Value at the Nexus of Energy and Real Estate

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Introduction

This whitepaper is the result of a collaboration between Rocky Mountain Institute (RMI) and the Urban Land Institute (ULI) who are working together to explore innovation at the nexus of new information technologies, business models, energy policies and finance mechanisms which are emerging across the global real estate marketplace today. Key content from this paper was presented at the ULI Global Policy & Practices Forum: “The New Calculus: Technology, Energy & Real Estate in Houston March 6th, 2013.

Our exploration of innovation in network and building technologies, energy efficiency solutions, building performance measurement, infrastructure, and energy efficiency finance has reinforced our recognition of the central role value plays in driving energy, and related technology investment, in real estate. The real estate industry is at a crossroads. Energy & related technology investment is growing, but without explicit consideration of value and risk in decision-making, investment will remain limited, an unacceptable result for society and profit-maximizing investors.

The purpose of this whitepaper is to energize and focus the sustainable property value discussion and actions to expand the breadth and depth of energy/sustainability investment. Specifically, the report will: 1) describe why value is at the nexus of energy and real estate, 2) present Rocky Mountain Institute’s (RMI) innovative new approaches to calculating and presenting value to decision makers, and 3) identify value related activities underway in the industry and outline additional steps needed to transform the energy/sustainability performance of the property sector.

Value at the Nexus of Energy and Real Estate

Value is at the nexus of energy and real estate because without proper recognition of the value that energy investment creates in properties and companies, energy investment will remain below what society requires, and investor profits would suggest is prudent. Energy cost savings is necessary, but not sufficient, to both motivate investors, and support the deep energy retrofits and renewable investments needed.

Today, most investors in energy efficiency ignore real estate value, instead basing their retrofit decisions on simple payback of energy costs, with an average allowable payback period of only 3.4 years. Even current industry best practice analysis (Life Cycle Cost Assessment) only incorporates energy cost savings, operating cost reductions, and cost avoidance over the life of improvements, while still largely, if not completely, ignoring value and risk.

The result of ignoring value and risk has been slow adoption of deep energy retrofits and renewable energy in both the commercial and residential sectors, despite tax subsidies, grants, entitlement incentives, favorable financing (in limited cases) and government/utility-supported efforts to ease the burden on investors/service providers.

1 2012 Energy Efficiency Indicator, Global Results, June 2012, Institute for Building Efficiency, Johnson Controls.
What is Sustainable Property Value?

There are a number of ways to think about sustainable property value, and they are all important. One way is to think of sustainable property value as the incremental value contribution (“value premium”) of the energy/sustainability component of a retrofit, new investment or renewable investment. Another way to articulate the concept is to think about the “Value Beyond Energy Cost Savings” that is derived from health and productivity benefits, reputation and leadership, and other non-cost benefits.

In practice, when calculating sustainable property value contributions, sustainability investment (and property outcomes) should be treated like one of the many factors that influence value (location, tenant mix, quality of design, etc.) and appropriately incorporated into the analysis. The relative value contribution of sustainability can only be understood, and calculated and presented, in the context of all the factors that influence value. This imperative to consider sustainability in the context of all factors that affect value simultaneously, the standard daily fare of appraisers and due diligence analysts, is why statistical studies often fall short, and attempts to calculate the incremental value contribution of sustainability are difficult.

Sustainable property value is more than value is that the application of value knowledge to decision-making goes well beyond the production of formal appraisal reports. Sustainable property value knowledge can and should be applied in equipment/system/technology decisions, tenant improvement analysis, as a supplement to a simple-ROI analysis, in acquisition analysis, and in portfolio rebalancing and repositioning.

One of the most important things to understand about value is that it incorporates risk. Property value is simply the net operating income divided by a capitalization rate. Most commercial properties are valued looking at a stream of cash flows over time, with an assumed sale of the property in the future (NOI in last year divided by cap rate—called a residual cap rate). This string of cash flows is brought to a present value by applying a discount rate—which is simply the rate of return required to attract an investor to the stream of cash flows. Accordingly, the discount rate and the residual cap rate incorporate the markets assessment of the risk associated with the string of cash flows.

