

Empowering the Market: How Building Energy Performance Rating and Disclosure Policies Encourage U.S. Energy Efficiency

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ABSTRACT

There is tremendous potential to achieve energy and greenhouse gas reductions in the U.S. building stock. Today, U.S. policymakers are turning their attention to existing buildings, where opportunities for greater energy efficiency are abundant but fraught with barriers that continue to severely impede progress.

Comparatively rating building energy performance and disclosing ratings to the marketplace will help overcome many of these barriers, encouraging greater energy efficiency in new and existing buildings. Recently, several U.S. cities and states have enacted mandatory rating and disclosure policies targeting existing commercial buildings. The goals of these policies include raising the energy efficiency awareness of building owners, operators and real estate stakeholders who assign value; creating market recognition of energy efficiency and energy inefficiency in buildings; improving building energy code compliance by providing performance measurement data and ratings; creating a feedback loop and accountability among the designers and operators of buildings; and allowing governments to collect building performance data to construct better public policy for buildings.

This paper examines how mandatory rating and disclosure policies can achieve these goals. The paper also presents a policy framework, based on best practices in current policies, that maximizes the market transformation potential of rating and disclosure policy.

Introduction

With climate protection and energy security issues at the forefront of global and national politics, improving the energy efficiency of existing buildings is emerging as a central goal for policymakers in the United States. Nationwide, buildings account for roughly 40% of greenhouse gas emissions (see Figure 1), nearly half of which are from commercial buildings (EIA 2009).

Our ability to make meaningful reductions in building energy consumption depends on unlocking efficiencies in existing buildings. The size of the existing building sector is enormous and the useful life of a commercial building spans decades. Historically, new construction adds only about 2 percent of floor space each year to the commercial building stock, which totaled 79 billion square feet in 2009 (EIA 2010). According to the Department of Energy's assessment of commercial buildings in 2003 about three quarters of U.S. commercial buildings were more than 10 years old, and 40 percent were more than 30 years old (EIA 2008). In New York City, commercial and multifamily buildings account for 80 percent of greenhouse gas emissions and \$15 billion per year in energy costs, and 85 percent of those buildings will still be in use in 2030 (NYC 2009). For better or worse, the buildings of today are the buildings of tomorrow.

Creating regulations to improve the efficiency of U.S. buildings is difficult politically and unpopular with building owners, many of whom are indifferent to energy efficiency or unaware of efficiency benefits. Financial incentives offered by governments and utilities are unlikely to

transform markets without policy support. Even so, improving the energy efficiency of buildings is one of the most cost-effective methods to reduce overall energy demand and cut energy bills for consumers. So how do we bridge this gap?

An emerging policy solution is to comparatively rate and disclose the energy performance of buildings. Rating and disclosure policies can unleash the market's ability to encourage efficiency improvement by improving building energy transparency. Currently, real estate consumers cannot easily assign value to building efficiency because efficiency indicators are insufficient and the flow of information between parties is restricted. Overcoming this communicative barrier will make efficiency and inefficiency plainly visible in the marketplace and allow the market to reward efficient buildings with more business.

There are other applications for rating and disclosure policies. Greater building energy transparency will lead to a greater understanding of building performance by architects, building engineers and building operators, helping close the gap between designed and actual performance. Local governments can use efficiency data to baseline the efficiency of regional building stocks and craft effective policies based on those assessments. Over the long-term, efficiency ratings have the potential to increase building energy code compliance.

Several U.S. states and cities, including California, the District of Columbia and New York City, have enacted commercial rating and disclosure policies. Each policy is unique in its scope and requirements. We propose a policy framework modeled on best practices from each of these states and jurisdictions.¹ This framework maximizes the market transformation potential of rating and disclosure policy.

Rating and Disclosure Policies Encouraging Market Transformation

Rating and disclosure policies do not inherently improve building energy performance. Instead, they create favorable market conditions for building efficiency investment. Rating and disclosure policies can encourage greater energy efficiency in buildings by:

- 1) Increasing transparency in commercial real estate markets, allowing comparative valuation of building efficiency
- 2) Allowing governments to assess building stocks and create better energy solutions
- 3) Creating a building performance feedback loop and accountability among building designers, engineers and operators
- 4) Improving building energy code compliance

Increasing Transparency in Commercial Real Estate Markets

Information is a critical component of consumer choice. Without credible and accessible information, consumers cannot compare products. And if consumers cannot compare products, their ability to make intelligent purchasing decisions is diminished.

