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Poster Title: If You've Got It, Flaunt It: Maximizing Inhouse Data for Purposes Beyond Program Evaluation

Abstract: Energy efficiency programs produce a wealth of data, but at a considerable price. The data sets serve program tracking, savings verification, and evaluation needs, but rarely do programs repurpose data for other innovative uses. This poster will describe results from an analysis that will mine program tracking and other data sets to answer two pressing questions: What combinations and magnitudes of home retrofits can help achieve net-zero home energy use? Can existing data be used to identify homes that are good candidates for net zero retrofits?

 Net zero energy use has traditionally been the exclusive province of new construction programs. The assumption that existing homes cannot be cost effectively retrofitted to net-zero energy use excludes millions of homes nationwide and necessitates a focus on new homes, depleting vital resources and producing externalities and negative non-energy impacts. One program administrator (PA) in the Northeast believes that some home styles and vintages may be well suited for deep retrofits that, alone or paired with typical residential renewable systems, could yield net zero energy use. The PA further posits that a segmentation study that combines internal program and baseline data, third-party data, and state and federal data could possibly identify the characteristics of those homes, their locations, and the profiles of their occupants. The PA envisions density maps of these homes to display target areas that could be utilized by a net-zero retrofit pilot program.

The PA asked the authors to conduct the analysis needed to determine if net-zero retrofits are possible, and, if so, generate profiles of those homes and occupants and describe the combinations of measures that could make net zero retrofits a reality. To accomplish this, the authors will use building energy optimization software to identify multiple packages of measures that could achieve net zero energy use for selected home types. The modeled home type characteristics will then be matched to existing housing stock to identify geographic areas with the highest concentration of homes with the most net zero potential. Existing homes will be matched using free publicly available data. Once the actual homes have been identified and matched the results will be mapped at the ZIP Code and county levels to display the concentrations of homes that would best be served by a net zero energy retrofit pilot program. The maps will maximize the use of color and shading to clearly exhibit the results.

This poster offers two important contributions to the energy efficiency field. First, it will demonstrate how existing program and similar data can be mined to answer pressing planning and evaluation questions. Reanalysis of existing data costs far less than net primary data collection and analysis. In short, PAs potentially have a wealth of available data that can be productively mined. Second, the study will provide insights into whether certain types of existing homes can achieve net zero energy use through deep retrofits and results reviewed through data visualization.   The work on this research has already begun and will be concluded by March of 2019.