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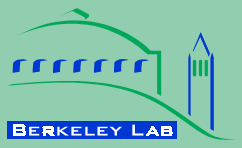

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Who Should Administer Energy Efficiency Programs?

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Environmental Energy
Technologies Division

August 2003

http://eetd.lbl.gov/ea/EMS/EMS_pubs.html

(This is a Pre-print of article submitted to Energy Policy)

*C. Blumstein is a researcher at the UC Energy Institute.

The work described in this study was funded by the Assistant Secretary of Energy Efficiency and Renewable Energy, Office of ElectricTransmission and Distribution of the U.S. Department of Energy under Contract No. DEAC03-76SF00098, and by the University of California Energy Institute.

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Who Should Administer Energy-Efficiency Programs?

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Abstract

The restructuring of the U.S. electricity industry created a crisis for ratepayer-funded energy-efficiency programs. This paper briefly describes the reasons for the crisis and some of its consequences. Then the paper focuses on issues related to program administration and discusses the relative merits of entities—utilities, state agencies, and non-profit corporations—that might be administrators. Four criteria are developed for choosing among program administration options: compatibility with public policy goals, effectiveness of the incentive structure, ability to realize economies of scale and scope, and contribution to the development of an energy-efficiency infrastructure. We examine one region, the Pacific Northwest, and three states, New York, Vermont, and Connecticut, which have made successful transitions to new governance and/or administration structures. Attention is also given to California where large-scale energy-efficiency programs have continued to operate, despite the fact that many of the key governance/administration issues remain unresolved.

We observe that no single administrative structure for energy-efficiency programs has yet emerged in the US that is clearly superior to all of the other alternatives. We conclude that this is not likely to happen soon for three reasons. First, policy environments differ significantly among the states. Second, the structure and regulation of the electric utility industry differs among the regions of the US. Third, market transformation and resource acquisition, two program strategies that were once seen as alternatives, are increasingly coming to be seen as complements. Energy-efficiency programs going forward are likely to include elements of both strategies. But, the administrative arrangements that are best suited to support market transformation may be different from the arrangements that are best for resource acquisition.

Keywords: energy-efficiency, restructuring, administration.

1. Introduction

Proponents of energy efficiency received the Energy Policy Act (EPACT), passed by the US Congress in 1992 (P. L. 102-486), with satisfaction because of provisions in the Act that encouraged utilities to conduct Integrated Resource Planning.[1] Integrated Resource Planning, also known as Least-Cost Planning, is a process in which utilities plan for the future needs of their customers by considering and assessing benefits and costs to society, the utility, and customers of a broad range of resource options including new generation, transmission capacity, and demand-side alternatives. In the Integrated Resource Planning context, energy-efficiency programs were seen as one mechanism for ensuring that the supply of electricity was adequate.

The archetypal efficiency program under Integrated Resource Planning was one in which a utility's customers were provided with technical assistance, information, and financial incentives to purchase or invest in energy-efficient building materials (e.g., additional insulation), equipment (e.g., high-efficiency chillers), or appliances (e.g., buying more

[1] Provisions in Title 1, Subtitle B of EPACT required state regulatory commissions to consider directing utilities under their jurisdictions to employ Integrated Resource Planning. Non-regulated utilities also had to consider using Integrated Resource Planning.

efficient refrigerators) (Eto, 2001). Such programs were commonly referred to as "resource acquisition" programs because they were expected to meet the demand for energy services at a cost that was lower than the cost of acquiring generation resources (NARUC, 1988).

But EPACT also contained provisions that enabled restructuring of the electricity industry in the US and significantly diminished the importance of Integrated Resource Planning in the regulatory agenda.[2] In the US, expenditures for utility energy-efficiency programs peaked at $1.7 billion in 1993-94. But expenditures began a steep decline in many states after the California Public Utilities Commission (CPUC) announced in April 1994 that it intended to restructure California's electricity industry.[3]

Restructuring in the US was premised in part on the belief that formal resource planning processes that authorized or approved acquisition of supply- and demand-side resources by state-regulated utilities would not be necessary because market outcomes would be better than the outcomes from plans developed by utilities and regulators. Generation, transmission, and distribution were to be unbundled and no firm or agency was to be responsible for assuring supply. Interactions among buyers and sellers in a competitive wholesale electricity market were expected to provide the right balance of supply and demand. In those states with retail competition, distribution utilities typically no longer had the "obligation to serve" for all customers, which meant that there was no place in the restructured electricity industry for Integrated Resource Planning and the attendant acquisition of energy efficiency as a resource.[4]

Although the rationale for resource acquisition was weakened or eliminated in states that restructured, the underlying reasons for public support of energy efficiency did not disappear. Restructuring did not eliminate most of the externalities and other market failures that energy-efficiency programs were intended to address. These externalities and other market failures provided the rationale for continued support of energy-efficiency programs after restructuring (Blumstein et al., 1980; Golove and Eto, 1996; Vine et al., 2003).

As a consequence, a different program strategy, "market transformation," was introduced in many states that typically supplemented existing objectives or, in a few states, became the primary objective of energy efficiency programs. State policymakers articulated this objective of transforming energy service markets in various ways: "the mission of market transformation is to ultimately privatize the provision of cost-effective energy efficiency services" (California); "[the goal is] facilitating the transformation of markets so that they effectively respond to customers' needs and public interests in increased energy efficiency" (Wisconsin); "market transformation efforts are designed to create long-term changes that reap continuous energy efficiency savings at low cost" (Massachusetts); "[energy-efficiency program]funds should be targeted towards programs that emphasize permanently transforming the market for energy efficient products and services or

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[2] Provisions in Title 7 of EPACT were intended to increase competition in the electric generating sector by creating new entities, called "exempt wholesale generators" (EWGs), that could generate and sell electricity at wholesale without being regulated as utilities under the Public Utilities Holding Company Act of 1935. This title also provided EWGs with a way to assure transmission of their wholesale power to its purchaser.

[3] Energy efficiency spending in the US reached a low point of $918 million in 1997, a drop of almost 50% compared to 1993 spending. Spending has since increased, rebounding to $1.1 billion in 2000 (York and Kushler 2002).

[4] With restructuring, transmission system planning is increasingly being done by regional ISOs rather than utilities; ISO plans typically provide information to the market on system resource needs, rather than pre-approve a set of resources that can either be built or acquired by the utility.

reducing market barriers, rather than achieving immediate or customer-specific savings" (New York) (quotations from material in Eto et al., 1998).

As can be seen from the above statements, market transformation encompasses several themes. It is a broad umbrella under which many activities may be undertaken. Market transformation emphasizes making lasting changes in markets for energy-consuming goods and services (Keating et al., 1998; Blumstein et al., 2000). This is different from resource acquisition, which emphasizes obtaining savings from individual consumers by subsidizing energy-efficiency measures at the consumers' premises.[5] Examples of market transformation efforts include encouraging retailers, distributors, contractors, and builders to change their business models to promote energy efficiency. Other market transformation activities have targeted education and training efforts at key consumer and business decision points such as the replacement of existing appliances or equipment and the remodeling of buildings with the goal of influencing purchasing decisions for long-lifetime products and building environments.

