employed and information properly considered. Model documents and procedures may help streamline this process.

Another significant source of inertia is the vast amount of information to be collected and considered, and the corresponding time requirements and cost. Thus, of key importance is designing and implementing more time-efficient systems for mobilizing and analyzing salient information. Public research entities can support the process by making existing tools and data more usable within the valuation profession. There may also be a role for financial incentives (e.g., from utilities), to help defray some of these transaction costs, particularly given the “lowest-bidder” syndrome that impinges on the appraiser selection process.

Cutting across these individual activities, there is a need for outside stakeholders (such as public agencies) to formulate and follow a disciplined roadmap instead of piecemeal initiatives, bridging the professional/cultural divide between appraisers and green/HP communities, and tracking progress in order to know what is working.

There is no silver bullet for advancing the practice of valuing the green/HP features of buildings. Close collaboration between appraisers and other experts is critical. Large organizations and agencies should have a united approach that includes all stakeholder perspectives. This requires improved communication and education within and between these communities.

Endnotes

1 Here “green” refers to the entire panoply of green building strategies, including sustainable materials, improved indoor environmental quality, site-sensitive citing, water efficiency, and energy efficiency. High performance refers primarily to energy and the indoor environment. The building sector and appraisers alike have long struggled with ambiguity in these definitions.


9 Personal communication, Sandra Adomatis, September 8, 2015.


13 A catalog can be found at: https://sites.google.com/site/appraisinghpbuildings/valuation.

14 See https://sites.google.com/site/appraisinghpbuildings/.

15 See https://sites.google.com/site/appraisinghpbuildings/key-topics/indoor-environmental-quality.

16 Appraisers typically require four to six sales comparison, or one highly identical paired sale.

17 Note that CoStar does not list buildings with sales prices under $250,000. See http://www.costar.com/News/Article/Case-for-Green-Buildings-Grows-Stronger-for-Owners-Occupants/127092.


22 See https://sites.google.com/site/appraisinghpbuildings/key-topics/quality-assurance.

23 See https://sites.google.com/site/appraisinghpbuildings/key-topics/disclosure-1.


27 See https://www.disastersafety.org/building_codes/rating-the-states_ibhs/.


29 A leading errors & omissions liability insurer for appraisers is LIA. See http://www.liability.com/.

30 See http://www.greenbuildinglawblog.com/.


NAHB. NAHB Green Toolbox: Overcoming Appraisal Challenges. No date.


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