

“\$300,000, 4 Bedrooms and a ‘B+’ Energy Rating” – Transforming Markets with Mandatory Building Energy Labeling

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ABSTRACT

As states ramp up their energy and CO₂ savings goals, energy efficiency leaders must find new and innovative ways to achieve savings in the stock of existing homes and buildings. One key tool – mandatory building energy labeling (“MBEL”)– seeks to transform markets by requiring that meaningful information about building energy performance be disclosed to potential buyers, renters and the public.

Under new policies adopted in more than 30 nations worldwide, building owners must obtain an energy performance label. The label can assess physical assets or actual operations, and can compare them against their peers or best practices. Owners are required to disclose their label in advertisements (e.g. MLS listings), in rental transactions or to a public registry.

This paper presents the results of work completed for Northeast Energy Efficiency Partnerships (NEEP) in the fall of 2009. The NEEP white paper is the most comprehensive U.S. review of these policies produced to date. It provides an assessment of the international experience (including lessons learned from early experiments abroad), a review of new U.S. policies, analysis of critical design options and keys to success, and a framework and roadmap for adopting MBEL policies in the U.S.

The paper goes further by presenting the most recent developments from the EPA, DOE, ASHRAE and industry stakeholders, considers potential interactions with new financing mechanisms, and addresses two key questions: (1) how – and under what conditions – these initiatives can support MBEL, and (2) how MBEL can act as a powerful complement to conventional energy efficiency programs.

Introduction

In 2007, residential and commercial buildings accounted for approximately 40% of U.S. greenhouse gas emissions and total energy consumption (EPA 2009). Yet potential energy savings from building retrofits are known to be substantial: for example, a 2005 study conducted for NEEP suggested that cost-effective retrofits of existing buildings and equipment could reduce total electricity use in New England by 17% (NEEP 2005). Indeed, efforts towards improving building energy efficiency have increased dramatically in the United States over the last five years, in reaction to the economic potential as well as energy security needs and the climate change challenge.

Energy efficiency programs, coupled with improved codes and standards, have had some impact on the performance of *new* homes and buildings, as well as on the efficiency of new appliances and other manufactured goods. Yet despite years of voluntary programs, the biggest opportunity for energy savings, *improving the energy performance of existing homes and buildings*, remains largely untapped relative to its enormous potential. By allowing buyers,

renters and other market actors to value energy efficiency performance, building labeling can provide a powerful impetus towards obtaining these savings.

First adopted over a decade ago in Australia and Denmark, mandatory building energy rating policies are now in place in more than 30 countries worldwide. They are also increasingly being considered, adopted or implemented in the U.S., particularly in the last two years. States and municipalities with requirements in existence, planned, or actively under consideration include California, the District of Columbia, Maine, Maryland, Nevada, New Mexico, New York City, New York State, Oregon, Austin (Texas), Seattle (Washington) and Washington.

Concept Overview

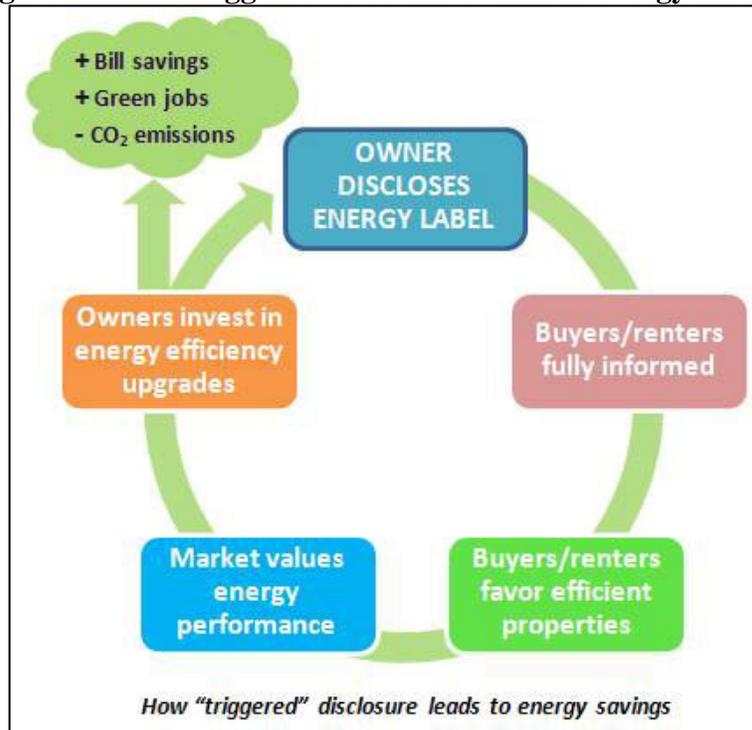
Though mandatory building energy labeling disclosure policies involve a wide array of specific policy and design choices, they coalesce around two key approaches:

