STATE OF MICHIGAN

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of the Application of	)	
Consumers Power Company for Reconciliation	)	Case No. U-10554
of its Demand-Side-Management Program	)	
and Determination of Incentive	)	

DIRECT TESTIMONY OF

PAUL CHERNICK

ON BEHALF OF

MICHIGAN CONSERVATION CLUBS

Resource Insight, Inc.

November 17, 1994

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I. Identification and Qualifications

Q: Mr. Chernick, please state your name, occupation, and business address.

A: I am Paul L. Chernick. I am President of Resource Insight, Inc., 18 Tremont Street, Suite 1000, Boston, Massachusetts.

Q: Summarize your professional education and experience.

A: I received a SB degree from the Massachusetts Institute of Technology in June, 1974 from the Civil Engineering Department, and a SM degree from the Massachusetts Institute of Technology in February, 1978 in Technology and Policy. I have been elected to membership in the civil engineering honorary society Chi Epsilon, and the engineering honor society Tau Beta Pi, and to associate membership in the research honorary society Sigma Xi.

I was a Utility Analyst for the Massachusetts Attorney General for more than three years, and was involved in numerous aspects of utility rate design, costing, load forecasting, and the evaluation of power supply options. Since 1981, I have been a consultant in utility regulation and planning: first as a Research Associate at Analysis and Inference, after 1986 as President of PLC, Inc., and since August 1990 in my current position at Resource Insight. In those capacities, I have advised a variety of clients on utility matters, including, among other things, the need for, cost of, and cost-effectiveness of prospective new generation plants and transmission lines; retrospective review of generation planning decisions; ratemaking for plant under construction; ratemaking for excess and/or uneconomical plant entering service; conservation program design; cost recovery for utility efficiency

programs; and the valuation of environmental externalities from energy production and use. My resume is attached as Exhibit I-____ (PLC-1).

Q: Have you testified previously in utility proceedings?

A: Yes. I have testified over one hundred times on utility issues before various regulatory, legislative, and judicial bodies, including the Massachusetts Department of Public Utilities, the Massachusetts Energy Facilities Siting Council, the Vermont Public Service Board, the Texas Public Utilities Commission, the New Mexico Public Service Commission, the District of Columbia Public Service Commission, the New Hampshire Public Utilities Commission, the Connecticut Department of Public Utility Control, the Maine Public Utilities Commission, the Minnesota Public Utilities Commission, the South Carolina Public Service Commission, the Federal Energy Regulatory Commission, and the Atomic Safety and Licensing Board of the U.S. Nuclear Regulatory Commission. A detailed list of my previous testimony is contained in my resume.

Q: Have you testified previously before this Commission?

A: Yes. I testified before the Michigan PSC in Cases Nos. U-7775 and U-7785, on power plant performance standards. I also testified before the Commission in Case No. U-10102 on Detroit Edison's demand-management program, and in Case No. U-10335, on Consumer Power's demand-management planning, non-residential program design, screening, avoided-cost calculations, and cost-recovery proposals.

Q: Have you been involved in least-cost utility resource planning?

A: Yes. I have been involved in utility planning issues since 1978, including load forecasting, the economic evaluation of proposed and existing power

plants, and the establishment of rate for qualifying facilities. Most recently, I have been a consultant to various energy conservation design collaboratives in New England, New York, and Maryland; to the Conservation Law Foundation's conservation design project in Jamaica; to CLF interventions in a number of New England rulemaking and adjudicatory proceedings; to the Boston Gas Company on avoided costs and conservation program design; to the City of Chicago in reviewing the Least Cost Plan of Commonwealth Edison; to the South Carolina Consumer Advocate on least-cost planning; to environmental groups in North Carolina, Florida, Ohio and Michigan on DSM planning; and to several parties on incorporating externalities in utility planning and resource acquisition. I also assisted the DC PSC in drafting order 8974 in Formal Case 834 Phase II, which established least-cost planning requirements for the electric and gas utilities serving the District.

Q: Have you testified previously on demand-side management cost-recovery issues?

A: Yes. I testified specifically on this issue in Vermont PSB Docket 5270 on behalf of Central Vermont Public Service Company, Conservation Law Foundation, Vermont Natural Resources Council, and Vermont PIRG. I have also testified on DSM cost recovery in Massachusetts (DPU 472, 86-36, and 88-67), South Carolina (PSC 91-216-E), Pennsylvania (PUC I-900005), and Florida (PSC Docket 920606-EG), and prepared comments in New York PSC Case No. 28223. I recently testified on Detroit Edison's DSM cost-recovery in U-10102.

Q: Have you worked on cost-recovery issues in collaboratives between electric utilities and other parties?

A: Yes. I have consulted on cost recovery in separate collaborative projects with Central Vermont Public Service, New York State Electric & Gas, New England Electric System, Baltimore Gas & Electric, Vermont Gas Systems, and Potomac Electric Power Company.

Q: Have you advised other clients on issues relating to utility cost recovery for demand-side management?

A: Yes. I assisted Boston Gas Company in development of its cost-recovery proposal to the Massachusetts DPU and assisted the Washington State Public Counsel in reviewing incentive proposals for Puget Power.

II. Introduction and Summary

Q: On whose behalf are you testifying?

A: I am testifying on behalf of the Michigan United Conservation Clubs.

Q: What is the purpose of your testimony?

A: The purpose of my testimony is to assess Consumers Power Company's proposal to overhaul its DSM acquisition strategy as presented in the direct testimony of Carl A. Gilzow.

Q: Please summarize the Company's proposal.

A: Consumers Power's primary proposal is to discard the DSM spending plans for the next three years that were approved by the Commission in Case U-10335. The Company also recommends permanent cessation of all further DSM spending. If the Commission insists on continued spending, the Company's alternative proposal is to include in its DSM portfolio only residential and commercial programs that pass the Rate Impact Measure (RIM) Test; no programs, RIM-passing or otherwise, would be offered for primary

service customers over 500 kW. Since the Company has been unable to identify any efficiency program that passes the RIM, the alternative proposal may not yield materially greater energy savings than the proposal to simply eliminate spending. In addition, the Company proposes to eliminate the lost recovery and shareholder-incentive mechanisms, and to allocate all DSM costs by customer class.

Q: Please summarize the findings of your evaluation of the Company's proposal.

A: The Company's DSM funding proposal is simply without merit. In response to some ill-defined threat of retail competition, and without any analytical basis, Consumers proposes wholesale abandonment of its obligation to provide least-cost energy services to its customers. The Company has apparently concluded that the only feasible response to rate concerns on the part of its large industrial customers is to forego DSM efforts that can provide cost, environmental, risk-reduction, and employment benefits to all ratepayers.

The Company's proposal to eliminate or severely scale back its DSM efforts is ill-advised, given the broad customer support for these programs and strong evidence of significant potential for additional cost-effective savings. Evaluation results from the last three years of program implementation show that the Company's programs, including the program targeted to large commercial and industrial customers, achieved high levels of customer satisfaction and prompted customer demand for services well in excess of program goals. Based on the findings of Consumers' 1992 Integrated Resource Plan and 1993 Update, current activity levels will acquire only a minor fraction of the cost-effective savings potential in the Company's service territory. Comparisons with achievements of well-

designed programs around the country confirm that the potential estimates in the IRP are achievable.

The Company's proposal constitutes imprudent planning. Consumers faces an immediate need for new capacity, even accounting for its currently authorized DSM efforts. If these efforts are abandoned, ratepayers will likely face immediate cost increases as the Company substitutes more-expensive supply for the foregone DSM. Ironically, the Company's proposed strategy could lead to significant rate increases in the near term; the rate effects associated with front-loaded recovery of additional supply costs could be severe. The increase in bills (and perhaps rates) and the reduction in customer service would tend to reduce the competitiveness of Consumers and its business customers.

Q: Has the Company analyzed the cost or rate implications of its proposal?

A: No. Consumers apparently has not estimated either total system cost or rate effects of its proposed DSM strategy. In particular, the Company has not performed an integrated resource planning analysis of its proposal.

The Company's failure to undertake an integrated planning analysis contravenes explicit Commission directives, as reaffirmed in its October 12, 1994 order in Case U-10574 (at 12):

> Although the Commission may not make utility management decisions, the Commission must determine whether a utility has incurred costs pursuant to reasonable and prudent actions, a prerequisite for cost recovery. Based on that authority, the Commission has stated the expectation that each utility will ground its decisions concerning meeting additional needed capacity on the company's integrated resource plan. Because the Commission also expects a reasonable degree of continuity in utility planning processes, the companies are required to fully explain and justify any significant deviation from the most recent integrated resource plan.

Q: Has the Company presented a reasonable assessment of the likely role of DSM in a competitive market?

A: No. The Company has not presented a credible evaluation of the likelihood or nature of retail competition, or of the role of DSM in a competitive market. In particular, the Company has failed to provide any evidence to support its position that competition will be primarily on the basis of commodity price, or that DSM-related rate effects will be a major consideration in price competition.[1] Instead, Consumers simply asserts that price concerns will be paramount, and that DSM-related rate increases will undermine the Company's and its customers' competitiveness.

The Company's focus on price competition ignores the fact that a customer's viability will depend in part on its ability to minimize the cost of the energy service input to its production process, not necessarily the price of the electricity purchased. In short, competitiveness depends on bills (or bills per unit of output), not rates (or bills per kWh of input). Customer bills, in turn, depend on both rates and the efficiency with which electricity is converted to provide energy services. Demand-side-management-related rate increases should not reduce a firm's competitive position, or the economic attractiveness of the service territory, if the DSM activities allow the firm to reap proportionately larger process efficiency improvements.

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[1] Gilzow (at 7) claims that the "average rate impact for an industrial customer would reach almost 0.7 mills per kWh in the third year [of the authorized spending level] excluding ...incentive payments...or lost revenue recovery." However, this estimate appears to be for the size of the DSM surcharge, ignoring all other rate effects (Response to 10554-S-CP-50). As demonstrated below, the rate effects of even fairly vigorous DSM are likely to be minimal or favorable.

A well-designed DSM portfolio can increase the attractiveness of the Company's service territory to its current and prospective new customers. In fact, inconsistent with its position in this proceeding, the Company explicitly recognizes the competitive value of DSM in its filing in Case No. U-10625. In the latter proceeding, the Company asserts that one of its first lines of defense against the threat of self-generation would be to identify "opportunities for energy savings that provide better economic returns than the competitive alternative to the Company's electric service." (Polich, Richard, Direct Testimony in Michigan PUC Case No. U-10625, at 6) Yet, in the instant proceeding, the Company is proposing to dismantle the very tools required to address these savings opportunities and mitigate the competitive threat.

Q: Has the Company reasonably characterized the threat of price competition for customers that cannot or will not take advantage of the Company's DSM opportunities?

A: No. Even if competition were primarily on the basis of commodity price, the Company has failed to provide any evidence of the size or timing of the rate impact associated with its current spending plans, or of the level of rate increase that would undermine the Company's competitiveness. The Company therefore has no idea how much rates will increase with its current DSM plans, or whether its proposed strategy will in any way improve the attractiveness of its service to those customers who are most price-sensitive.

Moreover, the Company has failed to evaluate the effect of other rate-mitigating strategies on its competitive position. In particular, the Company has not determined how its proposal to allocate DSM costs to customer classes will affect the rates of each class, or whether this approach will

sufficiently moderate any competitive pressures on price-sensitive customers.[2]

Instead, the Company proposes to bar all large primary service customers from participating in DSM programs, regardless of their willingness to participate or the extent to which they are capable of acquiring savings on their own. In combination with Consumers' proposal to eliminate or severely restrict DSM spending for other customers, the Company's strategy represents a losing proposition for all parties.[3] Primary service customers willing to participate in a DSM program will be barred from doing so. Other customers, who are unlikely to participate in or gain from the competitive market, will no longer be able to reduce costs through DSM programs. And price-sensitive customers may look to alternative sources of power if the rate effects of supply replacements for the foregone DSM are too severe in the near term.

