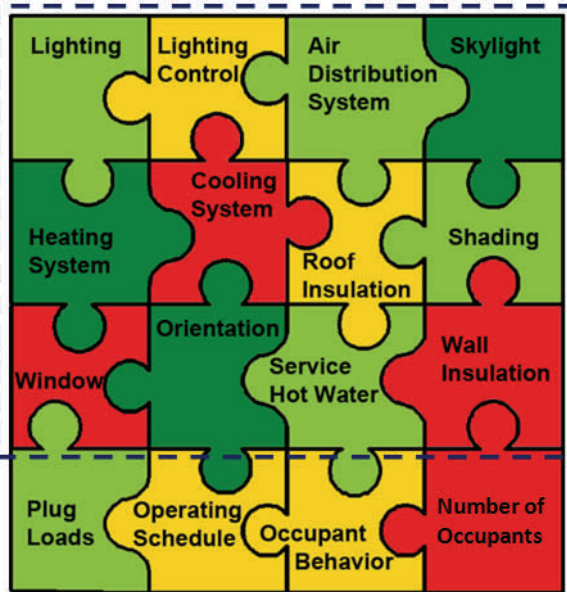


## MASSACHUSETTS PILOT: RAISING THE BAR TO IMPROVE ENERGY EFFICIENCY

The Building Asset Rating (BAR) pilot is a two phased project that seeks to develop and test new methods to assess the energy performance of building assets. As a complement to tools such as the EPA’s Energy Star Portfolio Manager (ESPM), the BAR pilot focuses on analysis techniques that assess building assets rather than the operations of the building. The BAR pilot is jointly coordinated by the Massachusetts Department of Energy Resources (DOER) and Northeast Energy Efficiency Partnerships (NEEP).

### Building Asset Rating



*Building energy use is affected by many factors*  
Source: Department of Energy

### WHY RAISE THE BAR?

*Massachusetts adopted one of the most ambitious greenhouse gas (GHG) emissions reduction plans of any state in the nation. The Clean Energy and Climate Plan (CECP) outlines the Commonwealth’s strategies to achieve a 25% reduction in GHG emissions (relative to a baseline of 1990 emissions) by 2020 and an 80% reduction by 2050. Improved energy efficiency in buildings is a key element of the CECP as the cost of the work is often quickly recouped through decreased utility bills. However, such potential savings are often left untapped. One reason commonly cited is a lack of information regarding the energy performance of building assets as available methods to analyze buildings can be costly and time-consuming.*

*The BAR pilot asks: can we improve building analysis to provide credible, investment-grade information in less time and with decreased cost?*

### A Two-Phased Project: Scope and Methodology

The BAR pilot is a two-phased project focused on commercial office buildings. In phase 1, which concluded in early 2013, eleven buildings in the Greater Boston area were subject to analysis by four different teams employing varying methods. Each building was subject to a traditional ASHRAE Level 2-type audit. Additionally, three “innovative” teams, selected through a competitive procurement process, demonstrated analysis techniques incorporating new data sources, such as satellite imagery and interval meter data, or using streamlined building energy modeling protocols. These three teams were a partnership of The Cadmus Group and First Fuel; Retroficiency; and The Weidt Group. Each team was asked to ground its work in a three-step process: 1) collect the data necessary to construct a model of the building’s energy use; 2) calibrate the model to 12 months of historic energy consumption; and 3) normalize the model parameters dependent on building operations. By normalizing these operational factors, the model results may better reflect the energy performance capabilities of the assets and enable an apples-to-apples comparison between buildings. The model results present an energy use intensity rate of kBtUs / square foot for each primary building system, including heating, cooling, lighting, and plug loads.

# BUILDING ASSET RATING (BAR)

## MASSACHUSETTS—RAISING THE BAR PILOT

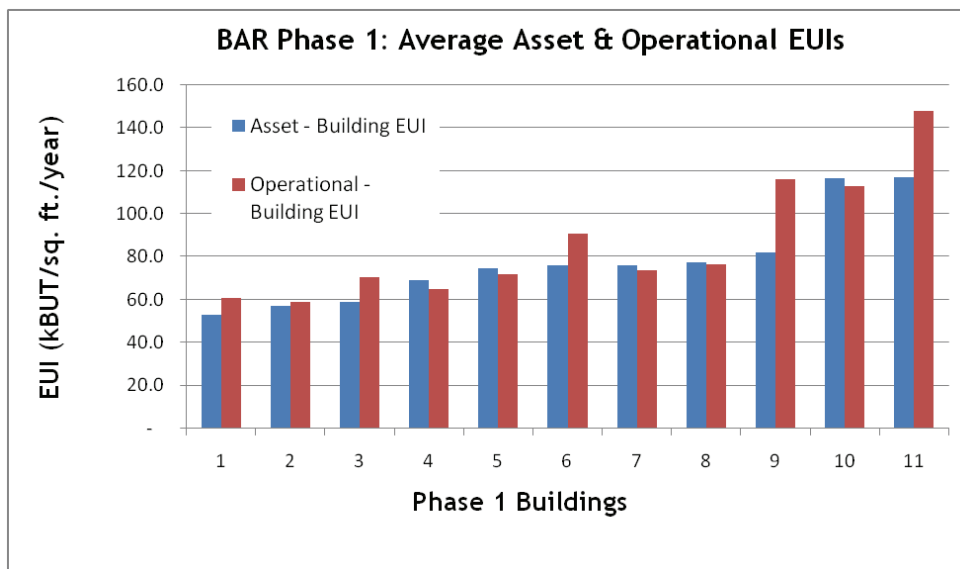


### PHASE 1 FINDINGS

- ✓ Actionable building assessments are available at a significantly lower cost than conventional methods: the traditional analyses averaged \$25,000 per building while the innovative methods averaged less than \$8,000 per building;
- ✓ The key elements of a successful, low-cost asset analysis appear to be:
  - ✓ Access to complete building energy consumption data, including, where available, interval meter data;
  - ✓ Site visit validation of modeling assumptions;
  - ✓ Streamlined energy modeling software;
- ✓ Building size and age alone do not appear correlated with energy consumption;
- ✓ Building plans and drawings are of limited use due to their scant availability and as the plans frequently do not accurately reflect actual building assets;
- ✓ Analysis of building assets requires clear, standardized guidelines to generate consistent results that enable an apples-to-apples comparison of buildings.

### LOOKING AHEAD TO PHASE 2

Two of the innovative methodologies tested in phase 1 will be further explored in phase 2 through broader deployment across a sample of about 40 commercial office buildings in the Greater Boston area. Phase 2 will formally launch in spring 2013, building analyses will occur over the summer, and evaluation of the results are expected to be complete by the end of the year. With a larger portfolio of buildings in phase 2, the results may provide a statistically useful sample size. DOER and NEEP hope that the phase 2 buildings will include properties with interval and traditional meters as well as a range of age, size, and fuel usage. In addition to a rigorous evaluation of the results of the analysis, DOER and NEEP seek to compare the BAR results with ESPM scores and to identify the existence of trends based on building size, age, and location.



### National Leadership Through Research and Innovation

The BAR pilot is one of a few initiatives in the United States seeking improved methods to assess the energy performance of building assets. This project is coordinated with and seeks to complement the California Energy Commission's [Building Energy Asset Rating System](#) and the US Department of Energy's [Commercial Building Energy Asset Score](#).

*The BAR pilot is generously supported by funds from The Barr Foundation and the US Department of Energy.*