

National Energy Efficiency Data: An Impending Crisis

by

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Introduction

Public programs that encourage and support energy efficiency in the transportation, residential, commercial, and industrial sectors have existed for at least 25 years. For many if not most of these programs, energy savings and other program statistics have, to one degree or another, been officially reported. However, longitudinal national-level databases and statistics on these programs are hard to come by. For example, other than the single database constructed from Form EIA-861 that collects electricity efficiency data from electric utility demand side management (DSM) programs, there is currently no central source of annual electricity efficiency program statistics. Making matters worse, since 1995 and the advent of electric utility restructuring, the quality of the EIA-861 data has deteriorated. Not only have utilities ceased their DSM programs, they have also ceased reporting information about their former programs.

This data shortfall is regrettable. Everyone knows what happens when you want to return a recently purchased object to a reputable retail store. Without proof of the purchase in hand – moreover, without the purchased object itself in hand -- you are bound to be dismissed summarily by the store manager. So imagine what might happen if, at some point in the near future, there is no receipt, nor believable evidence of any kind, that a stock of energy resources -- in the invisible form of energy efficiency -- has been purchased with the billions of dollars of public funds that have been allocated to its acquisition. In all likelihood public authorities, and the public at large, will believe they have been hoodwinked.

This paper describes the data shortfall dilemma currently facing the energy efficiency field, in particular the electricity industry, and argues for new efforts to develop a national energy efficiency database. After outlining the scope of the data shortfall problem and the current mechanisms for centralized data collection, this paper offers suggestions for how the impending crisis in energy efficiency proof-of-purchase might be averted with the founding of a national energy efficiency data center. This discussion should be of interest to anyone who believes that public funds should be used to finance or otherwise promote investments in energy efficiency resources.

Scope of the Problem

For some time it has been evident to many energy services professionals that the actual and potential supply of energy efficiency in the United States has been undervalued relative to fossil fuels and other energy sources. This bias is perpetuated by the findings of widely used macroeconomic energy models. With little or no data with which to

capture the contours of the resource, these models tend to be insensitive to changes in energy efficiency public policy and changes in consumer behavior. In effect, the magnitude of this resource reservoir is overlooked due to the lack of continuous, standardized data with which to estimate its impact.

The lack of energy efficiency program data hampers energy and environmental policy on several counts. First, retrospective energy efficiency program accountability tends to be local, piecemeal, idiosyncratic, and infrequent. Second, forward-looking projections suffer because historical knowledge of program operations and impacts are limited. Third, basic empirical research is likely to have embedded flaws that result in misleading and inconsistent estimates of economic productivity, energy price and income elasticities, weather response functions, and technological and environmental change. The best way to address these technical issues and generate more accurate and unbiased knowledge is to develop databases that can be used to improve existing models and analyses. Which leads to the question: how do we currently fare, as a nation, vis-à-vis electricity program data? The short answer is that we are short, and getting shorter.

To fully understand the nature of the impending data crisis, it is important to put the scope and breadth of existing electricity efficiency programs in perspective. Electricity energy efficiency programs, by which is meant programs that encourage permanent energy savings rather than peak hour reductions in demand, are divided into two categories by energy professionals. The first, preeminent until the mid 1990s, is DSM programs. Often referred to as resource acquisition programs, these programs were regulated by states and run by electric, and less so natural gas, utilities. They entailed recruiting customers to obtain free energy audits, or technical training, or financial incentives for the purchase of approved energy efficiency products and services. Annual expenditures on these programs by electric utilities peaked at about \$1.8 billion in 1993. Due largely to electric utility restructuring and deregulation, by the end of the 1990s DSM program expenditures, and the number of utilities running DSM programs, were in substantial decline.

