Energy Efficiency and Deregulation: Linking the Big Questions

Julie A. Fitch, California Public Utilities Commission[1]

ABSTRACT

With the second half of the States still moving towards deregulating their electric utility industries, we can learn a great deal from the experiences of the first half on the treatment of energy efficiency both during the transition period and after deregulation. This paper is intended primarily for policymakers at various stages in the deregulation process who want to create a logical basic framework for achieving energy efficiency goals. The linkages between five key policy issues are addressed in order of importance, beginning with structural issues, and followed by program strategies and cost-effectiveness screening. Emphasis is not on the right answers to key questions, but rather on the relationships between the issues. Examples of workable and unworkable frameworks are given in the conclusion.

Introduction

Most State deregulation legislation passed over the past five years has included some provision for funding public purpose energy efficiency activities. In many cases, however, the legislation included only a broad outline of how energy efficiency should occur, leaving the finer points of implementation to be worked out by independent regulatory commissions through rulemaking processes. In many cases, regulatory commissions dove directly into the details of program design and implementation without stopping to ask whether the broader framework for energy efficiency was sufficiently clear.

The idea for this paper arose from observing the rulemaking processes in California, Texas, and Oregon through participation in numerous working groups. This led to the realization that, in many instances, stakeholders and regulatory commission staff lack a roadmap for laying out a basic framework or context for making energy efficiency programs operational in the deregulated market. This paper attempts to outline some key choices and tradeoffs.

This paper outlines five interrelated "big questions" that any entity undertaking policymaking for energy efficiency should answer. In many cases, these questions may have been answered perfunctorily or implicitly, but sufficient attention was not given to how the answers to the questions related to each other. Exploring the relationship between the five "big" questions is intended to help energy efficiency policymaking institutions, even those part-way through the policymaking process, to take a balanced look at creating a logical context for energy efficiency programs in their states.

---

[1] This paper was written while the author was employed by Schiller Associates and is based on experience and insights gained through assignments there. The author is now a staff member at the California Public Utilities Commission (CPUC); the views expressed herein are the ideas of the author independently and do not necessarily represent the CPUC or its staff.

The five interrelated "big questions" that will be examined include:

Structure

1. Who will be responsible for delivering energy efficiency?
2. How much funding will be available for energy efficiency?

Strategy

3. What is the goal - Part 1: energy savings resources or market transformation?
4. What is the goal - Part 2: capacity (kilowatts) or energy (kilowatt-hours) savings?

Screening

5. Will there be a cost-effectiveness standard and, if so, how will it be defined?

The three categories of "structure," "strategy," and "screening" represent the decreasing level of importance of the five questions. The "structure" questions represent the foundation or framework of how energy efficiency services will occur in the state. "Strategy" questions address the types of programs or activities that will deliver the types of energy efficiency services needed in the state. Cost-effectiveness "screening" is often used to ensure prudent energy efficiency spending; though this issue may eventually become irrelevant in a fully deregulated market, is it often difficult for stakeholders to ignore during the transition period.