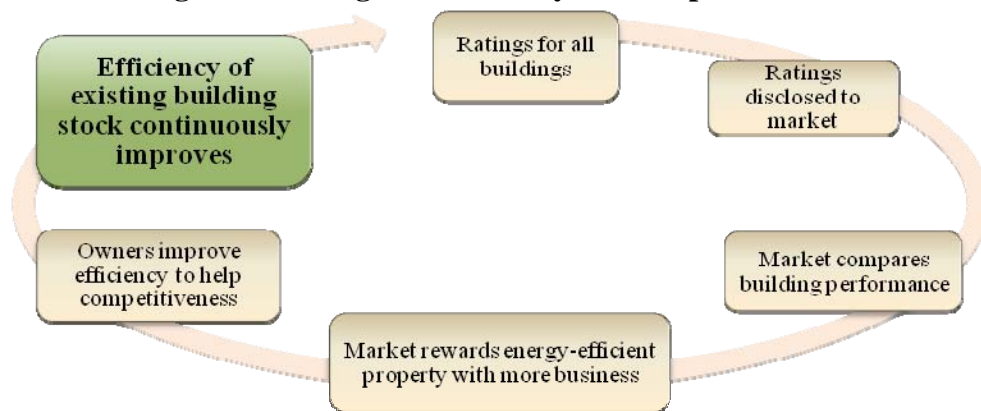
This is the situation in commercial real estate markets, where prospective investors, tenants and lenders have virtually no way to differentiate between efficient and inefficient

¹ None of these policies are fully implemented, making analysis on policy effectiveness impossible.

buildings.² In fact, most building owners have never measured the relative efficiency of their buildings, and many believe their buildings are more efficient than they truly are (Choi Granade et al. 2009, 62). Without ratings to verify and compare efficiency, building consumers cannot assign value to efficiency. As a result, there is little demand in the market for energy-efficient buildings and little competition between owners to improve building efficiency. Essentially, there is no market for efficiency.

Despite this situation, there is a clear financial upside to efficiency for many building stakeholders and untapped benefits waiting to be released by market forces. For owner-occupiers, increasing energy efficiency reduces utility costs and increases profitability. For investment owners, increasing efficiency can lower tenant utility bills, increasing the marketability of rentable space. These competitive advantages can translate into benefits with investors and lenders, such as higher building sale prices and better financing terms. Ultimately, as demand for efficient buildings increases, less-efficient buildings will come under competitive pressure to improve their energy performance. The result is a virtuous cycle where the efficiency of the existing building stock continuously improves as owners vie for competitive advantages related to energy efficiency (See Figure 2).

Figure 2: Rating/Disclosure Cycle of Improvement



Source: Institute for Market Transformation

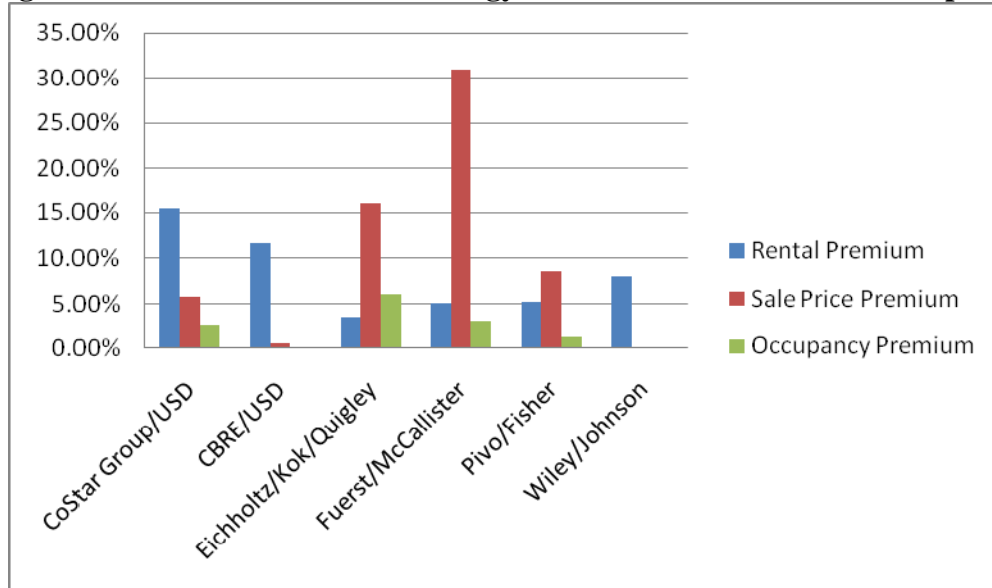
Since 2008, six studies have been conducted on the market demand for energy-efficient commercial property in the United States³ (see Figure 2). Presented here in aggregate, the studies compare rental rates, sales prices and/or occupancy levels between Energy Star-labeled buildings⁴ and non-labeled buildings.