- **Triggered disclosure (appropriate for residential and commercial markets).** Mandates that when selling a home or commercial building (“time of sale” trigger), owners must disclose a valid energy label to potential buyers. The label indicates current performance and potential improvements, providing meaningful information to consumers and empowering them to consider energy performance in their decision-making. Armed with information, some consumers will give preference to more energy efficient homes, enabling markets to value energy performance, and providing a greater return on investment to projects aimed at energy efficiency improvements. The same requirement – and feedback loop – can also apply at other triggers, such as at the “time of rental” or lease, and when requesting financing.
- **Scheduled disclosure (commercial markets only).** Mandates that commercial building owners must obtain a simplified, standardized label, indicating their annual “operating” energy performance. This enables owners *and building managers* to measure their performance annually, to institute continuous improvement practices, to benchmark their performance over time and against other buildings (within or outside of their own fleet), and to establish performance targets in their annual plans and objectives. A key additional option is for policies to require that labels be displayed in prominent locations within the building or published in a publicly-available registry (database).¹ These options create additional drivers to improved energy monitoring and performance: renters may ask owners to address energy performance, utility incentive programs may be marketed more effectively at owners with poorer performance, recognition programs can identify and highlight owners with above-average performance, energy service companies can more effectively identify and market to potential customers, and owners can gain market recognition and other added value from their efforts.

¹ Note that public display can also in theory be a feature of triggered disclosure.

Figure 1, below, illustrates the policy logic behind triggered disclosure.

Figure 1: How “triggered” disclosure leads to energy savings.



Source: Dunskey et al. 2009

How Can Building Labeling Complement Conventional Efficiency Programs?

There are at least six market barriers which impede the adoption of cost-effective energy efficiency measures, particularly via retrofits. Building owners lack **information** on the costs, benefits and appropriateness of measures for their buildings. **Access to capital** for up-front investments in efficiency is equally a barrier. Perhaps most importantly, long payback periods create a **split incentive** between current and future owners, as current owners face the risk of not obtaining the payback on their investment. A similar split incentive is created when renters pay energy bills – owners are less likely to invest when they do not benefit from savings (and when resale and rental markets fail to value energy savings). Owners may also choose not to implement cost-effective measures out of sheer **inertia** (retrofit savings are too incremental to notice, other projects come first), or to avoid the ‘**hassle**’ and disruption caused by renovation. A **lack of qualified contractors** trained in building science and specializing in retrofits can delay work. Taken together, these barriers cause the existing building sector to leave significant savings on the table.²

Conventional retrofit programs are typically a combination of low-cost audits, grants and financing, and in some cases ‘turnkey’ provision of services by an auditor-contractor. These programs effectively address the information barrier, partially address the issue of access to

² The new construction market also faces key barriers that can be overcome at least in part by disclosure policies – most importantly, the split incentive between builders, who pay up front costs, and buyers, who reap energy savings although lack of information and ‘hassle factor’ both come into play.

capital, and can ensure access to quality contractors. The use of grants to reduce payback periods also reduces owner risk and split incentives, and the provision of turnkey services can reduce inertia and hassle. However these last three barriers – risk, inertia and hassle – remain substantial.

Labeling addresses risk much more effectively, as buyers begin – in theory at least – to pay premiums for efficient homes. It also addresses inertia, by requiring everyone to participate in obtaining a rating. Finally, the potential for significant returns on investment can make the hassle of retrofits worthwhile.