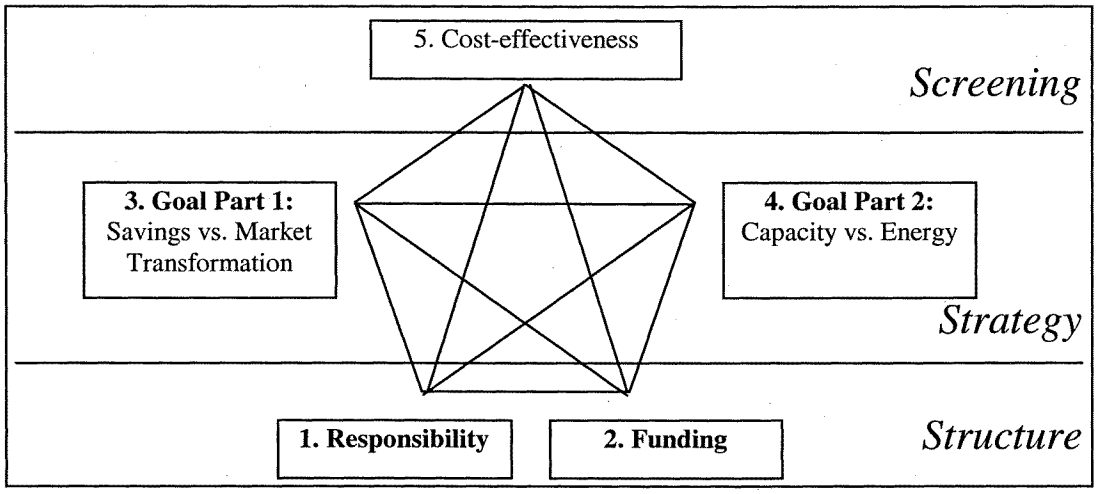

Figure 1. Interrelationships Among the "Big Questions" and Categories

Although asking all these questions may seem obvious, in many states, the deregulation law passed by the legislature answers only one or two of the questions. Others are left to be answered during a rulemaking process. At that stage, stakeholders generally choose to lobby on behalf of the remaining issue(s) they consider to be most important, elevating some issues and de-emphasizing others. Many times, the resulting rules, while providing detailed guidance on particular issues, do not adequately address the relationships among these issues to create a logical framework.

In this paper, each question will be addressed briefly. Then, each question will be examined in the context of the other four, to help illuminate the relationships between the choices made in answering each question. Structure questions will be addressed first, since they are most important to creating the overall framework. Decreasing emphasis will be given

to the strategy and screening questions. The objective of this paper is not to select the right answers to these questions, but to identify the issues and relationships that should be examined in order to create a logical and consistent framework for energy efficiency.

Ideally, an analysis of these policy issues would consider actual energy efficiency results and impacts achieved by states implementing various models for providing energy efficiency after deregulation. At the time of writing, however, adequate data have not become available for a systemic analysis of the various options for answering each question. Consequently, this paper represents a qualitative rather than quantitative analysis of the key issues.

Basic Characterization of the Questions

The purpose of this section is to briefly summarize the range of options available to policymakers in answering each of the five "big" policy questions related to the creation of an energy efficiency framework in the deregulated environment.

Strategy Questions

Who Will Be Responsible for Delivering Energy Efficiency? At the outset, it is important to define what is meant by "delivery." In some states, the entity responsible for program delivery is referred to as the administrator; in others, the administrator simply collects funds and manages contracts through which private sector organizations provide energy efficiency services to consumers.[2] Entities responsible for delivering energy efficiency services may choose different means to meet its objectives, including outsourcing to private sector providers.

The choice of entity tasked with delivering energy efficiency is usually the most important and contentious issue to be addressed when creating a framework for energy efficiency in the deregulated context. Generally, there are three basic types of entities that deliver energy efficiency services. These are:

- Distribution utilities;
- State agencies; and
- Newly-created non-profit agencies.

Though choosing the type of organization to deliver energy efficiency services often presents a stumbling block, each option has advantages and disadvantages. A brief illustration of the advantages and disadvantages of each institution is shown in Table 1.

[2] When referring to the entity responsible for delivering energy efficiency, this paper refers to the organization being held responsible for the success or failure of the effort.

Table 1. Some Advantages and Disadvantages of Responsibility Choices

Entity	Advantages	Disadvantages
Distribution utilities	• Existing staff and organizational capacity • Subject to regulatory oversight • Access to and trust of consumers • Responsible for electric system reliability for consumers	• No built-in incentive mechanism • Area of influence limited to service territory • Represents "status quo;" often viewed as bureaucratic • Lack of trust by consumers
State agencies	• Statewide authority • Independence • Public policy advocate	• May lack expertise, capacity or resources • No direct access to customers • Subject to political pressure
Newly-established non-profit agencies	• Offers "clean slate" • Independence • Statewide authority	• Requires start-up costs and long lead time • No direct access to customers

The choice of responsible organization for energy efficiency will be an individual one for each state. Some states have existing agencies that have been actively involved in energy issues, such as the New York State Energy Research and Development Agency (NYSERDA) or the California Energy Commission (CEC), which are delivering energy efficiency services as part of each state's public benefit programs. Other states have taken advantage of regional entities such as the Northwest Energy Efficiency Alliance or the Northeast Energy Efficiency Partnership to deliver public benefit programs. Still others have utilities that have been highly successful at delivering energy efficiency benefits to consumers. The choice for each state will depend on the existing capacity within each type of organization.