² This is also the situation in the U.S. residential sector as determined by the Recovery Through Retrofit Report, released Oct. 2009 by the Middle Class Task Force and the Council on Environmental Quality. See http://www.whitehouse.gov/assets/documents/Recovery_Through_Retrofit_Final_Report.pdf

³ Three studies (CoStar Group/USD, Eichholtz/Kok/Quigley, Fuerst/McCallister) used property data from CoStar Group; the Pivo/Fisher study used property data from the National Council of Real Estate Investment Fiduciaries; the CB Richard Ellis/USD study used property data from CB Richard Ellis; and the Wiley/Johnson study used an undetermined property data source. Please see full studies for control variables.

⁴ The U.S. Environmental Protection Agency's Energy Star label is used as a proxy for efficiency. The Energy Star label is a voluntary recognition of the top 25 percent most energy-efficient properties in the United States.

Figure 3: Market Premiums of Energy-Efficient U.S. Commercial Property



Source: Eichholtz et al. 2009; Fuerst et al. 2009a; Fuerst et al. 2009b; Miller et al. 2008; Miller et al. 2009; Pivo et al. 2009; Wiley et al.

All of the studies indicate statistically significant, competitive advantages for the efficient buildings, suggesting that the cycle of improvement has already begun. Notably, these premiums exist in the current real estate market where performance rating and disclosure is voluntary, and disclosure is likely limited to only the most efficient buildings. As ratings for less efficient buildings are disclosed to the market according to state and local policies, competitive advantages for buildings with better ratings could become more pronounced.

Government Capturing Efficiency Ratings

Rating and disclosure policies present an opportunity for governments to collect building efficiency data and study the performance of their building stocks. Governments can analyze ratings to identify broad efficiency trends, estimate energy savings, set efficiency goals, evaluate the effectiveness of other building-related policies and target incentives at subsets of buildings that are underperforming, improving or top-achievers. Aggregate ratings for building stocks may even spur building efficiency competition among cities, regions or nations.

Creating a Feedback Loop and Accountability for Building Stakeholders

Many people are responsible for the energy performance of a building: the architects and engineers who design; the contractors who build; the facility and property managers who operate; and the tenants who occupy and use energy. Too often, there is little dialogue and accountability between these parties related to energy use. Building operation assumptions made by architects and engineers are frequently different from actual operation, creating a split between expectation and reality.

Comparing operational and asset ratings for a single building can help identify discrepancies in energy performance.⁵ Analyzing this performance gap can give architects and engineers a deeper understanding of how their buildings are operated, and educate operators on intended use. In this context, asset and operational ratings can help align modeled energy performance, which often underestimates energy consumption, with actual performance. Integrated design – the practice of convening all parties prior to the start of a project – remains a best practice and a potential solution to address the performance gap.

Ratings will also increase the accountability of designers and operators for poorly performing buildings, particularly if ratings are disclosed publicly.

Improving Building Energy Code Compliance

In the long-term, ratings may help improve building energy code compliance, which is very poor in many parts of the country. Outcome-based energy codes, where code compliance is based on verified building performance rather than prescriptive or performance-based energy codes, is one logical application. Code officials could use operational ratings to determine compliance, saving them time and reducing inspection costs, assuming ratings are appropriately aligned with the needs of inspectors.

In the near-term, publicly disclosing asset ratings alongside operational ratings could improve compliance by increasing accountability and transparency.

