A Preliminary Look at Electric Efficiency Potential

A systematic review of more than 20 studies of electric efficiency potential suggests that, contrary to what might be desired of such objective analysis, the study author, sponsor, and intended audience may matter in the conclusions that are reached. This pattern warrants further study.

Jess Chandler

I. Introduction

Energy efficiency potential studies are being used by policymakers to inform decisions from approval of utility rate cases to developing legislation requiring energy efficiency supply some percentage of future consumption (in most cases, the ''energy'' is limited to ''electricity generating sources'').

This article seeks to provide a preliminary discussion of commonalities and differences in electric efficiency potential studies. Such a review has been attempted before; however, the previous studies failed to be systematic, ignoring important concepts like differences in length of study. Understanding which results from energy efficiency potential studies are generalizable could allow for greater comfort with efficiency for policymakers. Indeed, no measure exists by which to evaluate the reasonableness of any potential study claim – aside from ''gut feelings'' of what is ''too much'' or ''not enough'' savings.

Energy efficiency potential studies are expensive – on the order of tens to hundreds of thousands of dollars per study. Policymakers would do well to understand what key points should be examined at length in the study they pay for. In addition, if there are small ranges at the high level of analysis,

Jess Chandler *is pursuing a Ph.D. in Energy Policy at the School of Public Policy at the Georgia Institute of Technology in Atlanta.* *This research is an extension of a project funded by the Turner Foundation, whose funding is appreciated.*

 1040-6190/$–see front matter , doi:/10.1016/j.tej.2009.12.003

policymakers might best be suited by focusing on more detailed-level analysis.

This article is organized into five sections: Section II provides a description of efficiency potential studies, Section III describes how studies were collected and analyzed, Section IV reviews the variability in results based on study parameters, and Section V concludes with a summary and policy implications.

II. Efficiency Potential Studies

Most studies of efficiency potential consider technical, economic, and/or achievable potential for energy efficiency to offset future forecast demand for energy (electricity, in this case). In most cases, the achievable potential is a subset of economic potential which is a subset of technical potential. Each study has slightly different definitions of these potentials, but they fall within the general bounds of explanations below.[1]

Technical Potential assumes the complete penetration of all energy efficiency measures that are considered technically feasible from an engineering perspective.

Economic Potential refers to the subset of technical potential that is cost-effective. Cost-effectiveness requirements vary from study to study, but usually, the efficiency technology must cost less than supply-side alternatives.

Achievable Potential refers to energy saved as a result of specific programs or policies. While these savings usually represent a subset of the economic potential, some studies determine potential based on policy before examining cost-effectiveness. *Maximum Achievable Potential* is assumed to be the potential that could be achieved over a given time period under the most aggressive policy or program scenario. For example, if a study included three levels of policy aggressiveness, covering 25 percent, 50 percent, and 100 percent of incremental costs; the 100 percent case is considered the ''maximum'' because it is the most-aggressive policy scenario in the study. A 100 percent incentive level is not recommended due to free-riding problems (Quantum Consulting, 2004).

III. Methodology

Studies of electric efficiency potential that covered the South were identified for inclusion in the present study; this includes national, regional, state, and utility-level studies. The focus on the South is largely due to available data and a need to limit the scope to run this initial investigation. The 23 included studies were collected from public sources, so file-cabinet studies and private findings are not included. While the results are focused on the South, the nature of the findings is expected to be generalizable. From these reports, 215 individual estimates of electric efficiency potential (divided by sector and source) were available; 64 of these estimates were presented as summary potentials across ''all sectors'' or did not delineate by sector, so they are excluded. Included estimates are shown in **Table 1**.

Once a study was identified, site electric savings potential in percent at the end-year was extracted. In most cases, this number was explicitly provided by the study; in some cases, the number had to be determined from other data provided. For example, some studies provided savings in kWh or Btu; these units had to be compared with forecast consumption in the end-year to determine the percent relationship.

This article provides a common unit of percent per year in order to

Table 1: Count of Electric Efficiency Potential Estimates by Sector and Type

	Commercial	Industrial	Residential	Total
Tech	6	6	8	20
Econ	11	9	11	31
AchMax	13	11	13	37
AchMod	14	12	16	42
AchMin	7	7	7	21
Total	51	45	55	151

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