From Resource Value to Market Transformation: The Case for a Change in the Design Goals of Publicly Funded DSM programs

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This paper articulates a vision of how the goals and objectives of utility and state agency Demand Side Management (DSM) programs are likely to change in response to market pressures and consumer demands during the restructuring of the electric industry. Some electric utilities will choose to provide energy services on a fee for service basis using shareholder funding or possibly by spinning off unregulated subsidiaries. Others will choose to continue to operate DSM programs at the distribution level using public funds that may be administered or allocated by independent non profit organizations or more traditional government agencies. The analysis focuses on explaining why some electric utilities have already begun to shift away from a focus on creating resource value using DSM programs in competitive markets, why a change to market transformation objectives using public funding is desirable, and what actions are needed by regulatory agencies to smooth the transition towards a new generation of DSM programs designed to develop a sustainable demand for energy efficient products and services.

INTRODUCTION

This paper articulates a vision of how the goals of utility and state agency Demand Side Management (DSM) programs are likely to change during the restructuring of the electric industry. Changes in the structure of retail electricity market will stimulate the development of new goals, approaches and designs for current utility and state DSM programs based on the customer's growing need for credible information in what may be a chaotic and fragmented market. In response to these changes, some electric utilities will choose to provide energy efficiency services and other information services on a fee for service basis using shareholder funding and possibly by spinning off unregulated subsidiaries. Others will seek to continue to operate DSM programs at the distribution level using public funds because of their assessment that the market for these services is not as profitable as other opportunities or that many of these services/ programs produce public goods that are not easily captured through market pricing. This analysis focuses on the evolution of utility program goals from a focus on creating resource value to a new focus on market transformation, why a change to market transformation objectives using public funding is desirable and necessary given expected changes in market structure, and what actions are needed to smooth the transition to a new generation of DSM programs.

THE EVOLUTION OF UTILITY DSM PROGRAM GOALS: FROM RESOURCE TO SOCIETAL VALUE

Theory: The Use of Resource Value as a Surrogate for the Profit Motive

For the last ten years, some utilities have designed DSM programs that attempt to reduce the overall cost of providing energy services to all customers by encouraging their customers to invest in energy efficient equipment that was less expensive than purchasing or constructing new supply facilities at the system level. Programs that reduced this overall cost of providing a given level of energy services for all current and future ratepayers would create resource value for society by reducing the cost of providing marginal energy and capacity resources. Resource value was measured as the difference between the present value of the energy savings that could be attributed to the program over the life of the more efficiency equipment (the net benefits) and the sum of all the incremental costs incurred by the utility to administer the program and by the customer to install the more efficient equipment (the net costs). The necessary data inputs to ''measure'' resource value included an estimate of first year net energy savings from the equipment, useful life of the

product or service, both first year and lifecycle incremental costs of installing the more efficient equipment and an accurate forecast of the avoided marginal energy and capacity costs resulting from product installation over its useful life. Utility programs and their managers that were successful in creating resource value would be reinforced by a regulatory incentive formula that granted them a small (10% to 30%) share of the resource value measured after the programs were completed.

The calculations and input parameters for estimating resource value were codified into a complex series of cost benefit tests in 1987. One of the tests, the Total Resource Cost (TRC) test was selected by many regulators as the appropriate test to use to test the cost effectiveness of DSM programs from a societal perspective (CPUC 1987). The TRC test and variations of it have been used for over a decade to determine the cost effectiveness of utility programs and as measures of the potential value created by utility programs for the purposes of setting shareholder earnings from DSM programs.

