ETO Asset Rating Label

February, 2012

Context

In 2008, a pilot was conducted on 300 homes to assess modeling tools that could provide an asset rating for existing homes. A building's asset rating is one developed by modeling the energy use based on the thermal envelope and mechanical and electrical systems while assuming standard behavior. Earth Advantage Institute completed this study under subcontract to Energy Trust of Oregon (ETO).

The goal of the study was to determine the attributes of an asset-rating label that would be meaningful in the energy efficiency market in the same way MPG ratings are useful for gauging fuel efficiency in automobiles. Meaningful was defined as improving the adoption of energy efficiency in the residential sector. The attributes of the asset rating were narrowed down to:

- Timeless (not anchored to changing codes, baselines)
- Cost effective ($200-$300 per audit)
- Comprehensible (to stakeholders-consumers, Realtors, contractors, builders)
- Useful as a market mechanism (finance, MLS, appraisal, insurance, incentives, etc.)
- Allowed home-to-home comparison
- Benchmarked current performance with recommendations to improve rating
- Reflected energy consumption, operational cost, and the associated carbon emissions.

Stakeholders surveyed overwhelmingly supported the value such a rating would offer. The study concluded that with some additional work, such an asset rating could be produced for homes. The rating became known as the Energy Performance Score (EPS).

In 2009, ETO created the EPS for the new construction market. The label featured an energy score, a carbon emissions score, and the operational cost. The modeled annual site energy consumption was shown on the label with absolute zero energy consumption shown as best or optimal. The corresponding carbon emissions (CO_2) impact from the consumption of the home's site energy was also shown in tons of CO_2 with zero shown as best or optimal.

A significant number of Oregon's builders who had previously built to achieve the ENERGY STAR for New Homes threshold certification, built above and beyond this level with the introduction of the EPS. The EPS allowed builders to clearly

demonstrate how efficient their home was beyond a code built home and helped homebuyers comparison shop based on energy costs and efficiency.

Earth Advantage refined the top contending tool (SIMPLE) from the study, and with sanction from ETO, pursued opportunities to promote the EPS asset rating outside of the state. In the Northwest, more than 4,000 EPS labels have been issued with an additional 12,000 expected by the end of 2013. Programs in Seattle, Bellingham, Spokane, Snohomish Co., Kitsap County, and Thurston County are using the EPS label as part of their audit program. Nationally the EPS is used in 11 programs in 7 states, including Washington, Massachusetts, Virginia, New Mexico, Illinois, Maryland and Alabama. Earth Advantage anticipates generating EPS labels for another 38,000 homes by the end of 2013. Audit-to-conversion rates in these programs run from 25% to 60%.

The EPS label has been received well in ETO's new home sector and in the existing homes markets outside of Oregon. John Davies, Director of the Opportunity Council's Building Performance Center in Bellingham, WA points to the EPS as being a "model approach that utilizes market levers to increase energy retrofits."

Tool Evaluation

ETO recognizes the need for an EPS for the existing homes market in its service territory and the state of Oregon. The modeling tool (RemRATE) ETO uses in its new homes program is not suitable for use for existing homes. It engaged a third party to manage a comprehensive review of existing tools that might be suitable to generate an EPS for the existing homes market (ideally use the same tool for the new homes EPS too). It recently released the evaluation report by Stellar Processes ahead of a stakeholder meeting held on 1/26/12. The report ranked tools against SEEM data and found that Earth Advantage's SIMPLE and CSG's Energy Measure Home (EMH) were the top contenders with the overall first place rank awarded to SIMPLE. Recurve and US DOE's Home Energy Score (HES) were eliminated from consideration in the evaluation.

Issues

Site vs. Source

ETO's new homes EPS and Earth Advantage's SIMPLE uses site energy (energy consumed at the home) instead of source energy (accounts for transmission and distributions losses). US DOE's HES models source energy. Gas utility perspective is that in its current form, the EPS does not tell the complete picture and that source energy would be a better metric to use. The gas utility contends that a gas home performs less favorably than a heat pump home when viewing the energy scale of the EPS.

ETO suggested a possible solution would be to index the scores to eliminate the fuel bias so that the consumer would ostensibly compare a heat pump home to a heat pump home.

Carbon

Some stakeholders question the value of displaying a carbon impact on the asset rating. Awareness of carbon emissions and their relevance to the market is cited as reasons to consider removing the metric from the asset label.

Scale

The current ETO new homes EPS and Earth Advantage's EPS for existing homes is based on total annual energy consumption and associated carbon emissions impact with zero being the best in both cases. US DOE's HES reflects the asset rating on a scale of 1 – 10 where 10 is the best. RESNET's HERS Index reflects the home's energy performance on a 0 – 100 indexed scale. Additional stakeholder input suggests assigning points to measures of retrofit activity (one point for duct sealing, and three points for ceiling insulation).

Complexity

Some stakeholders believe that scale orientation (0 up/down or left/right), metric display (absolute consumption, 1-10, 0 -100), and carbon score are too complex for homeowners to contend with.

Commentary

Site vs. Source

The EPS should be viewed as **dual** metric; energy score and carbon score. By displaying both it accomplishes what source energy reflects. Promoting the dual metric (71/4.5 or 71 MTU/yr and 4.5 tons of CO_2) ensures equal parity is given to the consideration of the home's performance. Coupled with the dual metric, the operational costs complete the picture for the residence. The MLS could thus display a home's EPS as $/MBTU/Tons.