Labeling becomes particularly interesting when combined with other program innovations recently gaining momentum, notably transferable financing (e.g., Property-Assessed Clean Energy (PACE) financing). Under transferable financing, loans remain with the property even when ownership changes hands. In the PACE model, for example, loans are tied to property taxes. This type of financing has the potential to reduce the barriers of capital access and split incentives, with labeling then providing a powerful incentive based on potential sale price adjustments. Transferable financing and other forms of preferential energy efficiency financing are gaining momentum. For example, New York State recently passed a law allowing municipalities to adopt PACE financing, and other jurisdictions have already begun implemented it. U.S. DOE is also working to ensure that its national building rating will be sufficiently robust to support PACE and other financing initiatives.

By reducing risk, providing information, and promising returns, labeling should go a long way towards eliminating barriers. Combined with transferable financing and substantial recent investments in improving the quality and training of retrofit contractors, it promises to allow states to unlock savings and eventually transform the market. Table 1, below, illustrates this concept.

Table 1. Combining Labeling With Other Strategies to Overcome Market Barriers

Barriers	Conventional Retrofit Programs	NEW INITIATIVES			Combined Impact
		LABELING	Transferable Financing (e.g. PACE)	Increased Training / Certification	
Information	✓	✓			✓
Access to Capital	~		✓		✓
Qualified Contractors	~			~	✓
Risk/Split Incentive	~ (↓ investment)	✓ (↑ mkt.value)	✓		✓
Inertia		✓			✓
Hassle	~	~ (\$ payoff)		~	✓

✓ : addressed; ~ : partially addressed.

Evidence to Date

Despite a recent surge in interest, significant, on-the-ground experience with mandatory disclosure policies remains limited (the vast majority of mandatory policies currently in place have been operating for less than two years). Nonetheless, several statistically significant studies, including two that address markets with long-standing mandatory disclosure policies, shed some light on the ability of disclosure policies to influence markets.

The most important statistical study to date was conducted for the Australian Capital Territory (ACT). It is of particular interest because the ACT has one of the longest running disclosure policies (10 years), and has, from the beginning, required disclosure *early* in the sales process (in all advertising), an essential design feature. The Australian system also has a smart, market-based enforcement process, and a high degree of compliance.³

The study used regression analysis on all homes sold in the region within a 12 month period (5,000 homes in all), to assess the impact of the energy asset rating on housing prices. To do so, the study isolated 13 other independent variables more commonly associated with sales price (size, location, etc.). The study found that the market now attributes approximately \$9,000 USD to every additional star on a 6-star scale. **In practice, this amounts to a price premium of 3% per star improvement** and an improved return on investment for efficiency retrofits (DEWHA 2008). After a decade of experience with mandatory, enforced, pre-sale labeling, buyers in the ACT region are valuing energy efficiency, thus providing a return to owners who invest in the efficiency of their homes.

On the commercial buildings side, three studies published in 2008 and 2009 used CoStar data on commercial building rentals and sales to analyze whether or not voluntarily labeled ‘green’ buildings (Energy Star and LEED buildings) were preferred by buyers and leasers. Although they approached the data using different methodologies, all of the studies found that green buildings earned significant premiums on rents (3%-6%) and sales (16%-35%). (Eiholtz, P, N. Kok and J. Quigley 2009) (Fuerst, F. and P.McAllister 2009) (Miller, N. et al. 2008). A similar study looking at a smaller sample found that green buildings have 3.5% lower vacancy rates, a 13% premium on rents and provide up to \$25/ft² in non-energy benefits. (Miller, N. and D. Pogue 2009)

An additional study looks at the case of Denmark, which has had a time of sale labeling requirement in place since 1996, but limited enforcement and, as such, low compliance and awareness rates (barely 50%). The study focused on the energy consumption of labeled homes *after the sale*, and was unable to conclude that labels influence *post-sale* consumption. Unfortunately, the study failed to test for energy consumption changes *prior* to the sale, i.e., improvements undertaken by owners in the hope of increasing resale value, which we consider the most likely impact. Unlike the Australian study, it did not examine the impact of label results on housing prices, and took place in a context of low compliance. (AKF 2008)

While few in number, the majority of these analyses provide **empirical support for the theory that markets can be brought to value energy efficiency through use of labeling and rating systems.** They also underscore the importance of “getting it right” by adopting some key policy ingredients.