Estimates of the lifecycle energy savings (and thus resource value) produced by DSM programs are still quite uncertain and pose a risk to future earnings calculated for the programs based on a ten year earnings recovery mechanism. The current calculation of resource value assumes the present value of the lifecycle energy savings or load impacts can be estimated with precision given an initial engineering estimate of the first year energy savings from the program and an assumption that the savings will not degrade for at least ten years. Unfortunately, there is little evidence that supports the assertion that first year energy savings will not degrade over the useful life of the product. Those field studies that have been completed suggest that savings could degrade from 10% to 40% over these time frames (Skumatz & Hickman 1994) due to remodeling or early replacement. It is also not clear whether the net long term savings can be estimated using some form of measurement process or whether it requires the use of forecasting models (McMenamin 1994). In addition there is considerable uncertainty about whether the forecasts of avoided costs over the next ten to twenty years will be useful if the generation industry is deregulated. These uncertainties led some analysts to conclude that utilities should not pursue programs unless they attain a minimum threshold value of at least a 1.4 to 1 benefit cost ratio.[1] This is because utilities are required to pay rate payers back for any decrease in societal welfare if the ex post measurement studies find that the programs were not cost effective; if the value of the ''measured or actual energy savings is found to be less than the total program and administration costs of the program.

Experience With Using Resource Value to Motivate Regulated Utilities

The motivational effects of incentive formulas based on the pursuit of resource value on utility management have been weak because of the aforementioned management uncertainties related to the present value of future energy savings, their ability to ''verify'' these savings in future years, and utility management's recent motivation to hold down electricity rates rather than customer bills during industry restructuring (Schlegel et al. 1993). Moreover the concept of measuring the resource value produced by a given DSM program rested on a number of assumptions which may no longer be viable in a restructured electricity market. In particular the assumption that utilities will continue to make investment decisions, both demand and supply side, for all or most of its customers, and then successfully pass on all of the costs of these investments to the same customers on a non discriminatory basis is not viable in a restructured electricity markets. In fact, a strong case can be made that electric utilities will no longer be able to count on a fixed customer base to pay for the costs of either new generation plants or DSM programs, or to accurately predict the value of program energy savings given the expected volatility in energy costs during restructuring.

In practice the users of the TRC or resource value test also excluded some difficult to quantify, yet important, costs and benefits that may remain after the program is completed. Many of these non energy factors have been shown to be more important to consumers in making a purchase decision than the estimated reduction in energy costs or increase in cost associated with more efficient equipment. For example the value of non energy benefits resulting from lighting programs such as increases in comfort and the productivity of workers are thought to swamp the expected change in energy bills by many practitioners (Romm 1994, 91). In addition, important remaining market barrier costs are excluded from the test calculation because the test presumes that the programs have been 100% successful in reducing the market barriers that currently impede customer adoption of these measures. In fact, there is no attempt to quantify the costs of market barriers either before or after the program in the TRC test (Herman 1994, 8.77-8.87).

Finally, even though the most significant customer benefits generated by many DSM lighting programs are often related to changes in productivity, comfort and the value of office space, regulators have resisted proposals to monetize the comfort or productivity benefits caused by a DSM program for inclusion of the TRC test. This is ironic given that some of the biggest business opportunities from more efficient lighting equipment stem from opportunities to increase productivity and comfort, not energy savings. This policy further decreased utility interest in pursuing these programs

within a regulated setting where the biggest components of customer value created by their efforts were excluded **by definition** from cost benefit tests. These advocates also asserted that other assumptions in the TRC test were leading to program designs that facilitated the capture of short-term energy savings at the cost of not dealing or papering over continuing market barriers to energy efficiency (Herman 1994).

The Indicators or Measures of Success Used for the Evaluation of Program Effectiveness Must Change in a Restructured Markets

Measurement of resource value produced by utility DSM programs was appropriate in a market structure where vertically integrated utilities can capture the value of load or energy savings achieved by the programs by reducing their operation or capital expenditures but is not appropriate in a competitive market where capacity and energy savings are spread over a variety of different producers. This is because it is impossible for the utility to capture the capacity savings they pay for by pursuing a program if alternative sources of generation are being dispatched by an independent operator beyond their control. Thus the indicators of effectiveness are already evolving towards the direct measurement of the market effects of DSM programs and their success or failure in reducing market barriers that inhibit customers from voluntarily adopting energy efficiency products or services. A comprehensive list of market barriers to be measured and their relationship to DSM programs has just been completed for the California CADMAC (Eto, Prahl & Schlegel 1996).

