Financing Options for Demand-Side Management Programs: Risk-Reward Tradeoffs for Ratepayers

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Traditionally, ratepayers have funded the up-front cost of utility demand-side management (DSM) programs through rebate programs or direct investment, or through loans from the utility to customers purchasing and installing various DSM measures. Alternative sources of financing have emerged in response to a number of factors, including competitive pressures to reduce rates, near-term rate impacts of ratepayer-funded programs, concern that costs be allocated to program participants, and skepticism about the long-term efficacy of DSM. In addition, some investor-owned utilities have developed shareholder-funded programs, in which shareholders take additional risks for the opportunity to earn increased returns.

This paper evaluates several types of DSM financing options as alternatives to traditional utility/ratepayer-funded loan programs. These options include: (1) energy service charges, (2) out-sourcing loan programs to traditional financing institutions, (3) securitization and sale of existing utility loan portfolios to raise additional capital, (4) state and federal programs for funding DSM investment, (5) contracting for energy savings (performance contracting), and (6) shareholder-funded programs. Tradeoffs regarding implementation and administrative costs, scale economies, near-term rate impacts, loan-loss risk exposure for ratepayers, cost allocation, and long term performance/efficacy risk are assessed on a relative basis. The extent to which third-party financing can transfer risk away from utilities and ratepayers is also described. Finally, specific program examples from across the United States are provided.

TRADITIONAL UTILITY LOAN PROGRAMS

Over the last 15 years, both investor-owned and municipal utilities have offered various types of incentives to customers to encourage them to participate in load management and energy efficiency programs, including rebates, energy audits, direct investment, sign-up bonuses, bill discounts and financing assistance. Traditionally, utilities have provided financing assistance through loans to customers for DSM improvements. From 1989 to 1993, total DSM investment by utilities grew from $870 million to about $2.4 billion per year (Levine et al. 1995) Loan programs have become the third most frequent type of DSM program, following energy audits and rebate offers. In 1994, 297 utilities offered some form of loan program to their customers (EIA 1995).

In a typical DSM loan program, the utility lends money to participants to fund the initial investment, charging the customer an interest rate that is slightly greater than the utility's own borrowing cost, with the difference targeted to cover loan administration, servicing costs and loan losses.

Advantages of Traditional Utility Loan Programs

Traditional utility loan programs have several advantages compared to other types of utility DSM programs. For ratepayers, loan programs have advantages over utility rebates, bonuses, discounts and direct-investment programs because the up-front costs of the loan are repaid over time by the participant that benefits from the energy savings generated. Participants like utility loans because they tend to be relatively low-cost compared to alternative financing sources, due to utilities' low cost of capital. (This is particularly true for publicly-owned utilities that have access to tax-exempt debt, and in some cases, excess debt capacity.) Utilities can take advantage of ready availability to their customer base, and, in many cases, favorable customer relationships which can improve participation rates. As loans are repaid, a revolving loan pool is created that can be used to fund new loans.

Disadvantages of Traditional Utility Loan Programs

Utility loan programs are not without risks and costs for utilities and ratepayers. The utility assumes the role of administering, monitoring and collecting loans, but it may not have any particular expertise or competitive advantage in this area. Utilities are not banks, and therefore may not have the skills required to design and implement a cost-effective loan program. Some particular challenges include: (1) the administrative cost burden of loan origination, servicing and administration (2) loan default risk and limited loan security (Loans are generally unsecured with repayment separate from utility billings, with little recourse in the event

of default). (3) pressure to achieve high participation rates, together with lack of expertise in loan underwriting and credit evaluation, creating ratepayer exposure to high loan loss rates (4) under-performance of installed DSM measures.

Recent developments in the electric industry have also put pressure on utilities to consider third-party sources of financing for DSM investments. Increased competition is placing downward pressure on prices and revenues, driving utilities to cut costs in whatever way possible, including reductions in DSM funding. DSM programs may be especially vulnerable to competition as higher electricity prices caused by DSM will cause consumers to choose electric providers that do not incorporate DSM in rates (Chamberlin & Herman 1995).