Background on U.S. Commercial Rating and Disclosure Policies

State and Local Policy

As of May 2010, a total of six U.S. states and major cities have enacted commercial rating and disclosure policies. They include the states of California and Washington, the District of Columbia, and the cities of Austin, Texas; New York; and Seattle, Wash. (see Figure 4 for a timeline of events). Policy details are presented in the next section. Additionally, several states and cities are actively considering rating and disclosure policies, including Illinois, Maryland, Massachusetts and Oregon, and the cities of Portland, Ore., and San Francisco, Calif.

Federal Policy

The United States has no federal policy related to building energy rating and disclosure, however there has been recent action in government agencies and the U.S. Congress. Rating and disclosure language is included in two pending bills: H.R. 2454 and S. 1462. Both bills were introduced in 2009 and require federal agencies to create a building energy label or certificate for the purpose of energy performance rating and disclosure. They do not grant the federal government the authority to make rating and disclosure mandatory.

Additionally, the National Building Rating Program was established by DOE in Oct. 2009, following the publication of the Recovery Through Retrofit report. Though not a policy, the program closely follows the provisions laid forth in H.R. 2454 and S. 1462, instructing U.S.

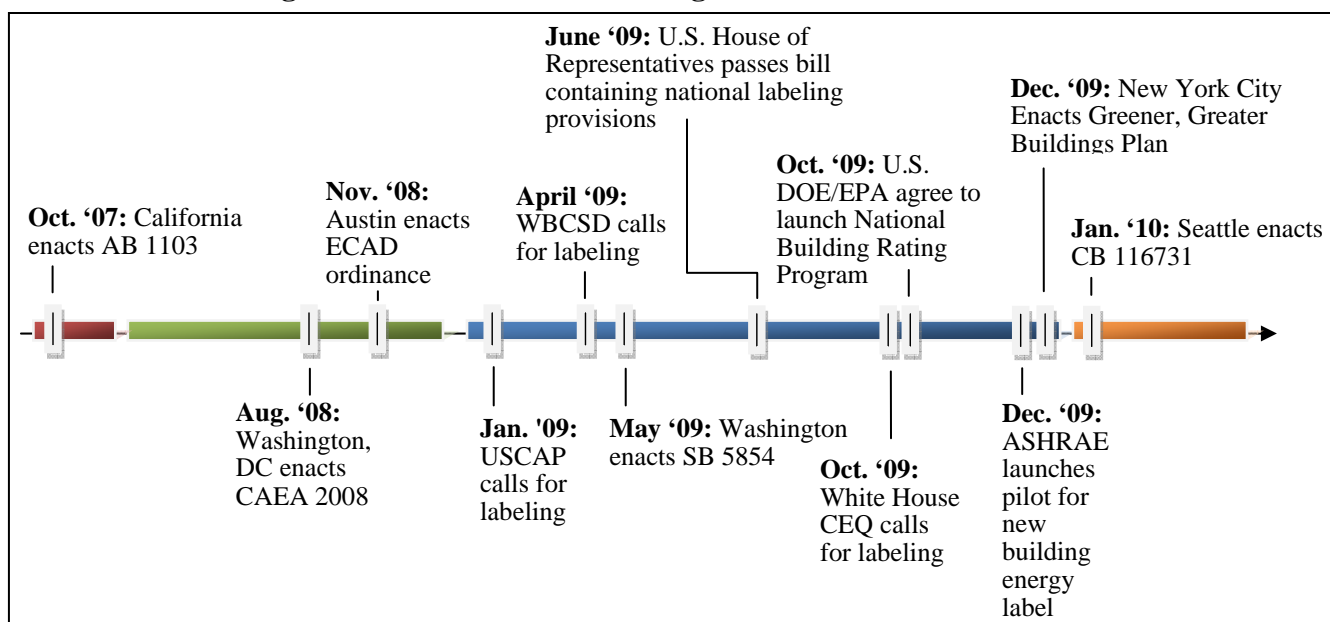
⁵ Operational ratings indicate actual building energy performance using utility bills. Asset ratings indicate the intrinsic efficiency of a building's physical characteristics and systems.

DOE and EPA to develop a building energy rating methodology and label for use by states and local jurisdictions. The program is currently focused on residential buildings, with similar work on commercial buildings to follow.