How Much Funding Will Be Available for Energy Efficiency? The possible answer can be determined in a variety of ways using a number of different mechanisms. Some of the most common are the following:

- A component of utility distribution tariffs to be filed by distribution utilities in rate cases
- A designated percentage of consumer utility bills or utility revenues
- Established as a "wires charge" per kilowatt-hour of energy consumption.

The first option leaves the funding up to distribution utilities to propose, while the second and third are variations of a similar concept to collect funding through power distribution entities, based on the amount of electricity used.

The most common measurement of funding levels for energy efficiency is in "mills per kilowatt-hour."[3] A quick survey of states that have determined funding levels as a percentage of utility bills or through a wires charge reveals that funding levels tend to fall into one of the categories summarized in Table 2. The table also gives a framework for dividing funding terms into short-, medium-, and long-term categories.

[3] One mill equals one-tenth of a cent.

Table 2. Categorization of Energy Efficiency Funding Levels and Terms

Category	Funding Level	Funding Term
Low/short-term	Under 1.0 mill per kWh	Less than three years
Medium	Between 1.0 and 2.0 mills per kWh	Three to five years
High/long-term	Over 2 mills/kWh	More than five years

Strategy Questions

What is the Goal, Part 1: Energy Savings Resources or Market Transformation? This dimension of the goal for energy efficiency relates to the distinction between acquiring verifiable energy or capacity savings or transforming the energy efficiency market. The acquisition of energy efficiency resources usually implies a short-term strategy to meet a particular need for energy savings, while market transformation is a more long-term strategy for changing the behavior of market actors in making energy efficiency decisions.

Examples of energy efficiency resource acquisition programs include rebates, programs that provide design or engineering assistance to commercial and industrial customers, and standard performance contracting programs (if they are aimed at meeting a particular energy savings goal). Examples of market transformation programs include heating and air conditioner contractor training programs promoting the use of Energy Star appliances or Energy Star new home construction programs, and standard performance contracting programs that are targeted at creating and sustaining the private sector delivery of energy efficiency services.

What is the Goal - Part 2: Capacity (kilowatts) or Energy (kilowatt-hours) Savings? The choice of capacity or energy savings as the primary purpose of the energy efficiency activities depends mostly on the particular set of circumstances facing the state undertaking the initiative. Some states, including Colorado and Texas, are facing real or potential short-term capacity shortages, which dictate a larger emphasis on load management. Other states, including California and New Jersey, have shown long-term commitments to energy savings and their related environmental and societal benefits, and therefore place more emphasis on long-term energy savings over short-term peak demand savings.

The mix of consumers within a state or utility service territory could also dictate more emphasis on capacity or energy savings. For example, many technology companies, particularly internet companies, are now focusing on reliability of power supply as a crucial goal to maintaining their services and systems around the clock.

Screening Question

Will There Be a Cost-Effectiveness Standard and, if so, How Will It Be Defined? To maximize the impact of energy efficiency investments, most energy efficiency programs offered by regulated utilities in the past required some sort of demonstration of cost-effectiveness. The test most commonly used by utilities was the total resource cost (TRC) test. Though some would argue that cost-effectiveness tests become irrelevant in fully deregulated markets, there is a general reluctance on the part of policymakers to abandon all cost-effectiveness testing. More work may be required to develop new measures of cost-

effectiveness, but some interim choices during the transition period are likely to be made to ensure prudent energy efficiency spending in the short-term.

Examination of the Relationships Among the Big Questions

In this section, each "big" question is examined in relation to each of the other questions. The questions of structure are grouped together and addressed first, since they are most important for setting the overall framework. Next, strategy questions are addressed alone. Structure questions are then addressed in relationship to program strategies, followed by structure and strategy in relationship to the screening question. A representation of a suggested decision-making process, beginning with assigning responsibility for delivering energy efficiency and ending with the selection of cost-effectiveness criteria or tests, is shown in Figure 2. Questions represented on the vertical axis are considered in order of consideration, in relation to the questions on the horizontal axis.