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[2] The Company does not express any concern about the equity of intra-class rate effects, but such concerns may contribute to its reluctance to fund energy efficiency. In any case, Consumers does not appear to have considered alternative program delivery strategies to maximize the equity of the distribution of DSM program costs and benefits within classes.

[3] Except perhaps for Consumers' and Midland Cogeneration Venture's shareholders, if the foregone DSM is replaced with additional purchase of MCV power above currently authorized amounts. In fact, the Company's 1995 PSCR Plan in Case U-10710 assumes savings for only the first program year and 320 MW of additional MCV purchases (Polena, R. J., Direct Testimony at Exhibit A-RJP-1). As proposed by the Company in Case U-10625, the additional MCV purchases will be used to offer discounted prices to customers at risk of leaving the system. A less-expensive load-retention strategy might be to reduce load at these customers' facilities with cost-effective efficiency upgrades, rather than meeting their demand with more costly MCV power.

Q: Have you estimated the revenue requirement and rate effects of the Company's proposal to cease further spending on DSM?

A: Yes. Compared to the currently authorized plan for spending $30 million per year from 1994 to 1996, the Company's proposal will increase revenue requirements an average of $11 million per year between 1995 and 2003. This increase in costs to ratepayers will yield a negligible decrease in rates of 0.3¢/kWh, or 0.4%, on average between 1995 and 1997. This rate decrease will diminish over time, such that by 2000 rates will actually be higher than they would be if the Company were to comply with the Commission's spending directives. The Company is therefore proposing to sacrifice cost-effective savings for a short-term and negligible reduction in rates; in the long term, ratepayers will face higher costs *and* rates as a result of the Company's proposal.

In contrast, the Company could *increase* DSM spending to support comprehensive DSM portfolios and realize significant decreases in revenue requirements and relatively small rate increases. Compared to the currently authorized spending plan, increasing spending to levels comparable with those of utilities with comprehensive DSM portfolios will decrease revenue requirements an average of about $48 million per year between 1995 and 2003. Between 1995 and 1997, rates will increase 0.1¢/kWh, or 1–2%. However, this rate differential will decline over time, such that by 2000 rates are lower than they would be under the currently authorized spending plan. There are comparable effects when compared to the Company's proposal to cease all future spending.

These results indicate the cost and rate effects that should be expected from the Company's proposal and alternative spending scenarios; they should

not be construed as definitive estimates. Given a lack of time, resources, and data from the Company, several simplifying assumptions were made in the development of this rate impact analysis.

Q: Please summarize your recommendations.

A: As it did in its August 18, 1994, order in Case U-10335, the Commission should deny the Company's request to reduce the spending levels authorized in that proceeding. As noted by the Commission in that order:

> The appropriate level of future DSM spending was addressed in detail in the Commission's May 10, 1994 order, and the decision on that issue was based on hundreds of pages of testimony and exhibits offered by the parties. Furthermore, the $30 million annual spending level authorized for 1994 through 1996 represented a significant reduction from the levels proposed by Consumers' witnesses and supported by the utility's most recent integrated resource plan. In contrast, Consumers' current proposal to further reduce spending is based solely on vague claims of an increasingly competitive environment, rather than on specific facts or circumstances arising after the close of the record. (At 17–18)

The Company's current proposal is based on equally vague claims that are similarly unsupported by events since the issuance of the order two months ago.

In addition, the Commission should deny the Company's request to rely on the RIM as its primary screening test. The Commission should remind the Company of its directives in its August 18, 1994 order to

> remain cognizant of (1) the fact that the primary goal of integrated resource planning (IRP) is to minimize the utility's total long-term cost of service, (2) the Commission's requirement, as set forth in its March 19, 1990 order in Case No. U-9172, that Consumers rely on the IRP process to achieve the lowest cost for its future supply of power....

> Similarly, Consumers remains obligated to offer "a balanced DSM program that makes measures available to all customer classes...." Therefore, the utility may need to implement DSM measures that, although failing the RIM Test, pass the UC and TRC Tests and satisfy other worthy goals of DSM. (At 18–19)

Finally, the Commission should deny the Company's request to exclude large primary-service customers from eligibility for participation in the Company's DSM programs. Instead, the Company should be directed to design and implement a DSM program targeted to customers who are viable candidates for self-generation or retail wheeling or are in economic distress. In addition, the Company should couple its DSM efforts with economic development strategies to increase the attractiveness of relocation to its service territory.

Q: What are your recommendations for addressing concerns regarding the effect of DSM on Consumers' competitive position?

A: The Commission should require Consumers to undertake a systematic evaluation of the system-cost implications of its proposal within an integrated-resource-planning context. The Company should be reminded of its least-cost planning obligation

> to use integrated resource planning principles to prevent current and future planning decisions from burdening future customers with unwarranted costs or unreliable energy systems. (Michigan PUC Order in Case No. U-10574 at 21)

In addition, Consumers should be required to estimate the rate levels or increases that trigger competitive pressures, the rate effects of the Company's current DSM spending levels, and the effects of cost allocation and program delivery strategies for moderating DSM rate effects. The Company's analyses will need to consider the manner in which DSM costs are recovered in retail wheeling rates, as determined in ongoing proceedings in Case U-10143. The

results of these analyses, and information gained from implementation of the retail-wheeling experiment, should inform the development of a comprehensive and effective strategy for DSM resource acquisition in competitive markets.

Finally, both the system cost and rate-impact analyses should be based on a comprehensive assessment of available strategies for reducing costs and improving competitiveness. The Company should evaluate the effectiveness of such strategies as

- corporate-wide reductions in discretionary spending,
- early retirement of aging plants in need of significant repairs or environmental upgrades,[4]
- write-down to market value of uneconomic assets,
- buy-outs or renegotiations of uneconomic purchase contracts, and
- innovative rate designs, including interruptible, time-of-use, and special discounted rates.

Q: What do you recommend with regard to the Company's cost allocation, lost revenue, and incentive proposals?

A: Unless there is some reason to believe that allocation to the participants' class will significantly affect program participation or lead to inequitable rate effects, the Company should be allowed to allocate DSM program costs to

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[4] One obvious candidate for such analysis is Big Rock Point, a small and expensive nuclear unit. In 1993, operating at a fairly high 72% capacity factor, Big Rock Point cost 6¢/kWh for fuel and O&M, in addition to overhead expenses on the O&M (staff pensions, benefits, payroll taxes, legal and regulatory expenses, personnel and administrative costs), property tax, insurance, and any required capital additions. Since Big Rock Point is unlikely to operate beyond its currently scheduled retirement date in 2000, capital additions would have to be amortized at a rapid rate.

participating classes. Although allocation by class is not purely consistent with current supply-cost allocations, the potential for reducing inter-class conflicts over cost-effective DSM spending justify the deviation.

If the Commission rejects the Company's proposal to stop its DSM investment, no action is necessary on the lost revenue and incentive mechanisms; if the Company wishes to further reduce customer bills, it can forego recovery of any costs allowed by the current mechanism.[5] If the Commission adopts the Company's proposal to eliminate DSM, no recovery of lost revenues would be needed, and no positive incentive would be justified.

To the extent that the Company fails to implement a program of the scope approved by the Commission, and to ramp up investment to the full cost-effective level as evaluation data become available, Consumers' shareholders should be held liable for the additional costs incurred due to its delay in program implementation, reduction in program spending from $30 million annually to $22.5 million over two years, and elimination of DSM after 1996. These costs should include generation capacity, fuel, purchased power, environmental compliance costs, and transmission and distribution investments.

III. Consumers' Proposed DSM Strategy

Q: What is the Company's proposed strategy for future DSM resource acquisition?

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[5] The same is true for other costs, whether collected through the PSCR, or through base rates.

A: In his direct testimony, Company witness Gilzow offers two strategy options. In both cases, the Company is requesting permission to eviscerate its DSM plans for the next two program years.

The Company's first, and apparently preferred, option is to simply cease all further spending on DSM for the next two program years (and presumably beyond):

> Q: What are you recommending with respect to DSM to address this competitive situation?
>
> A: Based on the above, the Company still believes that DSM costs ought to be eliminated. (Gilzow at 7)

The Company does not develop this option in any detail. Consumers apparently prefers to meet customer energy service needs with more expensive supply alternatives, and permanently abandon further acquisition of cost-effective DSM.

Q: What is the Company's alternative recommendation?

A: In lieu of Commission authorization to completely abandon DSM activities, the Company proposes a four-pronged overhaul of its DSM strategy. First, the Company requests that the Commission permit it to discard the DSM spending plans approved in Case U-10335. In particular, the Company (Gilzow at 4) requests authorization to forego the planned $60 million investment in DSM over the next two program years (May, 1995 to May, 1997). Instead, the Company proposes to spend only the $30 million budget authorized by the Commission for the first program year, but to spread this spending over the second program year.[6]

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[6] The Company takes this position in its response to 10554-S-CP-51. Although Mr. Gilzow's testimony indicates that the Company is proposing to spend the full $30 million budget

Second, Consumers recommends adoption of the RIM as the primary screening test, and proposes to file a revamped DSM portfolio consisting solely of RIM-passing programs for the third program year. (Gilzow at 7, 12)

Third, Consumers requests authorization to exclude all primary customers larger than 500 kW from participation in the Company's DSM program offerings. These large customers would also be excluded from participation in the RIM-passing programs implemented in the third program year and thereafter, and would bear none of the costs associated with program implementation, even within their customer class. (Gilzow at 9)

Finally, the Company proposes significant changes to its approved DSM cost recovery, lost revenue, and incentive mechanisms. In particular, the Company recommends that the cost of each DSM program be allocated directly to the customer class eligible for program participation. (Gilzow at 9) In addition, the Company proposes to eliminate the lost revenue and incentive mechanisms approved by the Commission in U-10335 for all DSM spending after May, 1996 (Response to 10554-S-CP-35; Gilzow at 8).

Q: What is the magnitude of cost-effective savings foregone by the Company's proposal?

A: The Company's filing in this proceeding does not provide any estimate of the loss of savings due to the Company's abandonment of its current DSM spending plans. However, in response to 10554-S-CP-48, the Company

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authorized by the Commission in Case U-10335, the Company's responses to 10554-S-CP-46 and-48 and the Company's August, 1994 load forecast indicate that Consumers is actually planning to spend only $22.5 million. The Company does not offer any explanation for this discrepancy.

estimates that DSM spending of $22.5 million will save, after a one-year lag, about 60 GWh and 20 MW per year (inclusive of losses.)[7]

Assuming a linear relationship between spending and savings acquired, the Company's proposal to cease all further spending, rather than spending the authorized $30 million annually for three years, would result in a loss of approximately 240 GWh and 90 MW of annual savings. Under the Company's alternative proposal, to spend only $22.5 million, the loss will amount to approximately 180 GWh and 70 MW of annual DSM savings, due to just the first three program years.[8]

As highlighted by the Commission in its August 18, 1994 order in U-10335, the magnitude of foregone cost-effective savings is actually many times larger than estimated above. In its 1992 IRP, Consumers' Preferred Plan included $69 million of cost-effective DSM spending in 1995, yielding annual savings of 116 MW and 335 GWh (Consumers Power 1992 IRP at 10-2).[9] Cost-effective spending in the Preferred Plan increased steadily through 2001, with cumulative savings reaching 687 MW and 3,228 GWh. In addition, the Company's analysis of an intensified DSM scenario indicated a cost-effectively achievable potential almost double that of the Preferred Plan.

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[7] These saving levels will decline over time as installed measures reach the end of their useful lives. The calculations in the response to 10554-S-CP-48 appear to assume an average measure life of about 15 years.

[8] The lost savings and the need for replacement supplies would continue long beyond the three-year period.

[9] In the Company's 1993 Long-Range Resource Plan Update to its 1992 IRP, Consumers reduced these savings estimates by 20% because it assumed that DSM was only 80% "effective" (Consumers Power, 1993 Long-Range Resource Plan Update at Exhibit 1).