The gas utility's concern over the how a gas home performs will be alleviated with the dual metric approach. Gas homes perform well on the carbon score and on operational costs.

Research in the 2008 EPS pilot found that consumers were apathetic when asked to consider source energy as they felt that it was beyond their control.

In the pilot's focus groups for the EPS, 8 of 10 surveyed preferred a consumption metric, and supported a metric that showed multiple fuels as *one score*. Their feedback confirmed that a source energy metric would disempower consumers given that the mix and transmission losses are beyond their control.

Another nuance to the argument against source energy is the additional confusion around "zero" energy homes. We feel that net site energy use easily accounts for site energy production, allowing the energy score to be lowered by the amount of energy, produced onsite. For most homes, this methodology quickly exposes the truth that adding solar photovoltaic panels will only reduce their net site energy consumption by 10 to 30%. With source energy as the metric, it is unclear how site energy production can be accounted for.

If the goal of the asset label is to spur action in the retrofit market, we are bound to deliver a tool that is meaningful to the consumer, and not one that is only meaningful for utilities.

Carbon

We believe that there is little doubt we are moving to a carbon-constrained economy. Even new vehicles on the lots in Oregon carry an Environmental Impact score alongside the MPG rating.

Calculating carbon emissions is an integral part of the EPS and completes the picture of energy use in the home by indicating the impact on greenhouse gas emissions of different fuels. The carbon score balances the fuel efficiency bias that would result from only using an energy score. It is our belief that inefficiencies of the centralized power plants should not impact the energy score of the building.

We recognize the challenge in the needed ETO messaging of "buy efficiency, save money." While this is indeed a challenge today, the EPS asset rating should present the facts as it pertains to home's performance and allow the consumer to decide. The automobile industry has managed this where buying an efficient hybrid does not necessarily correlate with saving money.

This is the opportunity to introduce the concept and role of source energy to the consumer. The lessons of the European Energy Performance Buildings Directive (EPBD), advocating all member states to deliver an energy certificate that depicts both energy and greenhouse gas emissions, may serve to inform efforts here. The EPBD manages labeling for residential and commercial buildings in Europe. The Directive on energy efficiency of buildings was adopted and entered into force on 4 January 2003. It is considered a very important legislative component of energy efficiency activities of the European Union designed to meet the Kyoto commitment

and responds to energy supply security. Estimates projected a cost-effective savings potential by the end 2010 of around 22% within the building sector.

The ultimate currency for homes, buildings, and products should be the carbon impact. Allowing the EPS to carry the carbon score builds needed literacy. Further, it allows the carbon impact of the state's residential industry to be measured, and coaxed to higher levels of reduction. Losing the carbon metric on the EPS will eliminate management of a significant contributor to carbon emissions.

Scale

Nothing can be clearer than absolute consumption. Creating an index or bins prohibits the creation of a true MPG for homes, and provide no additional value if the goal is to inform the homeowner on the energy use of the home. Further, we do not believe that a bin or symbols approach has merit. These very questions were asked in the extensive Energy Trust of Oregon EPS 2008 pilot and consumers resoundingly confirmed their preference for an absolute consumption figure that related to the home's energy consumption.

When food labels with calorie content and the MPG metric were introduced, they were quickly integrated into the vernacular of the consumer once their relevance was established.

Consumers have managed to understand calories, MPG, FICO, golf scores, and GPA scores. An interested homeowner will undoubtedly manage the detail on energy, carbon, and cost on one of their largest assets.

The EPS provides home performance literacy; consumers and stakeholders will learn that down/zero is good, and high is bad. "Simplifying" the display to a 1 through 10 does not provide sufficient granularity (i.e. motivation) to affect a retrofit activity.

It is important to note how homeowners and contractors are using the EPS in other markets with great success to providing a meaningful context for the discussion on energy use and how a retrofit will affect this. This is what the market needs.

Complexity

Some stakeholders believe that scale orientation (0 up/down or left/right), metric display (absolute consumption, 1-10, 0 -100), and carbon score are too complex for homeowners to contend with. If the goal is to provide meaningful information to encourage upgrades, then the asset label should provide the level of information to allow that.

We have embedded the notion of Calorie intake into our dietary lives, despite the fact that formally, a Calorie is a measure of the amount of energy required to heat one kilogram of water one degree Celsius. This adoption came about because all food groups were rated on their absolute Calorie content and not just a select few.

It is important to note that there are some who will never glean any value from an EPS rating and would thus term it "too complex;" Those are invariably the same people for who energy consumption and conservation have little-to-no relevance. We believe that the EPS tool should appeal to a broad audience, and also provide meaningful data.

Summary

In our opinion, the metric chosen for a national scheme needs to appeal to all market actors in the built environment. This would include Realtors, banks, insurance agencies, consumers, builders, appraisers, and energy efficiency program administrators. Having a transparent consumption-based numeric scale will satisfy this requirement. We are already witnessing engagement and considered adoption of the EPS in financial loan products, insurance, and appraisal considerations in the Northwest. This never occurred with any energy efficiency index and is a very encouraging sign that EPS can assist with market transformation and consumer adoption.

We urge ETO to release the EPS in its current format to allow the market to begin using it in the existing homes market.