Other Events

In 2009 two prominent business coalitions, the U.S. Climate Action Partnership and the World Business Council for Sustainable Development, issued calls for rating and disclosure policy.⁶ Additionally, in Dec. 2009, the American Society of Heating, Refrigerating and Air-Conditioning Engineers formally launched its Building Energy Quotient labeling program for commercial buildings. The program is currently in the pilot phase and scheduled to be fully available to the market in 2011.

Figure 4: Timeline of U.S. Rating and Disclosure Events



Source: Institute for Market Transformation and Natural Resources Defense Council

Summary of U.S. Rating and Disclosure Policies

Austin, Texas

The Austin City Council approved the Energy Conservation Audit and Disclosure Ordinance on Nov. 6, 2008. It requires rating and disclosure for nonresidential buildings and energy audits for homes and apartment complexes. Some multifamily buildings are also required to undergo energy retrofits.⁷

⁶ The USCAP report, *A Blueprint for Legislative Action*, was published in Jan. 2009. The WBCSD report, *Transforming the Market: Energy Efficiency in Buildings*, was published in April 2009.

⁷ "High energy-use" multifamily properties consuming more than 150% of the average multifamily energy use per square foot in Austin must make energy retrofits within 18 months to bring the property to within 110% of the average.

Nonresidential buildings greater than 10 years old must rate their energy performance by June 1, 2011 using Energy Star Portfolio Manager⁸ or a free, online tool from Austin Energy, the municipal utility. Buildings less than 10 years old are required to rate their energy performance within 10 years of the completion of construction. Benchmarking data must be disclosed to prospective buyers prior to the completion of a sales transaction.

California

The state of California passed Assembly Bill 1103 in 2007, requiring the rating and disclosure of nonresidential buildings for the first time in the United States. California Governor Arnold Schwarzenegger signed the bill on Oct. 12, 2007.

AB 1103 requires building energy performance to be rated using Energy Star Portfolio Manager and disclosed to transaction counterparties prior to the completion of a sale, lease or financing agreement for the entire building. It also requires utilities to aggregate building energy data and upload it directly into Portfolio Manager upon the request of a building owner.

Implementation was delayed from Jan. 1, 2010 to Jan. 1, 2011 while the California Energy Commission engages in rulemaking. The most recent draft rules⁹ call for a three-year, phased-in approach to compliance determined by building type and size. Notably, the minimum size threshold for building rating is much lower for some property types than is standard in other U.S. rating policies. Also, all Energy Star rating disclosures must be accompanied by a state disclosure report administered by the CEC.

District of Columbia

The Council of the District of Columbia passed the Clean and Affordable Energy Act of 2008 on July 15, 2008, requiring the annual energy rating and disclosure of nonresidential buildings. DC Mayor Adrian Fenty signed the Energy Act on Aug. 4, 2008.

The DC mandate was the first in the nation to require rating at scheduled intervals (rather than at the time of a transaction) and disclosure to the general public (rather than to transaction counterparties only,) which will occur via a public web site administered by the District of Columbia. The requirement affects nonresidential buildings greater than 50,000 square feet and is being phased-in over several years. Beginning in 2010, buildings greater than 200,000 square feet must rate their energy performance using Energy Star Portfolio Manager. The size threshold decreases by 50,000 square feet each year until 2013, when all buildings greater than 50,000 square feet must be rated annually. The disclosure implementation schedule is structured the same as the rating implementation schedule, except it begins one year later.

Buildings owned or operated by the District of Columbia that are greater than 10,000 square feet in size were required to begin rating using Portfolio Manager in late 2009. The benchmarking data will be posted to the web site.

Additionally, newly constructed nonresidential buildings greater than 50,000 square feet that file construction permits on or after Jan. 1, 2012 must estimate and publicly disclose their

⁸ Portfolio Manager is an operational rating. It rates commercial buildings on a 1-100 scale relative to the energy efficiency of similar U.S. buildings. Building comparison data is derived from the Commercial Building Energy Consumption Survey (CBECS) administered by the Department of Energy's Energy Information Administration.

⁹ Issued August 5, 2009 by the California Energy Commission

energy performance using Energy Star Target Finder.¹⁰ Those buildings must rate and disclose their energy performance annually using Portfolio Manager after the building delivers.