Restructuring also called into question the mechanism for funding energy-efficiency programs. Before restructuring, when the utilities were vertically integrated monopolies, regulators simply ordered the utilities to include program costs in the utilities' rates. After restructuring there was concern that including program costs in rates might place the incumbent utilities at a competitive disadvantage—customers might avoid the charge by switching to a new competing supplier. This problem was addressed by creating "non-bypassable" charges. In the ~20 states that restructured, most energy-efficiency programs are now funded by ratepayers through a separate "public benefit fund" or "system benefit charge" included in their bill from the (still) monopoly distribution utility.

The result of these changes in program rationale and funding mechanism was that US states began experimenting with a variety of administrative and governance arrangements. While this experimentation is continuing, the disastrous collapse of the electricity market in California in the winter of 2000-2001 (Blumstein et al., 2002) has greatly altered the regulatory landscape in California and other states. When the California electricity market collapsed, leading to system emergencies and power outages, energy-efficiency programs in California shifted emphasis and funding towards programs and activities that produced quick, near-term electricity and summer peak demand savings with some success (Goldman et al., 2002). With the suspension of retail competition, California utilities are again being asked to take responsibility for assuring the adequacy of supply, which includes assessment and procurement of generation and demand-side resource options. In states such as New York and Connecticut where state regulators are still pursuing policies that facilitate wholesale and retail competition, the new energy-efficiency program administrators have adapted their programs to meet pressing state and regional needs. For example, there have been efforts to dampen wholesale price volatility by reducing peak demand in tight supply markets and efforts to mitigate transmission constraints by targeting energy-efficiency and load management to "load pockets" such as in Southwest Connecticut or downstate New York. In the Pacific Northwest with its energy-constrained, hydro-based system, policymakers have created a regional energy-efficiency administrator that takes a longer-term market transformation perspective as well as resource acquisition programs that are administered by a non-profit corporation in Oregon and utilities in Washington.

In this paper we examine some of the questions that are important for the administration of energy-efficiency programs in the new regulatory environment. What are the key

[5] The two strategies are not mutually exclusive; they can be pursued simultaneously. The distinction between the strategies is useful for the analysis of options for program administration, but in practice the distinction is not always as sharp as it is drawn here.

factors and criteria to consider in choosing among different types of entities to administer, design and implement programs? What were the key drivers for policymakers in various states in selecting among alternative administration and governance structures? What should and can policymakers do to ensure that the strategies and activities of ratepayer-funded energy-efficiency programs contribute to the long-term development of an energy-efficiency services infrastructure?

2. Administrative Options

Prior to restructuring in the US, the administration, design, and delivery of ratepayer-funded energy-efficiency program activities was largely the responsibility of utilities, operating within the context of an Integrated Resource Planning process that was overseen and governed by state regulators. Most states that restructured their electricity sector re-evaluated the administration and governance of energy-efficiency programs, trying to find the structures that were best suited for the new policy environment. In some states, alternative structures have evolved in which program administration and governance have been taken over by non-utility entities, such as existing state governmental agencies, or non-profit corporations with boards of directors.

In assessing the relative merits of administrative structures, policymakers and regulators must evaluate the trade-offs involved with working with single-purpose vs. multi-purpose organizations. The core mission of utilities typically involves the reliable, efficient delivery of electric power to end users (and may include power generation). Some utilities also view energy-efficiency programs as a core part of their customer services activities. However, regulators recognize that utilities often have financial disincentives to promote customer load reductions, given that electricity sales are the main source of their revenues and profits. As such, utilities are multi-purpose organizations. Policymakers must weigh the benefits that derive from utilities' trusted position with customers and market entities, their economies of scale and scope, and their experience against their perceived conflicts of interest in administering energy-efficiency programs.

State agencies, as parts of state governments that have many responsibilities, are also, in effect, multi-purpose organizations. When considering state agencies as candidates to administer a public-purpose energy-efficiency program, policymakers must weigh the potential benefits of an administrator without perceived conflicts of interest against the potential problems of state government administration. Examples of these potential problems include difficulties agencies may have in focusing on a new mission, constraints imposed by staffing limitations or bureaucratic procurement requirements, challenges of providing effective incentives for state agencies, and the potential for sub-optimal allocation of funds or mix of programs due to political pressures.

Non-profit energy efficiency corporations with boards of directors are typically single-purpose organizations whose sole mission is delivery of energy-efficiency programs. Policymakers must weigh this alignment of administrator objectives/mission with public policy against the challenges of creating an acceptable governance mechanism (for example, a board that balances stakeholder interests or novel arrangements for regulatory oversight) and establishing a well respected, trusted administrator with a significantly expanded scope of activities for existing staff or creating a new organization.

The delivery of energy-efficiency programs involves a diverse set of responsibilities that can be grouped according to several core functions (Table 1). There is some degree of overlap among the functions and responsibilities. For example, program design falls within the domain of Program Development, Planning, and Budgeting, as well as Program Administration and Management.

This paper focuses on the entity that maintains primary responsibility and accountability for the proper use of the public or ratepayer funds supporting the programs (General Administration and Coordination in Table 1). But this entity, which we call the energy-efficiency program administrator, need not (indeed, typically does not) perform all the functions in Table 1. The division of responsibilities may be left to the energy-efficiency program administrator or policymakers may prescribe it.

In regions where market transformation and building private sector infrastructure are priorities for policymakers, a very large portion of the responsibilities in Table 1 may be contracted out as a means of building private sector infrastructure. Other entities, including private firms, can participate at many levels within the program delivery chain: at the program portfolio level, the individual program level, the project level, or for specific implementation functions (e.g., program design, energy auditing, measurement and verification services, program evaluation, etc.). These arrangements may be established through competitive solicitation, such as demand-side management bidding programs, where a request for proposals is issued for energy-efficiency projects to deliver some specified amount of energy or demand savings. Or alternatively, they may be based on a partnership arrangement, such as with industry or vendor trade associations (e.g., for information campaigns), academic institutions, etc. Ultimately, the administrative structure itself, and the nature of the relationships among the institutions involved will be dictated by a host of factors.

Table 1
Elements of Energy-Efficiency Program Administration and Delivery

Program Function	Specific Responsibilities
General Administration and Coordination	• Manage overall budget for portfolio of programs • Manage contracts with all primary contractors • Maintain centralized information system for reports to regulators, legislators, advisory groups, etc.
Program Development, Planning, and Budgeting	• Prepare initial technical and/or market reports necessary for program strategies and initial program designs • Facilitate development of public planning process • Prepare general program descriptions and budgets for regulatory approval
Program Administration and Management	• Prepare detailed program designs and propose changes based on experience-to-date • Hire and manage staff and/or sub-contractors for program implementation • Develop and implement quality assurance standards and tracking protocols • Review and approval of invoices
Program Delivery and Implementation	• Promote and market programs • Develop and implement program services (e.g., energy audits, financial incentives, contractor certification, information and education, etc.) • Develop energy-efficiency projects at specific sites • Develop measurement and verification (M&V) procedures and/or conduct M&V to determine performance-based administration fees or shareholder incentives
Program Assessment and Evaluation	• Assess program impacts and/or cost-effectiveness • Evaluate effectiveness of program processes and administration

3. What criteria need to be considered in choosing an administrator?

In this section we examine several criteria that need to be considered in creating the administrative structure for energy-efficiency programs.[6] These criteria are compatibility with public policy goals, effectiveness of the incentive structure, ability to realize economies of scale and scope, and contribution to the development of the energy-efficiency infrastructure.

