November 1994 Volume 7, Number 9

# the Electricity JOURNAL

## De-Integration—The Right Way?

the Electricity JOURNAL

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# In this issue...

We begin this month with two articles that address the restructuring of the electricity industry, because structural change is the 800-pound gorilla driving each of the key issues that are part of the industry's transition.

**Richard J. Pierce, Jr.** begins by urging complete and prompt de-integration of the industry as the very best way to benefit from competition. Best of all, he suggests, it could be relatively easy to accomplish, as regulators can induce utilities to engage in voluntary de-integration.

**David Moskovitz** and **Douglas Foy** believe that the U.S. electric power industry can have a relatively smooth transition if it deals with its two hardest problems: creating open-access regional transmission systems and putting the stranded investment issue behind it. They offer a solution that unlocks both of these riddles.

What kind of future will we see for the business of energy efficiency, what we know as demand-side management?

**Jim Newcomb** sees energy services as the strategic center of the chessboard in a reconfigured electricity market. He envisions a "hyper-competitive" market for energy services in the years ahead, in which "super ESCOs" bring efficiency to the growing global market.

**Rolly Rouse** believes it's time to embrace a new, performance-based energy conservation paradigm, based on a new kind of financial instrument — the "DSM performance annuity." This new approach, he believes, established on a market-based platform, would serve everyone better.

**Doug Houston** thinks the kind of conservation promoted as DSM today must be quickly replaced by a market-driven approach that will move far beyond the confines of current DSM, to develop efficiency that is cost effective and valued by the market.

**Harlan Lachman, Paul Cillo, Ian Goodman** and **Peter Kelly-Detwiler** have developed a cost recovery approach to utility DSM programs for commercial and industrial customers that will work whether the industry is reconfigured or not. All interests, they say, would benefit by its adoption.

Finally, **Greg Hill** looks at the issue of inter-generational equity in the context of the Pacific Northwest power system and comes to a surprising conclusion: The price of energy there today is higher than it should be and will be lower to future customers than it should be, unless remedial steps are taken.



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Editor and Publisher
*Robert O. Marritz*

Executive Editor
*R. Evan Wallace*

Business Manager
*Betsy Anderson*

Administrative Assistant
*Kim Sullivan*

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# A Win/Win Approach to Commercial/Industrial DSM: Making DSM Work for All Utility Customers

*For utilities in a competitive environment, here is an approach that lets managers use demand side management as an effective tool for retaining customers — while reducing all customers' costs.*

*Harlan Lachman, Paul Cillo, Ian Goodman and Peter Kelly-Detwiler*

**Harlan Lachman** *and* **Paul Cillo** *are principals of the Energy Efficiency Institute, Inc. of Colchester, VT. They have extensive field-based experience with residential, commercial and institutional energy efficiency programs, and have testified and written numerous papers concerning utility DSM.*

**Ian Goodman** *is president of The Goodman Group, Ltd., energy and economic consultants. He has testified and published extensively concerning electric and gas integrated resource planning, demand-side management, special industrial rates, and the employment and economic development impacts of various energy options.*

**Peter Kelly-Detwiler** *is a Senior Research Associate at The Goodman Group, Ltd. He has performed research consulting in various aspects of utility regulation and economics, and co-authored a number of papers concerning electric and gas integrated resource planning.*

Demand-side management has been proven to offer utilities a cost-effective alternative to new generation. However, most DSM not only reduces system energy requirements and their associated costs, it also reduces utility revenues.