Cash Rebates Designed to Reduce the First Costs of Equipment are Often Ineffective if the Goal is to Create a Lasting or Sustainable Increase in the Customer Demand for Efficient Products

Utility cash rebates are not treated as a societal cost in the TRC test but rather a transfer payment between customer classes. This assumption encouraged utilities to shift program dollars from administrative expense categories (that directly reduce resource value) to cash rebates for customers since the rebates theoretically created more energy savings and thus resource value at no additional cost. However, the widespread use of cash rebates in utility program designs may be simply compensating customers for incurring high transaction costs when purchasing more energy efficient equipment unless the transaction costs such as the risk that the product may not perform up to expectations are simultaneously reduced by the program. Some rebates may reduce customer search costs, the costs of finding and acquiring the product, while others may simply allow customers to purchase more capacity or value from the product without reducing any real market barriers. Much more research is necessary to confirm whether rebates are actually helping to develop a sustainable demand for more efficient products or simply providing a temporary subsidy for product sales (Goldstone 1995).

A PRACTICAL SOLUTION EMERGES: THE MARKET TRANSFORMATION APPROACH

The disintegration of the resource value approach in the face of utility restructuring and regulatory decisions related to unbundling the costs of generation in California has hastened the development of a ''new'' goal for publicly funded DSM programs called market transformation.[2] Market transformation designs evolved from utility attempts to get more bang per program dollar spent by moving their programs focus upstream in the product development process (McNally 1996). Supporters of market transformation are driven by the belief that the role of publicly funded energy efficiency programs is not to compete with the private market for energy efficiency services but make the market work better by reducing transaction costs for both producers and consumers. Identifying strategies to reduce market barriers that inhibit the development of energy efficiency services is the key to operating successful market transformation programs.

Market transformation programs are designed to reduce market barriers to the adoption of energy efficient practices or measures that are not likely to be reduced by private firms due to the ''public goods'' nature of the program or service. For example, market transformation programs aim to directly reduce barriers that inhibit customers from obtaining credible information on the performance of energy efficiency products that is not normally supplied by ''the market.'' Providing recognition for quality service providers through certification programs is another way of dealing with the customer's need for some method of differentiating between suppliers of credence or experience goods.

The design of market transformation programs are usually different than resource value programs because they aim to create **lasting** structural and/or behavioral changes in the market rather than temporarily increase the adoption rate of specific technologies through rebate promotions (Schlegel & Prahl 1994, 6.158). The ultimate goal of market transformation programs would be to build a sustainable customer level of demand for energy efficiency measures by empowering customers with new and better decision tools or and access to credible energy service vendors. In sum these programs would work with market forces to increase the size of the energy service industry rather than compete with existing energy service firms to provide services as a last resort.

Matching Program Designs to Market Conditions in a Restructured World

Deciding which market barriers to address through programs or policies in the restructured world is a crucial task. The first step will be to perform a careful analysis of the information environment confronting consumers and producers in the restructured markets. We expect that market conditions in a post restructuring world will be dominated by the following factors:

(1) Customer confusion over energy rates and available services.

(2) Multiple energy service providers with little or no reputation or credibility with customers.

(3) Customer reluctance to devote the resources necessary to shop for unbundled energy services.

(4) Aggressive aggregators of energy and non energy services that offer free or enticing packages of services that will be difficult for customers to verify.

The principal strategies used to address these market barriers are likely to be:

(1) Use of the Internet and other media to reduce excessive search and acquisition costs for the ''cheapest'' energy service provider and/or for more energy efficient equipment or audit services.

(2) Provision of financing programs to address the disconnected incentives between building occupants who pay energy bills and owners who don't.

(3) Joint public-private quality control programs achieved through inspections or ratings for bundled energy efficiency service providers.

(4) Development of new communication devices to provide consumers with real time feedback on product performance and power reliability/quality.

(5) Policies/programs to increase private market access to utility information assets that represent a barrier to market entry for new service providers.

Working With the Private Market to Design an Exit Strategy

The final defining characteristic of market transformation programs is the need to plan for the eventual transfer of the delivery of the program or services to the private sector at the beginning of the project. Market transformation programs designers should work with private firms in the product delivery infrastructure to develop an approach to reducing market barriers that could be initially publicly funded but gradually shifted to private market actors for sustainable funding. The key is to identify what types of market barriers can be successfully reduced by government or utility interventions while screening out program designs that might temporarily increase the adoption rate of energy efficiency technologies without building the foundation for customers to support these technologies after the program has terminated.