What the value formula (which is similar for a company’s value) establishes is that risk is not a soft, indirect, or non-financial consideration, but one of the most important value elements in sustainable property investment. For example, if I have a long term $1000 annual net cash flow from a Google lease, I might only require a 4% return, which would on a simple cap basis value the lease at $25,000. However, if I have the same $1,000 cash flow from a forecasted energy cost savings from a retrofit, I might want a 10% return, which would value the same cash at $10,000, a 60% value reduction.

Simply put, even if you did nothing else but clearly identify risks, and how they are managed and mitigated in a simple-payback analysis you prepared for a retrofit capital request, you would

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2 This term was first used by Scott Muldavin in his 2010 book “Value Beyond Cost Savings: How to Underwrite Sustainable Properties, and is the name of Rocky Mountain Institute’s sustainable value work.
have successfully applied important value concepts in a way that is not typically done today. In the next section we will present an innovative new definition, based on classical valuation theory that will help clarify how to define sustainable property value to enable a structured calculation and presentation of sustainable property value.

How Will “Value” Knowledge Expand Energy Investment?

While industry participants have different requirements of value knowledge, deep and broad energy investment in real estate will be limited until sustainable property value and risk can be integrated into decision-making. The central and important role of value for key groups is illustrated and discussed below:

**VALUE AT NEXUS OF ENERGY & RE**

**Advisors**

Commercial property sales and leasing brokers, architects, engineers, and non-profit energy advocates all play a critical role in advising their clients on their energy efficiency/sustainability choices in their real estate decisions. Their inability to integrate value and risk into their discussions, and in the case of architects, engineers and consultants, into their calculations and recommendations has been a big limitation on both the breadth and depth of adoption.

**Capital Providers**
Private equity investors like pension funds, REITs, and corporations/owner-occupants have taken the first steps to move sustainability forward, but thoughtful calculation and presentation of value is required to increase the depth and breadth of investment. Private investors are confronted with the challenge to address sustainable value issues in their appraisal management, acquisition, research, performance measurement, and capital raising functions. As value investors, this sector is poised to address this issue.

Government agencies like the General Services Administration and the Department of Defense have had to focus on the “value” and non-energy cost benefits of sustainability investment to support their continued investment in higher levels of energy efficiency and sustainability. This trend for governments to support their investments with value arguments is expected to grow.

**Execution**

You might expect the value challenges for Property Assessed Clean Energy (PACE) Sponsors, Energy Service Companies, and utility sponsors to be limited because they all base their lending and service offerings on that which can be supported by energy cost savings alone. In fact, value has become a central consideration in the future success of PACE, and related programs. The issue has been demand for the programs by borrowers. The rates look good, and longer terms are positive, but borrowers need to be “sold” on the potential value benefits of the investments, with a particular focus on risk mitigation and management. These same issues are also important to convince first mortgage holders to approve the secondary liens, which is required or sought in most circumstances.

**Due Diligence**

Every retrofit or renewable investment has somebody, typically multiple somebody’s, charged with taking a hard look at a project’s assumptions. Due diligence people do not need “empirical” or statistics based evidence to prove every point, but they do need to clearly understand the support for assumptions about value and risks. Structured analytic methodologies applied rigorously by professionals are what are needed in the value space to move forward.

**Stakeholders**

Sustainability and energy efficiency have become central concerns to regulators, employees, customers, clients, boards, and other stakeholders. The most successful deep energy retrofits and renewable investments require clear presentation of the value proposition.

**Innovations in Retrofit Valuation**

While a growing body of statistical evidence suggests rent premiums of 3 to 6% and sales price premiums of 10% or more for green office buildings and the health, productivity, and recruiting

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3 The term retrofit in this paper refers to a property retrofit that incorporates sustainability/energy efficiency measures.
advantages for occupants of sustainable properties are becoming better known, authoritative
guidance on how to calculate and present value of sustainable investment for specific property retrofit decisions has not been available.

RMI’s Value Beyond Energy Cost Project (VBECS) Project is working to fill this gap, integrating Scott Muldavin and the Green Building Finance Consortium’s work in “Value Beyond Cost Savings” with RMI’s historic strengths in best practices building technology, design, and retrofit execution. The first phase of our work will be available in the Spring, and represents a significant advance from earlier work due to its focus on retrofits, explicit separation of occupant and investor value models, more direct link between specific energy efficiency measures and value, and focus on a structured process for calculating and presenting value.