Although regulatory mechanisms exist to allow utilities to recover net lost revenues from ratepayers, these recovery mechanisms usually result in electricity rate increases, at least in the short term. Utilities have been concerned about DSM-induced rate increases because they believe any rate increase hurts their price competitiveness with other energy sources and may be unfair to program non-participants.[1] As a result, some utilities have resisted pursuing even the most cost-effective DSM programs. This resistance is intensifying as competition emerges as a central focus for the utility industry.[2]

There has been extensive debate about how DSM affects electricity bills and rates, as well as the customers who do and do not participate. Five years ago, Myron Katz proposed mechanisms by which utilities could recover the cost of

DSM from participating customers, thus avoiding adverse impacts on non-participants.[3] Over the last several years, PacifiCorp has implemented several "Energy FinAnswer" programs which provide financing for commercial/industrial new construction and retrofit measures, with the cost recovered from participants through an energy service charge.[4]

Eric Blank has suggested that utilities pay for the entire incremental cost of DSM *and* provide an upfront bonus payment to participants.[5] In exchange, the utility would be entitled to recover a significant share of the bill savings. Maniatis and Pfeifenberger and Chernick and Wallach have challenged some of Blank's concepts.[6]

The authors of this article were intrigued by the various positions that have emerged in the debate about restructuring DSM. This article describes a Win/Win approach to DSM. For most utilities, the proposed approach will eliminate the pressure for short-term DSM-induced rate increases. In fact, for some utilities, the proposed approach will enable the utility to lower rates for all customers. The promise of DSM has always been that at some point in the future, both participants and non-participants would pay lower energy bills than they would have paid without DSM. The benefit of the proposed Win/Win approach is that the future is now.

The approach discussed in this paper is designed for application to commercial, institutional and industrial demand-side management measures. However, many of the key elements of this approach might also be used to design residential and small commercial DSM programs with similar benefits.

## I. The Problem: How DSM Can Increase Non-Participants' Costs

DSM can increase non-participants' electricity bills. One reason for this increase is that most programs require non-participants to help pay the costs for participants' energy savings. Although all of a utility's customers share in the system benefits of DSM, non-participants may perceive their payments for DSM program costs and the utility's lost base revenues — which may be recovered from all customers — as being inequitable.

*The promise of DSM has always been that both participants and non-participants would pay lower energy bills than they would have paid without DSM.*

- *Program Costs.* When program costs are recovered through rates or conservation charges, all ratepayers bear these costs.[7] Program participants realize energy savings which offset these costs. However, non-participants do not have energy savings to offset their share of program costs. This is often perceived as unfair.
- *Lost Base Revenues* (LBR). DSM programs which produce energy savings for participants also create lost base revenues for most utilities. If the utility is allowed to recover LBR through a usage-based charge or a rate increase to all customers, these charges or increases may also be seen as unfair since participants receive savings which to some extent offset these costs while non-participants do not.

Costs for electricity may also increase if a monetized value of environmental externalities (such as air pollution) is considered when evaluating the range of DSM measures to install in a customer's home or business. The value of avoided externalities may be considered a benefit attributable to DSM, or a cost attributable to, say, coal-fired generation. In general, utilities may be willing to implement more DSM (and pay more for it) when externalities are included in determining the cost effectiveness of measures and programs.

While all customers benefit from avoiding undesirable externalities and pay some portion of the cost for avoiding them, DSM participants' costs are to some extent offset by their reduced energy consumption. Non-participants' costs are not similarly offset, which raises further concerns about equity.

## II. The Win/Win Approach to DSM

The Win/Win approach to DSM allows both participants and non-participants to share more equitably in the benefits of DSM. Currently, participants receive most of the financial benefits of DSM through reductions in their electricity bills. The Win/Win approach combines innovative features that encourage program participation and large energy savings with a mechanism that channels a substantial portion of DSM's financial benefits to non-participants.

In most situations, if the Win/Win approach is used, non-participants will pay lower rates and bills than under traditional DSM cost and savings allocation methods. For some utilities, the proposed Win/Win approach will also result in more DSM which passes the RIM (rate impact measure) test; in other words, DSM will result in lower electricity bills for both participants and non-participants.[8] (See **Figure 1.**)

### A. Key Program Design Elements of a Win/Win Approach to DSM

The Win/Win approach[9] strives to realize most, if not all, of DSM's potential savings and environmental benefits while distributing the financial benefits in a way that minimizes negative impacts. The key elements of this approach are summarized below. The inset box (next page) describes a typical customer interaction with the utility under this approach.