WHY IS THERE A SPECIAL NEED TO ADDRESS MARKET BARRIERS FOR ENERGY PRODUCTS AND SERVICES AS OPPOSED TO FOOD PRODUCTS OR AUTOMOBILES?

Substantial economic, engineering, and behavioral research (Blumstein 1980; Sanstad 1994; Stern 1994) has documented the existence of market barriers that prevent well-informed energy choice by consumers. With market barriers in place, consumers tend to choose products with a lower first-cost (but a higher energy usage) over products that may initially cost more yet over their useful life achieve more value per dollar. This phenomenon is often referred to as the energy efficiency gap or paradox (Jaffe & Stavins 1994). Nevertheless this tendency of consumers to under-invest in the quality or reliability of durable goods by purchasing the lowest first cost is certainly not limited to the energy service market. What distinguishes the products in the energy service market from others?

There are three major distinctions:

(1) A high proportion of energy efficient goods and services are experiential or credence goods that require feedback after the purchase to ensure a well functioning market.

(2) The resale value of many efficient investments is either low or impossible to unbundle from other product attributes, making the market for these investment risky and of low liquidity.

(3) The cumulative spillover effects of energy efficient investments on the economy and the environment are extremely large but hard to collectively value in decentralized energy services markets.

These distinctions are discussed below:

Credence Goods, Resale Value, and Internal Market Barriers to Energy Efficiency Investment

Internal market barriers arise primarily due to the different costs of obtaining access to credible information between consumers and suppliers. Suppliers often have access to information about the performance of their products but customers have no way to verify these claims since energy is billed as a lump sum of all energy using products in a home or building. In fact, all too often consumers cannot verify the quality of the product or service even after they make a purchase. For example, they wonder but frequently cannot tell whether their new ''efficient'' refrigerator is really saving energy; whether their insulation was installed properly, or whether the maintenance on their air conditioning system was performed adequately. Thus consumers look to develop a relationship with ''credible'' providers since their savings claims cannot be easily verified. Market transformation programs can play a key role here by helping to discriminate between high and low quality energy service providers and build the requisite trust.

The unusually large information differential, that characterizes most energy service markets, makes it particularly difficult for well functioning markets, where consumers can realize meaningful well informed choice, to evolve. Confronted with various choices a consumer must either (a) incur the risks associated with accepting the difficult to verify claims of suppliers, (b) incur the costs associated with independently verifying these claims before their purchase, or (c) incur the costs of independently ascertaining and resolving any disputes that may be associated with significant discrepancies that may be discovered after their purchase. These are all costs of carrying out transactions, commonly known as transaction costs, that are beyond those directly expressed in the price of energy but are often cited by consumers as the driving factors in their decision making process (Cambridge Systematics 1994).

This problem is exacerbated by the fact that it is difficult if not impossible to resell many energy efficiency products. For example, if a consumer concludes they have made the wrong choice with respect to the level of ceiling insulation, there is virtually no market to resell this insulation. Thus, there is a high premium value to making the ''right'' decision in the first place.

Finally the cumulative effects of even a small change in the cost or efficiency level of common appliances is often very small from the perspective of savings on an individuals bill but very large when considered at the societal level. For example, a $40 increase in the cost of a refrigerator caused by an increase in appliance standards produced customer bill savings of only $15 per year for a simple payback period of 2.2 years. However this small change at the customer level was expected to lead to cumulative energy savings of over $20 billion in energy expenditures and reductions in carbon dioxide emission of over 8,000 tons per year by 2015 (McMahon et al. 1990).

It follows that successful DSM programs should seek to create public benefits by reducing market barriers that cannot be successfully reduced by private firms in a competitive market. The reasons that private firms cannot reduce these barrier range from credibility and conflict of interest problems to an inability to recover the costs of their market barrier reduction investment because the benefits they produce are inherently public goods. The focus of market transformation programs should be to work cooperatively to reduce or eliminate these transaction costs to the point where public intervention is no longer necessary.