In this section, we summarize some of the innovations and insights from our work to date, including our foundational Retrofit Value Models, some observations on retrofit value evidence, and an introduction to our seven principles for retrofit value presentations.

**RMI Retrofit Value Models**

The work and discussions about the value of retrofits has often been confusing, and hard to apply at a property level, because retrofit value models for occupants and investors have not been explicitly separated. While there is significant overlap, especially if the occupant is also the owner of the property, there are significant differences in how performance is measured, and how the value of the retrofit is calculated and presented.

**RMI Retrofit Value Model for Occupants**

For occupants, the value of the sustainable/energy efficient retrofit is defined as the value contribution to the occupant’s “enterprise”, and value should be calculated and presented in those terms. Accordingly, it is the value as determined by enterprise cost savings, enterprise revenue enhancements, and enterprise level risk management and mitigation that matter to occupants.

RMI’s Retrofit Value Model for Occupants is illustrated below:

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4 Over a dozen studies provide evidence suggesting a 3 to 6 % rent premium and 10% or more sales price premium (See codes 15.71 and 15.72 of Green Building Finance Consortium Research Library (www.GreenBuildingFC.com).


6 We use the term “enterprise” to broadly incorporate all types of occupant including corporations, partnerships, government entities, non-profits, or other types of organizations.
To properly calculate and present the value of a retrofit you need to understand how value is created—skipping steps can confuse the facts and message. The better you understand and communicate the linkages shown in the graphic, the better supported your financial analysis will be. This is particularly important for retrofit decisions because they are typically made based on forecasted performance, meaning capital providers must be convinced of the logic and basis of the forecasts.

First, as shown in columns 1 & 2 above, energy efficiency measures, other sustainability measures, and retrofit processes result in property and process outcomes. You do not automatically achieve all the retrofit outcomes with a certified sustainable building; you must actually assess and determine which outcomes were achieved given the design and execution strategies followed for a specific retrofit.

Second, the property outcomes that are achieved generate enterprise performance, which is measured through a combination of property and enterprise performance measures. We have
made the decision for the purposes of our work to separate out the property performance and operations, although it really is logically just a component of enterprise performance. Note that occupant performance in column three is broken out by individual occupant performance and occupant performance at the enterprise level. This breakout is important in order to be able to calculate and present value as shown in the fourth column—Retrofit Value.

Finally, column four presents the 16 value elements that together define the value of a sustainable/energy efficient retrofit for occupants. The key to calculation and presentation is to use the terms relevant to the capital providers. Productivity benefits are good, resulting health cost savings and employee cost savings are great. Reputation and leadership benefits are interesting, but higher revenues, lower employee costs, and reduced enterprise risk are career enhancing.

RMI Retrofit Value Model for Investors

For investors, the value of an energy/sustainability retrofit is defined by the value contribution to the property. RMI’s Retrofit Value Model for Investors is illustrated below:
As can be seen from the illustration above, the Design and Execution Practices and Retrofit Outcomes shown in columns 1 & 2 are evaluated in the same way for occupants and investors. The real difference starts in how property performance is evaluated as shown in column 3. While fundamentally, the value that occupants recognize from retrofits drives both occupant and investor value, the way you measure performance and apply performance data to determine value is very different.

As shown in column 3, in order to calculate retrofit value for investors, you must measure the demand for sustainability by occupants, investors, and regulators and utilities associated with the property. This represents a significant divergence in methodology from the RMI Retrofit Value Model for Occupants, requiring a more traditional real estate market analysis focused on tenant and investor demand for the sustainability performance (outcomes) of the specific subject property.7

As shown in Column 4, the Retrofit Value Model for Investors follows a traditional real estate property value framework incorporating initial development costs, operating costs, revenues, and risk. The difference, and challenge in the Retrofit Model is that the goal is the incremental value premium as a result of the sustainability/energy efficiency aspects of the retrofit. Finance costs are also included in the Retrofit Model, and not in a traditional property value model, because of the unique, and valuable benefits available for some retrofits through subsidized financing.