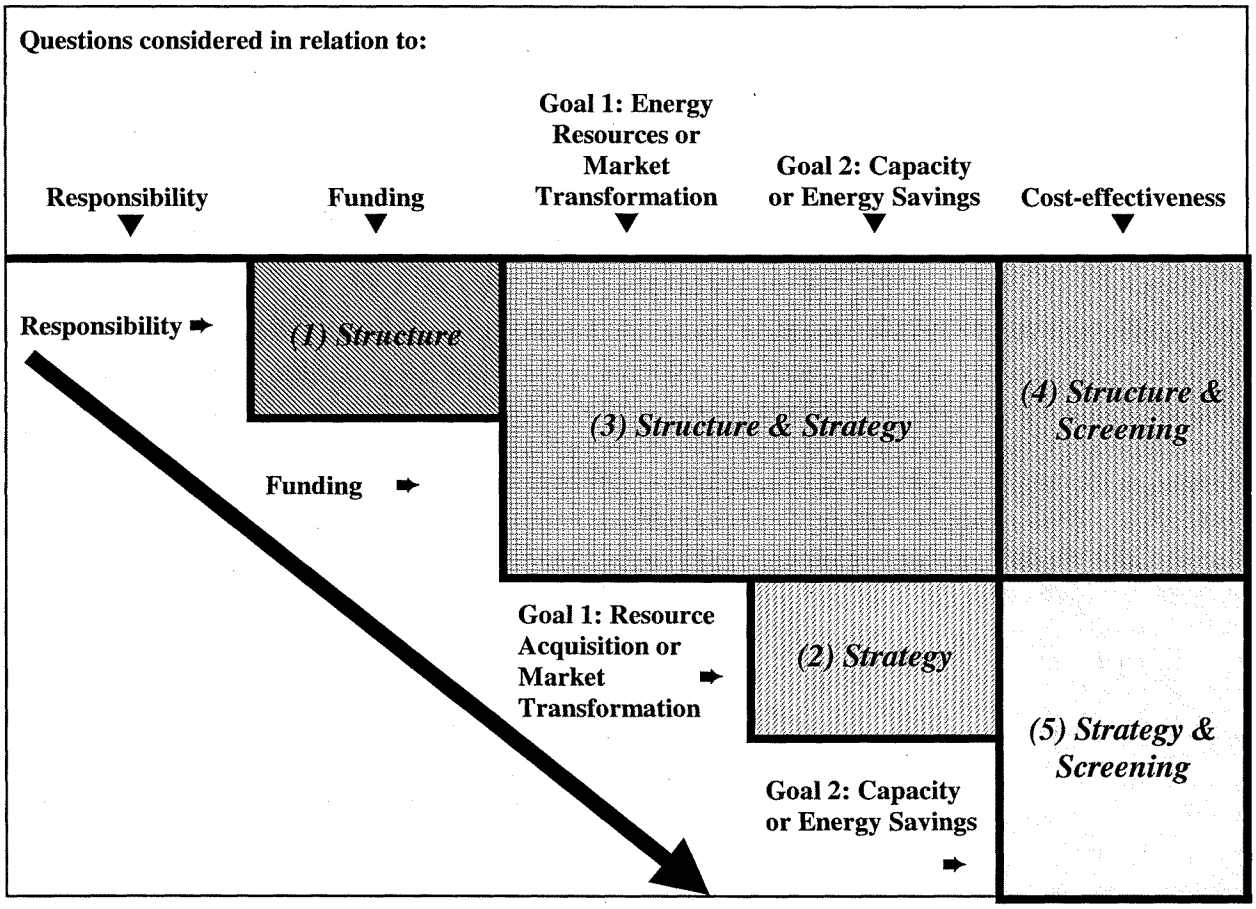

Figure 2: Decision-Making Flow in Relationship to Other Big Questions

Structure

The most important structural issues involve the relationship between selection of organization with delivery responsibility and the level of funding available. In particular,

different types of administrative responsibility for energy efficiency service delivery have different funding requirements. In most cases, distribution utilities represent the status quo of energy efficiency service delivery, and therefore do not require significant investment in infrastructure or staff to continue delivering those services. State agencies or new non-profit organizations, on the other hand, may require a sufficient level of funding to create or augment their capacity to delivery energy efficiency programs. If the amount of funding available falls into the 'low" category, or the time frame is short, the costs of setting up an entirely new organization will likely outweigh the benefits. In such cases, it would seem preferable to assign the responsibility to either an existing state agency or to the distribution utilities. On the other hand, if funding is medium to high and long-term, an investment in setting up a workable independent non-profit administrative structure may be worthwhile, especially if market transformation is the long-term policy goal.