WHY IS AN EVOLUTION TOWARDS MARKET TRANSFORMATION OBJECTIVES DESIRABLE OR NECESSARY FOR PUBLICLY FUNDED DSM PROGRAMS?

1. A Shift Towards a Focus on Market Barriers is Necessary Because the Delivery of Energy Efficiency Services to Private Customers May No Longer Cause or Create Public Benefits by Reducing Aggregate Expenditures on New Sources of Electricity Supply

In the past, DSM programs with positive TRC ratios provided benefits for all ratepayer because the costs of providing energy were constrained to the utility monopoly system and a reduction in need to spend money on new resources in one part of the system could effectively be passed through to all other ratepayer in the system. In a restructured market, the linkage between the reduction in energy consumption associated with energy efficiency actions from one class of customer and the system wide benefits in terms of reduced expenditures for all other customers is no longer certain and may not exist at all for direct access customers. Thus, it may not be enough for a DSM program to simply reduce the bills of one customer to create public benefits in the form of reduced expenditures on energy. The new performance standard for DSM programs is likely to shift to demonstrating that a particular program design will provide benefits for all of the consumers in a market, not just those lucky or intelligent enough to participate in a program.

2. The Public's Desire to Shop for New Energy Services or Rates Will Be Frustrated by the Emergence of Signifi-

cant Market Barriers in the Initial Stages of Restructuring

We expect that retail energy service markets during the transition to a new electricity structure barriers will be heavily dominated by high transaction costs and fractured decision making. High levels of uncertainty will pervade the market place as prospective vendors flood the mails with offers to provide low cost direct access contracts. Consumers will lack the basic tools necessary to compare the basic cost of service delivered by alternative vendors. This problem of a lack of comparability between services and vendors currently plagues the telecommunication industry and is now being belatedly addressed by Public Utility Commissions. Publicly funded market transformation programs can help prevent a repetition of these problems in the electricity market by providing customers with credible software tools or maybe improved energy service billing formats to ensure the information provided by new service providers and existing distribution companies is comparable and perhaps even credible.

3. The New World of Increased Customer Electricity Service Choices is Likely to Eliminate Some Market Barriers While Creating New Ones

The restructuring of the electric utility industry is expected to eliminate some of these market barriers related to the monopoly structure (distortions between average cost and marginal cost pricing and embedded cost ratemaking) but other market barriers related to the structure of the energy services market are expected to remain. These include the problem of split-decision making caused by building owners who are not users of energy (landlords), the significant costs of learning about and finding energy efficient products (search costs), and finally, the costs of assessing the relative performance of new energy service products (e.g. the need for performance feedback on experience or credence goods) (King & Hastie 1995). Distribution Utilities that provide DSM programs that meet these emerging customer needs will be at a competitive advantage if and when restructuring proceeds to the retail level.

4. Focusing on the Reduction of Market Barriers is a More Cost Effective and Sustainable Strategy for Society Than Subsidizing Investments in Energy Efficiency Through Cash Rebates to Customers

A comprehensive market transformation approach needs to distinguish between temporary changes in customer purchase patterns and permanent changes in the structure or behavior of market participants. Traditional utility rebate program designs focus on inducing customers to buy more efficient equipment through rebates and thus creating a temporary increase in the customer demand for more efficient refrigerators. The offering of cash rebates to consumers may not be sufficient to induce long-term change in the way most customers purchase refrigerators or value their services. Rather than induce consumers to buy high efficiency equipment, we need to teach them how to evaluate the performance of the energy efficient products they purchase. Without addressing the customers perception of the value of these new and more efficient products, DSM programs run the risk of a long-term customer backlash and the buildup of high efficiency refrigerator inventories. Prudent public policy should limit this risk by taking the time to properly diagnose and treat the major market barriers to the provision of credible information on product cost and performance in the residential and small commercial markets.