Competitive pressures aside, utilities have found that the costs of designing and running their own DSM programs are higher than anticipated. A review of DSM program costs of ten major utilities found that DSM measures cost from 1.9 - 6.9 cents/kWh (1991$) to obtain average savings of approximately 3.4 cents/kWh (Joskow & Marron 1993). Concerns about the long-term efficacy of DSM measures and verification of savings have also emerged. Not all DSM measures under utility-funded programs have performed as expected (increasing rate impacts and reducing program cost-effectiveness compared to alternatives). Similarly, savings may be hard to verify or measure, making it difficult to demonstrate program cost-effectiveness to regulators. Studies have found that utility accounting methods may not adequately measure the true costs and savings of DSM programs (Eto, et al. 1995).

ALTERNATIVE DSM LOAN PROGRAMS

Due to the challenges facing traditional DSM loan programs, utilities are seeking ways to ''outsource'' financing where possible and cost-effective, so that costs and risks can be shifted away from the utility and its ratepayers. Alternative sources of capital for DSM Loan programs are being seen as an attractive way to reduce program costs, limit rate impacts, and realign risk. In some cases third-party sources of capital may be cost-competitive with the utility's own cost of capital. There are currently six alternative structures and sources of financing for DSM measures that are in use or have been proposed across the United States. Although not all-inclusive, these financing options cover most of the third-party funding currently substituting for ratepayer-funded loan programs. These are discussed below.

Energy Service Charges

Energy service charges (or tariffs) are a variant of traditional utility loan programs. Initial funding for DSM investments is provided by the utility, but rather than structuring a separate loan and loan repayment arrangement, an energy service charge (either a flat fee or payment per unit of savings) is added directly to the customer's utility bill for a specified term, with the amount targeted to be less than what the customer is saving as the result of the DSM investment.

Although not strictly a third-party source of financing, energy service charges are designed to improve loan security (reducing loan loss risks) and may enhance the utility's ability to package a portfolio of loans for sale to a third party.

Program Advantages. Since loan and lease payments are collected on the utility bill, loan security is improved and the utility may be better positioned to mitigate loan loss risks. In addition, loans and leases can be ''attached to the meter,'' such that if the customer moves, the loan or remaining payments come due immediately, or the new customer takes on the repayment obligation, subject to utility approval. The utility may also take a security interest.

Program Disadvantages. Energy service charges have some of the same disadvantages of utility-funded loan programs. Initial funding is typically provided by the utility, requiring that the utility have sufficient access to capital. Loan origination, servicing and administration costs are likely to be similar to traditional utility loan programs, and could be burdensome. Although security is improved ratepayers take 100 percent of the risk of loan losses, to the extent that costs associated with loan losses are not included in the interest rates charged to participants. Finally, reselling or out-sourcing energy service charge programs may be difficult due to the built-in linkage to electricity billing. As described below, however, at least one utility has been able to package energy services charges as receivables that are sold to a bank.

Utility-Specific Examples. Southern California Edison's Envest[SCE] and PacifiCorp's Energy FinAnswer both include financing options structured as energy service charges. PacifiCorp's Energy FinAnswer program provides a variety of financing options for commercial and industrial customers to install DSM services and equipment. A segment of its program, which targeted commercial-sector new construction in the utility's Oregon service area has been particularly successful, achieving penetration rates of 76 percent (Prindle 1995). The program extends a variety of DSM services as a package whose cost, including financing, appears as a line item of the occupant's utility bill. This allowed developers to pass through the costs and benefits of the DSM investment to tenants, thereby overcoming owner-occupant barriers that often lead to landlord under-investment in DSM improvements. Because the energy service charge offered to commercial developers is not a financial liability, the project costs were financed ''off the balance sheet.''

Out-Sourcing New Loan Programs to Traditional Financing Institutions

Historically, traditional lending institutions such as commercial banks and savings and loans have been reluctant to lend directly to utility residential, commercial and industrial customers to finance investments in DSM measures. Traditional lenders have had difficulty getting comfortable with a loan supported by energy or demand ''savings'' that would reduce utility bills, particularly give perceptions that the long-term performance of many demand-side measures was largely untested and unproven. Generally, lending institutions have required that the loan be supported by the overall balance sheet and credit of a business, or by a mortgage or other security.

Utilities own loan programs have demonstrated that DSM lending is a sizable, growing market. For example, the Sacramento Municipal Utility District (SMUD) has built its DSM loan program to a portfolio totaling $40 million, and expectations are that the portfolio will grow by about $10-$20 million per year (net of principal repayments). This track record, combined with several years of operating history for many DSM strategies, has brought some traditional lending institutions into the DSM market.