Compatibility with public policy goals. This criterion includes several subsidiary criteria, which are of two types. The first type are "good-governance" criteria that might apply to any publicly funded organization and include legitimacy, accountability and resiliency. By legitimacy we mean that the energy-efficiency program administrator is established in a way that forestalls challenges to the organization's right to act. This might be achieved by a legislative mandate or a consensus among stakeholders. Accountability requires reviews of the administrator's performance in achieving goals and mechanisms for correcting poor performance.[7] Resiliency means the ability of the administrator to adapt quickly to changing circumstances, including changing public policy goals.

The second type of criteria are related to either broader electricity market or energy-efficiency specific policy goals articulated by state policymakers. For example, electricity restructuring led many states to adopt policies that encouraged or compelled utilities to divest generation assets, encouraged the entry of competitive retail energy suppliers, and created new institutions to administer the transmission grid. What remained of the utilities were distribution companies under state regulation. In this market structure, energy services were to be provided primarily by the competitive providers, including those affiliated with utilities. Thus, policymakers increasingly considered such factors as ability to foster provision of energy-efficiency services by the competitive market and were concerned about the role and influence of the energy-efficiency program administrator on competition among retail electricity suppliers. In other cases, the public policy goals were focused primarily on energy-efficiency objectives, such as the capability of the administrator to support market transformation goals. Specifically, if the program is focused on achieving market transformation objectives, then it is particularly important for the administrator to have comprehensive knowledge of the retail energy and energy-efficiency markets, have the ability to quickly ramp up and down program initiatives, and to have flexible contracting and procurement processes.

Effectiveness of the incentive structure. Incentives have been an issue from the inception of utility-administered energy-efficiency programs. After years of command and control regulation, many policymakers in the US concluded that incentive mechanisms were needed both to reward performance in delivering energy-efficiency resources and to address disincentives that were inherent in rate-of-return regulation. For most utilities under rate-of-return regulation, profits in the short run increased with increasing sales. Thus, utilities actually had a disincentive for effective program administration. Before restructuring, regulators in some states dealt with this issue by creating rate designs that made utility profits independent of sales, and many state PUCs offered financial

[6] Two other papers that address criteria are Eto et al. (1998) and Didden and D'haeseleer (2003). Eto et al. (1998), written when confidence in restructuring was very high, provided the starting point for the criteria that are developed here. Didden and D'haeseleer (2003), which addresses the implementation of energy efficiency programs in the European context, focuses on isssues related to the incentive structure.

[7] For regulated utilities, regulators have the authority to investigate and assess disallowances or penalties for poor or non-performance. In cases where energy efficiency program administrators have established a contractual relationship (e.g., non-profit corporation), the governing agency's primary mechanism to discourage poor performance is the possibility of contract termination or failure to renew.

incentives to shareholders based on performance in delivering cost-effective energy-efficiency programs. Because the purpose of the energy-efficiency programs was resource acquisition, the incentive payments were typically based on measurements of the energy savings and/or net benefits directly attributable to the programs.

When the policy agenda shifted in some states from resource acquisition to market transformation, the problem of incentives became, in some ways, more complicated. First, the effectiveness of market transformation programs and activities are more difficult to measure than the effectiveness of resource acquisition programs. Second, traditional incentive mechanisms used to motivate utilities—that is, "mark-up", "shared savings", and "bonus" based on net societal benefits (Stoft and Gilbert, 1994)—were less applicable to the new entities under consideration for energy-efficiency program administration (i.e., non-profit organizations, and state agencies). Third, because it typically takes at least several years to observe and assess market transformation impacts, it is preferable to develop performance incentives based on multi-year program and evaluation periods. Fourth, the trend toward "outsourcing" program implementation to for-profit or non-profit corporations has meant that policymakers have had to consider structuring performance incentives for program implementers and the extent to which energy efficiency program administrators should be held accountable for the performance of program implementers.

Evaluation of the incentive structure should go beyond consideration of financial incentives and disincentives for organizations. Intra-organization factors should also be considered. These factors include the ability of organization to offer sufficient compensation to attract skilled personnel and to provide them with opportunities for advancement when they perform well. Civic motivations, such as a desire to contribute to a sustainable future, are often important to personnel involved in conducting energy-efficiency programs. The degree to which civic motivations are respected and contributions to civic goals are recognized is an important part of the incentive structure.

Ability to realize economies of scale and scope. Prior to restructuring, utilities seemed the obvious choices for administrators of energy-efficiency programs because they were responsible for resource acquisition of all types and had well-established relationships with the customers from whom efficiency resources were to be acquired. When resource acquisition is the primary program objective there are no obvious economies of scale beyond the need to be large enough to maintain an effective professional staff.

The situation is different if market transformation is the sole or primary program objective. Markets often extend beyond the boundaries of a single utility's service territory, and thus it is often more appropriate to conduct market transformation programs on a statewide, multi-state regional, national, or even international basis. Quite substantial resources may be required to have a significant market impact; efforts that are undertaken on too small a scale may dissipate resources without any impact.

When resource acquisition and market transformation are both important program objectives, there are likely to be gains from coordination. An example of coordination might be a resource acquisition program offering rebates to customers for the purchase of efficient washing machines that is coordinated with a market transformation program that encourages dealers to stock efficient washing machines. Although coordination does not require that both types of activities be administered by the same organization, the gains from coordination create an economy of scope since intra-organization coordination is typically easier than inter-organization coordination..

Contribution to the development of the energy-efficiency infrastructure. In the initial enthusiasm for restructuring and expectations for the effectiveness of markets in the electricity sector, some policymakers concluded that ratepayer-funded energy-efficiency programs were transient phenomena. In this view, government intervention would only

be needed for a short transition period, after which the competitive retail market would provide robust energy-efficiency service offerings to all customer classes and market segments. This view now seems overly optimistic (Kushler and Witte, 2001). An alternative view is that the externalities and other market failures that are the underlying justification for energy-efficiency programs are going to be with us for the foreseeable future. In this view a steady improvement in energy efficiency – that is, a steady reduction in the energy intensity of the economy (Rosenfeld et al., 2001) – is at least part of the path to a sustainable future. To accomplish this end it will be necessary to build an energy-efficiency services infrastructure that is capable of sustaining a steady reduction in energy intensity over the long term. This requires, at a minimum, greater stability and predictability in public support for energy efficiency. During the era of Integrated Resource Planning, funding levels for energy efficiency varied significantly over time depending on the utility's overall load/resource balance, forecast of avoided costs, and regulator's concerns about rate impacts. With passage of legislation or regulations that typically authorize specified levels of public benefit funding, the largest uncertainties are the duration of funding (e.g., sunset provisions in legislation) and the mix and allocation of program funds. The recent spate of state budget crises has added to the uncertainty about the duration of funding: some state legislatures are now considering appropriating public benefits funds to the states' general funds to cover revenue shortfalls.