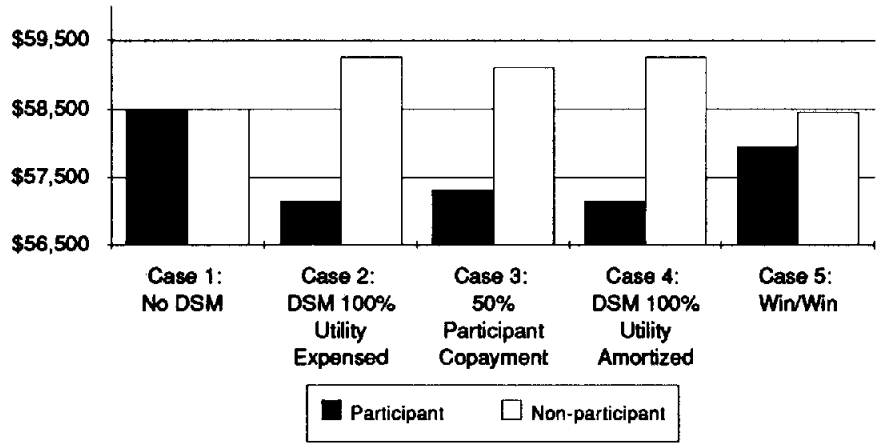



**Figure 1: DSM Participant and Non-participant Electricity Costs.** This figure shows how a DSM program participant and a non-participant fare under five different scenarios for an example utility with high costs for existing supply (7 cents/kWh) and low new-supply costs (4 cents/kWh). DSM is available at a cost of 2 cents per kWh. Both customers start with 100,000 kWh annual consumption, but the participant's consumption is reduced by 4,000 kWh per year through DSM. For this utility, only the Win/Win approach provides both non-participants and participants with lower electricity costs than if the utility implements no DSM. (Chart reflects net present value of 12-year net electricity costs to each consumer.)

1. *Up-front Cash Incentive to Participants.* The participant pays no money up-front. Additionally, the participant receives an immediate financial incentive payment for conferring to the utility the right to select, pay for, and install DSM measures in the customer's business once the work is completed. The incentive must be sufficient to facilitate participation but small enough so that the installation remains cost effective.

The up-front incentive reduces risk for the participant. Although the promise of future savings makes the offer more attractive, the cash incentive is guaranteed and immediate. This approach takes into account the extensive evidence that energy users value first cost highly and greatly discount future cost savings.[10]

2. *Amortizing Costs.* The utility finances the entire effort, including marketing, assessment, installation and incentives, using its customary methods for raising capital, and amortizes these costs over a period approximating the estimated life of the measures.[11] This approach ensures that the annual cost for DSM will more closely approximate the annual value of the energy savings achieved by the system.

3. *Cost-Effective Measures.* An on-site analysis by the utility determines which package of measures will result in a positive benefit-cost ratio (BCR) to the utility based on its avoided costs. The Utility Cost Test is used to screen for measure selection: All costs for installing measures (including marketing, assessment, incen-

tives, and financing) must be less than the avoided cost to the utility for capacity and energy during the life of these measures.[12]

At least in the near term, we propose that valuation of externalities not be included in determining the package of cost-effective measures. Typically, a very substantial amount of DSM will be found to be cost effective relative to utility avoided costs, even without any consideration of externalities. For a variety of reasons, utilities generally target only a small portion of cost-effective potential in the short run.[13] Thus, it appears likely that the Win/Win approach (without explicit inclusion of externality benefits) will be effective in achieving at least the same amount of DSM as traditional utility approaches (even with explicit inclusion of externality benefits).[14]

Given the uncertainties in the data used to evaluate DSM cost effectiveness, measures with a BCR slightly less than 1.0 are installed as long as the package of measures as a whole is calculated to have a BCR of 1.0 or more.[15]

**4. *Utility Selects Measures for Installation.*** In traditional utility DSM programs, cost-effective measures which are not selected by participants become lost opportunities and result in lower overall electricity savings. Even when a utility pays for the full cost of measures, the promise of future savings may not be sufficient incentive to get a customer to agree to installation of all cost effective measures. In the Win/Win approach, participants must permit installation of all cost-effective measures as a requirement for participation.[16] This requirement minimizes the potential for lost opportunities.