As a result, many utilities are out-sourcing DSM loan programs to these institutions. The bank, rather than the utility, loans money to and collects payments from the customer installing the DSM measure. The bank is responsible for loan origination, credit approval, loan administration, and payment collection. The utility provides assistance by: (1) determining and/or approving what types of measures will qualify, (2) estimating bill savings, (3) providing the bank with access to its customer base, and/or (4) reducing the cost of the loan to the customer by ''buying down'' the interest rate and/or backstopping loan losses.

Interest rate buy downs, if any, are designed to provide an incentive for a customer to participate in the program. In some cases, utilities limit ratepayer contributions (including program costs) to a percentage of what would otherwise be provided as a rebate. Utilities have counted interest rate buy downs as rebates in some of their programs.

Using its own criteria, the third-party bank can take responsibility for credit review and loan approval. Loan security and arrangements for sharing loan losses vary, and are negotiated between the utility and the lender. Depending on project size and the lender's credit assessment, loans may be secured. The utility may contribute to a loan loss reserve fund or bear loan losses above a certain ceiling, and may pay bank fees.

Program Advantages. Out-sourcing loans can largely eliminate the business risk that utility ratepayers assume by providing financing services. This risk can be shifted to a bank, which should be much better equipped to evaluate and manage that risk. No up-front funding by utility/ratepayers is required (beyond program design and implementation costs). Responsibility and costs for underwriting, credit review, loan servicing, administration, and monitoring are reduced or eliminated. Customers can benefit from a faster application process and streamlined loan approval. Because banks will assume some or all of the risk of loan losses, such a program exploits the strengths of both parties. The bank is in the lending business and brings economies of scale, and the utility is in the energy services business, providing access to its customer base and offering its understanding of DSM technologies.

Program Disadvantages. Banks may have a higher cost of capital or higher spread requirements, making it expensive to ''buy-down'' interest rates to the point that they match the utility's own lending rates. Similarly, bank credit criteria may be more onerous than the utility's. While this reduces loan losses, it increases customer dissatisfaction and can potentially limit market penetration. Although in theory loan processing and servicing should be better and less expensive, this will vary according to each bank's capabilities, and the utility bears the risk of selecting a qualified bank. Finally, banks are likely to out-source only the lowest risk, ''cream of the crop'' loans, (e.g., commercial sector loans are generally lower risk and lower cost to service than residential loans) potentially leaving the utility with a relatively weak and costly portfolio.

Utility-Specific Examples. Pacific Gas & Electric (PG&E) has several programs that use outside financing sources. The Capital Advantage program is a low-interest loan program targeted at commercial, industrial and agricultural customers. Loans are provided by Wells Fargo Bank (WFB). WFB is responsible for credit review and loan approval and uses its own criteria. Thus, PG&E is not responsible for loan administration, credit checks, funding, collection or loan repayment. PG&E verifies that the measures are eligible for financing, and funds are paid to the borrower after completion of construction and PG&E's technical verification of installation.

PG&E's Energy Advantage Program provides cities and counties with low-cost financing for DSM projects. Coordinated through a joint Powers Authority (the California Statewide Communities Development Authority), PG&E can provide lease-purchase financing at a cost that is only slightly above the cost of tax-free debt. The Authority provides up-front capital, and is responsible for loan review and approval, administration and servicing. The Authority bears the risk of loan losses. PG&E is also running a pilot program in

which loans are originated and serviced by a bank, and then sold to the Federal National Mortgage Association (see further discussion below).

The Comfort Home Program, also in PG&E's service territory, is an attempt to establish a market niche for ''green lenders.'' Developed by three mortgage banks, the program offers new homes for sale that exceed federal energy efficiency standards by at least 25 percent. In assessing the mortgage application, the banks consider the savings in utility costs in evaluating the amount of debt the loan applicant can shoulder. To attract customers to the program, the mortgage companies offer $500 off of closing costs and guarantee a 14-day loan processing period. Analysis indicates that prospective buyers who are aware of energy efficiency are at a lower loan risk than the general population. Funding, origination, underwriting, administration, servicing and risk of loan losses are provided by the mortgage bank. The utility assists with program promotion and marketing. Advertising and administration costs are jointly underwritten by the mortgage companies, PG&E and statewide builder's associations.