The power of RMI’s Retrofit Value Model for Investors is that value is calculated and presented in the language of real estate investment. Occupant demand is good, higher occupancy, faster absorption and higher tenant retention is great. Stronger investor demand is interesting, lower capitalization rates and higher value means I can raise more capital for future investments and keep my profitable company growing.

**Observations on Retrofit Value Evidence**

The topic of creating the data to support energy efficiency and sustainable property investment decisions has got a lot of attention from academics, governments, and practitioners. As might be expected, given the nearly sole focus on energy cost savings as the basis for approving capital for retrofits, most of the effort, and money, has gone to energy transparency and disclosure in buildings, consistent definition and measurement of energy use and cost, and related activities.

The scientific and academic community has focused on measuring the property, and in some cases, financial performance of scores of different inputs into a sustainable building including energy efficiency measures like lighting and controls, daylighting, and HVAC systems or sustainable processes like commissioning and various operations and maintenance strategies.8

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7 A detailed presentation of how to underwrite market demand for sustainable properties can be found in Section F. Underwriting Space User Demand, in Chapter VI of Value Beyond Cost Savings: How to Underwrite Sustainable Properties”.

8 See pages 7 to 78 of Expanded Chapter IV: Sustainable Property Performance in “Value Beyond Cost Savings: How to Underwrite Sustainable Properties for a detailed presentation of value evidence from specific sustainable processes and features/measures.
Hundreds of studies have focused on the relationship between specific sustainable/energy efficiency measures and various individual health and productivity outcomes.  

A disconnect exists between the output from many of these performance measurement and scientific research efforts and the inputs capital providers require for their sustainable investment decision-making. For example, in some cases, the right information is collected, but it is not presented in a useful format, or critical information necessary for appraisers/due diligence professionals to interpret the work is not properly or thoroughly presented.  

Following the logic that the analytic models used for decision-making should drive the form and content of data collection/development efforts, substantial additional attention needs to be paid to the many inputs needed to calculate and present the value of retrofits effectively. One area of need is better documentation of the specific retrofit processes and risk mitigation practices that were applied for a specific retrofit. More frequent, consistent, and better surveys of occupants and investors are needed to enable more sophisticated assessments of the demand for sustainability in multi-tenant buildings. Similar studies for investors are also needed.  

Seven Principles for Successful Retrofit Value Presentations  

All retrofit value presentations are not created equal. The format, length, and emphasis will vary based on the type of capital investment (equipment or system replacement, minor retrofit, major retrofit, etc.) and the specific energy efficiency and sustainability measures recommended. However, regardless of the type of capital investment, there are seven principles that should be followed in conducting the analysis and preparing retrofit value presentations:  

1. **Employ a Structured Repeatable Analytic Process**  
2. **Know Your Audience**  
3. **Present VBECS as a Supplement**  
4. **Do Not Present Like You Calculate**  
5. **Be Property and Company Specific**  
6. **Avoid Double-Counting—Know Your Data**  
7. **Present Risk Context for Decision**  

1. **Employ a Structured and Repeatable Analytic Process**  

It is important that retrofit value presentations follow a structured and logical process that is consistent with what capital providers are used to reviewing prior to allocating capital. Given the high level of subjectivity in interpreting and applying data in real estate valuation and financial analysis, the appraisal and finance industries have relied upon standards, guidelines, structure, rigor, and professional certification to guide their work, and retrofit valuation needs to follow a similar course.  

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9 See pages 104 to 114 and Appendices IV-C and IV-D of Expanded Chapter IV: Sustainable Property Performance in “Value Beyond Cost Savings: How to Underwrite Sustainable Properties” for a summary of the results of over 200 building related health and productivity studies.
2. Know Your Audience

Knowing your audience and what action you want them to take after the presentation—up front—is one key to success. It is likely you will have more than one audience, so you either need more than one presentation, or a presentation that can be presented/consumed easily by senior decision-makers but provide necessary detail for others. Since retrofits are real estate decisions, you need to understand the type of analytic models, data, and presentation formats are currently used for similar situations.