5. The Breakup of Integrated Electric Utilities Into Smaller Functional Generation, Transmission and Distribution Units Will Make it Increasingly Difficult to Estimate the Resource Value Created by a DSM Program and Will Correspondingly Reduce Utility Motivation to Pursue Programs That Produce Resource Value Without Simultaneously Reducing Market Barriers

In a restructured electricity world, customers will have the choice of taking power from a pool at real time prices, paying average prices to their current distribution utility, or negotiating a contract for differences at a firm price with an independent power producer. Estimating the resource value to the system from reducing a single customer's power needs will be difficult given the lack of experience with the pool system and the expectation that prices will fluctuate rapidly during the transition. In many cases demand bids may be used to ration supply in the short term. Distribution utilities will purchase energy from a variety of suppliers but they will not necessarily have knowledge of the prices charged by some suppliers through direct access contracts. Thus, there is likely to be no basis for forecasting future prices given the tumult in both the supply and customer markets for services.

6. Significant Opportunities for Private Firms to Provide More Customer Value by Piggybacking Energy Efficiency Services on New Metering and Communication Options Could Be Stifled If Distribution Utilities are Allowed to Simultaneously Compete in the Customer Specific Energy Services Market and in the Market For Public Market Transformation Funds

Utilities that opt to spin off their current utility program staff into a deregulated subsidiary are expected to form strategic alliances with other private partners involved in the communications revolution. The use of public funds to subsidize certain ''energy only'' technologies could stifle competition and create significant anti trust complaints from unregulated firms that have to compete with a distribution

utility with access to public funds to sweeten the deal for selected customers. It is also possible that the public entity overseeing the use of public funds for DSM purposes could unwittingly create unnecessary barriers to new products that combined communications and metering software with energy efficiency products by excluding consideration of these non-energy benefits in benefit/cost tests.

WHAT ARE THE RISKS OF SHIFTING TO A MARKET TRANSFORMATION FOCUS?

There are four major weaknesses of switching to a market transformation focus for publicly funded DSM programs. First, the measurement of market effects produced by DSM programs are more difficult than estimating load impacts or energy savings. Developing the ability to discriminate between superior and average performance in market transformation programs will take time and require many value judgements that are currently hidden in the false precision of TRC benefit-cost ratios. Second, utility or private firm motivation to develop successful market transformation programs will hinge on the development of a replacement to the very successful shareholder incentive system that is currently solely based on resource value calculations in California. Third, the collection, administration, and allocation of funds to operate market transformation programs will be more difficult in an environment where funds are no longer raised as part of a general energy rate but are collected as either a separate monthly fee or a surcharge on total energy bills. Customers will rightly demand more accountability for the use of their funds and a convincing demonstration of the benefits of their investment. Finally, the shift to market transformation focus may cause some utilities to choose to abandon the pursuit of public funds in lieu of the potentially more lucrative market for customer specific energy services. The potential loss of expertise and industry contacts could result in a temporary loss of benefits to society as a whole while new market transformation institutions develop.

A TRANSITION STRATEGY TO DEVELOP A NEW MARKET TRANSFORMATION APPROACH

1. Regulatory Agencies Should Recognize That the Goals of Market Transformation (MT) Programs are Similar to Those Used to Support ‘‘Resource Value’’ Programs but the MT Approach is More Suited to the Evolving Competitive Market

The goals of reducing market barriers and creating resource value from a DSM program are not mutually exclusive, they both desire to promote the adoption of cost beneficial energy using equipment. For example, many utility DSM programs were designed to maximize resource value by explicitly targeting market barriers in order to increase the energy savings associated with the program by *participants*. The market transformation approach it seeks to maximize the effects of programs on all market participants, not just participants.

To some extent the focus on achieving resource value by focusing on reducing participant bills was a byproduct of an improperly designed regulatory incentive system. For example, in many cases innovative market transformation program designs were not properly rewarded because of the tendency of regulators to discount attempts to measure or claim credit for the spillover load impacts to non participating customers. For example, LBL researchers found that the value of spillover benefits from a Massachusetts Electric New construction program were a factor of two larger than the conventional measure of resource value for direct participants (Levine & Sonnenblick 1994). In general, programs that focus on reducing market barriers are much more likely to have significant spillover effects to non participating customers precisely because the removal of these barriers benefits all of the customers in present and future energy markets, not just the utility program participants.