Sale of All or Part of Existing Loan Portfolio

In the lending industry, there is a large ''secondary market'' for the purchase of loan pools that have been originated and funded by ''primary'' lenders (such as commercial banks, savings and loans, etc.). Primary lenders package loans of similar type, size and credit characteristics, so that the pool looks like a single loan of much larger size, with characteristics similar to individual loans, but not burdened with the high transaction costs or uncertainty of repayment associated with an individual loan. In recent years, several different kinds of loans have been packaged and sold into the secondary market, including, for example, consumer credit card debt, automobile loans and leases, and other non-mortgage assets. By 1990, more than $90 billion of non-mortgage assets had been securitized (AFIMR 1991).

In most cases, the primary lender, or a dedicated loan servicing company, retains responsibility for loan administration, billing and payment collection (including delinquent accounts). Typically, the secondary purchaser absorbs some amount of loan losses on the portfolio. Loan losses above a certain percentage would be absorbed by the primary lender. The extent of risk borne by the secondary purchaser will, to a large extent, determine the price (or yield to maturity) the secondary purchaser is willing to pay (or accept) for the loan portfolio.

While most utility loan portfolios are small relative to other pooled transactions, larger, established utility loan portfolios could be attractive in the secondary market. The utility with a strong portfolio could remain the primary lender, and would continue to be responsible for loan origination (unless another intermediary was brought in, as is the case with PG&E's residential loan program described below). Pricing for sale of the loans would depend on several factors, including, for example, track record of the portfolio, interest rates on the loans compared with the buyer's own cost of funds, size of the portfolio, and the extent of loan loss risk transferred to the buyer.

Program Advantages. The secondary market may be an attractive source of relatively low-cost funds. Once sold, the purchaser bears some or all of the loan loss risk. This strategy exploits a utility's strengths in targeting customers and identifying appropriate DSM investment opportunities. For example, in support of PG&E's proposed program, the Federal National Mortgage Association (Fannie Mae), which purchases pools of residential mortgages, stressed the importance of PG&E's involvement in the process, including marketing and promotion, identification of appropriate retrofit measures, project management and quality control. In addition, this approach potentially allows a utility to capture the value added in its portfolio due to size, diversification characteristics, and track record.

Program Disadvantages. Potential buyers (e.g., Fannie Mae, Federal Home Loan Mortgage Corporation (Freddie Mac)) may have a relatively high cost of capital, resulting in purchase at a discount, or less favorable rates for participants on new loans. The utility may need to provide loan loss guarantees, limiting the risk transfer potential of this approach. In general, there may be administrative or legal requirements that the utility must address to ensure that loan pool is attractive for resale. These requirements could create a program design that is cumbersome and discourages participation.

Utility-Specific Examples. Up to this point, secondary sales have been limited, but there is some activity in this sector. Last year, Citicorp began to purchase PacifiCorp's loans under its Energy FinAnswer program. As part of the purchase arrangement, PacifiCorp continues to charge the customer for energy improvement measures on the utility bill. Citicorp then purchases the energy service charge payments. The partnership has allowed PacifiCorp to lower its loan interest rates.

PG&E operates a residential loan program that sells third-party loans for residential energy efficiency measures to Fannie Mae. Loans are originated and serviced by a primary lender and then sold to Fannie Mae, the nation's largest source of residential mortgage funds. The primary lender retains the responsibility for billing the customer, processing payments, and collecting on delinquent accounts. Interest rates are established by the primary lender, based on its costs of originating and servicing loans. Interest rates are also based on the percentage of loan losses absorbed by

Fannie Mae. Fannie Mae absorbs up to 1.5 percent of cumulative loan losses. Any additional losses are absorbed by PG&E. The California Home Energy Efficiency Rating Systems (CHEERS) and PG&E's own Energy Savings Plan are used to identify cost-effective measures.

State and Federal Programs for Funding DSM Investment (Stand Alone and in Combination with Utility Programs)

Utilities can leverage the financing provided by their own programs with funds that are available through state and federal agencies. State and federal programs can be attractive to a utility because they provide access to pools of funds raised to serve numerous customers across several utility service territories. Pooled funding and program administration offer opportunities to coordinate DSM activities with others, to expand services offered, to reduce risk through diversification, and to lower transaction costs per program participant.