If funding levels are intended to be determined on the basis of distribution utility rate cases, however, this generally presupposes a decision to place responsibility in the hands of the distribution companies. In this instance, distribution companies will be in the best position to access customer information and estimate the potential for and the cost of delivering energy efficiency in their service territories.

There are several other questions that relate to the selection of an entity to deliver energy efficiency programs in the deregulated market. In particular, if mechanisms have been identified in legislation for implementing energy efficiency programs with consumers, these may influence or suggest the assignment of responsibility. For example, in Texas standard offer programs and market transformation programs are the two mechanisms allowable by legislation for delivering energy efficiency programs.

In addition, in many cases, a particular mechanism has been identified for collection of energy efficiency funding (such as a wires charge or through distribution utility tariffs). Responsibility for collecting funding does need to be clearly outlined, but should not be confused with assigning responsibility for delivering energy efficiency services. The collection entity does not need to be the same as the delivery entity, as long as the accounting structure and cash flows are clear.

Strategy

There is also an important relationship to be recognized between the two dimensions of program goal setting: market transformation vs. energy savings goals, and energy vs. capacity savings goals. The choice of a market transformation or energy resource acquisition goal may automatically imply whether the second dimension of the goal is energy or capacity savings. If market transformation is part one of the goal, then part two of the goal should be energy savings. Because market transformation is a long-term strategy, it would not make sense to use market transformation programs to acquire short-term capacity resources through load management. If part one of the goal is acquiring energy savings resources, however, part two of the goal could involve the acquisition or either capacity or energy savings resources.

One example of a disconnect between the two dimensions of the energy efficiency goals occurred in the rulemaking process in Texas. One of the stated mechanisms for achieving energy efficiency in the Texas deregulation legislation is market transformation. The rulemaking there, however, has set goals for distribution utilities to achieve in peak

demand and capacity savings (measured in kilowatts). Thus, the use of market transformation strategies is marginalized, because transforming markets for energy efficiency will not immediately meet the need to achieve verifiable short-term goals measured in kilowatts annually.

Relationship Between Structure and Strategy

Delivery Responsibility Considerations. The goals for the energy efficiency programs are also important drivers in the choice of an entity to deliver energy efficiency. State agencies or non-profit agencies are more likely to be able to achieve market transformation objectives, because of their focus on meeting statewide or regional objectives. Upstream market actors, such as manufacturers and distributors, are more likely to be influenced by energy efficiency programs that affect larger geographical areas than individual utility service territories. In addition, other market transformation objectives such as consumer education are likely to be more applicable and effective if delivered over statewide or regional geographic areas. The influence of distribution utilities to transform markets, however, is limited to the markets within their respective service territories.

On the other hand, because of their access to detailed customer electricity usage patterns and their established relationships with consumers, distribution utilities may be in a better position to acquire verifiable energy or demand savings. Distribution utility personnel may have worked with individual commercial or industrial customers within their service territory in the past to identify energy efficiency opportunities and the customer may have come to rely on utility involvement in such decisions.

One example of a disconnect between the entities responsible for delivery of energy efficiency and the goals to be achieved is occurring in California. Beginning in 1998, distribution utilities retained the responsibility to deliver energy efficiency services to consumers. The primary mechanism chosen for delivering energy efficiency programs is through third-party contractors participating in standard performance contracting programs. Those programs, however, are expected to help transform the market for the delivery of energy efficiency services. There is some evidence that this may be creating a more robust energy services market in California, however performance contracting programs are not ideally suited to achieving transformation of energy-efficient product markets because they tend to attract only a narrow range of participants. These programs generally emphasize measuring and verifying energy savings to justify ratepayer investments. Therefore, standard performance contract programs are better equipped to deliver energy savings than to be relied upon to transform markets for energy efficiency overall.