New York City

The New York City Council passed bill no. 476-A requiring the energy rating and disclosure of commercial and multifamily buildings on Dec. 9, 2009.¹¹ New York City Mayor Michael Bloomberg signed the bill on Dec. 28, 2009.

Nonresidential and multifamily buildings greater than 50,000 square feet in size must rate their energy performance annually using Energy Star Portfolio Manager. The initial deadline to benchmark is May 1, 2011. Benchmarking data will be posted to a public web site administered by New York City beginning Sept. 1, 2012 for nonresidential buildings and beginning Sept. 1, 2013 for multifamily buildings.

Buildings greater than 10,000 square feet owned or fully leased by the New York City government must rate their energy performance annually using Portfolio Manager beginning May 1, 2010. Benchmarking data will be posted to the web site.

Washington

The state of Washington passed SB 5454 in 2009. It requires rating for nonresidential buildings and disclosure to prospective buyers, lessees and lenders prior to the closing of a transaction.¹² Washington Governor Chris Gregoire signed the bill on May 8, 2009.

Nonresidential buildings greater than 50,000 square feet must rate and disclose using Portfolio Manager beginning Jan. 1, 2011, while buildings greater than 10,000 square feet must rate and disclose beginning Jan. 1, 2012. Beginning this year, utilities were required to upload utility data directly into Portfolio Manager upon the request of a building owner.

Public buildings are subject to more comprehensive requirements. Ratings are required by July 1, 2010 and will become public. A preliminary energy audit is required for buildings with poor energy performance (a Portfolio Manager score of less than 50). If the audit identifies cost-effective energy savings, an investment-grade energy audit is required by July 1, 2013 and cost-effective efficiency measures must be implemented by 2016.

Washington has also begun using building energy ratings to set minimum efficiency requirements for state leases in privately owned buildings. Starting Jan. 1, 2010, state agencies may not sign a new lease or renew space in a private building with an ENERGY STAR rating less than 75. Exceptions are permitted when a building owner agrees to undertake an energy audit and implement cost-effective upgrades within the first few years of a state lease.

¹⁰ Target Finder is an asset rating. It rates commercial buildings on the same scale used by Portfolio Manager. Energy data for subject buildings is based on an energy simulation.

¹¹ The bill was one of four bills collectively known as the Greener, Greater Buildings Plan. The other bills require periodic building energy audits and retrocommissioning, lighting upgrades, sub metering of large tenant spaces and the establishment of a city building energy code. The rating and disclosure bill also requires water benchmarking.

¹² The bill also requires improvements to building energy codes and a report on home energy rating.

Seattle, Wash.

Less than a year after the state of Washington enacted its rating and disclosure legislation, Seattle passed a city ordinance that expands on the state law. Seattle City Council Bill 116731, passed on Jan. 25, 2010, requires annual rating for nonresidential buildings and multifamily buildings; the reporting of ratings to the city government; and the disclosure of ratings to current tenants in benchmarked buildings upon tenant request.

Buildings 50,000 square feet and greater will report ratings annually to the city beginning April 1, 2011, while buildings 10,000 square feet and greater will begin reporting April 1, 2012. Multifamily properties must report benchmarking data to the city annually beginning April 1, 2012. Seattle does not plan to post any rating data publicly.

A Rating and Disclosure Policy Framework

There is great innovation occurring in U.S. rating and disclosure policy as state and local governments enact mandates with a variety of requirements and methods of implementation. This framework seeks to maximize the market transformation potential of building performance rating and disclosure policy by identifying best practices from current U.S. policies. Some ideas presented in the framework are not yet present in any U.S. policies.

Rating System

In the near-term, the most practical rating systems for use in policy are Energy Star Portfolio Manager for operational ratings and Energy Star Target Finder for asset ratings. Both rating systems are available online at no cost, although Target Finder requires an energy simulation. Portfolio Manager is already the most widely used voluntary commercial building energy rating tool in the U.S. marketplace, with more than 13 billion square feet of commercial floor space cumulatively rated over the past decade (EPA 2009, 2). All current U.S. rating and disclosure policies require Portfolio Manager. The District of Columbia also requires Target Finder ratings for new construction.

Not all building types can be rated using Portfolio Manager and Target Finder,¹³ however buildings that are ineligible for ratings can still generate weather-normalized energy use intensity data. This data can be compared against national average source energy use intensity and thus used as an indicator of relative efficiency.