The issue of how best to build and sustain an energy-efficiency services infrastructure is directly related to the roles and responsibilities provided by energy-efficiency program administrators. Should the energy-efficiency program administrator be an institutional home for "human capital" (that is, people with the expertise needed to develop, design and implement energy-efficiency programs)? Or, should the energy-efficiency program administrator be only a "funding agent" whose primary role is outsourcing programs in order to foster the development of private sector firms, non-profits, and other institutions that support energy efficiency?

Institution building is a significant challenge, either in terms of retaining the capability of existing institutions or creating new institutions that are sustainable over the long term. In the US, policymakers have considered such issues as the potential value and/or loss of existing energy-efficiency expertise and resources of utilities, the linkages among incumbent energy-efficiency program administrators and the broader network of energy-efficiency service providers, and the ability of different types of energy-efficiency program administrators to attract highly qualified and motivated administrative and technical personnel.

4. Energy Efficiency Program Administration and Experience in the US

As states in the US have restructured their electricity sectors, a range of different approaches has been adopted for the administration and governance of energy-efficiency programs. Some states have opted to continue using the utilities as primary administrators, while other states shifted some or all of that responsibility to state agencies or nonprofit organizations. Five states/regions, discussed below, provide specific examples of the types of administrative approaches that have been adopted and the issues that these approaches have sought to address (Table 2).

4.1 Pacific Northwest

Energy-efficiency programs in the Pacific Northwest (Oregon, Washington, Montana, and Idaho) are administered by a combination of regional and state-based organizations (see Figure 1, which uses Oregon as an example). The regional energy-efficiency program administrator is a non-profit organization, called the Northwest Energy Efficiency Alliance ("the Alliance"). Programs offered by the Alliance are all strongly geared towards market transformation (for example, marketing support for new energy-

efficient products and efforts aimed at influencing market intermediaries that are "upstream" of the customer such as retailers, builders, and contractors). The Alliance is governed by a board of directors, which includes representatives of public and investor-owned utilities, BPA, state governments, and consumer groups. Funding is provided by the investor-owned and public utilities, the Energy Trust of Oregon (a non-profit corporation administering programs in Oregon), and the Bonneville Power Administration (BPA)—each of which use the Alliance to fulfill their organization's market transformation goals. For example, in 2003 BPA is spending $138 million on energy efficiency, $10 million of which goes to the Alliance to fund market transformation efforts (Keating, 2003). The Alliance programs are then augmented by a variety of more traditional local resource acquisition programs administered by individual utilities in Washington, Idaho, Montana, the Energy Trust of Oregon, and BPA.

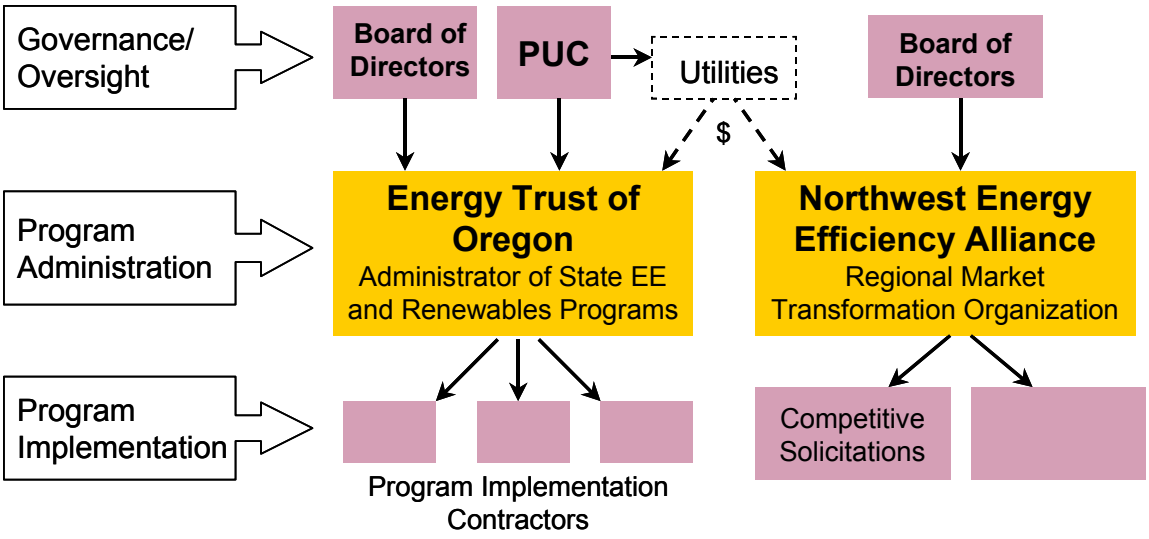

Fig. 1. Energy Efficiency Program Administration and Governance in Oregon and the Pacific Northwest

The Alliance was born out of a long-term resource plan by the Northwest Power Planning Council, which called for a coordinated and sustained effort to build the market for energy-efficiency services and products in the region, as a strategy for offsetting a portion of the projected growth in electricity demand. Historically, energy-efficiency resource acquisition programs had been funded and administered by BPA, a number of large investor-owned utilities, and hundreds of small public utilities. The region's policymakers decided that this administrative structure was sub-optimal for their new market transformation objectives and also resulted in relatively high administrative costs. Thus, a fundamental rationale for creating a regional non-profit corporation to administer market transformation programs was to capture the economies of scale necessary for reducing administrative costs and providing a consistent signal to market actors and customers in a multi-state region.

While the scale of the Alliance is multi-state, the scope is narrow. The Alliance focuses on market assessment, program design, and project development, but does only a very limited amount of program implementation. The defining feature of the Alliance, as an organization that manages and oversees energy-efficiency programs aimed at market transformation, is the degree to which its activities are guided consciously and explicitly by the goal of building the capabilities of other organizations in the region.

The Alliance has a small, highly trained and experienced professional staff that is strongly motivated by civic concerns. The Alliance does not have any explicit financial

incentives for good organizational performance. But, as a single-purpose organization dependent on the goodwill of numerous stakeholders, good performance is probably necessary for long-term survival.

In Oregon, the efforts of the Alliance are complemented by the recently formed Energy Trust of Oregon, which is a non-profit organization established to direct the public benefit funds for energy-efficiency and renewable energy programs in the state. Energy-efficiency programs in Oregon were previously administered by the utilities, but restructuring legislation passed in 1999 granted the authority to the Oregon PUC to select an alternative program administrator. In many ways, the administrative and governance model of the Energy Trust of Oregon is patterned after the Alliance. The Oregon PUC and the Energy Trust of Oregon signed a grant agreement, which codifies their contractual relationship, builds in significant accountability (e.g., periodic outside audits, review of contracts, composition of board of directors) and provides broad policy direction and review and approval of long-term strategic plans by the Oregon PUC. In return, the Energy Trust of Oregon is given significant flexibility to achieve the five long-term goals in its Strategic Energy Plan.