The relationship of assigning responsibility with the choice of capacity or energy savings as a goal is also important. Distribution utilities have a built-in bias. In the absence of regulatory incentives or inducements, distribution utilities are only inherently likely to be concerned about reducing capacity (measured in kilowatts (kW)) and may be motivated to increase energy sales (depending on the type of regulation). Distribution utilities' primary market function is to deliver electricity to consumers. As long as the distribution system has sufficient capacity to carry the electricity, distribution utilities are interested in delivering energy (measured in kilowatt-hours (kWh)). Meeting increased demand in terms of capacity (kW) is a more serious concern, because augmenting distribution line capacity could require

significant capital investment and may be difficult to do in terms of siting new distribution lines. Thus, distribution utilities may already have an incentive to minimize consumer demand (kW) though not necessarily energy (kWh).

Distribution utilities may also have secondary incentives to actually increase energy use by consumers (sales of kWh) since most have affiliate relationships with generators or retail electric providers, both of which make more profits if more energy is sold.

State agencies or non-profit entities do not face the same built-in incentives or disincentives as distribution utilities. Either of these entities may have a goal of delivering either energy or demand savings or both. The pressures these organizations face may be more political in nature. For example, environmentalists may lobby for energy savings over capacity savings. Concerns about capacity shortages, driven by threats of or actual rolling blackouts, for example, may force these organizations to focus on capacity savings to increase system reliability.

Funding Considerations. The selection of market transformation as a primary program goal influences and is influenced by the level of energy efficiency funding. The goal of market transformation is generally defined more broadly than simply acquiring energy savings at customer sites. Therefore, it is often more expensive to achieve in the short term. Market transformation implies systemic changes in the energy efficiency marketplace, as well as influencing individual actors to make particular energy efficiency decisions. Thus, if the funding for energy efficiency in the short-term is at the low or medium level or if it is limited to less than five years, successful market transformation will be hard to achieve. Over this shorter period, acquiring energy savings at particular targeted types of customer sites might be a more reasonably achievable goal.

Another argument commonly made is that if market transformation is the goal, if the efforts are successful, eventually the market should be considered transformed and no further energy efficiency investments should be required. Some would argue, however, that some market failures are still likely to exist even in a largely transformed energy efficiency market. Given that energy efficiency investments continue to be made twenty years after energy efficiency investment was initially recognized in the 1970s as a means to meet energy and environmental goals, it is probably unrealistic to expect that all energy efficiency investments will be ready to be phased out within a short- to medium-term planning horizon (especially given the uncertainties associated with energy efficiency in the deregulated market).

The definition of a capacity or an energy goal is also related to funding levels. Capacity savings are generally less expensive to acquire on a per-unit basis than energy savings. This is mainly because capacity savings can be acquired and paid for during a finite period through load management activities (for example, curtailment of usage on summer weekdays between 4 and 6 p.m. during one year). Energy savings, however, generally require installing equipment that will deliver energy savings over a period of three to 20 years. Thus, energy savings are more of a long-term resource requiring significant investment in high-efficiency equipment rather than short-term behavioral change. These different characteristics of load management and energy savings goals imply different funding requirements that should be considered when setting goals.

Relationship Between Structure and Screening

The relationship between the definition of cost-effectiveness and assigning responsibility for delivering energy efficiency is driven by the realities of access to information about costs and benefits. The most common cost-effectiveness test used in the past, the Total Resource Cost test, assumes knowledge of avoided costs of generation, transmission, and distribution investments that are achieved by pursuing energy efficiency savings. In a deregulated market, even distribution utilities may not have access to these avoided costs. In addition, they will not have ready access to estimates of the energy and bill savings benefits to consumers, since retail electricity providers could be billing consumers directly. A state or non-profit agency would be further divorced from the energy consumption and billing process than a distribution utility. All inputs to a cost-effectiveness test would need to be obtained from sources external to the agency, except perhaps societal or environmental benefits (depending on the scope of responsibility of the agency).

The relationship between level of funding and cost-effectiveness criteria is also important. If the cost-effectiveness bar is set at a high level, there may be less energy efficiency that can be cost-effectively achieved (because very little market reaction will occur if incentives are low), and therefore less funding will be required to achieve the goal. Generally, the lower the cost-effectiveness standard, the more funding required.

Relationship Between Strategy and Screening

If market transformation is one of the goals of the energy efficiency programs, cost-effectiveness will need to be measured over more than one individual program year. This is a departure from the commonly-used TRC test, where all inputs to the cost-effectiveness test were done on the basis of individual program years. Market transformation programs are typically cost-effective when costs and benefits are summarized over a multi-year period. Because these efforts usually involve market preparation activities such as consumer education and advertising. Benefits are only realized after these up-front investments have been made. Thus, market transformation programs typically have difficulty passing the standard cost-effectiveness tests in the short term.