³ The ACT has a unique enforcement mechanism under which buyers can, *after a sale has occurred*, obtain compensation from sellers equal to 0.5% of the sales price if sellers do not provide the rating information and report as required.

Keys to Success

As we indicated previously, most policies in place are relatively new. Nonetheless, two regions with over a decade of experience each (Denmark and Australia’s capital region), others with more recent implementation experience (notably the U.K.), and the lessons learned from decades of voluntary efficiency programs, combine to provide valuable insights on the success drivers for mandatory disclosure policies. **Below we address 11 key issues – both success drivers and challenges – to consider.**

First, we identified **key factors** that can make the difference between success and failure:

1. **A Trusted Rating System:** At a minimum, market actors must believe that ratings reflect the relative performance of homes or buildings, and trust that these ratings have been produced honestly and competently.
2. **Clear Messaging:** The information disclosed, especially the overall building rating, must be clearly understood by the average consumer. It must also allow prospective homes and buildings to be easily compared and, in the case of scheduled disclosure (commercial buildings), must allow building owners and operators to measure performance over time.
3. **Universal Application:** Mandatory disclosure policies are predicated on the ratings being ubiquitous enough that market actors grow used to considering energy efficiency. Voluntary approaches will be much less effective, since many owners will not participate, and those that do will tend to own higher-performing buildings. Similarly, enforcement is essential. Information campaigns and light penalties are likely insufficient; rather, a combination of strong enforcement and dissuasive penalties are essential to ensuring success.⁴
4. **Timely (Early) Disclosure:** For triggered disclosure policies, ratings must be displayed early in the process, i.e. in all advertising, including listings. If buyers only receive the information toward the end of the process, after having made an offer, for example, or when notarizing a sale, they will not be able to use that information effectively, and the policy will have forfeited its opportunity to influence the marketplace.
5. **Link to Action:** Mandatory disclosure policies are an important tool in the toolbox to incent cost-effective energy savings, but are only a means to an end. To lead to action, the rating or audit report should assist consumers by recommending appropriate improvements and referring to other resources (financing, grants, contractors, etc.)

In addition to these primary success drivers, **two other considerations**, while not “make-or-break” issues, should be given careful consideration:

6. **Public Availability:** For scheduled disclosure policies (commercial buildings only), there is great value in ensuring, as some regions have begun to do, that ratings are made public (e.g., in an online registry, or in a visible area of the building). This approach can leverage market forces to encourage building owners to continuously improve their performance. More broadly, aggregate data on rating results are a vital source of information on the building stock and market behavior and must be made available to policy makers.

⁴ Participation incentives from utilities or government can also play a role, particularly in the initial phase-in stage.

7. **Eye on the Prize:** Disclosure policies are part of a long term strategy of moving the building stock as a whole toward high energy performance. Ideally buildings should be benchmarked not only against their peers (“statistical” rating scales), but also against society’s efficiency goals (“technical” scales). Similarly, ratings should be compatible with energy codes.

Challenges to Overcome

Despite strong interest in mandatory disclosure policies and evidence of their power to address market barriers, valid concerns remain. Four issues are particularly important:

8. **Cost to States:** To ensure that development of disclosure policies is not prohibitive, policymakers need give due consideration to using existing tools and support infrastructure (building evaluator training and certification, software certification, modeling protocols, etc.), and to adopting simple approaches wherever possible. The federal NBRP initiative discussed below should prove an important resource for states adopting disclosure policies.
9. **Cost to Consumers:** While the benefits of a mandatory disclosure policy should far outweigh its costs, consumer (and political) acceptance will depend on keeping rating costs to a minimum. For both homes and businesses, an effective policy will need to strike a balance between requirements (e.g. rating level of detail and frequency), value, and associated costs. One solution being considered for residential disclosure is the use of integrated rating tiers that increase in complexity, reliability and cost. Other solutions are subsidizing audits (at least initially) and minimizing the frequency of audits. For example, many jurisdictions requiring asset ratings allow ratings to remain valid for seven to ten years. Unless the ratings are considered “affordable” (e.g. \$100 - \$300 for the residential sector), legislators are unlikely to adopt policies that impose excessive costs on their constituents.
10. **Keeping Transactions Fluid:** Disclosure requirements linked to the time of sale need to minimize unnecessary delays or obstacles to the sale process. Doing so requires giving careful thought to issues such as the moment, during the sales process, at which disclosure is required (it should be early on, as discussed previously), and to ensuring a sufficient volume of raters able to respond quickly to market demand. This latter point requires a careful market analysis, and may require specific efforts aimed at providing low-cost training (as well as launching political signals early in the process to encourage industry to build up supply). Furthermore, a staged approach to implementation can ease concerns about rater bottlenecks.
11. **Balancing Label Design with Other Rating Needs:** Energy labels often overlap (in design and methodology) with other building energy audits, namely those used for building code compliance, and for identifying retrofit savings potential and costs, both for owners and lenders. Ideally, a single nationally-recognized label could meet all of these needs. However, each requires a varying degree of accuracy, in some cases far beyond that needed for labeling. One solution being pursued is the use of multiple, interlocking methodologies that vary in accuracy and cost, while still using a single scale and label.

Current and Planned U.S. Efforts

At the time of writing (Spring 2010), multiple parallel efforts were underway to develop or refine residential and commercial rating systems, spearheaded by individual states, industry associations, stakeholder groups, and the federal Department of Energy. We discuss key efforts below.

The National Building Rating Program (NBRP). Under a joint MOU signed by the Environmental Protection Agency (EPA) and the DOE in September 2009 (DOE and EPA 2009), an ‘enhanced’ NBRP will include development of:

- **Rating System:** A comprehensive, whole-building label, rating scale, methodology and rating tool standard will be developed for both residential and commercial buildings. The rating system will offer both asset and operational ratings. Each rating system is likely to be built of several rating tiers, increasing in complexity, accuracy, depth and cost.
- **Training and Certification:** Certification standards, training programs and quality assurance standards will be developed for evaluators and contractors.
- **Utility Data Standards:** The NBRP will work with utilities to develop a common format for automatically uploading utility bills into the rating tool.
- **Database:** A new database on energy usage and building characteristics from all buildings receiving federal efficiency funding.

Residential labeling activity. Three overlapping national-level efforts are ongoing to develop a home rating system appropriate for mandatory labeling: DOE’s work on the NBRP (above), RESNET’s internal work on adapting the HERS label, and an ad-hoc group of stakeholders which began to meet in December 2009. In parallel to these efforts, significant work is underway in Oregon to refine a state-level rating system and label.

DOE: Although no final decisions had been taken on rating system design as of the Spring of 2010, DOE remains committed to an initial rollout in September 2010, with all elements of the rating system likely in place at some point in 2011. Current thinking appears to be moving towards multiple, integrated tiers of rating options that balance accuracy and cost, allowing end users to pick the rating tier most suited to their needs. For example, building owners may be satisfied initially with a simple, self-administered online audit; mandatory labeling programs may require a more detailed third-party audit that stops short of a full HERS rating, while financing programs may require detailed diagnostics and financial analysis.

RESNET has reviewed international approaches to labeling and discussed options for meeting the needs of mandatory labeling policies at its annual conference in February. It is considering supplementing its HERS system with the additional development of lower-cost, less precise rating systems, and will continue to participate in DOE and industry discussions.

