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Poster Title: Energy Intensity Matters - Calculating EUIs to Guide Programs for the Future

Abstract: Zero Energy Buildings are the holy grail of energy efficiency. These buildings consume little and generate at least as much energy as they use over the course of the year. However, most buildings are far from the efficiency levels required to cost effectively generate enough energy to satisfy their annual consumption requirements. Efficiency programs, therefore, are increasingly seeking ways to achieve deeper energy savings. Impact evaluations can help to direct such efforts by collecting and presenting data that help program administrators understand:

- How their current suite of measures is impacting total building energy consumption
- Where participants are on the path to low energy consuming buildings
- What the most effective investments are in moving the market toward Zero Energy Buildings

This poster will look at three recent applications of benchmarking to assess program effectiveness as a component of impact evaluations. These studies analyze the impact of energy efficiency measures on building energy use intensity (EUI). EUI is like a car's miles per gallon rating for a building (except the lower the EUI, the more efficient the building). EUI measures annual energy consumption per square foot of building area and is often reported as kBtu/sf/year. Benchmarking is widely used in the building industry to rate and compare building performance, but has not been consistently incorporated in impact evaluation. The poster will demonstrate methods and outcomes for benchmarking savings and the benefit of EUI analysis to informing program impacts on total building energy use.

Graphics will include data from three rigorous commercial, new construction, and multifamily retrofit program impact evaluation studies. Data presented will include:

- Graphs of savings factors (kBtu/sf/year of savings) for energy end uses addressed by a C&I new construction program in the northeast
- Graphs of whole building energy use intensity from recent C&I program participating new construction projects in comparison to the 2012 CBECS average for each building type
- Data showing EUI impacts of a multi-family retrofit program at the building level

Developing an industry standard for including EUI analyses in impact evaluation and building a library of data on the savings factors associated with various measures will provide a solid basis for the next generation of programs which are likely to focus on moving buildings toward minimum practical consumption levels. One question that the energy efficiency industry must answer is "how low can we go in terms of energy intensity?" As programs mature, savings factors and EUI analyses will be necessary tools in understanding program impacts and opportunities.