Despite the decline in DSM programs, total expenditures on electricity energy efficiency programs appears to have remained relatively stable throughout the latter half of the study period thanks to a newer generation of energy efficiency programs. Beginning in 1991 with the U. S. Environmental Protection Agency's (EPA) Green Lights™, and in 1995 with its successor ENERGY STAR®, DSM programs were gradually supplemented by national and regional public programs whose collective mission was to *transform* the nascent markets for energy efficiency products and services. Market transformation (MT) programs explicitly target both sides of the market. On the supply-side, MT programs work with the entire business chain, from product development, to manufacturing, to distribution and retailing. On the demand-side of the market, MT programs use public relations, marketing, educational and advertising campaigns to influence consumers.

In addition to EPA's program, other federal programs started in the 1990s include DOE's Federal Energy Management Program (FEMP) and Rebuild America. At the regional

level, four organizations now implement numerous commercial sector MT programs through what is known as *public benefits charges* levied by states and collected through local utility billings. The Northeast Energy Efficiency Partnership (NEEP) covers 6 states, the Midwest Energy Efficiency Alliance (MEAA) covers 7 states, the Southwest Energy Efficiency Project (SWEET) covers 6 states, and the Northwest Energy Efficiency Alliance (NEEA) covers 4 states. MT programs are also being implemented by individual states. For example, commercial programs are active in California, New Jersey, New York, Texas, Vermont and Wisconsin. According to a recent ACEEE report “Public benefits spending has increased rapidly since 1998 and has become a large share of total funding for energy efficiency programs” (Kushler and Witte (2001): *A Revised 50-State Status Report on Electric Restructuring and Public Benefits*). This study estimates spending for MT programs across all customer sectors at about \$1.1 billion in 2000, not including federal funding for MT programs

Until the mid-1990s, virtually every electric utility DSM program was monitored and evaluated on a regular, if not yearly, basis. The results of these studies – reported to local regulatory agencies, various interested parties and stakeholders, and often company shareholders -- produced rolling, cumulative estimates of the stock of resources purchased with ratepayer funds. Starting in 1989 investor owned utilities were required by the federal government to report DSM accomplishments on Form EIA-861 to the Energy Information Agency (EIA). This detailed, geographically diverse information was thus centralized and made easily accessible, thereby permitting the data to be aggregated for multi-utility, multi-state and multi-year analyses. Unfortunately, with the ascension of electric utility deregulation in the mid-1990s and the fading of DSM programs, DSM reporting on Form EIA-861 deteriorated. Although some utilities continued to file Form EIA-861 correctly, a large number of utilities either ceased their reporting entirely or paid little attention to the accuracy of their DSM reports.

This widening loss of annual energy efficiency program data is magnified even further with the rise of MT programs funded with state public benefits charges. In addition to an entirely new set of programs being administered by non-utility organizations, many of the older DSM-type programs are currently reclassified as public benefits programs -- even though they are administered by electric utilities -- and are effectively extensions of the former programs. And yet, at present there is no central national repository for critical statistics related to public benefits programs, nor are there any private or public organization that have taken the lead in trying to go about collecting such data and organizing it into a single, central database. Making matters worse, methodologies for conducting impact evaluations of publicly-funded MT programs and deriving reliable program statistics, such as cumulative energy savings, are in their early stages of development.

While a mission to coordinate, collect and standardize such program data might naturally fall to EIA, given the federal budget deficit for the foreseeable future, it is unlikely that EIA will be able to expand its mission to include data collection of this sort. Moreover, MT energy efficiency programs, being administered by newly-formed regional organizations rather than by electric utilities, are not bound by mandatory federal

reporting requirements and may therefore be unreachable by federal regulatory or executive branch agencies. Thus, at present there is neither coordination nor standardization of the reporting of MT energy efficiency program accomplishments. This blind spot has many dangers, three examples of which come immediately to mind. First, without a centralized database there is little motivation for developing rigorous, universally-acceptable methodologies for evaluating programs. Second, without a centralized database it is not possible to perform comprehensive cost-effectiveness analyses. Third, without empirical evidence of energy efficiency impacts and the relative costs of this energy resource, the political process is likely to supercede rational decisionmaking regarding national and global environmental policies.

