



Guide for Conducting Energy Efficiency Potential Studies

A RESOURCE OF THE NATIONAL ACTION PLAN FOR
ENERGY EFFICIENCY

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About This Document

This *Guide for Conducting Energy Efficiency Potential Studies* is provided to assist state officials, regulators, legislators, and others in the implementation of the recommendations of the National Action Plan for Energy Efficiency (Action Plan) and the pursuit of its longer-term goals.

This Guide identifies three main applications for energy efficiency potential studies and provides examples of each, along with a description of how key decisions regarding scope and methodology are made to best achieve the studies' objectives. It also provides an overview of the main analytical steps in conducting a potential study and introduces several related concepts.

The primary intended audience for this Guide is policy-makers, state officials, utility staff, and efficiency advocates looking for guidance on the process of conducting potential studies. These individuals can also use the Guide to review the results of already-completed studies.

The *Guide for Conducting Energy Efficiency Potential Studies* is a product of the National Action Plan for Energy Efficiency Leadership Group and does not reflect the views, policies, or otherwise of the federal government. The role of the U.S. Department of Energy and U.S. Environmental Protection Agency is limited to facilitation of the Action Plan.

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Executive Summary



This Guide provides information on standard approaches for parties looking to build the policy case for energy efficiency, evaluate efficiency as an alternative to supply-side resources, and formulate detailed program design plans by understanding the potential for cost-effective energy efficiency. Policy-makers, state officials, utility staff, efficiency advocates, and others can use this information to quantify the magnitude of the energy efficiency resource. The Guide is provided to assist in the implementation of the National Action Plan for Energy Efficiency's five key policy recommendations for creating a sustainable, aggressive national commitment to energy efficiency.

Importance of Conducting Energy Efficiency Potential Studies

Improving energy efficiency in our homes, businesses, schools, governments, and industries—which consume more than 70 percent of the natural gas and electricity used in the country—is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and independence, air pollution, and global climate change. Despite these benefits and the success of energy efficiency programs in some regions of the country, energy efficiency remains critically underutilized in the nation's energy portfolio. It is time to take advantage of more than two decades of experience with successful energy efficiency programs, broaden and expand these efforts, and capture the savings that energy efficiency offers. Conducting a potential study provides key information to inform policies and approaches to advance energy efficiency.

The National Action Plan for Energy Efficiency was released in July 2006 as a call to action to bring diverse stakeholders together at the national, regional, state, or utility level, as appropriate, and foster the discussions, decision-making, and commitments necessary to take investment in energy efficiency to a new level. This Guide directly supports the Action Plan recommendation to “make a strong, long-term commitment to implement cost-effective energy efficiency as a resource.” A key option to consider under this recommendation is establishing the potential for long-term, cost-effective energy efficiency savings (see page 1-2 for a full listing

of options to consider under each Action Plan recommendation). Conducting a potential study supports this option and provides critical data for the design of policies and programs aimed at increasing investment in energy efficiency, including:

- Setting attainable energy savings targets.
- Quantifying the energy efficiency resource for system planning.
- Determining funding levels for delivering energy efficiency programs.
- Designing programs to achieve the long-term potential.
- Reassessing energy efficiency opportunities as conditions change.

Energy efficiency potential studies are an effective tool for building the policy case for energy efficiency, evaluating efficiency as an alternative to supply side resources, and formulating detailed program design plans. They are typically the first step taken by entities interested in initiating or expanding a portfolio of efficiency programs, and serve as the analytic basis for efforts to treat energy efficiency as a high-priority resource equivalent with supply-side options.

Potential studies conducted by utilities, state agencies, advocacy groups, and other entities consistently find that significant gains in cost-effective energy savings (e.g., MWh of electricity, MCF of natural gas) and capacity (e.g., MW, MCF/day) are currently possible in all sectors and regions of the country, and are likely to

continue to be available at low cost in the future. These studies show that energy efficiency can yield more than 20 percent savings in total electricity demand nationwide by 2025. This is equivalent to reducing the forecast growth in electric demand by 50 percent under some forecasts (Nadel et al., 2004; NEEP, 2005; SWEEP, 2002).

Energy efficiency potential studies can be broadly characterized by how the results are applied in a policy and program development context. In each case, the cost and time needed to complete a study is directly correlated with the level of detail and accuracy of results. This Guide identifies three main applications for energy efficiency potential studies:

1. Potential studies that are written with the aim of *building policy support and making the case for energy efficiency programs and funding*. Usually these types of studies are done at a high level of aggregation, and focus on the macro-level societal benefits of doing efficiency.
2. Potential studies that are written with the aim of *evaluating efficiency as an alternative to a specific supply-side project*. These types of studies present highly accurate estimates of the energy efficiency potential, as they need to provide certainty and foster confidence in energy resource planners to invest