Thus, in the Pacific Northwest, policymakers have made a long-term public policy commitment to sustain energy efficiency as an environmentally benign resource that can dampen load growth in a hydro-based system. Given their emphasis on long-term sustainability of energy-efficiency infrastructure and services, they have opted to use single purpose, non-profit organizations with broad geographic reach to administer regional energy-efficiency programs. Key to the success of this approach thus far has been the compatibility of energy-efficiency program administrators in the Pacific Northwest with public policy goals. The administrators have demonstrated the legitimacy, accountability, and resiliency of their organizations and the Alliance has achieved market transformation goals in specific markets (NEEA, 2002b).

4.2 California

Energy-efficiency programs in California are currently administered by the state's four large investor-owned utilities. Energy-efficiency public benefits programs are funded through a non-bypassable surcharge on customers' utility bills, established through state legislation, which provides approximately $275 million annually for electric and natural gas energy-efficiency programs.[8] Oversight of program design and budgeting and review of program performance is conducted through regulatory proceedings of the California Public Utilities Commission (CPUC), where members of the public and other stakeholder groups can provide input and recommendations to the CPUC on the utility's proposed program plan, budget, and incentive mechanism for rewarding their performance.

Since the onset of restructuring, California policymakers have devoted significant time and attention to program administration, as it has been a very contentious issue. Initially, legislation only provided funding for four years. In 1997 the primary policy objective of the CPUC was to cultivate a self-sustaining market for energy-efficiency services so that significant public funding would not be needed after 2002. Compatibility with this policy goal required that any potential conflicts of interest related to the unregulated utility-affiliated companies be addressed. There was therefore a desire to move toward "independent" administration of the public benefits funded energy-efficiency programs. The CPUC created an advisory board, the California Board for Energy Efficiency (CBEE), whose mission was to facilitate the selection of an independent administrator and make recommendations regarding utility program designs and budgets to achieve the CPUC's market transformation objectives (CPUC, 1998). Working with the utilities and

[8] Customers of municipal utilities (about 25% of electricity sales) are exempt from this charge since municipal utilities are required to fund and operate their own programs.

other interested parties, the CBEE recommended, and the CPUC adopted, major changes in energy efficiency programs in various markets which led to innovative statewide programs in new construction, residential appliance, and commercial and industrial markets. However, the objective of restructuring program administration conflicted with the objective of phasing out program funding in only a few years. It was a tumultuous period for the utility program administrators; day-to-day program operations undoubtedly suffered as a result.

In 2000 legal problems associated with a lack of enabling legislation caused the CPUC to withdraw its competitive solicitation to select independent program administrators. However, the CPUC continues to promote "outsourcing" type strategies that limit the functions and scope of activities performed by utility administrators. For example, in 2002, with the electricity crisis apparently over, the CPUC took a significant step toward redefining the administration of efficiency programs in California. The CPUC established a set of statewide programs, which were to be managed and implemented largely by the utilities, and established policy goals, budgets, and a competitive solicitation process for "local" programs, which were to be administered and implemented primarily by other entities. Historically, the vast majority of funds have been allocated to the statewide programs and thus, to a large extent, under utility control. However, in 2002 in an effort to increase the flexibility of the programs and better serve hard-to-reach customer segments, the CPUC opted to substantially shift funding toward local programs operated by non-utility entities, allocating approximately $125 million over two years for this purpose. In a break with past practice, the CPUC moved beyond oversight to more directly conduct some program administration functions—the solicitation and selection of the local program proposals (CPUC, 2002a).

The move in California toward "standardized" statewide programs, even though administered by the four utilities, was an attempt to realize some economies of scale. Unlike other states, the California utilities are of sufficient size (e.g., Pacific Gas and Electric's annual retail sales of electricity are almost half the size of all retail sales in the entire Pacific Northwest) that they have the ability to manage statewide market transformation programs targeted at certain markets, such as new construction and residential appliances, although there is some loss in efficiency because of four administrators.

Over time the CPUC has increasingly become disenchanted with various incentive mechanisms to motivate utility performance. Because the CPUC believed that incentive payments were too high, it has steadily lowered the fraction of program budgets available for incentives since the mid-1990s. Between 1998-2000, the CPUC adopted a comprehensive set of 50-75 program and market indicator milestones whose accomplishment was linked to performance incentives and incentives were capped at 10-12% of program expenditures. In 2001, the CPUC revised its approach to performance incentives and adopted fewer milestones, which are linked to energy and peak demand savings and net benefits. In 2002, the CPUC changed its approach again and removed the "carrot" of performance incentives, in favor of the "stick" which involved withholding a portion of program cost recovery pending satisfactory achievement of program goals such as energy and demand savings and program participation (see Table 2). Thus, the CPUC's latest approach relies more on "benchmark competition" and the threat of "local" energy-efficiency programs administered by non-utility parties, rather than providing financial incentives based on performance to motivate utility energy-efficiency program administrators.

California policymakers and energy-efficiency program administrators have also adjusted the mix of programs, their design, and budget allocations as market conditions and relative emphasis among policy goals changed. For example, during the electricity crisis, the CPUC responded by shifting the focus of the 2001 energy-efficiency programs

toward short-term energy savings and peak demand reductions. As a result of this move, the public-benefits-funded programs were successful in achieving peak demand reductions of 320 MW in 2001, compared to approximately 190 MW during each of the two prior years (Global Energy Partners, 2003; CPUC, 2001).

The California experience illustrates the difficulty of resolving public policy goals in the absence of a broadly shared consensus. During the 1998-2000 period, the CPUC directed its advisory board (the CBEE) to focus on creating a competitive process to facilitate "independent" administration and re-designing energy-efficiency programs in pursuit of market transformation objectives. This focus was derived in part from the CPUC's broader objectives of stimulating competitive retail energy markets with limited, defined roles for utilities. However, the CPUC was unable to confer sufficient legitimacy to its Advisory Board, while the State was unwilling to provide sufficient staff resources to the CPUC to oversee the "transition" to a contractual relationship with independent program administrators.

In 2000 California's state legislature made a long-term commitment to public benefits funded electric energy-efficiency programs by extending the law that provides funding through 2012. But, while the utilities remain the primary energy-efficiency program administrators, the CPUC continues to temporize on questions of administrative responsibility. Since 1998 the CPUC has granted only short-term extensions of the utilities' authority to administer programs. This continuing uncertainty about the utilities' role in program administration and the turmoil associated with this uncertainty, as illustrated in the ill-fated attempts to select an independent administrator and the controversies surrounding performance incentives and outsourcing, have not supported development of effective long-term programs, much less the creation of a self-sustaining energy–efficiency services infrastructure.

4.3 New York

The primary administrator for energy-efficiency programs in New York is the New York State Energy Research and Development Authority (NYSERDA). Programs are funded through a system benefits charge, which was established through a set of regulatory orders issued in 1996, initially for a three-year period. In 2000, annual funding for the programs was increased substantially, from $58 million to $139 million. NYSERDA's administration of the programs is based on an inter-agency Memorandum of Understanding (MOU) with the New York Public Service Commission (NYPSC), which receives guidance from an independent advisory group in its review of NYSERDA's program management and implementation (see Fig. 2).