Finally, as discussed below in Section V, savings projections for utilities with comprehensively designed DSM portfolios indicates that the achievable potential in Consumers' service territory may be several times as large as Consumers plans.

Q: Will this loss of savings subside with implementation of RIM-passing programs in 1996?

A: Probably not. As discussed in more detail in Section VII, adoption of the RIM as the primary screening test will result in the rejection of cost-effective DSM. In fact, the Company notes in response to 10554-S-CP-5 that it "has not identified any energy efficiency programs which pass the RIM Test."

Even if it is possible to design efficiency programs that pass the RIM, the savings will likely be significantly less than achievable with a program designed to maximize total resource or utility net benefits. For example, in support of proposed DSM goals, the four largest electric utilities in Florida estimated savings for a portfolio of TRC-passing measures and a portfolio of RIM-passing measures. Aggregate energy savings for the RIM portfolios were 26% to 63% of the savings for the TRC portfolios (Chernick, Paul, Direct Testimony in Florida PSC Dockets 930548-EG–930551–EG, at Exhibit LEAF-PC-5). Since the TRC portfolios (especially for the utilities with the higher RIM-to-TRC ratios) were not designed to maximize TRC net benefits, savings from measures and programs that would pass the RIM Test would likely be less than a quarter of the savings for an optimal TRC portfolio.

Q: Is the Company's argument for delaying implementation of a revised portfolio until the third program year credible?

A: No. The Company argues for a delayed implementation because evaluation results from the U-9346 programs have not yet been fully litigated. Yet, in Case U-10035, the Commission adopted the $30 million annual budget and not the larger amount found to be cost-effective in the Company's 1993 Update because of its concerns about "institutionalizing DSM spending at a relatively high level without first having the benefit of evaluation data" (Michigan PUC Order in Case U-10335 at 110). Incredibly, the Company is now proposing that no further money be spent until the Commission issues a decision on the evaluation results.

Mr. Gilzow (at 10) attempts to support the Company's position by noting that since some U-9346 programs had a wide range of probable savings at the 90% confidence limit, "the practical conclusion may be that the probability that a DSM measure or program is not cost effective is the same as the probability that it is cost-effective." This argument is flawed in two respects. First, the Company has not offered any evidence that the distribution of savings is such that there is a 50% probability of non-cost-effectiveness or even that the low end of the savings range is not cost effective. For example, evaluation results for the Custom-Designed Rebates Program indicated a savings range from approximately 27 GWh to 99 GWh. If the cost-effectiveness threshold for this program was 30 GWh, then the probability that the program was cost effective would far exceed the probability that it was not cost effective.

Second, the Company is proposing to delay implementation of all programs, simply because a minority of the U-9346 programs may have wide confidence intervals. The Company offers no reason for not going forward at full funding for the programs whose cost-effectiveness can be estimated with

adequate confidence, while running the programs whose cost-effectiveness is unclear at lower levels, and improving all program designs. Those programs whose cost-effectiveness can be estimated with adequate confidence should be continued at budget levels shown to be cost effective in the Company's most recent IRP.[10] This strategy would be consistent with the Commission's position in Case U-10335, where it left open the opportunity for Consumers to request additional spending authorization once evaluation data were available.

Q: Has Consumers prepared any analyses of the cost or rate impacts of its proposed DSM overhaul?

A: No. In response to 10554-S-CP-13 and-14, the Company admits that it has not conducted an integrated-resource-planning analysis of its proposal to eliminate all spending, or its alternative proposal to restrict spending to programs that pass the RIM, or even of the currently approved spending plan. Absent such analyses, the Company appears to lack critical information on the magnitude or timing of the cost and rate effects associated with its proposed strategy. Thus, the Company has no basis for determining whether its proposed strategy would have the desired effect on rates to retain or attract industrial and municipal load, or for estimating the cost implications of this particular load-retention strategy.

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[10] Least-cost planning proceeds mostly on expected values, not worst possible cases. The Company does not (and cannot) require that all new supply additions, or all new T&D investments, have the near certainty of cost-effectiveness that Consumers apparently demands of DSM.

IV. Market Competition and Least-Cost Planning

Q: What is the Company's rationale for proposing to discard its current DSM spending plans?

A: The Company sees the utility environment as ever more competitive and price-sensitive, with large customers and municipals able to turn to alternative energy suppliers, self-generation, or cogeneration. The Company contends that increasing rates due to DSM would drive away large, price-sensitive customers, and precipitate falling sales that would hurt all ratepayers. In this more competitive market, Consumers would apparently prefer to cease all further DSM spending. If the Commission will not approve a complete shutdown of DSM efforts, the Company recommends the minimization of rates, not bills, as the appropriate objective of DSM program planning:

> In summary, the current environment is much more competitive and price sensitive than it ever has been and Consumers Power believes it is only prudent to invest in DSM where the resultant rate increase to the customer is offset by the benefits provided. Continuing to select resources based primarily on the Utility Cost (UC) or Total Resource Cost (TRC) tests does not address the competitive realities in the marketplace. Customers pay rates, not revenue requirements. Over-reliance on the TRC and UC tests will simply result in more of the customers leaving the CPCo system. (Gilzow at 7–8)

Q: Has Consumers performed any analyses to support its claims about the effect of DSM on the competitiveness of the Company or its customers?

A: No. As acknowledged in responses to 10554-S-CP-3 and 4, the Company has not conducted any studies regarding the effect of DSM costs on customers' ability to compete, or on the likelihood that customers will seek out

alternative suppliers.[11] Moreover, the Company has not performed any analyses to support Company witness Gilzow's claim that reliance on the TRC or UC tests will lead to customers leaving the system (Response to 10554-S-CP-8).

Q: Will reliance on the TRC Test in the selection of DSM resources hurt the competitive position of the utility?

A: No. Bills are more important to customers than are rates. Bills, not rates, determine whether an industrial plant is competitive with others in its industry. Therefore, bills determine the competitive position of the utility.

Q: Do Consumers' concerns about competition justify making rate minimization its major planning objective?

A: No. The Company's outlook is clearly inconsistent with the interests of all customer classes and contrary to the economic interests of the region. Outright cessation of all DSM will needlessly raise total energy-service costs for both small, less-price-responsive customers and for large industrial customers alike. Reliance on the RIM Test to screen individual programs would have similarly detrimental effects by eliminate many efficiency measures that reduce total energy service costs.

Consumers proposes to discard not just its DSM spending plans, but its fundamental obligation to provide energy services at least cost. Least-cost

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[11] In support of its concerns, Mr. Gilzow (at 7) cites estimates of the bill payments required by primary service customers for their share of DSM program costs. However, in response to 10554-CP-S-33, the Company acknowledges that these payments constitute less than one percent of these customers' total electricity bill. Furthermore, Mr. Gilzow's calculations do not account for potential bill savings if these customers participated in the Company's DSM programs.

planning dictates that Consumers select DSM resources whenever they are less expensive than the supply alternatives for meeting customer demand. In contrast, a rate-minimization strategy would reject the low-cost DSM resource, in favor of the more-expensive supply, if DSM raised rates more than supply.

Q: How can economical DSM raise rates more than the supply alternative?

A: Utility expenditures, whether on DSM or supply resource, directly increase revenue requirements and rates. However, unlike supply, many DSM measures reduce sales.[12] This reduction in sales further increases rates because the sunk costs of the existing system are spread over a smaller sales base; reduced revenues from program participants translates into higher rates for all customers. This revenue loss is not an economic cost—total revenue requirements are unaffected—but a redistribution of the burden of sunk costs.

The effect of DSM lost revenues is illustrated in Exhibit I-____ (PLC-2). If DSM costs 3¢/kWh and supply costs 4¢/kWh (Columns A and B), the increase in revenue requirements to serve additional load are 25% lower with DSM than with supply. In contrast, rates with DSM increase 0.4%, while rates with supply *decrease* only 0.4%.[13]

Exhibit I-____ (PLC-2) also illustrates how seriously the RIM Test and Consumer's uncritical pursuit of rate minimization would frustrate least-cost

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[12] This is the direct effect. By increasing discretionary income and reducing the costs of doing business, energy efficiency may result in increased economic activity, industrial production, and electricity sales in Consumers service territory.

[13] In addition to generating supply, DSM avoids investments in reserves and load-related upgrades to the transmission and distribution system. In this example, "supply cost" can be considered to include costs for all avoided components.

planning objectives. Assuming the same level of DSM savings at no cost to the utility, revenue requirements will be 0.6% lower when selecting DSM over the more-expensive supply. However, since rates with DSM exceed rates with supply, the RIM Test would reject the no-cost DSM, in favor of supply.

Q: Who might gain from the Company's strategy?

A: Consumers' strategy appears to be targeted primarily to large industrial customers who are capable of leaving the system (by relocation, self-generation, municipalization, or direct access) and who are unwilling or unable to reduce energy-service costs through DSM program participation. These are the only customers who (1) could be said to "pay rates, not revenue requirements" (Gilzow at 8),[14] and (2) have the capability to seek out lower-priced alternatives to Consumers' electricity. The Company asserts that any increase in rates will cause more of these customers to exit the system.

In essence, the Company would impose real economic losses on captive ratepayers, and on the vast majority of large customers who could benefit from higher energy efficiency, for the sake of avoiding any DSM costs for the subset of large industrials who might not participate in DSM programs. These non-participating industrials could see their rates and bills decrease, as long as the reduction in lost revenues from the discarded DSM exceeds the increase in costs from replacing DSM with more expensive supply. In this case, the industrials' gain implies a real economic loss by way of increased system costs.

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[14] For these customers, rate increases translate directly into bill increases, since there are no offsetting efficiency gains.

Q: Won't captive customers face higher rates and bills if industrial load is lost?

A: Perhaps, but the rate effect will depend on how stranded investment costs are shared between ratepayers and shareholders, the extent to which revenue losses from departing industrial load are offset by revenue gains from load growth on the system, and the costs of the avoided supply resources. As long as prices exceed the marginal cost of serving new load, load growth will moderate the rate effects from loss of industrial load.[15]

Unfortunately, the Company has not estimated the revenue loss associated with a reduction in industrial load, other than an unrealistic analysis in Case U-10625. The Company's analysis in U-10625 estimated the rate effect of load reducing assuming that (1) no new load is added over the analysis period, and (2) no new resource costs are avoidable. (Lefere, Royal, Direct Testimony in Michigan PUC Case U-10625, at 22) The latter point is particularly egregious; if Consumers loses load, it will not have to add as much expensive new generation (and T&D) capacity, resulting in large reductions in revenue requirements relative to the lost revenues. Mr. Lefere assumes that Consumers would add the same amount of capacity regardless of the extent of its load reductions, and only save the value of avoided fuel. Consumers' analysis yields meaningless results.

Q: Are the Company's options limited to choosing either higher bills through abandonment of DSM or higher bills through loss of industrial load?

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[15] Since the 1992 IRP found that additional DSM would reduce rates, it is possible that Consumer's marginal costs exceed rates, even in the fairly short term.

A: No. As discussed in detail in Section VI, there are a number of strategies that can be employed to minimize costs, retain existing load, and attract new load without sacrificing the economic benefits of DSM. In fact, these options include the use of DSM for reducing the cost of doing business in the Company's service territory.

Q: Besides cost savings, are other benefits sacrificed under least-rates planning?

A: Yes. In addition to reducing direct costs to ratepayers, DSM can also reduce cost uncertainty, reduce environmental impacts, and create jobs. Although not explicitly reflected in revenue requirements, these are tangible benefits that improve the welfare of Consumers' customers, including large industrials, and the attractiveness of the service territory.