The relationship between the measure of cost-effectiveness and an energy or capacity savings goal is complicated. The most problematic aspect of this relationship is that it may be difficult to acquire information about costs of added capacity and energy. Capacity costs, in particular, may be difficult to obtain, because they will fall under the purview of generation utilities, which, in most cases, will have become unregulated. Thus, generator costs will be considered proprietary information and not publicly available. Energy costs may be more readily available, since they are primarily based on fuel costs. Some would argue, however, that traditional avoided cost inputs to cost-effectiveness tests will become irrelevant entirely, since they will be replaced by market prices.

Conclusion

As the brief discussion above highlights, creating a logical framework for the treatment of energy efficiency under deregulation involves sorting through a number of important and interrelated issues. In most cases, when examined individually, the relationships between the questions seem obvious and simple; however, putting each choice into a workable framework is not necessarily obvious or simple. Clearly, there are combinations of answers to the big questions that will work well together and combinations that will not. Table 3 gives two examples of suggested frameworks that may be successful. Table 4 gives two examples of frameworks that are not as likely to be successful. In Table 4, the italicized items represent elements that do not work well together.

Table 3. Examples of *Workable* Energy Efficiency Frameworks

Big question	**Framework 1**	**Framework 2**
Responsibility	State agency or new non-profit agency	Distribution utilities
Funding	Moderate level for 5-10 years	Low level, short-term
Goal Part 1: Energy savings or market transformation	Market transformation	Energy savings
Goal Part 2: Capacity or energy savings	Energy savings	Capacity
Cost-effectiveness	Societal or public purpose test	Participant-style test
States currently using similar framework	Wisconsin	Colorado

Table 4. Examples of *Unworkable* Energy Efficiency Frameworks

Big question	**Framework 1**	**Framework 2**
Responsibility	*Distribution utilities*	*New non-profit agency*
Funding	High level, limited term	*Low level, short term*
Goal Part 1: Energy savings or market transformation	*Market transformation*	Energy savings
Goal Part 2: Capacity or energy savings	Energy savings	*Capacity savings*
Cost-effectiveness	Public purpose test	Total resource cost test
States currently using similar framework	California, New Jersey	None (hopefully)

Setting up a clear and logical framework for energy efficiency initiatives in a deregulated environment may be only the first step in creating successful programs. But it is a necessary step.

References

Barakat and Chamberlin. 1993. *Comparison of Cost-Effectiveness Tests.*

California Public Utilities Commission. 1994. *Order Instituting Rulemaking and Order Instituting Investigation of the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation.* Docket R. 94-04-032, April 20.

_____. 1998. *Adopted Policy Rules for Energy Efficiency Activities* http://www.cbee.org/library.cfm

CPUC and California Energy Commission. 1987. *Standard Practice Manual for Economic Analysis of Demand-Side Management Programs.*

Kushler, M. 1998. *An Updated Status Report of Public Benefit Programs in an Evolving Electric Utility Industry.* Washington, DC.: American Council for an Energy-Efficient Economy.

Kushler, M. and Margaret Suozzo. 1999. *Regulating Electric Distribution Utilities as if Energy Efficiency Mattered.* Washington, DC.: American Council for an Energy-Efficiency Economy.

Legislature of the State of Texas. 1999. *An Act Relating to Electric Utility Restructuring...* Senate Bill No. 7. http://www.capitol.state.tx.us/data/docmodel/76r/billtext/rtf/SB00007F.RTF

Oregon Legislative Assembly. 1999. *An Act Relating to Restructuring of Electric Power Industry.* Enrolled Senate Bill 1149. http://www.puc.state.or.us/erestruc/sb1149.pdf and http://www.puc.state.or.us/agenda/pmemos/spm/021400a.htm

Public Utility Commission of Texas. 2000. *Substantive Rule. Chapter 25. Electric.* http://www.puc.state.tx.us/electric/projects/22241/22241.cfm and http://www.puc.state.tx.us/rules/rulemake/21074/21074.cfm