The decision to designate NYSERDA as the administrator of the state's energy-efficiency programs was based on a certain set of policy objectives as well as the previous experiences with utility-administered energy-efficiency programs in New York. In New York, the utilities divested their generation and focused on providing distribution service. Furthermore, the performance of the seven investor-owned utilities' previous energy-efficiency programs had been uneven and the administrative cost of the programs and the incentives required to motivate utility performance were judged to be high in some cases. Moreover, several utilities indicated a lack of interest in continuing to administer energy-efficiency programs. As a result, regulators concluded that, given limited funds and an uncertain duration of public benefit funds, it would be better off working with NYSERDA.

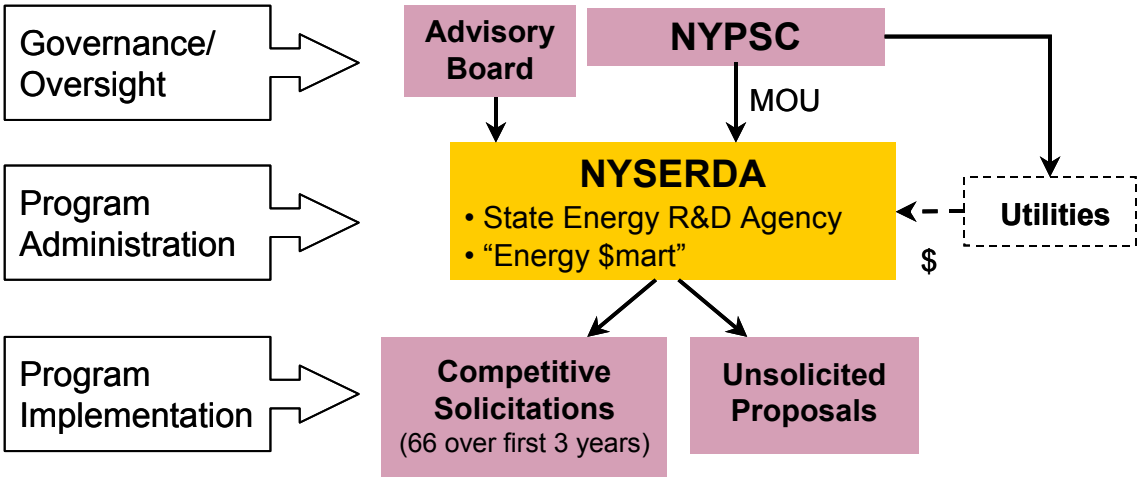

Fig. 2. New York Administrative and Governance Model

NYSERDA is a public benefit corporation established by the Legislature of the State of New York in 1975 with the mission of conducting an energy R&D program. While the Governor of New York appoints a majority of its Board of Directors and can veto actions of the Board, NYSERDA has developed more flexible competitive procurement processes and contracts, which are less cumbersome and restrictive than those utilized by many state energy agencies. The NYPSC capped NYSERDA's administration expenses at 5% and initially adopted policies with a strong focus on transforming energy-efficiency services markets and stimulating retail markets in which companies would offer energy efficiency as part of a full array of commodity and value-added services. NYSERDA has pursued its market transformation activities by developing statewide energy-efficiency programs that target various market sectors (e.g., Energy Star appliances) and market actors (e.g., motor vendors and contractors), and by coordinating with other energy-efficiency program administrators on regional initiatives. NYSERDA has also devoted significant portions of its budget (27% of the total energy-efficiency budget for 2001-2006) to programs targeted at stimulating an Energy Services Company (ESCO) industry (NYSERDA, 2002). As a result, New York has ~80 active ESCOs and contractors working in its Commercial and Industrial Performance Program and institutional/schools markets. NYSERDA has tended to outsource a large amount of implementation functions, while retaining responsibility for program management and design. While outsourcing has held NYSERDA's costs below the cap set by the NYPSC, it may have shifted administrative costs to contractors and may have somewhat limited NYSERDA's ability to build up its own expertise.

Thus, NYSERDA has had some success in creating an energy-efficiency services infrastructure that will serve the New York market over the longer term, which is consistent with the historic "economic development" philosophy of the agency (Gilligan, 2003). However, it is by no means clear that the priorities for an economic development agency, which may be subject to political pressures, are always the same as the priorities for an energy efficiency program. NYSERDA has also been able to capture economies of scale by administering statewide programs and has offered end users and service providers in New York consistent statewide programs, which reduces transaction costs of participating. Finally, by keeping basic program management under the control of state government, administrators have also been able to respond to the threat of short-term generation shortfalls by increasing the emphasis on peak demand savings and targeting programs to constrained areas with transmission and supply bottlenecks (e.g., the New York City area).

4.4 Vermont

Vermont chose to hold off restructuring its retail electricity industry, but nevertheless decided to transition its energy-efficiency programs to a new administrator. The approach taken by Vermont's legislature was to consolidate the administration of all energy-efficiency programs under a single "Energy Efficiency Utility" whose sole purpose is to deliver energy-efficiency programs. The Energy Efficiency Utility is responsible for the majority of administrative functions, including program management, design, and implementation. Funding is generated through a system benefits charge on customers' electric bills. The specific entity that administers the programs, called Efficiency Vermont, was selected through a competitive solicitation and is a non-profit corporation.[9] Efficiency Vermont operates under a three-year contract with the Vermont Public Service Board (PSB), which was renewed for a second three-year term. A Fiscal Agent collects funds from the utilities and pays Efficiency Vermont, subject to approval of its invoices by a Contract Administrator. The Contract Administrator is also responsible for contract management, overseeing minor changes to scope of work and verifying performance. The Vermont Department of Public Service, which is a state energy office, provides policy and program evaluation input to the PSB (see Fig. 3). The Advisory Committee, which is composed of stakeholder representatives appointed by the PSB, acts as a channel of communication between Efficiency Vermont and important stakeholders.

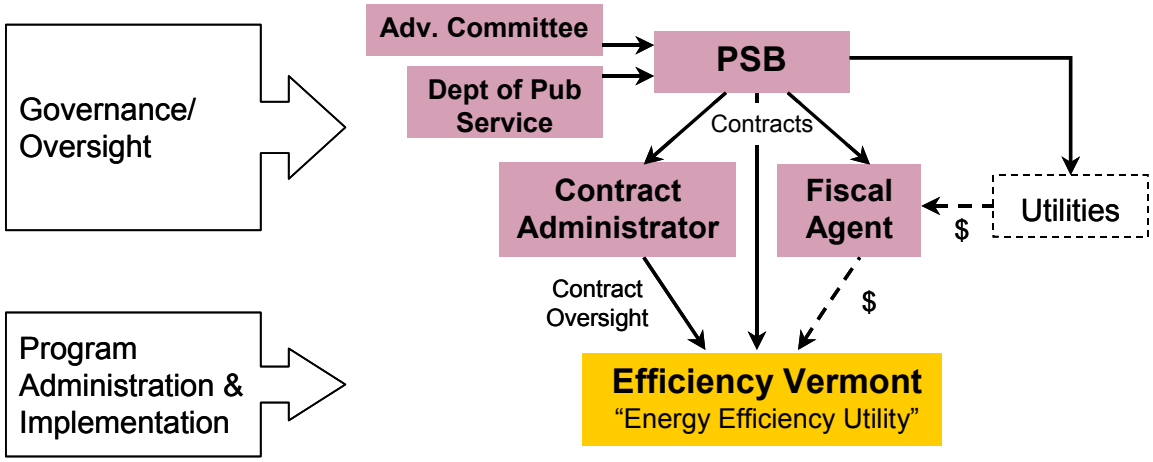

Fig. 3. Vermont Administrative and Governance Model. Adapted from Hamilton et al (2002).