An ad-hoc group of stakeholders from the energy efficiency community has begun a discussion on issues around mandatory labeling. The group has engaged the DOE on its residential rating efforts, organizing a “Summit to Advance a Framework for Accuracy and Standardization in Building Energy Labeling” and drafting a supporting white paper in January 2010. It continues to meet via industry events.⁵

⁵ Individuals interested in finding out more about this group can contact David Heslam, Earth Advantage in

Oregon's Energy Performance Score label, tested in a 300-home pilot in 2008, is now being implemented in a 5000-home project for the City of Seattle, due to be completed in 2010. Of particular interest is this project's use of a new, simplified modeling approach, dubbed SIMPLE, which shows promise as a relatively low-cost, accurate tool for home rating.⁶

Commercial labeling activity. In the commercial sector, there are several overlapping efforts as well: DOE's work on the NBRP, a new label launched by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), and the creation of COMNET, an energy rating standards initiative.

The NBRP aims to create a commercial asset and operational rating system and label at some point in 2011, although a final timeline has not been announced. Although no details are yet available, the EPA's Energy Star Portfolio Manager is a likely candidate for integration into the label, as it continues to be the principal national-level tool available for energy labeling.

ASHRAE launched its combined asset and operational label, the Building Energy Quotient, in the fall of 2009. The project is currently in a development and pilot project phase, with full implementation planned for 2011-2012.

Finally, the Commercial Energy Services Network (COMNET) is a multi-organizational effort to provide a standardized technical energy modeling rules and procedures set along with an eventual commercial energy rater certification standard. RESNET will publish and maintain the COMNET standard, with Phase One of the manual due to be published in March of 2010.

Clearly, building energy rating is going through a period of rapid evolution in both the residential and commercial sectors, in large part in response to a new focus on mandatory labeling and building retrofit initiatives by the federal government, state governments and ratepayer energy efficiency programs. Although the exact infrastructure is uncertain at the time of writing, it is likely that a national-level rating system will be at least partially in place for residential buildings by the end of 2010, and for commercial buildings at some point in 2011.

Roles for States

Given that labels, rating systems, and rater certifications are being developed and/or refined at the national level, what do states need to prepare to put mandatory labeling into place? Table 2, below, summarizes how states can build on national initiatives to implement the basic ingredients of these policies.

Portland, Oregon.

⁶ Individuals interested in finding out more about this effort can contact Diane Ferington, Energy Trust of Oregon.

Table 2. State Roles vs. National Initiatives in Developing Disclosure Policies

BASIC INGREDIENTS	NATIONAL INITIATIVES	STATE ROLE
1. ENABLING LEGISLATION	---	Lead
2. RATING SYSTEM DEVELOPMENT	Lead	Engage and monitor to ensure system fully supports state needs
3. RATING SYSTEM MANAGEMENT	Lead	
4. TRIGGER POINT REQUIREMENT	---	Lead
5. DATA COLLECTION AND REGISTRY	Lead	Engage and monitor
6. ENFORCEMENT SYSTEM	---	Lead
7. RATER TRAINING AND CERTIFICATION	Lead	Engage and monitor
8. PHASE-IN STRATEGY	---	Lead
9. LINK TO INCENTIVE PROGRAMS	Facilitate	Lead

Source: Adapted from Dunsky et al. 2009.

As Table 3 suggests, the key task for states is to develop enabling legislation and regulations identifying certification requirements, trigger points, enforcement systems and a phase-in strategy. This is a task that can begin immediately and in parallel with ongoing work on national systems. Legislation can appoint a policy administrator with responsibility to select and adapt an appropriate rating system - given the 12-36 month timelines typically required to develop and pass legislation, national systems should be finalized by the time legislation is in place.

While work is ongoing on legislation, states and other energy efficiency stakeholders can begin to prepare the groundwork for these policies. Actions can include adjusting incentive programs accordingly, launching pilot projects, subsidizing the cost of ratings to improve market and political acceptance and working with utilities to facilitate the automatic transfer of customer billing data to operational rating tools.

More broadly, states should develop mandatory labeling as part of a concerted overall energy efficiency strategy that incorporates transferable financing, incentive programs and improved building codes. Ideally, labeling should not be seen as a ‘silver bullet’ that can single-handedly transform markets, but rather as one piece of a core combination of policies.