3. Present VBECS as Supplement

While different approaches may be successfully applied, RMI’s Retrofit Value Models are designed as a separate supplementary analysis that would accompany traditional energy modeling, cost analysis and Life Cycle Cost Assessments. While it would be possible to adjust discount rates, add additional factors of consideration, and provide more sophisticated sensitivity analysis within traditional LCCA or Simple Return on Investment analyses, a separate analysis is more logical and reflects the nature of how content is delivered to decision-makers for other business decisions.

4. Do Not Present Like You Calculate

Solving a problem requires a structured approach where you ask questions, collect data, conduct analyses, access findings and conclusions, and present recommendations. In most cases, successful presentations are not presented the way solutions were calculated. This is particularly important for retrofit value presentations, were so much effort is spent on the technical analysis, whereas the decision-maker is most interested in the value to them using their traditional approaches to thinking about value. RMI’s Retrofit Value Models for Occupants and Investors are based on this principle of capital provider value focus.

5. Be Property and Company Specific

Specificity is critical to the successful presentation of a retrofit value case. This principle is why we created separate RMI Retrofit Value Models for Investors and Occupants. The importance of specificity goes beyond the type of decision-maker, to the application of the evidence of value. While much of the evidence of value is based on studies, surveys, and analytics on similar buildings or portfolios of buildings, a successful presentation of value must directly adjust and apply the evidence for the specific property and occupant. Productivity benefits are positive, but if you can translate third-party studies into specific ranges of value benefit based on the specific energy efficiency/sustainability measures and employees in your project, chances of success multiply.

6. Avoid Double-Counting—Know Your Data

The basis of this principle is that earning and retaining the trust of capital decision-makers is critical to a successful capital request. Unfortunately, it is easy to double count value benefits from retrofit projects, and equally easy to fail in your request as a result of such mistakes.
Double or fuzzy counting comes in when combining the “savings” estimates from research on single systems such as lighting, HVAC, data analytics, daylighting, etc. It does not mean you cannot use such data, just fully disclose and try not to improperly interpret integrated results. Citing, or otherwise misusing research studies that are potentially misleading or poorly done can doom a project if one of the investment committee asks a tough question or knows the research.

RMI’s Retrofit Value Models for Occupants endeavors to clearly separate benefits and avoid double counting. An example of this is that we specifically include the cost reductions of reduced absenteeism as part of health cost reductions, rather than under employee cost reductions. The productivity benefits of improved mental and physical health are calculated and presented under employee costs. Other decisions are where to present benefits/cost reductions might be reasonable, the important point is you need to make sure you only count the same value once.

7. Present Risk Context for Retrofit Decision

No decision involving the investment of money can ignore risk. With most retrofit decisions, traditional Life Cycle Cost Assessment or Simple Return on Investment analyses do not explicitly consider risk (or revenue impacts), but risk is factored into decisions by capital providers either turning down projects or scaling them back through valueless “value” engineering.

Retrofit decisions face significant new risks for occupants/investors from new products, materials, systems, service providers, contracts, and performance uncertainty generally. Fortunately, development and operational risks from retrofit projects can be managed, and in many cases mitigated, by best practices in retrofit execution and operation. Retrofit projects also generate substantial positive risk outcomes. Unfortunately, if risks are not intelligently and fully addressed, the record shows that capital providers make decisions assuming the maximum level of risk and uncertainty.

Sustainable Valuation in the Industry

The importance of the value created by sustainable property investment has been acknowledged for a number of years. Most early (Pre-2007) “value” efforts focused on the development of cost benefit studies and similar business case analysis that highlighted generally the benefits of improved health and productivity, improved employee, customer, and regulator satisfaction due to sustainable leadership, reduced energy volatility, and other benefits.¹⁰

The second major thrust in evaluating sustainable property valuation began in November 2007, when Norm Miller, Andy Florance, and Jay Spivey published “Does Green Pay Off” and continued through 2012 with studies such as the “Economics of Green Retrofits by Nils Kok, Norm Miller and Peter Morris.”¹¹ Gary Pivo, Jeff Fisher and others have also contributed a

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¹⁰ Most of this early work can be found in the Green Building Finance Consortium Library (www.GreenBuildingFC.com) in section 3.0.