DSM's risk-mitigating, environmental, and employment benefits have been extensively documented.[16] The Company's 1992 IRP also provides

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[16] For a survey of analyses of the risk-mitigating benefits of DSM, see Chernick, Paul. 1993. "Risk and Other Nonprice Factors in Valuing DM," *From Here to Efficiency: Securing Demand-Management Resources* 5:99–138. Harrisburg, Penn.: Pennsylvania Energy Office. In addition, see Xenergy, Inc. 1994. "Exploration of Diversity and DSM Flexibility in Integrated Resource Planning" ORNL/41X-03373V. Oak Ridge, Tenn.: Oak Ridge national Laboratory. For a detailed discussion of the environmental benefits of DSM, see (1) Ottinger, Richard, et al. 1990. *Environmental Costs of Electricity*. Dobbs Ferry, New York: Oceana. (2) Vine, Edward, Drury Crawley, and Paul Centolella (Eds.). 1991. *Energy Efficiency and the Environment: Forging the Link*. Washington: American Council for an Energy Efficient Economy. There have been numerous analyses of the job-creation benefits of DSM. These include (1) Laitner, Skip, John DeCicco, Neal Elliot, Howard Geller, and Marshall Goldberg. 1994. "Energy Efficiency as an Investment in Ohio's Economic Future." Columbus, Ohio: Campaign for an Energy-Efficient Ohio. (2) Jaccard, Mark, and David Sims. 1991. "Employment Effects of Electricity Conservation: The Case of British Columbia" *Energy Studies Review* 3(1):35–44. (3) Geller, Howard, John DeCicco, and Skip Laitner. 1992. "Energy Efficiency and job Creation: The Employment and Income benefits from Investing in Energy-Conserving Technologies."

evidence of the environmental benefits of DSM. Exhibit I-____ (PLC-3) compares total system emissions for three scenarios with progressively larger DSM savings: Base Case Preferred Plan, and DSM Scenario. As indicated, the increase in DSM energy savings from the Base Case to the Preferred Plan , and from the Preferred Pan to the DSM Scenario, dramatically reduces system emissions of CO_2, SO_2 , and NOx.

Q: How have commissions in other states responded to proposed DSM cutbacks due to competitiveness concerns?

A: Several utilities have proposed cutbacks explicitly due to *rate* concerns, without necessarily specifying what the underlying concerns are. It is thus difficult to determine whether competitiveness is a motivating factor.

In many of these cases, and unlike Consumers, the utilities have faced surplus capacity, low avoided costs, and a severely depressed regional economy. Most of the utilities that have recently reduced substantial DSM spending have nonetheless maintained spending levels much higher than the budget that Consumers is proposing to eliminate.

Commissions in New York and Oregon have reaffirmed their commitment to DSM and broader least-cost planning goals in the face of proposed cutbacks. The New York Public Service Commission rejected DSM cutbacks proposed by the Long Island Lighting Company, which expressed competitiveness concerns. The Commission based its decision on its staff's finding that "substantial value will be lost to customers, in terms of bill

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Washington: American Council for an Energy Efficient Economy. (4). Tennis, Michael, Ian Goodman, and Matthew Clark. "Employment Impacts of New York State Energy Options." Boston: The Goodman Group. A study of the employment impacts of DSM in Michigan is forthcoming from ACEEE.

savings and net resource savings, if all of the proposed program reductions are carried out." (New York PSC Case 93-E-1045, Staff Memorandum at 16) The staff of the Oregon Public Utilities Commission recommended in a draft decision denial of PacifiCorp's proposal to restrict DSM rate impacts, citing the utility's continuing obligation to minimize total resource costs.

> [T]he Commission has not wavered in the least-cost planning principles adopted by Order No. 89-507 and restated in Order No. 93-206: Minimizing total resource cost is the key standard by which to assess alternative resource acquisitions. Minimizing rates is a secondary consideration. (Oregon PUC Staff Proposed Order Regarding PacifiCorp's Third Resource and Market Planning Program [October 18, 1994] at 17)

In addition, the Connecticut Department of Public Utility Control has reaffirmed its commitment to DSM in a generic inquiry on retail wheeling. The DPUC asserted that its "commitment to cost effective conservation will not wane." (Connecticut DPUC, Draft Decision in Docket No. 93-09-29, at 52). The Department also noted the load-retention and load-building attributes of DSM:

> In a narrow sense, conservation lowers load but the primary purpose of much of the current conservation expenditures are to retain load and attract new business.... UI has recognized the importance of customer service and has aggressively pursued conservation despite or perhaps because of its high retail rates. Such emphasis on customer service should increase with competition. (Connecticut DPUC at 53)

V. DSM Potential

Q: Will the Company's proposal to cease further DSM spending sacrifice significant amounts of cost-effective DSM savings?

A: Yes. As noted above in Section III, the Company proposes to forego approximately 80 GWh and 30 MW of savings per year for each $30 million that it doesn't invest in DSM. More critically, the Company apparently has no intention to ever acquire the additional cost-effective savings identified in its 1992 IRP and 1993 update. The 1992 update indicated that Consumers could cost-effectively acquire 1,815 GWh and 415 MW of savings in 1995 under its DSM Scenario. Cumulative savings in this case were expected to reach 5,734 GWh and 1,150 MW by 2001. Although the Company's Preferred Plan acquired significantly less savings than the DSM Scenario, cumulative savings in the Preferred Plan were still expected to grow to 3,228 GWh and 687 MW by 2001.

By the time the Company filed the 1993 Update to the 1992 IRP and its testimony in Case U-10335, it had again reduced spending and savings goals to "a more manageable level" (Gilzow cross, cited in Order, Case U-10335, at 90). Yet, even in this case, cumulative savings were expected to reach 1,872 GWh and 433 MW by 2001 (Consumers Power, 1993 Long Range Resource Plan, at Exhibit 7).

Q: Didn't the Commission reject the Company's request for additional spending beyond $30 million per year in Case U-10335?

A: No. As noted above in Section III, the Commission adopted a lower budget amount than found to be cost-effective in the 1993 Update because of its concerns about a lack of evaluation data supporting the cost-effectiveness results for the 1993 Update portfolio. The Commission then left open the opportunity for Consumers to request additional spending authorization once evaluation data were available.

Q: What is the DSM potential for utilities that pursue comprehensive, cost-effective DSM programs?

A: In the early 1990s, a number of utilities in California, the Northeast, and Mid-Atlantic designed comprehensive and aggressive DSM portfolios, usually in collaboration with non-utility parties. Exhibit I-____ (PLC-4) summarizes the efforts and projections of a number of these utilities, including Boston Edison (BECo), Eastern Utilities (EUA), New England Electric Service (NEES), Western Massachusetts Electric (WMECo), New York State Electric and Gas (NYSEG), Potomac Electric Power (PEPCo), United Illuminating (UI), Pacific Gas & Electric (PG&E), and Sacramento Municipal Utilities District (SMUD).

These utilities designed DSM plans to meet integrated resource planning objectives. The energy and capacity savings of these plans are indicative of the level of savings that can be expected by a utility that implements aggressive and comprehensive DSM programs in all major DSM market segments, maximizing cost-effective DSM savings.

Q: How much electricity were these comprehensive DSM plans expected to save?

A: Exhibit I-____ (PLC-4) provides several measures of aggregate electricity savings for these leading utilities' efficiency plans. While the information used in the comparison is from utility forecasts made during the early 1990's, the comparison serves as an example of the magnitude of DSM savings which can be successfully pursued.

Planning periods for the utilities vary, ranging from 5 years to 20 years. Column 3 of Exhibit I-____ (PLC-4) shows energy savings in the last year of the planning period as a percent of pre-DSM sales in that year. Longer

projections include larger DSM achievements. SMUD's 19-year program plan generates the largest portion of future sales, with total energy savings amounting to 23.1% of its projected energy sales.

Column 6 of Exhibit I-____ (PLC-4) shows projected annual load reductions for the reference utility DSM plans. This computation normalizes for differences in DSM planning periods between utilities, producing a result analogous to a sales-growth projection. Average system sales reductions range from 0.5% to 1.5% annually. By class, annual savings range 0.2–0.5% for residential load, 0.7–1.9% for commercial, 0.2–1.6% for industrial, and 0.9–1.0% for combined commercial and industrial load (for utilities that do not differentiate between those classes). For the group, average annual energy savings represent 0.7% of average annual sales.

Finally, Column 9 of Exhibit I-____ (PLC-4) shows the fraction of new energy sales that each utilty expects to meet with new DSM. New system energy savings range from 28% to 59% of sales growth, averaging 41%.

Q: How much were these leading utilities planning to spend on DSM efforts?

A: Exhibit I-____ (PLC-5) summarizes total DSM spending planned by eight of the utilities appearing in Exhibit I-____ (PLC-4). Column 3 shows that utilities with ambitious DSM acquisition plans plan to spend between 2% and 9% of their annual electric revenue on DSM, with an average of 4.2%.

Q: How much were these savings expected to costs in cents per kWh?

A: Exhibit I-____ (PLC-5) also provides a rough indication of how much DSM costs per unit of energy savings acquired. Column 4 shows cumulative annual energy savings associated with the budget presented in Column 1. Column 5 amortizes total DSM budgets over an estimated average measure life of 15 years to arrive at annualized DSM expenditure over the years of program

savings. Column 6 divides Column 5 by Column 4 to compute the cost of conserved electricity, which ranges from 1.4¢/kWh to 5.8¢/kWh. On average, electricity savings cost 3.6¢/kWh saved.[17]

Q: Have these utilities revised their DSM programs since the time of the projections listed in Exhibit I-____ (PLC-4)?

A: Most of them revise their portfolios at least annually. Several of the leading utilities, especially in the Northeast, have reduced their savings projections due to the effects of the regional recession and the completion of a large amount of non-utility generation. Reduced load and surplus generation have resulted in low avoided costs and high rates, increasing concern about rate impacts at a time when local economies are already under much stress. To moderate short-run bill and rate effects, these utilities have generally stretched out spending on discretionary retrofits, continuing to capture lost opportunities and preserving the option to accelerate the retrofits as need or economics change.[18]

The conditions facing Consumers today is quite similar to that facing the utilities in Exhibit I-____ (PLC-4) a few years ago: load is growing, new generation capacity is avoidable in the near term, the local economy is fairly robust, and rates are relatively low.

Q: How do the updated forecasts compare to previous forecasts?

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[17] Although spending is expressed in terms of kWh saved, DSM spending will also cut peak demand, leading to reduced investments in generating, transmission, and distribution capacity. The higher-cost DSM programs may particularly targeted to reducing peak loads.

[18] Few of these utilities have been spooked by competition.

A: Since this comparison was produced, some utilities have revised their projections, but the trends remain the same. Exhibit I-____ (PLC-6) shows updated forecasts for four of these utilities: Northeast Utilities, New England Electric System, United Illuminating and Boston Edison. The updated plans for BECo and NU show smaller annualized DSM savings, while UI's savings projections have increased and NEES aggregate savings are about the same as in 1991, although the distribution between classes have changed.[19] The projected annual load reductions range from 0.5–0.9%. Some of the reductions are much higher in the short term, and decline as the retrofit markets are saturated.[20] While these long-run projections are useful for planning purposes, DSM potential past 1997 will be heavily influenced by changes in common practice, market technologies and regulatory standards. The generally more aggressive short-term DSM projections are far more important for current decision-making.

Q: How does Consumers' approved DSM portfolio compare to those of these leading utilities?

A: To say that Consumers lags behind the leading utilities is an understatement. The most aggressive DSM package that Consumers is even considering,

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[19] Given Consumers' concerns about industrial customers and DSM, it is interesting to note that NEES has increased its industrial-savings target, while NU has cut industrial savings projections much less than it has cut other class savings. These utilities appear to recognize the competitive advantages of industrial DSM programs. The savings from earlier residential and commercial DSM programs has declined as appliance and equipment efficiency standards have temporarily caught up with the efficiency levels widely available.

[20] For example, NEES is planning on adding 140 GWh (25% more than the average reported in Exhibit I-____ (PLC-4)) annually in 1995–97, an average of 165 GWh annually in 1998–2001, but only about 60 GWh annually in 2004–2008.

spends $22.5 million and would save only about 0.2% of the Company's energy requirements. As shown in Exhibit I-____ (PLC-7), the *total* fraction of sales Consumers might serve with post-1993 DSM (in its alternative proposal) is minuscule; even in the commercial class, which would get the largest proportional savings, the sales reduction peaks at less than 0.3% in 1996, and falls rapidly thereafter.