This requirement is feasible because the incentive to participate is known and immediate (in contrast with the promise of future savings) and because the customer is not required to pay for a portion of the measure costs. By contrast, if the utility requires participants to pay for a portion of the measure costs or if the customers' primary incentive to participate is to reduce their own electric

## The Win/Win DSM Approach — A Typical Customer Interaction

A typical interaction between a utility and a customer might occur as follows:

- Utility DSM staff compares its running total of DSM expenditures and projected savings against annual budget and goals and determines need to achieve further commercial DSM savings.
- Staff randomly select a commercial customer after screening a list of high users.
- The utility's telemarketer identifies him/herself and tries to locate the customer decision-maker. If too much time is required, another customer is selected.
- The telemarketer explains that the customer has been randomly selected for participation and that the utility wants to install energy saving measures at the customer's business at no cost, and will pay a premium for the opportunity to do so. (Since this is a commercial customer, with just a few questions it is likely that the telemarketer will be able to give the customer a reasonable estimate of the up-front incentive and the types of measures to be installed). If the customer is interested, the telemarketer explains in more detail how the program works and answers the customer's questions.
- The telemarketer asks the decision maker if the customer wants to participate. If the answer is yes, a brief contract is sent to the customer for signature. The contract makes the utility the agent for the customer. The contract specifies that, as the customer's agent, the utility will identify and install cost-effective measures and verification equipment. For the privilege of acting as the customer's agent, the utility will pay the up-front incentive to the customer. The customer agrees to allow installation of all cost-effective measures by a contractor and agrees to share 75% of the savings with the utility for 10 years.
- When the signed contract is returned, a specialist is sent to the business to perform an audit and write up a job order. (The specialist can also be sent to those businesses still interested in the program but which do not want to sign the contract without more information.) When the specialist has a reasonable expectation of the type of work the project will involve — e.g., lighting and motors — a contractor, selected from a rotating list, is invited to attend the initial meeting. At this meeting, the project is identified, priced, and a contract executed between the contractor and the utility, acting as the customer's agent. The customer will have two weeks from the date of this visit to sign its contract with the utility.
- When the work is completed, the contractor notifies the specialist who performs an inspection of the work. When the work passes inspection, the customer receives his/her incentive, the contractor is paid and the monthly shared savings fee is charged.

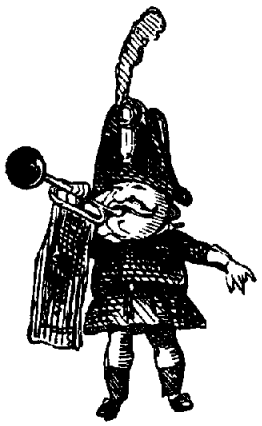
bills, as a practical matter the utility must offer customers the ability to select the measures implemented. Under such circumstances, customers may be reluctant to pay for measures with which they are unfamiliar, which they doubt will produce sufficient savings, or which they perceive as unattractive.[17]

5. *Shared Savings Surcharge.* Participating customers agree to pay a monthly shared savings surcharge which is offset by their reduced consumption. The reduction in the customer's regular usage charges will be greater than the monthly surcharge to ensure positive annual cash flow (assuming the customer's usage patterns remain as predicted when the DSM measures were installed). The surcharge will be set as high as possible to allow non-participants to share in the savings to the greatest extent possible without jeopardizing program participation.