Although the entity serving as Efficiency Vermont is a non-profit corporation, at the end of the initial contract period it could earn an incentive payment of up to 2.9% of the value of its contract with the PSB. This payment is based on several measures of performance including energy savings, total resource benefit, and several market-specific indicators, which are tightly linked to the broader public policy goals articulated by the PSB. The PSB believes that the performance incentives have been quite effective in focusing Efficiency Vermont and continued that approach in the second contract.

This unique administrative structure was adopted as a result of a number of factors particular to the state. Vermont is a small, rural state with approximately 600,000 people. Prior to the creation of Efficiency Vermont, energy-efficiency program activity was limited and the existing programs were administered separately by 22 small utilities. Performance among these utilities was quite uneven, and the regulatory oversight entailed in reviewing programs for many small utilities proved to be quite costly and burdensome

[9] Some for-profit companies were among the competitors.

for the small staff of the PSB, the Department of Public Service, and the utilities. The Vermont PSB sought to improve the quality and consistency of programs by mandating a single set of programs to be offered statewide, while also taking advantage of the increased scale of operation to create a more cost-effective delivery mechanism. These factors made the option of using a single organization to administer all energy-efficiency programs in the state an attractive approach. Thus, Vermont has made a conscious decision to build a long-term energy-efficiency services infrastructure through Efficiency Vermont, which provides a "one-stop" shopping model of energy-efficiency services. This model makes sense in small states or geographic regions or rural states where large, national private ESCOs or retailers are unlikely to enter the market.

In Vermont, all four of our criteria appear to have been factors in the decision to move to a statewide Energy Efficiency Utility: establishing an organization whose mission was well-aligned and compatible with the state's energy-efficiency policy objectives, capturing economies of scale to reduce administrative costs by transitioning from 22 utilities to statewide administrator, use of performance incentive mechanisms to motivate the administrator, and an approach to building an efficiency services infrastructure that was tailored to the conditions in a small rural state.

4.5 Connecticut

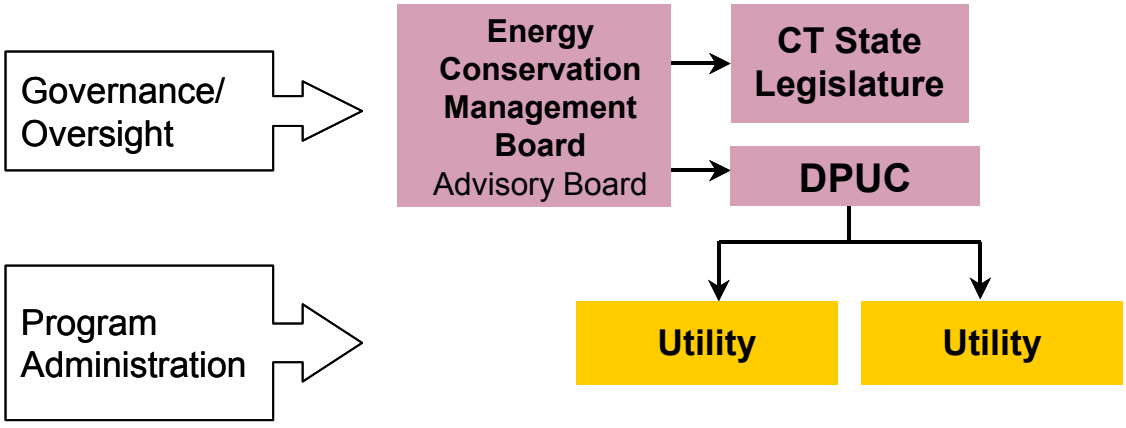

Fig. 4. Connecticut Administrative and Governance Model

The basic administrative structure in Connecticut is similar to that originally adopted in California during the 1998-2000 period. The energy-efficiency programs are administered by the state's two large investor-owned utilities, subject to the regulatory oversight of the Connecticut Department of Public Utility Control (DPUC). An independent advisory board, the Energy Conservation Management Board (ECMB), which holds regularly scheduled public meetings, was created to provide a forum for public input and to make recommendations to the DPUC and Legislature on energy-efficiency policies and program design, program mix, and budgets (see Fig. 4). Funding for the programs is provided through a system benefits charge, which was authorized as part of the state's restructuring legislation.

The basic administrative and governance structure in Connecticut was formulated during the restructuring process in an attempt to address a number of issues identified with the existing approach. The two investor-owned utilities had previously been responsible for providing energy-efficiency programs, but the programs were not uniform, and because of the utilities' financial disincentives to pursuing end-use energy efficiency, the DPUC believed that significant staff resources and financial incentives were required to motivate utility management. The DPUC sought to create a set of statewide programs in order to reduce customer transaction and administrative costs, and to establish greater market

presence and continuity with vendors and manufacturers. The ECMB was created to facilitate these efforts. This administrative structure has thus far proved successful, in terms of generating a set of consistent statewide programs and has also provided sufficient flexibility to respond to short-term conditions, by targeting additional funds and efforts towards southwestern Connecticut, where acute transmission constraints were identified as a significant reliability threat.

Connecticut has elected to maintain a regulatory oversight rather than a contract model in energy-efficiency program administration. The ECMB has been able to function effectively as an Advisory Board and provide guidance and recommendations on how to achieve DPUC policy goals. The governance/oversight structure has been less contentious than in California (i.e., the CBEE role as advisory board to CPUC) for two primary reasons: 1) the ECMB was authorized by and reports to the Connecticut Legislature and thus has greater "legitimacy" and 2) Connecticut's policy and programmatic directions to the ECMB were narrower in scope and required fewer institutional changes than the CPUC's guidance to the CBEE during the 1998-2000 period. Policymakers in Connecticut have relied on a two-pronged strategy to address potential disincentives of utility program administration: 1) financial incentives to utility shareholders as a way of aligning the utility's performance as a program administrator with the state's objectives for energy efficiency, and 2) reliance on an independent Advisory Board to provide input on energy-efficiency programs, program design, budgets, and balancing among policy goals.