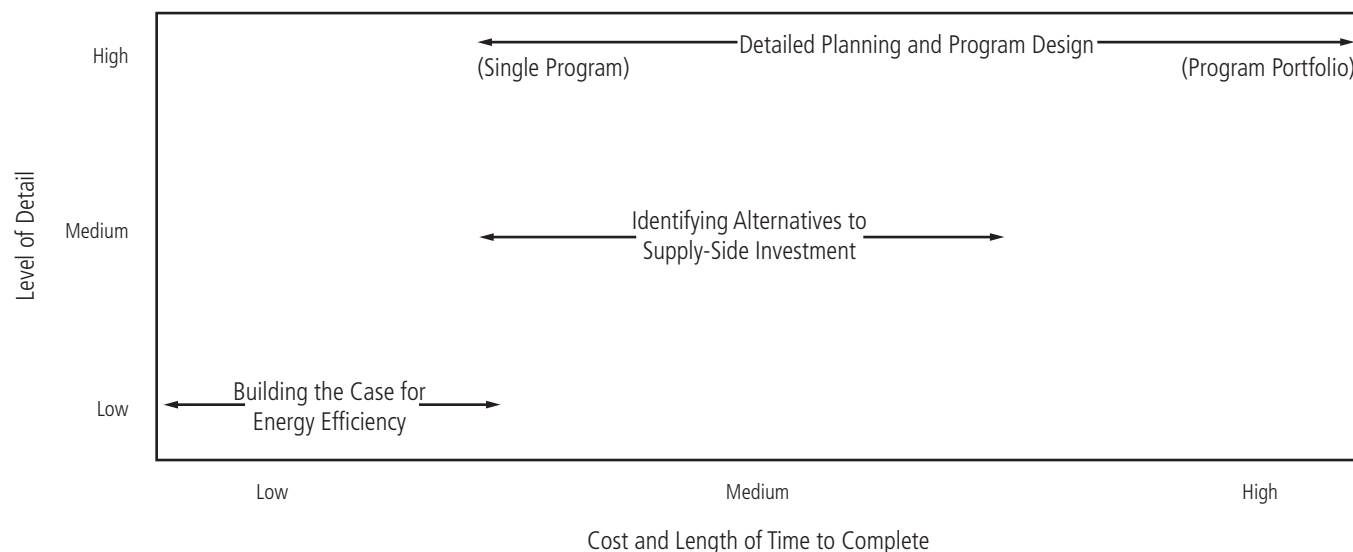
in energy efficiency instead of traditional “steel in the ground” resources.

3. Potential studies that are written with the aim of *determining how much to spend on efficiency, and how that money can best be spent*. These potential studies are conducted in situations where the policy decision to invest in efficiency has already been made and there is no need to make a case for supporting efficiency. These studies focus more on the disaggregated results (e.g., is there more opportunity in lighting or HVAC?) than other types of potential studies.

Each of these potential study applications incorporates general concepts and steps (discussed in Chapter 3), which include potential-type analyzed (technical, economic, or achievable), data collection approaches, level of aggregation, expected accuracy of results, and the type of output produced. Chapters 4 through 6 describe these concepts and steps, briefly address their implications for study cost and completion time, and provide recommendations for how each should be handled in the context of the three potential study applications (given a state or utility’s overall policy goals).

After reading this Guide, parties seeking to undertake a potential study will better understand: (a) the questions to ask to ensure that the appropriate potential study

Figure ES-1. Considerations for Conducting Potential Studies



application is selected, (b) the basic approach and steps for conducting the study, including the key questions and issues to raise with the analyst doing the work, and

(c) the types of results and insights that can (and cannot) be expected, including how potential studies can be used to advance the Action Plan recommendations.

Table ES-1. Key Issues for Selecting a Potential Study Application

	Building a Case for Energy Efficiency	Identifying Alternatives to Supply-Side Investments	Detailed Planning and Program Design
Typical Cost*	\$20,000–\$75,000	\$75,000–\$300,000	\$75,000–\$500,000
Estimated Time*	1 to 4 months	4 and 12 months	4 and 12 months
Key Questions	<ul style="list-style-type: none"> • Are we in the process of deciding whether to invest in efficiency and if so, are we deciding how much to invest? • Is the primary motivation of this study to demonstrate the benefits of efficiency and build policy support? • Can we accept a fairly high level of aggregation and thus uncertainty in our results? • Are the desired outputs primarily macro-level energy and capacity savings, and is there a role for related economic and environmental data? 	<ul style="list-style-type: none"> • Will this study determine whether energy efficiency can be used to defer or eliminate plans to build new capacity or upgrade transmission lines? • Are energy efficiency objectives best supported by “investment-grade” analysis with the aim of ensuring the future reliability of the power system? • Are energy efficiency objectives best supported by detailed measure-level data? Should certain measures (i.e., those that provide summer peak reductions) be given priority? 	<ul style="list-style-type: none"> • Has the decision to invest in efficiency already been made? • Are data needed primarily to aid in decisions about which market sectors, targeted geographic areas, end uses, measures, and programs should be tapped to realize efficiency potential? • Are study findings intended primarily for energy efficiency planners who will incorporate the results into portfolio decisions? • What is the history of efficiency programming in this area? What effect does this history have on the assumptions we make about program potential? • Should the study focus on one particular end use, customer segment, or set of measures? Are data available that can give reasonable disaggregated results?

* These ranges should be viewed as approximate. They are based on a sample of studies and are not intended to define the absolute limit of these parameters.