Other than Form EIA-861, only one other mechanism exists for centralizing energy efficiency data in a national database. This mechanism is the voluntary reporting of greenhouse gases program, called for in Section 1605 (b) of the Energy Policy Act of 1992 (EPACT). Its purpose is to collect national data on reductions in greenhouse gas emissions, about a third of which are caused in the United States by fossil fuel electricity generation. Unfortunately, the self-reported greenhouse gas savings that have been reported since 1992, much of which comes from energy efficiency projects implemented by private sector firms, are neither comprehensive nor verified, making the database of limited use, if any. In addition, a cursory inspection of this database reveals that this database does not contain identifiable DSM program or MT program. While EIA is currently in the process of revising the data collection forms and data elements based on a revised set of voluntary reporting program guidelines, it is difficult to foresee how this program can succeed in future years in providing even a somewhat complete, or somewhat accurate, inventory of national energy efficiency efforts.

The current state of national energy efficiency data, and of the prospects for collecting such data in the foreseeable future, can thus be characterized as very poor. Which means that while individual energy efficiency programs may be evaluated and studied at the local or regional level, in the future there may be no way to compose a detailed, uniform, national scorecard -- or to perform empirical studies that are national in scope -- to arrive at an economically efficient allocation of energy resources.

Development of NEEDC

One possible solution for avoiding a future data crisis in energy efficiency research is to create a national, non-profit organization whose purpose will be to collect, organize, disseminate and archive energy efficiency statistics. Energy-related programs at every level of government will be included in this effort. The name for such an organization might be something like the National Energy Efficiency Data Center (NEEDC).

NEEDC will be staffed with professional researchers whose jobs will involve collecting, processing and analyzing energy efficiency program data from all parts of the nation. The data collection effort will focus on a minimum of 2 key variables: annual program

energy savings and annual program costs. Other data series may also be developed. The ultimate product of NEEDC might be a website that includes:

- a brief monthly newsletter containing energy efficiency data news
- downloadable annual energy efficiency data, by state and type of program
- downloaded reports that discuss data issues and document data collection and processing protocols
- downloadable studies and analyses using NEEDC data.

Being central to national energy and environmental policy, and many believe to national security, the energy efficiency data collection effort might be patterned on the data series collected by FERC Form 423 ("Monthly Cost and Quality of Fuels for Electric Plants Report") and by Form EIA-906 ("Power Plant Report"). In the former, electric utilities document how much of each fossil fuel they purchased, the Btu content of the fuel, and its cost. In the latter, the amount of electricity generated by each form of fuel, both fossil and non-fossil, is reported. Since a Btu saved is a Btu earned, this would put energy savings on the same footing as other supply-related resources. However, unlike the FERC and EIA data that are provided by electric utilities on a monthly basis, the NEEDC data will be collected from program administrators and published sources and need only be provided annually. Also, whereas it is mandatory for electric utilities to report these data, NEEDC will have to rely on voluntary cooperation and publicly available records and documents.

It is important to stress that there are significant barrier to collecting accurate and timely energy efficiency program data. For example, some program administrators may be less than cooperative, some programs may operate on odd time lines, or some programs may simply not generate data in formats that are compatible with other NEEDC data. As a result, NEEDC will need to establish procedures and guidelines for generating program statistics and then verifying the accuracy of these estimates. Though errors may arise, it is essential to recognize that NEEDC must operate on the principle that it is far better to have approximate, unbiased data than to have no data whatsoever.

In conclusion, I invite all of the conference participants to offer suggestions on how best to avert the impending energy efficiency program data crisis. Quite frankly, many energy services professional have already indicated to me that they do not believe we will have to wait for the unfolding of this decade to experience the crisis – they believe it is already upon us. For the public good, I believe that the sooner the energy efficiency industry realizes that the current federal government data collection efforts are inadequate, and that no new data collection effort will be authorized on behalf of energy efficiency, the better. Only then might there be interest in creating an organization whose sole mission is to supply the nation with proof-of-purchase of energy efficiency.