A careful focus on diagnosing the actual causes of market failure and pilot testing potential strategies to reduce barriers with real customers could lead to lower energy savings in the first year of the program but will yield more energy savings in the long run when compared to traditional DSM programs. This is because the removal of persistent market barriers is likely to take more time and effort to succeed than simply convincing a small portion of a market to buy more energy efficient equipment using cash rebates. However, after the market has been successfully transformed the incremental spillover savings from the program are likely to increase, perhaps exponentially, in the years after the initial program effort was ‘‘completed’’ as these benefits accrue to all market participants. Unfortunately this type of serious attempt to permanently reduce market barriers is discouraged within the current regulatory environment where first year energy savings are rewarded with high shareholder incentive payments while studies of the persistence of these savings over time are discouraged due to a fear that the studies may actually reduce the estimated resource value and thus payments for the program.

2. Regulatory Agencies Should Redesign Shareholder Incentive Systems to Directly Reward Reductions in Market Barriers Rather Than Estimated Changes in Resource Value

The utility shareholder incentive system for DSM programs need to be improved so that the spillover impacts to non

participants and more permanent effects of market transformation programs are reflected in the measurement systems using to determine load impacts and ultimately shareholder earnings. There is considerable debate about how to structure these new systems but a consensus is beginning to emerge that the measurement of market effects will be much more important in a restructured world where energy efficiency services may be used a value added technique to retain customers. Whether these systems should be based on soft measurements of proximate ''market effect'' indicators or hard measurements of ultimate indicators of market success such as sales of more efficient products has yet to be resolved.[3]

3. Regulatory Agencies and Legislatures Should Develop a New Basis for Funding Market Transformation Programs by Collecting a Public Goods Surcharge on All Energy User Bills

Funding for energy efficiency programs by distributed electric and gas utilities is at risk because of their desire to reduce all costs in their current rates that do not contribute to their bottom line. Recognizing this problem, the CPUC has proposed that funding for programs that produce public goods such as energy efficiency programs should come from a non bypassable surcharge to ensure that all who benefit from such programs also pay for them. Adoption of the charge will simultaneously reduce the energy commodity rates of most utilities for generation, transmission and distribution services and communicate the true costs of market transformation programs to all customers. Currently a working group of all stakeholders is working out the details of administering and implementing this new charge in a report that is due to the CPUC on August 1, 1996.

SUMMARY

Changes in the structure of the electricity market are expected to catalyze changes in the way distribution utilities and regulators view the goal of DSM programs. The goal of creating resource value through DSM programs is likely to be replaced by a new approach to encouraging efficiency investment that focuses on creating lasting changes in the structure of the market and the attitudes and beliefs of buyers and sellers. Alternative institutions to oversee the use of rate payer funds for DSM programs are likely to emerge and focus on reducing new and existing market barriers to energy efficiency investments using a variety of market transformation approaches. The choice of what types of new market transformation institutions are created is likely to depend on the politics of the restructuring process, the structure of the new administration and to what extent customer input is used to define program designs.

ENDNOTES

1. Mike Messenger, CEC staff Testimony, *Analysis of the Probability that DSM programs might be found not cost effective during the ten year measurement period*. Filed in on May 26, 1994 in the CPUC's Order Instituting Rulemaking to establish rules and procedures governing DSM programs, R-91-08-003.

2. For this paper we define market transformation as programs designed to catalyze or cause long lasting changes in the structure or operation of the market by reducing market barriers to the increased availability and use of energy efficiency products and services. For a discussion of market barriers see Eto, Jan Golov, W., *Market Barriers to Energy Efficiency: A critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency,* Lawrence Berkeley National Laboratory.

3. For a discussion of the costs and benefits of using proximate vs ultimate indicators of market transformation success see, Shel Feldman, *Market Transformation: Hot Topic or Hot Air?* Wisconsin Center for Demand side Research. (Proceedings of the ACEEE 1994 Summer Study on Efficiency Buildings Vol 8 Pages 8.37 to 8.47).

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