In many cases, state and federal funds are available for financing DSM measures through programs deemed to be in the broad public interest because they encourage investment (e.g., the Energy Efficient Mortgage, Energy Efficiency Revenue Bond Program, addressed below). These programs are completely independent and separate from utility-run DSM programs. In other cases, pools of funds are raised by groups of utilities (e.g., FARECal, see below), or single utilities in conjunction with a state authority (e.g., Energy Advantage). Although funds are procured by the state authority that issues the bonds rather than the individual utility, the utility and its ratepayers may be required to guarantee the bonds or bear at least some of the risk of loan losses.

Program Advantages. Financing costs may be comparable to or below the utility's own cost of capital, particularly because some sources are tax-exempt. Economies of scale and reduction of risk result from consolidation of financing needs and program administration of several utilities into large pools. Finally, segregation of funding source and repayment obligation from the utility can shift risks and costs to participating customers, away from the utility and its ratepayers.

Program Disadvantages. Existing programs have been relatively small scale and/or not well known to utilities or their customers. In many cases, existing programs have not been fully exploited. In some cases, ratepayers may bear the risk of loan losses. Declining state and federal energy programs and inconsistency in government funding commitments have made it more difficult to access funding from government sources and incorporate programs into utility DSM plans.

State-Specific and Federal Examples. There are a variety of government-sponsored loan programs for residential customers. Three examples are the Federal Energy Efficient Mortgage (EEM) program, the Low-Income Home Energy Assistance Program (LIHEAP), and Oregon's State Home Oil Weatherization (SHOW) program.

Since 1993 the EEM program has been piloted in six states and allows qualifying home buyers to add up to $8,000 (under a VA loan) or $6,000 (under an FHA loan) in energy improvements to their mortgage. (The EEM program is expected to be extended to Freddie Mac and Fannie Mae conventional loans by June 1996.) To qualify, the buyer hires an independent energy rating company to recommend and certify cost-effective improvements. The weatherization component of the LIHEAP program provides free weatherization services to improve the energy efficiency of homes to qualifying low-income families. Oregon's SHOW program provides free home energy audits, low interest loans, and cash rebates to owners of oil and wood-heated homes. Loans are made through community banks at a rate which is subsidized by the state in the form of a corporate income tax credit for the lender. The banks and the state share the cost of the program and the risk of loan default.

Revenue bond programs are generally used to provide state-level support for larger public projects. The California Energy Commission (CEC) and the California Department of General Services (DGS) both target government-owned properties. The CEC's Public Sector Energy Efficiency Loan Program is available to local government entities and special district schools and hospitals and governments. Through the sale of bonds, the CEC operates a revolving loan fund for local government. Typical improvements include the installation of efficient lighting and energy control devices. The DGS' Energy Efficiency Revenue Bond Program is a similar program for state agencies interested in retrofitting improvements. This program has issued approximately $181 million in bonds since 1982. California municipal utilities have also used revenue bond programs to encourage energy efficiency programs for municipalities. The Financing Authority for Resource Efficiency of California program (FARECal) is operated by an association of 13 consumer-owned utilities and issues tax-exempt bonds to finance customer incentives and other energy measures. FARECal has issued $30 million in bonds since 1994. PG&E's Energy Advantage program, a joint effort of PG&E and the California Statewide Communities Development Authority, also provides financing for cities and counties. The Authority provides up-front capital, and is responsible for loan review, approval, administration and servicing, and bears the risk of loan losses. This program is in the pilot stage.

Contracting for Energy Savings (Performance Contracting)

Contracts for energy savings or demand reductions are a form of third-party financing for DSM measures. Rather than providing a rebate or loan to defray all or part of the initial cost of a particular DSM measure, the utility enters into a long-term contract with a customer, or more typically, an Energy Service Company (ESCO), agreeing to pay a certain price per unit of energy or demand savings **actually provided** to the utility. This commitment to pay is based on actual performance of the investment over the long term. The commitment, along with reductions in energy bills, provides a future revenue stream that allows the ESCO to earn a return on its up-front investment in the DSM measure. This promise to pay provides the ESCO with additional credit support that may allow it to raise the capital necessary to fund the cost of the measure. At the same time, the utility avoids any up-front expenditures of its own and pays only to the extent that the ESCO delivers on its obligations under the contract.

Many utilities have run bidding programs for DSM contracts, similar to (or even combined with) competitive bidding programs for purchased power contracts. Since 1987, about 30 utilities in 14 states have solicited bids for energy and/or demand savings with levelized total resource costs ranging between five cents to eight cents/kWh (Goldman & Kito 1994).