Based on experience in implementing DSM programs, we believe many customers will accept a shared savings fee that allows the utility to collect at least 75 percent of the savings with an up-front incentive equal to no more than 10 percent of the value of a project. Assuming this is possible, DSM under the Win/Win approach would typically cause little, if any, upward pressure on non-participants' electricity bills. In fact, Win/Win DSM could actually result in lower bills for both participants and non-participants at some utilities.

Selected sub-metering will be used to ensure that participants receive verifiable savings. If sub-metering verifies that savings are equal to or greater than estimated, the customer will pay the monthly shared savings surcharge. If sub-metering indicates savings are less than estimated, the surcharge will be adjusted (i.e., lowered to reflect actual savings) until corrective action has been taken and estimated savings are being verified.

6. *Ten-Year Contract.* Participating customers sign a contract in which the utility agrees to pay the



incentive and install the measures at no cost. The participant agrees to allow the measures to be installed, and the participant agrees to pay the shared savings surcharge for ten years.[18] The monthly surcharge is dropped after ten years and all future energy savings are retained by the participant.[19]

The ten-year surcharge paid by participants will postpone and mitigate the potential impact of DSM programs on non-participants' rates. This delay makes it more likely that resultant rates will actually be lower than they would have been without DSM.[20]

7. *Telemarketing.* The Win/Win approach takes advantage of the old adage: "A bird in the hand is worth two in the bush." Customers are offered up-front financial incentives to participate instead of the promise of significant monthly savings. Because there are immediate and assured benefits from participation, successful marketing should be simplified. Telemarketing can be targeted to appropriate customers (e.g., municipalities, government, industry, etc., depending on the utility's circumstances) to increase DSM's benefits. If telemarketing is the only marketing medium used, DSM marketing costs will be reduced by eliminating the need for advertising, bill stuffers, and media campaigns.

8. *Contracting.* Contractors will be pre-selected based on price, quality, and willingness to follow program guidelines. The utility (not the customer) will select contractors to install DSM measures. Since the utility will pay the customer an up-front cash incentive with no cost-share requirement for the measures installed, customers should be willing to give their utility permission to select contractors.[21]

Many utilities have already discovered the benefits of using pre-selected contractors to install DSM measures. Screening for price can obviously enhance DSM program cost effectiveness (bidding for a large number of jobs can result in lower prices than

achieved by job-by-job bidding). Pre-selecting quality contractors who will work cooperatively with a utility can also improve DSM cost effectiveness by simplifying program administration and reducing the number of callbacks.[22]

### B. Benefits of the Win/Win Approach

There are substantial benefits to the various groups affected by DSM.

*1. Participating Customers:*

- Receive an upfront incentive payment sufficient to motivate them to allow their utility to install energy efficiency measures in their businesses.
- Realize lower electric bills;
- Receive the value of 100 percent of the savings on each monthly bill at the end of the contract period (ten years).

*2. Non-Participating Customers:*

- Are relieved of the burden of paying higher rates to cover DSM costs and lost revenues and could realize lower rates as a result of successful DSM;
- Are likely to be more supportive of DSM programs. Broad-based support for DSM could increase participation rates (and associated savings) and reduce marketing costs, thus increasing the cost effectiveness of DSM programs.

*3. Utilities:*

- Implement DSM which results in neutral or positive rate impacts for all customers;[23]
- Reduce DSM performance risk, since the utility controls the selection and installation of measures, improving the likelihood that expected savings will actually materialize;
- Amortize DSM costs with reduced risk to their stockholders;[24]
- Can utilize this approach as a customer retention tool in a period of increasing competition for utility loads.

*4. Society:*

- Benefits from the environmental, economic, and social impacts of more efficient energy use and lower electric system costs. Among these expected benefits is improved economic competitiveness;
- Benefits from a more equitable distribution of DSM program costs and benefits.

### C. Costs & Savings Unique to the Win/Win Approach

The only additional DSM costs that are unique to the Win/Win approach are the up-front incentives used to motivate participation. However, the Win/Win approach should reduce some typical DSM expenses and increase electricity savings, offsetting some or all of the additional costs for the up-front incentives.