Under Consumer's recommended DSM portfolio, spending and savings for energy efficiency would be zero.

Q: How much larger would Consumers' DSM program have to be to match the leading utilities?

A: For each class, Exhibit I-____ (PLC-8) applies the average annual energy savings for the three best of the leading utilities (recognizing that even in this group, efforts have been uneven across classes) to projected class energy requirements for 1995–97 from Consumers 1994 load forecast. The additional energy savings added every year would be about 1% of sales, or 330 GWh, five times as large as the one-time energy savings under Consumer's proposed plan.

At the average load factor of Consumer's DSM portfolio, the extrapolation of the leading utilities' portfolios would save 114 MW/yr., and 350 MW for 1995–97, fifteen times Consumers' projection of one-time savings from its proposed plan.

VI. Competitive DSM Strategies

Q: Has the Company presented a credible characterization of emerging competitive forces at the retail level?

A: No. The Company's discussion of emerging competitive forces is limited to a recital of legislative and regulatory actions that are changing the landscape of wholesale competition, glancing reference to Michigan's retail wheeling experiment and California's recently approved guidelines, and a discussion of recent cogeneration and municipalization developments in its service territory. The Company cites these developments as evidence that the retail market is becoming "...much more competitive and price sensitive than it has been..." (Gilzow at 7).

Contrary to the Company's vague assertions, competition is nothing new. Utilities routinely compete in wholesale markets for off-system sales and purchases, against both other utilities and independent power producers. Utilities have also faced competitive pressure at the retail level for many years, with the ever-present threat of self-generation or relocation by their large customers. Utilities also actively compete for retail load by offering economic development rates and other incentives for industrial facility construction or expansion.[21]

In addition, the Company's concerns about changes in retail competition in Michigan may be premature and unwarranted. The Commission has made it clear that its decision to experiment with retail wheeling does not pre-ordain its permanence in this State:

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[21] What has changed in the nature of competitive pressures is an apparently renewed vigor on the part of large industrials to wield the threat of leaving the system to extract price concessions.

> The Commission emphasizes that the purpose of conducting a limited experiment is to gather and evaluate information that would inform future deliberations concerning whether retail wheeling is ultimately in the public interest and whether it should be included as an element of retail competition on a permanent basis. Today's decision does not find, or attempt to foreshadow a finding, that a large-scale, permanent program of retail wheeling will be in the public interest. (Michigan PUC Order in Case U-10143 and U-10176 at 29)

More critically, the Commission has repeatedly reaffirmed its commitment to least-cost planning and DSM in light of emerging competitive forces in its orders in Cases U-10135 and U-10574.

Finally, the Company's assessment of the competitive market fails to consider that competition may be on the basis of more than just commodity price.[22] Instead, customers may be looking for a bundle of services that provide reliable power at minimum costs with minimum cost uncertainty. These services could include

- enhanced or guaranteed reliability levels;
- power-quality services for increased power factor and reduced harmonic distortion;
- detailed end-use load data for load management and real-time pricing;
- increased energy-service efficiency, including DSM, end-use renewables, cogeneration services, and backup power;
- contract pricing that minimizes price volatility.[23]

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[22] Indeed, a New Hampshire company is planning to compete for Public Service Company of New Hampshire's industrial load by offering a bundle of power-supply and efficiency services, and believes that PSNH's lack of DSM makes PSNH more vulnerable to competition. Northeast Power Report. 1994. "N.H. Lawyer Wants to Become a Utility Underselling PSNH," *Northeast Power Report* (September 2, 1994):1–2.

[23] Pennsylvania Electric Company has taken this concept one step forward by offering a full array of technical services to help firms modernize and expand. In addition to assistance with

Competition should spur increased attention to development of services that increase customer value, not necessarily price:

> Increased competition holds the potential for breeding numerous innovations in consumer services, products, and packaging. Competition for customers may spur the development of value-added bundling of services and product features that are tailored more closely to the needs of particular consumer segments. (Connecticut DPUC Draft Decision in Docket No. 93-09-29 at 42)

Q: Is the Company's assessment of the role of DSM in a competitive retail market reasonable?

A: The Company's speculations on the role of DSM are flawed in three respects. First, the Company appears to assume that least-cost planning and DSM are fundamentally in conflict with competition, and therefore have no role in a future competitive market.[24] This view of least-cost planning's untimely demise is inconsistent with many of the retail competition scenarios currently under consideration throughout the industry. These scenarios assume a continued monopoly on distribution services with attendant cost-of-service regulation and least-cost planning obligations.

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efficiency upgrades, these services include plant operations reviews, assistance with environmental compliance, product testing of manufacturing methods, and accounting and marketing assistance. Tremel, Charles. 1993. "Customer Partnerships: The Magic of Succesful Industrial DSM," *Proceedings: Sixth Annual Demand-Side management Conference: Making a Difference* 165–173. Palo Alto, Cal.: Electric Power Research Institute.

[24] Interestingly, this does not seem to be the general conclusion regarding gas utilities, who have long faced as much competition (from other fuels and from transportation) as electric utilities are likely to face in the foreseeable future, and face even more competition in the wake of FERC Order 636. Many gas utilities (e.g., in Massachusetts, California, Maryland, and Wisconsin) have run extensive DSM programs for several years, and other states (e.g., New York, Connecticut, Minnesota) are moving to expand gas DSM even as competition has increased.

Since market barriers to customer adoption of DSM would persist in a competitive world, distribution utilities would continue to seek to minimize total costs by offering DSM programs tied to distribution service. Demand-side-management costs would be recovered from all customers through distribution charges, regardless of the customer's source of generation.[25] Priced in this fashion, DSM would no longer be a significant factor in retail competition; DSM costs could not be avoided simply by seeking out alternative sources of generation.[26]

Second, as noted above, Consumers is not accounting for the competitive value of DSM as part of a bundle of pricing, reliability, and efficiency services. As discussed below, DSM can be and has been used to assist firms in economic distress and to generally improve the attractiveness of the service territory to new business.

Third, Consumers has not demonstrated that DSM is a major contributor to price levels. The Company's proposal to abandon DSM and increase energy-service costs is likely to reduce rates little, if at all, compared to alternative cost-cutting measures that provide real economic gains.

Finally, even in the customer segment in which Consumers claims that price concerns are paramount, the Company has not offered any evidence

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[25] Alternatively, customers who do not participate would not be credited for any avoided-cost savings from DSM. The implications of such a system are explored by Frame, Rodney. 1993. "Characteristics of a 'Good' Retail Wheeling System." Paper presented to the Electric Utility Business Conference in Denver, Colorado. Washington: National Economic Research Associates, Inc.

[26] Such a pricing regime is discussed in Hogan, William. 1994. "A Competitive Electricity Market Model." Cambridge, Mass.: John F. Kennedy School of Government Center for Business and Government.

that its rates are uncompetitive. Apart from some poorly-described complaints from some of its industrial customers, Consumers has no basis for claiming that DSM will be a major factor in price competition.[27]

Q: Are there any indications that DSM expenditures will not significantly affect prices?

A: The Company's revenue requirements analyses conducted as part of the 1992 IRP indicate that DSM should not affect prices significantly. Exhibit I-____ (PLC-9) provides Consumers' 1992 IRP estimates of revenue requirements and average rates for three scenarios with progressively greater levels of energy savings. Compared to the Base Case in 1997, the Preferred Plan increased savings by almost 660 GWh, or 70%, while increasing rates by less than 1 mill/kWh, or less than 1%. By 2001, energy savings were about 1,700 GWh, or 110%, more in the Preferred Plan, while rates diverge by about 2 mills/kWh, or 2%. The rate effects from the currently approved spending plan should be substantially less than indicated by this comparison, since the increase in DSM spending and savings from Base Case to Preferred Plan was several times larger than anticipated for current spending plans.

More interestingly, the DSM Scenario in the 1992 IRP reduced both revenue requirements and rates compared to the Base Case and the Preferred Plan with significantly greater DSM energy savings. In 1997, savings in the

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[27] It is possible that the customers who have been complaining are really concerned about their total bill, not the DSM costs. Alternatively, they may be primarily concerned paying for DSM activities that serve other classes (a problem Consumers has proposed to solve through cost allocation) or their competitors. If customers are concerned about paying for DSM services not available to them, the Company could seek to broaden program participation and explore alternative cost-allocation methods.

DSM scenario were over three times that of the Base Case and double that of the Preferred Plan. Yet, DSM-scenario rates in 1997 are slightly less than rates in the Base Case and more than one percent less than rates in the Preferred Plan. By 2001, with savings continuing at levels two to four times that of the Base Case and Preferred Plan, DSM-scenario rates are 1.5% higher than in the Base Case and about 1.2% less than in the Preferred Plan.

Q: Should the 1992 IRP results still be relevant today?

A: It is impossible to determine without a detailed analysis how changes in the intervening years would affect the basic results from the 1992 IRP. However, the major planning revision since the 1992 IRP appears to be a significant increase in customer demand, even after accounting for the Company's estimates of sales loss due to self-generation and retail wheeling. An increase in demand would likely decrease the rate impacts of DSM, by increasing avoided costs and spreading any net lost revenues over larger sales.

Q: How can Consumers position itself to thrive in a competitive market?

A: There are several actions the Company can take to enhance its competitiveness and improve the viability of its customers' businesses. First, the Company should revise its perspective on competition. Rather than viewing all competition as a threat to its continued survival, Consumers should approach competition as an opportunity to develop new profit centers while strengthening relationships with its customers. The former perspective leads to a defensive posture, where the Company fails to position itself to profit from changes. The latter approach could include the provision of a broad array of (profitable) services for maintaining existing customers and attracting new load.

The Company should be identifying business opportunities in each market niche and developing robust and flexible business strategies for profitably servicing these markets. In addition, Consumers should be taking advantage of all opportunities to reduce short-and long-term system costs, to minimize cost uncertainty, and improve system reliability.

Q: What strategies might Consumers undertake to protect shareholders and any customers who are not able to take advantage of retail competition?

A: It is difficult to be very specific about responses to competition, since Consumers is vague about the nature of the competitive threat. However, I can identify several approaches that would benefit customers and help protect the Company from potential competition.

First, Consumers can increase the attractiveness of its product, by reducing the amount of electricity needed to provide a particular service, increasing power quality (protecting valuable equipment), increasing the reliability of energy delivery, improving the quality of energy service (improved quality of lighting, better temperature and humidity control, etc.), and reducing discretionary spending throughout the Company. In addition, the Company should consider writing down any investment in uneconomic plant and buying out or renegotiating uneconomic purchase contracts. The Company should also evaluate the cost-effectiveness of continued operation of aging plants in need of significant maintenance or environmental-compliance expenditures.

Second, Consumers can reduce the volatility in its costs (and hence in its customers' rates and bills) and maintain the reliability of power supply. Most customers will prefer predictable, stable electric bills. The Company can pursue this goal by

- moving away from its riskier supply resources, such as nuclear and older fossil units;
- reducing environmental risks by anticipating requirements, building capability to procure DSM and renewables, and reducing utilization of polluting resources;
- reducing planning risks by investing in short lead-time renewable and distributed generation, and DSM; minimizing fluctuations in load growth with DSM, especially market-driven lost-opportunity options (which Consumers has virtually ignored);
- using long-term contracts, options, and other hedges to minimize fuel-price volatility.

Third, Consumers can prepare itself to react to changes in its operating environment (new environmental regulations, fuel price spikes, loss of capacity) by creating contingency resources for cost management (which requires resources that supply significant amount of energy at prices that are not tied to the Company's other supplies), as well as reliability. Retrofit DSM, distributed generation, renewable generation, and high-efficiency cogeneration can provide fully diversified contingency resources, while options on existing and new conventional generation can provide insurance against some outcomes.