A few financial institutions do provide, or even specialize in, project finance loans for DSM projects. Large commercial banks and other financial institutions are still somewhat reluctant to provide non-recourse project financing to ESCOs with demand-side contracts with utilities. This is largely due to the relatively small size of DSM transactions, the small size and large number of credits (customers), and the overall complexity of most DSM transactions. Performance contracting may be best suited for larger projects using proven technologies where energy and demand savings can be easily measured and verified.

Program Advantages. The primary advantage of performance contracting is that the contract between the ESCO and the utility transfers financial, performance and efficiency risks away from the utility and non-participant ratepayers. Financial and performance risks can be borne almost entirely by program participants, and no up-front funding bythe utility and its ratepayers is required beyond initial program design and implementation costs. Utility and ratepayer payments and obligations are obligations are based on performance over the long term.

Program Disadvantages. The primary disadvantage of performance contracting is that ratepayers lose if contract pricing is high relative to alternatives, or if damage payments for non-performance are insufficient to cover replacement costs for expected energy savings. Measurement and verification procedures can be complex or difficult to implement. These are the tradeoffs for allocating performance risk to participants. In addition, third-party financing costs can be high both compared to the utility's own cost of capital and relative to other sources of financing, increasing the cost of savings provided.

Utility-Specific Examples.

Numerous utilities have implemented DSM contracting programs, with a range of success rates. Generally, program results have varied according to (1) program administration costs, (2) terms and conditions in contracts, (3) pricing, and (4) project completion and savings delivery rates. Extensive surveys of demand-side bidding and performance contracting programs have been conducted, so detailed descriptions of program examples are not included here (See, for example, Goldman & Kito 1994).

SHAREHOLDER-FUNDED PROGRAMS

Typically, investor-owned utilities (IOUs) have treated DSM costs as expenses, and DSM investments have traditionally been borne by ratepayers, with shareholders earning no return. More recently, many IOUs have proposed or implemented programs where shareholders put capital at risk and have the opportunity to earn a return on that capital. Just as third-party funding sources (as described above) are willing to provide capital and take certain risks for DSM investments, utility shareholders may be willing to do the same. Utilities can draw on certain features or structural elements of third party-funded programs to optimize the risk/reward profile of programs for all DSM participants, the ratepayers, customers of the program, and third parties.

Utility-Specific Examples. Southern California Edison's ENvest[SCE], is a good example of a ''state of the art'' shareholder-funded program. The three-year pilot program, which expired at the end of 1995, is structured in such a way that the risks taken by ratepayers, shareholders, program participants and other third parties are well-defined and quantifiable. For example, ratepayer contributions are capped, and are designed to cover only certain kinds of DSM investments (long payback) and a limited, fixed share of investment losses.

This program provided a ''one-stop DSM shop'' for commercial, industrial, and government customers on the SCE system. ENvest[SCE] acted as a project manager, mobilizing third-party designers, contractors, and funding sources.

SCE's stated goals for ENvest[SCE] were to overcome the following three barriers to DSM investment: (1) lack of affordability, (2) complexity, and (3) diffused accountability for measuring performance. Loans and lease options were priced to cover SCE's administrative costs, loan and credit losses, warranty claims, and to provide a return equivalent to SCE's authorized rate of return. Shareholder funding insulated ratepayers from up-front capital outlay requirements. Shareholders also bore the risk of loan and credit losses.

Some of the unique features of ENvest[SCE] designed to protect ratepayers from risk while exploiting the utility's DSM expertise include: (1) loan and lease payments are collected on the utility bill and are ''attached to the meter,'' potentially reducing loan losses; (2) SCE provides the customer with a performance guarantee on DSM measures that it finances, which is likely to increase customer participation rates; (3) loan and lease pricing is designed to cover the costs of loan losses and warranty claims, so that ratepayers are insulated from these costs; (4) SCE believes that its expertise in DSM technology and equipment, pre-qualification of ESCOs and contracts with ESCOs with regard to performance, and SCE's role as general contractor, will largely mitigate the risks and costs associated with measure performance, and will increase customer acceptance of and participation in DSM measures; and (5) SCE seeks to recover essentially *all* of its costs, including loan/credit losses and warranty claims, as well as returns equal to its authorized rate of return, from program participants. Ratepayers will bear some program risks, although these risks are well-defined and capped.