1. ***Fewer Lost Opportunities.*** There are likely to be more measures installed by each participant using this approach. Since participants pay nothing and instead receive up-front cash, they should be more willing to accept the entire package of selected measures than participants in programs who are required to share costs or who depend on future savings to realize program benefits.

2. ***Fewer Transactions.*** There may be significant administrative savings from the comprehensiveness and simplicity of this ap-

*Customers sing the praises of DSM programs that lower costs and don't raise rates.*

proach. With more savings realized from each participant, fewer participants (and therefore fewer contacts) will be needed to meet annual program savings goals. Use of pre-selected contractors may also increase DSM program cost effectiveness.

3. ***Reduced Marketing Costs.*** As described above, if telemarketing is the only marketing used, DSM marketing costs will be reduced.

4. ***Reduced Free-Rider Impacts.*** Customers who would have installed measures without utility DSM may choose to forgo the program offer, pay the costs for installing measures themselves and reap 100 percent of the energy savings rather than share them with other ratepayers. If free riders do participate in programs which use this approach, however, they will have to accept installation of measures they likely would not otherwise have installed. This should reduce the overall impact of free riders.[25]

5. ***Reduced Take-Back.*** The incentive to participate is an up-front, lump-sum payment which is not related to the participants' energy bills. Since participants' monthly bills are not significantly reduced for ten years, it is unlikely that participants will feel there is anything to "take back." Participants have the same incentive as other customers to use energy wisely. Reducing takeback would lower a utility's cost to achieve targeted savings, because more of the projected savings would be realized from measures installation.

## III. Conclusion

We have developed the approach outlined here in response to what we perceived as a growing backlash to DSM by customers and managers of certain utilities. We do not believe that all utilities should immediately cease — or even slowly back away from — their current DSM efforts and implement new programs modeled on this approach.

If a utility is experiencing little or no need to recover DSM-related costs from non-participants, it should not experience any customer resistance to DSM. If DSM's rate impacts are perceived by a utility's customers as insignificant, if it does not raise customer equity issues, or if customers are sufficiently pro-conservation that they are not concerned about rate impacts or equity issues, this approach may not be the best alternative.

But if a utility or its customers *are* concerned about DSM's rate impacts, we believe this approach offers an opportunity to acquire the benefits of DSM with minimal impact on non-participating customers. ■

**Endnotes:**

1. Supply-side investments can also increase electric system costs and rates, creating the same types of equity problems as DSM investments.

2. According to Dallas J. Frandsen, Jr., director of Texas Utiltities Electric Co.'s conservation and load management department, utilities are now positioning themselves to compete even in areas where historically there has been no competiton among electric utilities.

3. Myron B. Katz, *Utility Conservation Incentives: Everybody Wins*, ELEC. J., Oct. '89, at 26.

4. The Results Center, Profile #46: PacifiCorp, Large Commercial Energy FinAnswer, July 1993; P.A. Centolella, Testimony in NYPSC Cases 94-E-0098/99 at 73-75 (Aug. 1994). There is a wide range of opinion concerning the efficacy of these programs.

5. Eric Blank, *Minimizing Non-Participant DSM Rate Impacts — Without Harming Participation*, ELEC. J., May '93, at 32.

6. M.A. Maniatis and J.P. Pfeifenberger, Letter, ELEC. J., June '93, at 3; P. Chernick and J. Wallach, *Is There a Transfer Loss in Utility DSM?*, ELEC. J., July '93, at 34.

7. Some utilities allocate DSM costs across all ratepayers. In other instances, the costs of DSM programs for each customer class are allocated directly to each class. *See* P.A. Centolella *et al*, Cost Allocation for Electric Utility Conservation and Load Management Programs, NARUC (Feb. 1993), and M.W. Reid, J.B. Brown, and J.C. Deem, Incentives for Demand-Side Management, 3rd Ed., NARUC (Oct. 1993).