Fourth, the Company can concentrate on new resource options tied to the distribution system and recoverable through distribution charges. This category would include DSM and distributed generation.

Q: What role can DSM play in keeping Consumers' large customers on its system?

A: A comprehensive industrial conservation program will reduce the cost of doing business in Consumers' service territory, keeping customers viable and attracting new loads. Furthermore, Consumers can lever the DSM program to support economic development, for example, by

- Targeting early DSM treatment at vulnerable facilities, or at those that agree to expand employment;
- Tying utility-funding of DSM to a multi-year commitment by the customer to remain on system.

Demand-side management *has* been used by utilities as an effective marketing tool for attracting or retaining industrial load. For example, Boston Edison Company's Energy Efficiency Partnership program saved a Sealtest ice-cream plant and 180 jobs from likely elimination. A company spokesperson credited energy savings paid for by Edison with giving the plant "a major competitive edge."[28]

Northeast Utilities has had numerous successes retaining load by improving the competitiveness of its large customers. One of NU's success stories involves Fortune Plastics, a plastics manufacturing plant. Located in Connecticut and Tennessee, Fortune had been shifting production to Tennessee to lower its operating costs. By taking advantage of the DSM services offered by NU's retail subsidiary, Connecticut Light and Power, Fortune was able to decrease energy costs by 17% and to maintain, and possibly expand, operations in Connecticut. According to Fortune Plastics President John Duhlig,

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[28] Boston Globe. 1991 "At Sealtest, Sweet Smell Of Success With Energy," *Boston Globe* (October 9, 1991):39.

> This package allows our Tennessee and Old Saybrook [Connecticut] plants to operate on a much more equal footing. While electric rates will continue to be lower in Tennessee, our Old Saybrook operations will be made so much more efficient that the energy costs of the two facilities will be roughly similar.
>
> Now, instead of transferring the manufacturing capacity of our Old Saybrook plant to Tennessee, we're considering expanding our operations here because this plant is so much more efficient.[29]

NU's successes in improving efficiency at its customers' facilities have provided tangible benefits beyond retaining load, jobs, and the local tax base. The lighting, motor, and process upgrades installed as a result of participation in NU's industrial program have reduced water consumption, improved working conditions, and mitigated environmental hazards.

Q: What steps can Consumers take to reduce inter-and intra-class conflicts over DSM cost recovery?

A: There are a number of cost allocation and program delivery strategies that the Company can employ to reduce conflicts among customers without sacrificing cost-effective DSM savings. The most straightforward method to reduce concerns between customer classes is to allocate DSM program costs by customer class, as the Company is currently proposing.

Large industrials may also be concerned that their competitors are getting a larger share of the DSM pot, or that they are paying for their competitors' efficiency and productivity improvements. If so, the Company could adopt an innovative budgeting approach employed by Minnesota Power for its large customers. Minnesota Power allocates a fixed budget amount to each eligible customer in its Industrial Conservation program.

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[29] Quoted in Connecticut Light and Power. Undated. "Incentives Spell Good Fortune: Fortune Plastics, Inc., Old Saybrook, Connecticut." Hartford, Conn.: Northeast Utilities.

Whatever amount is left unspent by a customer after five years is returned to the general pool for re-allocation to other customers.[30]

The Company could also reduce spending on individual industrial customers by replacing direct rebates with financing of measure costs. This option should be pursued only if it can be shown that financing will not impose undo barriers to cost-effective participation and measure adoption. One strategy for mitigating such barriers would be to recover loan payments through customer bills and guarantee that loan payments do not exceed bill savings.

Q: Is the Company's proposal to exclude primary-service customers from DSM program participation a reasonable response to competitive threat?

A: The Company's proposal is unreasonable in several respects. First, in apparent response to concerns expressed by some major industrial customers, Consumers is proposing to drop *all* DSM services for *all* primary-service customers with demands greater than 500 kW. This proposal would exclude almost 1,300 customers, representing annual sales of about 13,500 MWh (Response to 10554-S-CP-36). Based on 1995 forecast sales, these customers represent about 40% of the Company's total sales. The Company apparently would exclude these customers regardless of their ability to implement efficiency improvements on their own, their willingness to participate in the utility's programs, or the potential for retaining these customers through program participation. As a result, the Company's proposal could, at a minimum, lead to a significant loss of cost-effective savings at these

[30] Gustafson, John; telephone conversation, November 1994. Mr. Gustafson does not expect that there will be many instances of unspent funds being reallocated, since response to the program has been strong.

customer's facilities and, at worst, a total loss of customer load due to plant shutdown or self-generation.

Second, the Company is apparently prepared to sacrifice cost-effective savings from large customers without first investigating whether customer concerns can be alleviated through other means. In particular, the Company has not considered the extent to which concerns can be allayed with its proposal for cost allocation by customer class, or the other mechanisms discussed above.

Third, the Company is proposing to exclude large customers from participating in and sharing the costs of the DSM resources delivered to their own class, without showing that these customers have undertaken or will undertake the bulk of cost-effective efficiency improvements on their own. If these savings are not acquired by the excluded customer, the Company's proposal will effectively require all customers to share in the cost burden of replacing the foregone savings with more expensive new supply.

Q: Why would you expect that the Company's proposal would exclude many large customers that would participate in DSM programs if given the opportunity?

A: Perhaps the strongest evidence is provided by the overwhelming response to the Company's Custom-Designed Rebates Program. Targeted to customers with demand greater than 300 kW, the initial program goal of 600 participants was oversubscribed by a factor of four, according to the Company's own evaluation report (Quantum Consulting, Inc., 1994, "Consumer Power Company's Reduce-the-Use Program Nonresidential Evaluation Report Evaluation Report," Jackson, Mich.: Consumers Power Company, at 2-9).

The low free-rider rates estimated for the program indicate that many of the customers who participated or were willing to participate would not have implemented DSM on their own. Depending on the measure installed, free-ridership ranged 0%–20% (Quantum at 5-7). For most measures, free-ridership was exceeded by free-drivership, indicating that the number of participants who would have installed measures on their own was exceeded by the number of non-participants who installed measures on their own, but would not have in the absence of a utility program.

Q: Does experience in other jurisdictions support the expectation that excluded customers would willingly participate?

A: Yes. In particular, the response to Niagara Mohawk's newly implemented Subscription Service Program indicates that, even when offered the option to not participate and avoid paying DSM costs, the vast majority of that utility's large customers prefer to remain eligible for rebates under standard program offerings. As of April, 1994, approximately 63% of the customers eligible for the opt-out option chose to reject the option and instead to participate in and pay for standard DSM programs (Dembkowski, Gary. 1994. "Niagara Mohawk Demand-Side management (DSM) Subscription Option Status Report." Report prepared for the New York Public Service Commission. Syracuse, N.Y.: Niagara Mohawk Power Corporation., at 4).

Q: For those customers that would prefer to opt out of the Company's programs, would you expect that they would have already undertaken or will undertake all cost-effective improvements on their own?

A: No. Many of these customers face the same market barriers to adoption of cost-effective DSM that motivate other large customers to actively participate in the Company's programs. These barriers include lack of capital, short

payback thresholds, capital rationing, perceived riskiness, lack of information, and inadequate management attention.[31]

Niagara Mohawk's experience confirms the potential for cost-effective savings and the persistence of market barriers even with customers that choose to opt out. Customers that opted out were required to submit detailed audits of the savings potential at their facilities. These audits revealed a potential for savings of over 379 GWh, or 9% of total sales to these customers (Dembkowski at 7).[32] Almost 80% of the identified savings were from measures with paybacks greater than two years, indicating the prevalence of short payback thresholds. Moreover, audited customers explicitly indicated that they faced payback and capital access barriers to implementation of measures identified in their audits (Dembkowski at 8).

VII. Rate Effects and the RIM Test

Q: What is the appropriate test of the cost-effectiveness of utility DSM options?

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[31] Fuller, Winslow. 1992. "Industrial DSM: What Works and What Doesn't," *Proceedings of the ACEEE 1992 Summer Study on Energy Efficiency in Buildings* 5:75–81. Washington: American Council for an Energy Efficient Economy. Kyricopoulos, Peter, Ahmad Faruqui, and Gregory Wikler. 1994. "Garnering the Industrial Sector: A Comparison of Cutting-Edge Industrial DSM Programs," *Proceedings of the ACEEE 1994 Summer Study on Energy Efficiency in Buildings* 10:123–131. Washington: American Council for an Energy Efficient Economy. Jordan, Jennifer, and Steven Nadel. 1993. "Industrial Demand-Side Management Programs: What's Happened, What Works, What's Needed." Washington: American Council for an Energy Efficient Economy.

[32] No cost-effectiveness estimates for the measures are reported, but since most of them have simple pay-backs of less than six years, they are likely to be cost-effective.

A: Utilities are publicly regulated entities with fundamental obligations to maximize benefits to their customers and to the wider community that constitutes the public interest. The purpose of utility DSM programs, like that of many other utility activities (supply acquisition, the design of distribution systems, rate design), is to maximize the net value of the energy services that the utility normally provides, or (almost equivalently) to minimize the costs of providing service. Hence, the basic test of cost-effectiveness is a measure of total costs.

Q: What role should the Ratepayer Impact Measure Test have in determining the cost-effectiveness of a demand-side option?

A: It should have no role in the economic screening of demand-side programs or the technologies incorporated in such programs. Screening with the RIM will lead to the rejection of economical DSM.[33]

Q: How does use of the RIM Test lead utilities to reject cost-effective DSM?

A: Demand-side management is cost-effective if its total benefits exceed its total costs under the Total Resource Cost Test. The present-value RIM Test is not a measure of total costs; nor is it a useful measure of equity or rate impact. The RIM Test varies from the TRC Test primarily in its treatment of the participant. Rather than including the participant's costs and benefits, along with those of all other customers, the RIM treats participant impacts as if they were of no concern to the utility or the Commission. The RIM ignores

- the costs the participant incurs in participating in the program,
- the benefit to the participant from any rebate or other incentives,

[33] In addition, setting incentives based on the RIM Test will result in unnecessarily low participation, excessive administrative costs per installation, and the loss of cost-effective DSM.

- the benefit to the participant of reduced bills.

The treatment of the latter two items is particularly inconsistent, since the RIM includes both the incentives and lost revenues as costs.

Revenue shifts involve a loss to one group of customers, but a gain to another. The RIM effectively adds the losses to the costs of DSM (subtracts them from its benefits), but does not account for the gain. If this same principle were applied to rate design, no rate would ever be decreased, because a rate change creates benefits for some customers but net costs to others.[34]

Q: Is the RIM Test a meaningful test of rate effects?

A: No. The RIM Test does not assess the rate effects of DSM among and within classes. The RIM looks at rate effects on a measure-by-measure or program-by-program basis, and estimates only the average system rate effect of a particular utility DSM program or measure. Estimating rate impacts of any one program is not meaningful, unless considered in the context of the number of participants in that program, the number of participants in other DSM programs, and that pattern of cost recovery between classes and over time.

The RIM Test may screen out programs and measures vital for the economic health of the state. A measure that fails the RIM might be the one that saves an industry in Consumer's service territory. For example, an industrial-process design program may be the only program in which many industrial customers can participate.

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[34] Unlike DSM, rate design and cost allocation shift costs between customers without directly reducing total costs.

The RIM Test also does not properly determine the pattern of rates and bills over time. A program failing the RIM Test may increase rates in the near term but reduce them in the long run, while a program passing the RIM may well raise rates in the near term. The RIM Test is typically calculated using estimates of avoided costs as a measure of the reduction in revenue requirements from DSM. Avoided costs are usually estimated on the deferral basis, which states avoided capacity costs as the change in the present value of costs due to a year's delay in construction. Avoided costs computed in this way will start low and rise with inflation. Revenue requirements and rate effects will actually be determined by the Commission's ratemaking procedures, which allow recovery of a return (and associated income taxes) on the unamortized investment. Ratemaking costs start at a high level, and decline over time, as the initial investment is depreciated. Thus, avoided costs will usually understate DSM's effect on reducing revenue requirements in the early years, when rate effects are most likely to be most pronounced.