5. Conclusion

In the US, electricity restructuring has resulted in significant changes in the acquisition of energy-efficiency resources as an outgrowth of an Integrated Resource Planning process, in establishing a role for transforming markets as a new policy objective, and in stimulating new models for administration and governance of these activities. Prior to restructuring, energy-efficiency program budgets and savings goals were developed as part of Integrated Resource Plans, and thus budgets could change fairly significantly when plans were updated depending on the overall supply/demand balance, energy-efficiency program cost-effectiveness, and rate impacts. After restructuring, in those states that adopted system benefits charges, the energy-efficiency planning process has changed somewhat as regulators/administrators are given some pre-specified amount of public benefits funds which is typically known over a multi-year period and legislatively or administratively authorized. The issues faced by regulators/administrators focus on how to allocate those funds among customer market segments, types of programs/activities, and the balance between near-term acquisition of electricity and peak demand savings vs. longer-term activities designed to reduce market barriers and create a sustainable energy-efficiency services markets/industry.

No single administrative structure for energy-efficiency programs has yet emerged in the US that is clearly superior to all of the other alternatives. And, in our view, this is not likely to happen soon for several reasons. First, policy environments differ significantly among the states. Second, the structure and regulation of the electric utility industry differs among the regions of the US. For example, in Vermont, the PSB regulates public and investor-owned utilities, many of which are quite small, while in most other states, PUCs regulate only investor-owned utilities, many of which are large. In addition, vertically integrated utilities continue to operate in many states, including states that allow retail competition. These different arrangements affect the administrative capabilities and perceived and actual financial disincentives of utilities to promote energy efficiency. In addition, senior management at utilities vary significantly in their interest in and commitment to effectively administer and design energy efficiency programs that are part of a regulatory or legislative mandate. Third, market transformation and resource

acquisition, which once were seen as alternative strategies, are increasingly coming to be seen as complementary strategies. Going forward, energy-efficiency programs and activities in various markets (e.g., appliances, new construction) are likely to include elements of both strategies. But, the administrative arrangements that are best suited to support market transformation may be different from the arrangements that are best for resource acquisition.

The differences in policy environments are partly due to different experiences with restructuring. By-products of electricity market restructuring, which include increased price volatility in wholesale electricity markets, occasional price shocks and system reliability events, have forced energy-efficiency program administrators to react quickly to these "short-term" crises with programs designed to reduce load, summer peak demand, or targeted at constrained areas. In some cases, they have had to divert attention from their longer-term market transformation goals and re-allocate program budgets and resources to address local emergencies (New York, Connecticut). In places where the crisis has been quite severe (California), there is a more fundamental re-thinking of the role of planning. In California, with the suspension of retail competition, the CPUC has directed the utilities to submit what are essentially Integrated Resource Plans as part of their proposals for procuring long-term resources.

When resource acquisition is the primary objective, utilities—provided that they are large enough—remain candidates for program administrators. Utilities have easy access to customers and are often trusted intermediaries between customers and suppliers of energy-efficiency products and services. The effectiveness of resource acquisition programs is relatively easy to measure, so incentives can be tied to performance. The situation is somewhat different if market transformation is the primary objective. Access to customers is not as important since most programs are not "one-customer-at-a-time." Often the targets are not customers but are suppliers like appliance or equipment manufacturers or intermediaries like lenders and retail product distributors. Program success and attribution of success to the administrator's activities are more difficult to measure. Performance incentives for these activities, if offered, may be based on both subjective measures such as of stakeholders' opinions about the value of the administrator's efforts and objective measures such as changes in market share. However, objective measures such as changes in market share may be difficult or costly to obtain given available market data. If the view that resource acquisition and market transformation are complements gains ascendancy, we may see the emergence of more arrangements like that in the Pacific Northwest where a single-purpose regional agency administers market transformation programs and utilities or non-utility entities (either state agencies or non-profit corporations) administer resource acquisition programs.

The debate over administration of energy-efficiency programs has often centered on the incentives, motivation, and capabilities of utilities vs. other types of entities. Issues related to developing an energy-efficiency services infrastructure have often been framed in terms of activities that can/should be performed by the administrator (that is, the utility) vs. private sector entities. Often, missing in this discussion is a more fundamental discussion on the underlying strategy to create a vibrant, long-term energy-efficiency services infrastructure, particularly one that serves residential and small commercial customers. Over time, it will be necessary to pay more attention to this issue if energy efficiency is to achieve its full promise and potential.

Acknowledgements

This work benefited greatly from the review and valuable comments provided by a number of colleagues, including Ann Bishop, Severin Borenstein, Sue Coakley, Chris Chouteau, Michael Dworkin, Joe Eto, David Gamson, Blair Hamilton, Ken Keating,

Marty Kushler, Steve Nadel, Gene Rodrigues, Frank Spasaro, and Craig Tyler. Any remaining errors or omissions are the sole responsibility of the authors.

The work described in this study was funded by the Assistant Secretary of Energy Efficiency and Renewable Energy, Office of ElectricTransmission and Distribution of the U.S. Department of Energy under Contract No. DEAC03-76SF00098, and by the University of California Energy Institute.

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Table 2
Administrative Structure of Energy-efficiency Programs in Five U.S. States/Regions

	Pacific Northwest [e, f]	**California** [a, g, k]	**New York** [a, c, d]	**Vermont** [a, b]	**Connecticut** [a, h, i, j]
Administrator	Northwest Energy Efficiency Alliance	Pacific Gas & Electric, Southern California Edison, Southern California Gas Company, and San Diego Gas and Electric	New York Energy Research and Development Authority (NYSERDA)	Efficiency Vermont	Connecticut Light and Power, United Illuminating
Organization Type	Regional nonprofit	Investor Owned Utilities	State Authority	Energy Efficiency Utility	Investor Owned Utilities
Governance	Board of Directors	Oversight by California Public Utilities Commission	MOU with New York Public Service Commission; input from advisory board	Contract with Vermont Public Service Board	Oversight by Connecticut Public Utilities Commission with input by ECMB advisory board
Funding Source	Ratepayer funding or public benefits funding from BPA and utilities in each state	Public Benefits Fund through surcharge of 1.3 mills/kWh	Public Benefits Fund through surcharge of 0.83 mills/kWh	Public Benefits Fund through surcharge	Public Benefits Fund through surcharge of 3.0 mills/kWh
Duration	Indefinite	Through 2012	Through June 2006	No sunset in legislation; three-year contract with Administrator	Indefinite
Annual Budget (approx)	$20 million (NEEA only)	$275 million	$74 million (EE only)	$13 million	$86 million
Performance Mechanism	None	A portion of cost recovery witheld pending satisfaction of program goals, including energy and peak demand savings as well as various program-specific participation goals	None	Electricity and Peak Demand Savings, Total Resource Benefit, and several market-specific indicators	Primarily based on electricity savings, with several additional program-specific participation goals
Performance Incentive	None	Up to 15% of cost recovery at risk	None	2.9% of contract value; maximum of $1.28 million cap over contract period	Up to 8% of expenditures

a. (ACEEE, 2003)
b. (Hamilton et al., 2002).
c. (York et al., 2002)
d. (NYSERDA, 2002)
e. (NEEA, 2002a)
f. (NEEA, 2002b)
g. (CPUC, 2001)
h. (UI, 2002)
i. (ECMB, 2002)
j. (DPUC, 2001)
k. (CPUC, 2002b)