

Utility Demand-Side Efficiency Spending

Russell M. Meyer (1st Year EPP PhD Student)

Advisors: Ines Azevedo, H. Scott Matthews, David Dzombak

Abstract:

This work examines energy savings and variation in the cost-effectiveness of utility demand-side energy efficiency (DSEE) expenditures. Self-reported utility-level data, made available by EIA from 1990, will be used to develop and estimate of the cost-effectiveness of reduced electricity demand. I hypothesize that this data will include significant geographic (and temporal) variation, reflecting differences in utility program design, state policy objectives, and regional climatic conditions. The existing literature on the subject of demand-side efficiency programs neglects this heterogeneity.

These data will be subsequently combined with data which captures the variation in emission factors associated with marginal generation. This will enable the development of an assessment of the social cost-effectiveness of the DSEE spending which will incorporate the geographic variation of both efficiency efficacy and emissions intensity.

Primary Research Questions:

- 1) What regions have benefited most from DSEE?
- 2) Has efficiency spending been cost-effective? Where? Where it has not been; why?
- 3) What have been the external costs/benefits and how does this vary geographically?

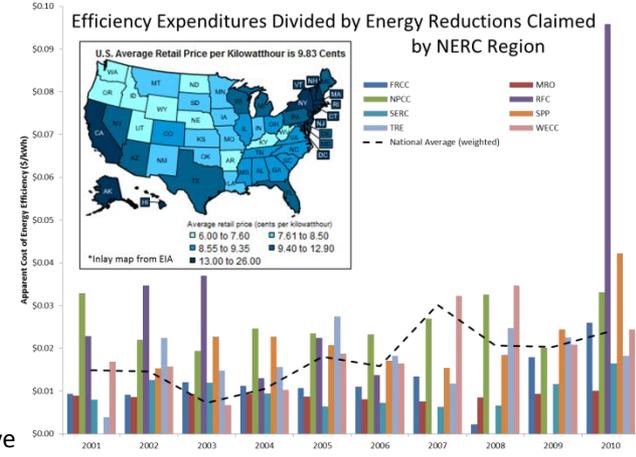
Initial Hypotheses:

- 1) Traditionally structured states, that have a guaranteed rate of return, will have less cost-effective EE programs.
- 2) Cost-effectiveness will vary between climate zones (in what direction?), but have some consistency within them.
- 3) States with greater cumulative EE spending will have higher costs for new spending (higher on the MCC).

Data:

EIA Form 861 provides utility-reported DSEE activities as well as other utility characteristics. This will be combined with data gleaned from reports to state-level PUCs for a sample of utilities to develop a characterization of the types of programs being implemented.

Reported EE Spending and Reduction, 2010



Key References:

ARIMURA, T. H., LI, S., NEWELL, R. G. & PALMER, K. 2011. Cost-Effectiveness of Electricity Energy Efficiency Programs. National Bureau of Economic Research Working Paper Series, No. 17556.

AUFFHAMMER, M., BLUMSTEIN, C. & FOWLIE, M. 2008. Demand-side management and energy efficiency revisited. *The Energy Journal*, 29.

EIA. *Form-861 Data*. Available at (<http://205.254.135.24/cneaf/electricity/page/eia861.html>)

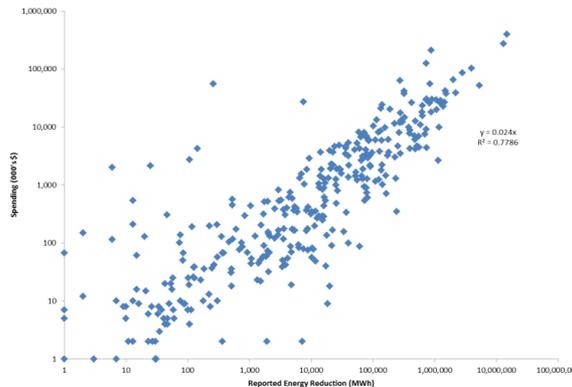
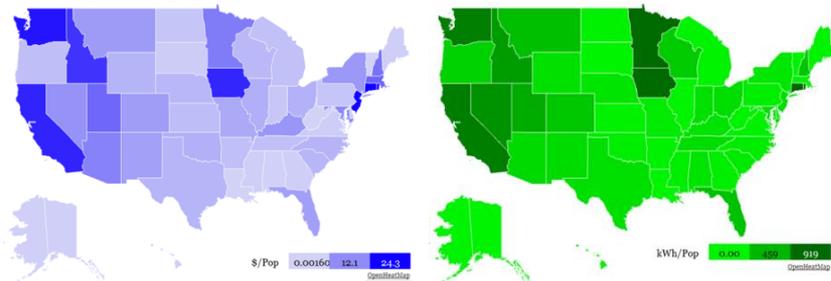
CARLEY, S. 2012. Energy demand-side management: New perspectives for a new era. *Journal of Policy Analysis and Management*, 31, 6-32.

PARFOMAK, P. W. & LAVE, L. B. 1996. How many kilowatts are in a megawatt? Verifying 'ex post' estimates of utility conservation impacts at the regional level. *The Energy Journal*, 17.



EE Spending per Capita, 2010

EE Reductions per Capita, 2010



The author thanks the Steinbrenner Institute for research support.

This work done in collaboration with the Center for Climate and Energy Decision Making (CEDM).