Q: Do utilities apply the equivalent of the RIM Test to decisions other than DSM?

A: No. A wide range of utility actions have rate implications. As noted above, rate design and cost allocation would be impossible if utilities refused to increase bills to some customers. Neither rate design nor cost allocation are generally reviewed with the RIM Test.[35] The RIM Test, for example, would indicate that utilities could reduce rates by requiring customers to purchase

[35] Applying the RIM Test to rate design would result in incentives to increase usage (such as declining block rates, requiring master-metering, providing rebates for wasteful energy usage) so long as marginal costs were less than average rates (including customer charges), even if marginal costs were greater than marginal rates.

their own services and meters, and, for larger customers, transformers and secondary lines. This change in policy would pass the RIM Test, but probably increase total energy service costs; utilities recognize that such a change would be counter-productive, since customers ultimately care about energy service costs, not rates.

Any supply-acquisition decision will affect the pattern of rates and bills over time and the allocation of costs to rate classes. Utilities do not simply stop building power plants because they make some customers better off, and others worse off, than they would have been otherwise. Rate impacts and equity considerations are not usually considered in selecting supply resources; where these factors are considered at all, they are secondary concerns, and do not dominate resource selection. The utility should design a resource plan that minimizes total costs, *then* decide how to allocate costs and benefits between and among customer classes: this principle should apply to DSM and supply alike.

Q: Does primary reliance on the TRC Test for screening DSM options mean that the ratepayer impacts should be ignored?

A: Not at all. The effects of the DSM and supply options on rates and bills should be determined for each customer class annually, but only after an initial DSM portfolio is constructed.

Q: How should the utility determine whether rate or bill effects are excessive?

A: There is no simple answer to this question. Acceptable levels of rate increases due to DSM depend on

- the starting level of rates,
- base-case rate increases without DSM,

- the distribution of DSM offerings (what percentage of customers can participate),
- the distribution of DSM savings (such as the percentage of customers with declining bills),
- provisions to aid vulnerable customers (low-income, at-risk businesses),
- the average level of customer bills.

Q: If DSM results in rates higher than they might be otherwise, does this imply that the rates are excessive, or that they endanger the state or regional economy or the competitive position of the utility?

A: No. The economic attractiveness of the state for business, and the disposable income of households, depends on bills, not rates. As long as DSM is cost-effective, it will decrease the costs of energy services, and bolster the local economy.[36] Whether a difference in rates between the base case and an aggressive DSM plan is a matter for concern depends on how much average bills are reduced, how widely the benefits of DSM are distributed, how rates would otherwise be moving, and how much risk is reduced, as well as the magnitude of the rate difference.

Q: If the portfolio as a whole fails the RIM Test, should the DSM plan be rejected?

A: No. The fact that the portfolio fails the RIM Test does not imply that rate effects are distributed unfairly, or that rate increases are too large compared to bill reductions. Equity problems should be addressed by changing cost-recovery patterns, altering the allocation of expenditures among and within rate classes, increasing the penetration of programs to groups that would

[36] This general relationship is in addition to the positive direct employment effects of DSM.

otherwise face higher bills, and changing the timing of particular programs. A DSM plan should not be rejected because it fails the RIM Test.

VIII. Rate Effects of DSM Spending

A. Introduction

Q: How are the rate effects of DSM spending generally estimated?

A: The effects of DSM spending on customer rates are measured relative to a base system that assumes no spending on DSM during the planning horizon. Instead, the base system adds only supply resources to meet customer demand. The average rate for the base system is simply annual revenue requirements divided by total sales.

Revenue requirements, and thus rates, for the DSM spending scenario are derived by modifying the base system in two ways. First, the annual cost of service for generating plant and T&D additions are reduced to reflect investments avoided by DSM savings. Second, annual revenue requirements are increased to reflect recovery of the additional DSM spending.

Q: What changes to annual costs of service need to be incorporated in the projection of revenue requirements for the base system?

A: Base system revenue requirements vary over time due to retirement of existing plant, termination of existing purchase contracts, addition of new plant, new purchases, and cost escalation for fuel and non-fuel expenses. To capture these variations, the rate analysis should track changes in annual cost recovery for all production plant, the T&D system, purchases and sales, and fuel and other expenses.

Q: Were you able to track annual variations in cost recovery in your analysis of base-system revenue requirements?

A: Not precisely. Due to a lack of data in the Company's filing, I had to make a number of simplifying assumptions in my estimation of annual revenue requirements and rates. In particular, the Company has not updated its IRP based on either its new load forecast, its revised estimates of savings from currently authorized spending, or changes in supply resource forecasts since its 1993 Update. I therefore lacked information on the Company's anticipated supply additions in each year that I standardly would rely on to estimate annual revenue requirements for new plant. Instead, I assumed that the pace and scale of new plant additions would exactly match load growth, such that a megawatt of supply would be added for each megawatt of load growth in any year.

Due to a lack of time and resources, I was also unable to gather the cost-of-service projections required to model annual changes in revenue requirements for the existing system. Instead, I assumed that existing system revenue requirements would increase steadily by 1% per year over the planning horizon. This growth rate should reasonably approximate the net effect of increasing production expenses and declining cost of service for existing plant.

Q: Please summarize your method for projecting average rates.

A: I developed estimates of annual revenue requirements, and thus average rates, for the years 1994 through 2003 in two basic analytical steps. First, I estimated annual revenue requirements for a base system that meets customer demand in the absence of future DSM investments. Base-system revenue requirements are calculated as the sum of revenue requirements for the

existing system and annual revenue requirements for load-growth-related additions to generation, transmission, and distribution plant, assuming no future investments in DSM.

Second, I estimated the reduction in base-system revenue requirements due to additional DSM spending. Base revenue requirements less the DSM-related reductions plus DSM revenue requirements yielded annual revenue requirements for a system that meets demand as reduced by anticipated DSM savings.

I developed system-with-DSM revenue requirements for two DSM spending scenarios. The U-10335 scenario incorporates projections of DSM spending and savings assuming currently authorized spending of $30 million over the next three years.[37] The Comprehensive DSM Scenario incorporates the annual energy and peak-savings estimates derived by applying projections from collaboratively designed DSM portfolios to Consumers system. The annual savings estimates for one year's spending in the Comprehensive DSM scenario are provided in Exhibit I-____ (PLC-8). Spending for DSM in the comprehensive DSM case are assumed to exceed U-10335 case spending in the same proportion as comprehensive-case energy savings exceed U-10335 savings. As with the U-10335 Scenario, the Comprehensive DSM Scenario assumes DSM spending for the next three years only.

Q: What are the results of your estimation of annual revenue requirements?

A: My projections of annual revenue requirements for the base system, for the U-10335 Scenario, and for the Comprehensive DSM Scenario are provided in

[37] Although spending amounts authorized in Case U-10335 were for the three *program* years from May, 1994 through April, 1997, I projected revenue requirements assuming spending of $30 million in each of the next three *calendar* years.

Exhibit I-____ (PLC-10). Revenue requirements for the base system are projected to rise steadily between 1994 and 2003 at an annual rate of 3%–5%, with growth exceeding 4% between 2001 and 2003.

Demand-side-management spending in the U-10335 Scenario slightly increases revenue requirements in 1995 and 1996 and then slowly decreases annual revenue requirements compared to the base system thereafter, so that revenue requirements are reduced by 0.9% by 2003. Although avoided costs are almost double DSM cost of service, the magnitude of the savings and thus net benefits is insignificant for a utility of Consumers' size.

In contrast, DSM spending in the Comprehensive DSM Scenario measurably reduces annual revenue requirements compared to the base system and to the U-10335 Scenario. Compared to the base system, spending in the comprehensive case reduces annual revenue requirements by about 0.6% in 1997; this differential grows to about 4% in 2003.[38] There is a comparable reduction in revenue requirements compared to the U-10335 Scenario.

Q: How were rates calculated from annual revenue requirements?

A: For both the base system and the DSM scenarios, average annual rates are simply the ratio of annual revenue requirements annual sales.

Q: What are the results of your analysis of average rates?

A: As indicated in Exhibit I-____ (PLC-11), average rates for the base system rise steadily from 6.43¢/kWh in 1994 to 7.70¢/kWh in 2003. Average rates increase around 2% per year throughout the planning horizon.

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[38] There is a marginal increase in revenue requirements in 1995 and 1996.

Between 1995 and 1997, DSM spending in the U-10335 case increases average rates relative to the base system by about 0.1¢/kWh, or 1.5%–2.0%. Rate effects decline steadily thereafter, with U-10335 rates actually falling below rates for the base system by 2000.

Q: What are the rate effects of DSM spending in the Comprehensive DSM Scenario?

A: Between 1995 and 1999, DSM spending in the comprehensive case significantly increases cost-effective energy savings with relatively minor increases in rates compared to both the base system and the U-10335 case. By 2000, rates in the comprehensive case are lower than for both the base system and the U-10335 case.

Between 1995 and 1997, comprehensive DSM spending increases rates relative to the base system by about 0.1¢/kWh, or about 2%. The rate differential decreases steadily thereafter, such that rates are lower than for the base system by about 0.1¢/kWh, or 2% by 2003. Comprehensive-case rates exhibit the same pattern compared to rates in the U-10335 case, with slightly moderated absolute-magnitude and percentage impacts.

Q: Did you estimate average rates by customer or rate class?

A: No. It would be too complex and time consuming to model accurately cost allocation for each major cost account, and the results of simplified allocation methods would probably not provide reliable and useful information on differences in class-specific impacts. In addition, it is uncertain how costs for future investments would be allocated. Because of these complications, I calculated average rates for customers as a whole.

B. Estimation of Revenue Requirements and Average Rates

1. Base System Revenue Requirements

Q: Please describe the derivation of the existing system revenue requirements shown in Exhibit I-____ (PLC-10).

A: As discussed above, lacking adequate time and resources, I assumed a 1% growth in existing system revenue requirements from a 1994 base-year value of $2,117 million. For 1994, I used the jurisdictional revenue requirement adopted in the Commission's decision in Case U-10335.

Q: What additions to the existing system are included in the estimate of base-system revenue requirements?

A: As shown in Exhibit I-____ (PLC-10), I projected revenue requirements for load-growth-related additions to generating plant, purchases, and the T&D system after 1994.

Q: Please describe the derivation of revenue requirements for generating plant additions.

A: My estimate of revenue requirements for plant additions assumes that the pace and magnitude of plant additions is exactly matched to load growth after 1994. For each megawatt increase in load, I assumed that a megawatt addition of combined-cycle capacity and, to meet reserves, a 0.2 megawatt addition of combustion-turbine capacity.

I calculated revenue requirements for generating plant additions by simulating annual recovery of fixed capital charges. For these calculations, I used the Company's assumption for gross plant investment in its 1993 Update (Consumers Power, 1993 Long-Range Resource Plan Update at Exhibit 4) and the cost of capital for permanent capital adopted by the

Commission in its decision in Case U-10335 (at 51). I assumed a book life of 30 years, tax life of 20 years, and a combined federal and state income tax rate of 38%. I then added annual fixed O&M expenses, calculated using Consumers' estimate in the 1993 Update (Exhibit 4) of fixed O&M costs for each type of generating plant plus 40% for general overheads. Finally, for the combined-cycle additions, I added fuel expenses using the Company's estimate of fuel prices in the 1993 Update (Exhibit 1) and assuming annual operation at the load factor for Consumers' system of 62%.

Q: How were T&D revenue requirements calculated?

A: As with generating-plant additions, I estimated annual fixed-charge recovery for load growth-related T&D investments. In this case, I assumed a gross plant investment of $1000/kW. This value is based on a survey of avoided T&D costs from utilities around the country. After converting gross-plant cost into annual ratemaking costs, I multiplied them by annual load growth to derive a stream of revenue requirements for each year's T&D capital investment. I then added annual fixed O&M expenses using an assumed value of $14/kW-yr. for fixed O&M costs and overhead.