¹¹ Most of these statistical studies, as well as expert based value studies can be found in the Green Building Finance Consortium Library (www.GreenBuildingFC.com) in sections 15.71 and 15.72.
number of important papers exploring value issues related to Responsible Property Investing. These statistically based studies have improved over time, and generated significant insight and attention to the value of sustainable investment, but are designed to test the relationship between sustainability and value, not provide guidance on how to calculate and present value to capital providers.

The Green Building Finance Consortium, founded in 2007 with the mission to enable private sector investors to evaluate sustainable properties from a financial perspective has published numerous papers and presentations addressing sustainable valuation, culminating with their 2010 book: “Value Beyond Cost Savings: How to Underwrite Sustainable Properties”. The work of the Consortium continues, but mostly through continuing work through Rocky Mountain Institute.

The Royal Institute for Chartered Surveyors has been an active supporter of sustainable property valuation research and other important activities like the Vancouver Valuation Accord, EcoPas, and many practices articles, papers, symposiums, and conferences. The Appraisal Institute has also been involved, developing a series of commercial sustainable property valuation courses for appraisers, publishing articles and other activities.

A number of other activities underway that will add to the body of valuation knowledge include:

- Rocky Mountain Institute’s Value Beyond Energy Cost Savings (VBECS) Project is focused on the development and distribution of practical sustainable property valuation practice guides to drive deeper energy retrofits and improved sustainable property outcomes. In addition to developing the practice guides, RMI tests its ideas and demonstrates success through its active implementation engagements with industry leaders.

- The Urban Land Institute, through its Climate, Land Use and Energy Initiative and the ULI Greenprint Center for Building Performance’s Valuation Committee are directing resources and attention to the critical issue of value recognition in sustainable property investment.

- The Northwest Energy Efficiency Alliance and their contractor, Molly McCabe have been developing an Integrated Property Assessment™ Total Value methodology that incorporates property, tenant, enterprise and community value factors.

- The Department of Energy is underway on a retrofit valuation study to evaluate the value contribution of retrofits based on a valuation review of completed retrofits by appraisers.

- The Appraisal Foundation formed an official collaboration in June 2011 with the Department of Energy to collaborate on issues of energy efficiency and the valuation of green buildings and have begun their work on a number of initiatives.
The Institute for Market Transformation, in cooperation with the Appraisal Institute published their second edition in 2012 of “Recognition of Energy Costs and Energy Performance in Real Property Valuation, Considerations and Resources for Appraisers” and continues to be active in research and policy issues around sustainable property valuation.

In the UK, in collaboration with IPD, a group of five of the largest UK property investors (AVIVA, Henderson Global Investors, HERMES, L&G and PRUPIM) plus the UK’s largest valuation practice (CBRE) have created EcoPAS, a benchmarking service run by IPD that focuses on environmental variables thought likely to impact asset and portfolio values, as well as performance, and demonstrates the extent to which you are facing greater or lesser risks than your competitors.

The Economics of Change Research Project, which initially focused on integrating the value of environmental and social benefits of high performance buildings into investment models, appraisal methodologies and land use/building policies is moving into its Phase II work which will involve more comprehensive research into specific valuation studies of ecosystem service within the built environment, further evolution of the Integrated Real Estate Investment Modeling Tool, and development of policy frameworks that will support an investment shift toward a more sustainable built environment.

The Preservation Green Lab of the National Trust for Historic Preservation completed work on “The Greenest Building: Quantifying the Environmental Value of Building Reuse” and continue to explore valuation issues from this important perspective.

McGraw Hill Construction has continued their research on sustainable valuation with the 2012 publication of “Determining the Value of Green Building Investments: A Perspective from Industry Leaders on Triple Bottom Line Decision-making."

Government agencies like the Department of Defense and the General Services Administration have undertaken numerous research and analytic efforts to document and articulate the value that deep sustainable retrofits and new investments are “worth” investing in.

The activities outlined above are just a handful of the many activities that are contributing to improving the value, and ability to calculate the value, of sustainable properties. RMI and ULI look forward to hearing from other individuals and groups about their activities so we can help move the market forward.

Conclusion

Value is at the nexus of energy and real estate and must be an important area of focus by the real estate industry if we are going to achieve the depth and breadth of energy investment necessary to meet societal goals. Integrating value and risk into sustainable
property decision-making will not be easy, but new innovations in technology, retrofit processes, and valuation practice provide the foundation for success.