Finally, states will need to engage DOE and its partners to ensure that the systems are designed with mandatory, as opposed to voluntary, policies in mind. In particular, states will need:

- **Timely development.** The availability of the NBRP rating system will dictate timelines for state implementation of disclosure policies – avoiding delays is therefore essential. In particular, ramping-up rater infrastructure will require timely access to NBRP training

and certification processes. If the DOE system cannot be operational in a timely manner, states can work with DOE toward transitional approaches to minimize delays.

- **State access to building rating databases.** The centralized databases outlined as part of the NBRP will likely be critical for state policy enforcement, but only if states gain full access (to results by building address, for example). Additionally, states should ensure that building owners can obtain copies of past ratings to simplify compliance and minimize costs.
- **Focus on reducing (home) ratings costs.** Nationally, HERS ratings cost an average of \$492 in 2008, with a range of \$165 to \$1000 reported. (RESNET, 2009). A provider survey suggested that this cost could drop by 30% if demand for ratings increased substantially. Ensuring the availability of a low-cost (under \$300, but ideally between \$100 and \$200) rating will go a long way towards ensuring acceptance of a *mandatory* disclosure policy. While states can work with utilities to initially subsidize rating costs, they will want to ensure that rating system developers make cost reduction a priority.
- **Flexibility for states to customize labels.** Individual states may wish to highlight specific energy efficiency (or climate change) targets directly on building labels. Some may even want to add an additional, state-specific rating scale. Ideally, national rating systems would allow states to easily build upon and enhance its rating system.

Early stakeholder outreach from DOE and others suggest that many of these needs are indeed being kept in mind during the development process. States should, however, work closely with national partners to maximize the efficiency and rapid rollout of the rating system.

Conclusions

As policymakers search for new opportunities to achieve deeper energy savings, they are likely to turn increasingly toward mandatory disclosure policies as a key policy opportunity. Indeed, both theory and early experience suggest that such policies can contribute to transforming real estate markets to valuing energy efficiency, in turn leading to voluntary adoption of energy savings measures.

Ultimately, states, utilities and other interested parties will want to familiarize themselves with the breadth of issues and options involved in designing an effective disclosure policy, and begin to develop implementation roadmaps and assign tasks and leadership. To this end, they can consult the roadmap developed by the Dunskey Energy Consulting team for Northeastern states, available at http://www.dunsky.ca/pdf/DUNSKY_NEEP_Report_Final_2009_12_14.pdf or by contacting the authors.

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The installation of post-construction energy efficient measures must be economically viable for house owners to be encouraged to outlay capital funds (Pellegrini-Masini et al, 2010). Viability is often measured in terms of house-owners ability to recover capital expenditure and obtain future benefits of reduced energy bills prior to selling.Â Department of Industry - Your Home, Accessed 26th November 2014 Home<http://www.yourhome.gov.au/sites/prod.yourhome.gov.au/files/pdf/YOURHOME-4-Energy-0-Intro-%284Dec13%29.pdf> Dunsky, P, Schmidt, E & Faesy, R 2009, 'â€œ\$300,000, 4 Bedrooms and a â€˜B+â€™ Energy Ratingâ€‘“ Transforming Markets with Mandatory Building Energy Labeling', paper presented to. Energy efficiency labels are information labels attached to manu-factured products indicating the productâ€™s energy efficiency rating or estimated annual energy use in order to provide consumers with the data necessary to make an informed purchase. Appliance energy efficiency labelling and standards can be a primary force in the creation of stronger markets for energy-efficient goods and services. By gradually eliminating low-cost, inefficient appliance models and by stimulating the develop-ment of more efficient technologies, labels and standards increase a countryâ€™s overall energy efficiency.... Buildings sector energy intensity (final energy use per m2) has been decreasing continuously by 0.5% to 1% per year since 2010. However, this rate is significantly below average annual floor area growth, which has remained around 2.5% since 2010.Â This could be achieved by 2030 with more stringent building energy codes, deep energy renovations, a tripling of heat pumping technology uptake and a 50% improvement in the average seasonal performance of air conditioners, along with other energy efficiency measures. In some emerging markets, particularly in Africa, Latin America and Asia, changes in buildings sector energy intensity have been spurred by a shift away from traditional solid biomass use.