In the mid-term and long-term, other rating tools should be evaluated as they become available. Operational ratings generated from building energy audits and accompanied by upgrade recommendations could be desirable, but the high cost of audits and the small number of auditors are significant barriers. The Commercial Energy Services Network (COMNET), a new program being developed to increase the accuracy and cost-effectiveness of building energy simulations and provide quality control mechanisms for third-party building energy assessors, may significantly enhance the feasibility of mandated asset ratings.

¹³ Due to limitations in CBECS data.

Scope of Ratings

In the near-term, operational ratings should be required annually for existing buildings and asset ratings should be required for new construction, followed by annual operational ratings after the building has sufficient operational data. Wherever possible, asset and operational ratings should appear side-by-side to highlight similarities or inconsistencies in energy performance. Requiring both asset and operational ratings achieves market transformation goals related to transparency, feedback and accountability, and code compliance.

In the mid-term and long-term, asset ratings should be required for existing buildings, however this is currently cost prohibitive due to the high cost of energy simulations. Incentives may be useful to encourage voluntary asset ratings for existing buildings in the near-term.

Disclosure of Ratings

Ratings should be published to a public web site and disclosed in all advertising materials for the sale or lease of a property. Ratings should also be disclosed directly to prospective buyers, lessees and financiers of a property at the time a contract is presented, as well as to current tenants in a rated building at least once every year. Local governments should collect all building rating data.

Disclosure to a public web site provides maximum building energy transparency to the real estate marketplace and the general public. Ratings for multiple years should be posted, providing recognition for buildings that have demonstrated rating improvement.

Disclosure in advertising materials¹⁴ is critical for any transaction-based disclosures. Ratings will be more influential to the potential buyers, lessees and financiers of buildings if disclosed early in the process.

Rating and Disclosure Implementation

In general, rating and disclosure policies should focus on larger buildings where opportunities to reduce energy and greenhouse gas emissions are the greatest, however the potential sale, lease or financing of just a portion of a building should trigger the requirement. Policymakers should analyze their building stock to determine a feasible size cut-off for buildings subject to rating and disclosure requirements. Policies should also phase-in over multiple years according to building size, with larger buildings subject to rating and disclosure requirements before smaller buildings. This gives the market time to rate buildings and make desired improvements before ratings become public. It may also reduce compliance issues.

Enforcement

Governments administering rating and disclosure policies should develop quality control and enforcement mechanisms. These may include random audits of rating accuracy and disclosure compliance, third-party verification of ratings, and fines for non compliance.

¹⁴ This may include listing services and most print and web collateral generated by real estate brokers.

Public Buildings

Buildings owned or partially or fully leased by government agencies should be required to rate and disclose energy performance before privately owned buildings. Public buildings should also be required to make cost-effective energy improvements based on an energy audit, which would be triggered by a low Energy Star rating.

Other Requirements

Where Energy Star Portfolio Manager is used for operational ratings, utilities should be required to aggregate energy meters in buildings and automatically upload utility data in Portfolio Manager, upon the request of a building owner. This is particularly helpful to owners of multi-tenant buildings where the owner would otherwise have to manually aggregate utility data. It also preserves the privacy of tenant utility data.

Additionally, governments should lease space only in buildings that achieve high ratings. In this way, governments can leverage their purchasing power to encourage rating improvements and reward energy-efficient buildings. It could also persuade private companies to set similar rating minimums for their leased space.

Conclusion

U.S. policymakers are beginning to embrace building energy performance rating and disclosure policies to encourage energy and greenhouse gas emissions reductions in existing buildings. By overcoming informational roadblocks, rating and disclosure policies can help the real estate market factor energy efficiency into building valuation and catalyze demand for more efficient buildings. Governments can use ratings to gain knowledge about the energy consumption of their buildings and translate that knowledge into effective building policies and practices. Stakeholders can leverage ratings to align building design and operation to maximize energy efficiency. Code officials may soon use ratings as a tool to streamline building energy code compliance.

As unique policies continue to emerge in states and cities, policymakers should collaborate to share innovative policy approaches, best practices, challenges, and eventually, empirical data on the effectiveness of their policies. In this way, rating and disclosure policies can become even more transformative.

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