8. The authors do not endorse the position that implementation of DSM programs should be limited to those that pass the RIM test.

9. This paper focuses on retrofit DSM activity. However, many of the elements of this approach can be made applicable to DSM programs for new construction and equipment replacement.

10. *See, e.g.*, Office of Technology Assessment, Energy Efficiency: Challenges and Opportunities for Electric Utilities, OTA-E-561, at 77-79, 86-88, 96-97 (Sept. 1993); and P. Herman and J. Chamberlin, Is DSM Really Improving Social Welfare?, at 15-16, and reports cited therein (Barakat & Chamberlin, July 10, 1992).

11. As with supply-side investments, the utility is permitted to accrue and recover financing costs on the unamortized portion of any expenditures.

12. Some observers have pointed out that there are additional financial savings to utilities from DSM such as avoided environmental compliance and credit and collection costs. All financial benefits accruing from DSM should be included in this calculation.

13. Many utilities restrict the extent of their DSM efforts because of perceived limitations in how rapidly programs can be ramped-up, as well as concerns about adverse rate impacts and the real-world accuracy of the data used to estimate DSM cost effectiveness. In some areas of the U.S., utilities now have significant surplus capacity and do not expect to require new supply-side resources until the year 2000 or later. In response, some DSM efforts have been cut back, at least in the short term.

14. To ensure that the optimal resource options are selected from a societal point of view, we recommend that environmental externalities be considered when the utility determines its overall resource portfolio. They should also be considered when necessary to ensure that sufficient DSM opportunities are available to offset supply-side resource acquisitions that would otherwise be required.

Excluding the monetary value of environmental externalities when selecting measures could also result in lost opportunities if the measures are never installed, even when needed to offset supply-side resource acquisitions. However, as described below, we believe this approach should lower administrative costs. The incremental cost (the administrative portion) of a return visit to a business should be relatively small. Therefore, use of a simple database could facilitate a cost-effective return to businesses for installation of additional measures at a later date when inclusion of the monetary value of environmental externalities is required to ensure that sufficient DSM opportunities are available to offset required resource acquisitions.

15. This flexibility will also increase the likelihood that measures that

would be cost effective with explicit inclusion of externality benefits will be implemented under the Win/Win approach.

16. We realize that utilities must allow for reasonable exceptions and cannot force customers to accept installation of measures which interfere with or detract from current end uses.

17. We do not believe any program design can completely eliminate these problems. However, we do believe that the approach described here will diminish this type of customer resistance to installation of DSM measures.

18. Ten years is an arbitrarily chosen duration, selected because it will delay non-participant rate impacts for long enough to allow a broad range of customers to have been offered an opportunity to participate. It is also long enough so that significant amounts of DSM or new supply will likely be required to meet the utility's energy resource needs during that period. Ten years is still less than the average life of DSM measures, which is typically about 12-15 years.

19. The regulatory body must allow shared savings fees to be linked to meter locations, so that if participating businesses or homes change hands, the new customers assume responsibility for the shared savings payments (inasmuch as they will realize savings from the installed measures).

20. Since more customers will be program participants after ten years of DSM activity, however, there will be fewer non-participants to be impacted by any rate increases.

21. If required to pay some of the cost for a measure, the customer may wish to use competitive bidding to select the lowest price or select a contractor known to the customer.

22. A limited number of contractors will agree to meet program requirements before the program begins. This should simplify communications and reduce the number of problems associated with the start-up of any DSM program.

23. Some utilities may have avoided costs so much lower than their retail rates that they will still experience net revenue loss using this approach. However, the amount of this loss should be relatively insignificant compared to that incurred with traditional DSM program designs.

24. Some utilities have expressed a preference for expensing DSM and will not see this as a benefit.

25. Savings realized by reducing the impact of free riders may be accomplished without any reduction in free drivers. Free drivers have even greater incentive to install measures themselves with this approach, because if they pay for installing the measures they realize all the savings.