Despite the program's innovative strategies, ENvest[SCE] has been discontinued following the completion of the pilot phase in late 1995. Actual investments fell short of targeted levels. According to SCE, although public-sector customers such as local governments utilized the program, ENvest[SCE] failed to attract commercial and industrial customers because of relatively high-cost financing, strict credit requirements, and limitations on the range of products and services provided. SCE has since created a new, unregulated subsidiary called Edison Source, which is not funded by ratepayers and offers a limited number of energy efficiency services borrowed from the more profitable components of ENvest[SCE].

CONCLUSIONS

In many cases, market barriers have limited consumer access to financing sources for investment in DSM measures themselves. As a result, many utilities are looking for ways to provide the capital required, or to mobilize third-party sources of capital. Some utilities are particularly well-positioned to encourage DSM investment by providing financing themselves, due to a low cost of capital and/or sufficient debt capacity compared to alternatives, particular in-house expertise or capabilities, good access to and/or credibility with customers, and other factors. At the same time, exploiting alternative sources of capital could help utilities to deliver DSM as cost-effectively as possible while minimizing risk exposure for ratepayers (particularly non-participants).

Alternative funding sources may be as or better equipped to assist utilities with financing DSM investments because: (1) traditional financial institutions have a great deal more experience with loan origination, underwriting, administration and servicing, and can likely reduce financing costs through economies of scale, (2) traditional financial institutions can diversify risk and lower transaction costs by pooling investments across utility service territories and regions; (3) third-party lenders may be willing to accept some or all of the risk of loan losses that would otherwise be borne by utility ratepayers (to the extent loan losses are not covered by interest rates charged to participants), (4) third-party lenders and investors may be willing to accept greater risk than would otherwise be comfortably borne by utility ratepayers, in exchange for greater return.

The challenge for a utility is to develop financing programs that take advantage of the utility's particular strengths, and exploit the strengths of third parties where possible. This paper has described a variety of financing options, all of them with different characteristics regarding cost and risk allocation. Table 1-1 summarizes some of these differences across alternative programs.

It is likely that the optimal program for a particular utility would be some combination of the features of these different options reviewed below:

(1) *Outsourcing loan programs to commercial banks is an attractive option for shedding some of the risk of loan losses, accessing outside sources of capital, and eliminating some of the costs and responsibility for loan servicing and administration. These programs may require a significant rate ''buy down'' by ratepayers to be comparable to the cost of utility-funded loan programs, particularly for municipal utilities with access to low-cost tax-exempt bond financing. A reduced ''buy down'' may still be attractive to customers compared to their alternatives.*

(2) *Sale of the loan portfolio presents similar trade offs. Diversification provided by pooling many portfolios and economies of scale for loan servicing and administration should reduce risks and costs. Utility experience is limited to date, and portfolios may need to be significantly larger before sale is cost-effective.*

Table 1. *Alternative Financing Options vs. Ratepayer-Funded Loans: Ratepayer Impacts*

	Costs to Administer Loans Reduced	Improved Economies of Scale	Initial Capital Outlay Reduced	Loan Loss Risk Reduced	Performance/ Efficacy Risk	Uses Utility DSM Expertise	Cost of Capital
Energy service charges				©		©	Similar
Outsource loans	©	©	©	©		©	Likely Higher
Sale of utility loan portfolio	©	©	©	©		©	?
State and Federal programs	©	©	©	©		©	Likely Lower
Contracting for energy savings	?	?	©	©	©		Higher
Shareholder funded programs	©		©	©		©	Likely Higher

(3) State and federal funding is available for financing DSM measures. These programs should be exploited by utilities wherever possible. This can likely be accomplished at low cost and low risk for utility ratepayers through information and marketing efforts.

(4) Performance contracting should be pursued by a utility to the extent that allocation of both financial and performance risks to program participants is attractive, and the utility is willing to expose ratepayers to a long-term commitment to purchase energy savings at a predefined price.

(5) As utility deregulation continues, it is likely that many DSM programs will be shifted to shareholder-funded programs, or carried out by unregulated entities. These programs can be structured to provide the same risk transfer benefits to ratepayers provided by third-party financing sources, while still exploiting the utility's expertise in DSM technologies and access to its customer base. Programs offer innovative structures relating to performance guarantees, creative financing, and improved security provisions to insulate ratepayers from risk.

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