2. Revenue Requirements for the DSM Scenario

Q: Please describe the derivation of annual revenue requirements for the DSM scenarios.

A: I made two basic adjustments to base-system revenue requirements to derive revenue requirements for the U-10335 and Comprehensive DSM Scenarios. First, I added annual cost recovery for each scenario's spending projections. Second, I reduced annual revenue requirements to account for generating-

plant investment, T&D investment, and energy-cost savings due to each scenario's reductions in customer demand.

Q: How did you calculate annual cost of service associated with projections of DSM spending?

A: Consistent with the recovery mechanism adopted by the Commission in Case U-10335, I amortized 80% of DSM spending over five years and expensed the balance. If the rate effects of a future portfolio of cost-effective DSM appear to be troublesome, the Commission should consider amortizing DSM costs over 10 years, as was done for the Company's U-9346 programs.

Spending for DSM in the U-10335 case was assumed to be $30 million per year from 1995 through 1997. Spending in the comprehensive case was assumed to be about $130 million per year from 1995 through 1997. The annual spending figure was calculated as the product of U-10335 spending and the ratio of comprehensive-case energy savings to U-10335 savings.

Q: How were reductions in generating capacity investment derived?

A: I valued coincident peak-demand reductions at the cost of a new combustion turbine capacity, including O&M and overheads. To account for reductions in reserve requirements, each megawatt of peak savings avoided 1.2 mega-watt of combustion-turbine capacity. Demand savings were multiplied by annual costs of service to derive annual revenue requirement reductions. I used the same annual cost of service estimates as for the estimation of combustion-turbine additions to meet new reserve requirements.

Q: How were reductions in T&D investments valued?

A: I valued avoided investments in T&D due to coincident peak savings in the same fashion as load-growth-related additions to the existing system. I used

the same estimates of annual ratemaking costs and multiplied them by annual demand savings to derive annual reductions in capital-related revenue requirements. I further reduced revenue requirements to reflect reductions in annual fixed O&M expenses, including overheads estimated at 40%.

Q: Please describe the derivation of avoided energy costs.

A: I valued energy savings at the cost to build and operate a new gas combined-cycle plant, less the capital and fixed O&M cost for new combustion-turbine capacity. Energy savings were thus assumed to avoid GCC fuel costs plus the capitalized energy component of GCC investment and fixed O&M costs.

Q: What is the source for coincident peak and annual energy savings for each scenario?

A: I derived savings projections for the U-10335 Scenario from the Company's estimate of annual savings from a single-year's expenditure of $22.5 million, as provided in response to 10554-S-CP-48. To reflect impacts from $30 million of expenditures, I increased the Company's savings estimates in proportion to the increase in spending. Total savings for each year were then estimated assuming spending of $30 million per year from 1995 to 1997; starting in 1997, total savings are essentially three times the savings for a single year of spending.

Annual energy and peak savings for the Comprehensive DSM Scenario are from Exhibit I-____ (PLC-8). As with the U-10335 scenario, savings accumulate for three years and are then stable as a result of assuming DSM spending from 1995 to 1997.

3. Average Rates

Q: What is the source for the sales projections used to derive average annual rates?

A: For the base system, I derived average rates using the Company's August, 1994 sales forecast to derive a forecast of sales assuming no DSM spending after 1994. For the DSM scenarios, I reduced this forecast by my estimates of annual energy savings in each scenario.

IX. Conclusions and Recommendations

Q: Please summarize your conclusions.

A: The Company has failed to provide reasonable justification for abandoning DSM. Consumers' various arguments regarding the connection of DSM to rate effects and competition are incorrect or inadequately supported. Where the Company's concerns may have some validity, it has not examined other alternatives for addressing them. The Company has simply prescribed termination of DSM as the panacea for all its potential future ills, real or imagined.

Consumers is not in a period of capacity surplus, and is expecting to acquire significant amounts of capacity in near term. This is no time to be sacrificing cost-effective savings to reduce rate impacts. Near term rate impacts from supply acquisition could be significantly larger than DSM impacts. In any case, the rate impact of Consumers' DSM programs is minimal in terms of absolute magnitude and percentage increases.

Consumers has presented no evidence that DSM spending is a major factor in determining its prices, would be a major consideration in price

competition, or (if reduced rates are vital) that cuts cannot be made in other budget areas (supply acquisition, retirements, overhead costs) at lower costs to ratepayers.

The Company has proposed changes in cost allocation, which I support, but has not determined whether this change would alleviate its concerns about the competitive position of its large customers. Consumers does not appear to have even considered other options for moderating DSM rate effects without sacrificing cost-effective savings.

Competition is nothing new to electric utilities. The existence of competition does not excuse utilities from pursuing least-cost-planning objectives.

The TRC Test remains the appropriate test for screening DSM; the Company's proposal to adopt the RIM Test as its primary screening test will lead to significant loss of cost-effective savings without materially improving (and perhaps impairing) its competitive position.

Q: What are your recommendations regarding the issues before the Commission in this docket?

A: The Commission should deny Consumers' request to reduce its spending levels, and reaffirm its guidance that Consumers should be spending at least $30 million annually in the period 1995–97. The Commission should remind Consumers that this is only an interim funding level, pending evaluation results; once litigation of the evaluation results is complete, Consumers should file an update, to include full-scale implementation of all cost-effective DSM.

The Commission should reject Company's proposal to exclude large industrials from the DSM program, and the proposal to limit DSM to measures that pass the RIM.

The Commission should approve Consumer's request to allocate DSM costs to the participants' customer classes. The Company should be permitted to forego recovery of DSM costs, lost revenues, and incentives, as well as any other costs the Company wishes to forego collecting, to reduce customer bills and improve its competitive position. If the Commission is concerned about current rate levels, it should authorize Consumers to amortize DSM costs over ten years, rather than the currently prescribed five-year period.

Q: What are your recommendations regarding Consumers' analysis of rate impacts?

A: The Company should adopt a method for estimating rate impacts that reasonably simulates annual variations in total system revenue requirements due to changes in cost of service for the existing system, additions to the existing system, and ongoing investment in DSM programs. An analysis of this type would involve the following analytical tasks:

- Estimation of annual revenue requirements for the existing system, accounting for anticipated plant retirements, changes in existing purchase and sale contracts, and cost escalation.
- Estimation of annual revenue requirements for load-growth-related additions of generation, transmission, and distribution plant, assuming no future investments in DSM.[39]

[39] Assumptions about additions should be consistent with those adopted for the purposes of developing the pre-DSM baseline case for avoided-cost purposes.

- Determination of rates and bills for the existing system in combination with additions required to meet load growth in absence of additional DSM spending.
- Determination of the least-cost mix of additions and associated annual revenue requirements required with load growth reduced by projected DSM savings.[40]
- Determining rates for the existing system in combination with additions required to meet load growth as reduced by additional DSM spending.
- Examining the effects on system-wide and class-specific rates and bills, for various amortization periods and cost-allocation rules.

Q: What other actions should the Commission require of the Company?

A: Consumers should be directed to:

- Report to the Commission on the maximum feasible rate of acquisition of cost-effective DSM energy savings, in light of the evaluation results and the Company's imminent need for new resources.
- Develop industrial DSM programs to maximize net benefits, while meeting industrial concerns.
- Offer a flexible bundle of reliability, power quality, on-site generation, efficiency, and real-time pricing services for its industrial and large commercial customers, placing priority on delivery of the services to economic distressed customers, those that are prime candidates for uneconomic bypass through municipalization or self-generation, and potential new customers.

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[40] Changes in the mix of additions due to DSM should be consistent with avoided-investment assumptions adopted for the purposes of determining avoided costs.

- Develop lost-opportunity programs addressing new residential and commercial construction; industrial process change and expansion; cooling system upgrades and replacements; and routine replacement of equipment and appliances.

Q: Does this conclude your testimony?

A: Yes.

Projected Energy Savings from Demand Management by Selected Third Generation Utilities -- Updated Forecasts.

Boston Edison		Energy savings, last yr of DM prog	Pre-DM energy req'ts, last yr of DM prog	DM as % of energy req'ts last yr of DM prog	Avg annual incr. DM	Avg Annual energy req'ts in prog period	Avg Annual DM as % avg energy req'ts in prog period	Growth in DM	Growth in energy req'ts	New DM as % of new energy req'ts
(1994-2004)		GWh	GWh		GWh	GWh		GWh	GWh	
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
	Residential	232	3963	5.9%	13	3813	0.3%	139	383	36.3%
	Commercial	655	8853	7.4%	44	8228	0.5%	483	1449	33.3%
	Industrial	149	1906	7.8%	9	1757	0.5%	104	270	38.5%
	system	1036	14722	7.0%	66	13798	0.5%	726	2102	34.5%
New England Electric System										
(1994-2008)										
	Residential	158	9738	1.6%	11	8863	0.1%	158	1615	9.8%
	Commercial	859	10713	8.0%	57	9364	0.6%	859	3022	28.4%
	Industrial	644	6709	9.6%	43	5701	0.8%	644	1849	34.8%
	System	1661	27160	6.1%	111	23928	0.5%	1661	6629	25.1%
United Illuminating Co.										
1995-1999										
	Residential	31.82	1944.00	1.6%	6.36	1905.00	0.3%	23.95	97.00	24.7%
Comercial /Ind	Commercial	209.90	3662.00	5.7%	41.98	3518.40	1.2%	170.15	235.00	72.4%
	system	241.72	5606.00	4.3%	48.34	5423.40	0.9%	194.10	332.00	58.5%
Northeast Utilities										
1994-2003										
	Residential	252.12	13201.00	1.9%	25.71	12715.80	0.2%	231.36	1065.00	21.7%
	Commercial	829.96	13717.00	6.1%	87.36	12714.60	0.7%	786.25	2182.00	36.0%
	Industrial	627.44	7806.00	8.0%	67.46	7294.80	0.9%	607.17	1035.00	58.7%
	System	1709.52	39239.00	4.4%	180.53	32725.20	0.6%	1624.78	4282.00	37.9%

Projected Energy Savings from Demand Management by Selected Third Generation Utilities -- Updated Forecasts.										
		Energy savings, last yr of DM prog	Pre-DM energy req'ts, last yr of DM prog	DM as % of energy req'ts last yr of DM prog	Avg annual incr. DM	Avg Annual energy req'ts in prog period	Avg Annual DM as % avg energy req'ts in prog period	Growth in DM	Growth in energy req'ts	New DM as % of new energy req'ts
		GWh	GWh	%	GWh	GWh	%	GWh	GWh	%
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Boston Edison										
(1994-2004)										
	Residential	232	3963	0.06	13	3813	0.00	139	383	0.36
	Commercial	655	8853	0.07	44	8228	0.01	483	1449	0.33
	Industrial	149	1906	0.08	9	1757	0.01	104	270	0.39
	System	1036	14722	0.07	66	13798	0.00	726	2102	0.35
New England Electric System										
(1994-2008)										
	Residential	158	9738	0.02	11	8863	0.00	158	1615	0.10
	Commercial	859	10713	0.08	57	9364	0.01	859	3022	0.28
	Industrial	644	6709	0.10	43	5701	0.01	644	1849	0.35
	System	1661	27160	0.06	111	23928	0.00	1661	6629	0.25
United Illuminating Co.										
1995-1999										
	Residential	32	1944	0.02	6	1905	0.00	24	97	0.25
	Commer\Ind	210	3662	0.06	42	3518	0.01	170	235	0.72
	System	242	5606	0.04	48	5423	0.01	194	332	0.58
Northeast Utilities										
1994-2003										
	Residential	252	13201	0.02	26	12716	0.00	231	1065	0.22
	Commercial	830	13717	0.06	87	12715	0.01	786	2182	0.36
	Industrial	627	7806	0.08	67	7295	0.01	607	1035	0.59
	System	1710	39239	0.04	181	32725	0.01	1625	4282	0.38