BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

IN THE MATTER OF	**)**	
THE PETITION OF	**)**	
TAMPA ELECTRIC TO	**)**	
DETERMINE NEED FOR	**)**	**DOCKET NO. 07-0467-EI**
POLK POWER PLANT	**)**	
UNIT 6	**)**	

PREPARED DIRECT TESTIMONY OF

DAVID NICHOLS

SOUTHERN ALLIANCE FOR CLEAN ENERGY

SEPTEMBER 6, 2007

1. INTRODUCTION AND QUALIFICATIONS

Q. What is your name, position and business address?

A. My name is David Nichols. I am Senior Consultant with Synapse Energy Economics, Inc, 22 Pearl Street, Cambridge, Massachusetts 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics is a research and consulting firm specializing in electricity industry regulation, planning and analysis. Synapse works for a variety of clients, with an emphasis on consumer advocates, regulatory commissions, and environmental advocates.

Q. Please describe your experience in the area of electric utility restructuring, regulation and planning.

A. My experience is summarized in my resume, which is attached as Exhibit __ (DN-1). For three decades, I have professionally assessed the costs and benefits of energy conservation, energy efficiency, and load management to utility ratepayers; designed demand-side management ("DSM") programs; evaluated DSM programs of electric utilities, gas utilities, and state agencies; and analyzed utility DSM cost recovery claims. I have presented studies on these matters in testimony before regulatory commissions in most U.S. states, before the U.S. Federal Energy Regulatory Commission, and in Canadian provinces. I have also worked in other energy areas such as rate design, resource planning, and renewable resources.

Q. Please describe your professional experience before beginning your current position at Synapse Energy Economics.

A. Before joining Synapse Energy Economics this year, I was an independent energy analyst in Boston, Massachusetts. Prior to that, I was for 25 years a vice-

president at Tellus Institute for Resource and Environmental Strategies, of which I am a co-founder. I received an A.B. degree from Clark University and a Ph.D. from the Massachusetts Institute of Technology.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Southern Alliance for Clean Energy (SACE).

Q. Have you testified previously in this docket?

A. No, I have not.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe my review of the electric DSM programs of Tampa Electric Company (TECO or the Company); significant increases which I believe the company could achieve to its planned DSM impacts on energy requirements and peak demands; and whether there are DSM measures reasonably available to TECO that would further mitigate the need for the proposed plant.

Q. How is your testimony organized?

A. My testimony is organized as follows:

1. Introduction and Qualifications.
2. Summary of Conclusions and Recommendations.
3. Increasing DSM Impacts Under the RIM Test Constraint
4. Increasing DSM Impacts Based on Total Ratepayer Benefits
5. DSM Impacts on the Company's 2013 Capacity Need

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your conclusions.

A. My primary conclusions are summarized as follows:

1. Pending in Docket 070375-EG is a modified TECO Demand Side Management Plan. Based on this Plan, TECO states in the present docket for the proposed Polk Unit 6 that it has identified all of the cost-effective DSM program potential in its service area for the years 2007 through 2014. This conclusion is not supported by analysis of TECO's filings in the DSM docket or in this docket.

2. The customer financial incentives employed in the Company's modified DSM proposal are low, as low as two percent of the customer's cost for an efficiency measure. Increased incentives would increase customer participation levels and the energy and demand impacts of the Company's DSM.

3. The Company offers no financing program, whereby the utility advances the money needed by the customer to invest in qualifying DSM measures and the customer then repays this money through the utility bill, out of his or her energy savings. Offering such a financing program would increase customer participation levels and the energy and demand impacts of the Company's DSM.

4. Under the Rate Impact Measure (RIM) test constraint on DSM cost-effectiveness, there is room for the Company to both increase incentives and offer a financing program, as described above. Since DSM impacts can be increased through these means, the Company has not succeeded in identifying all the cost-effective DSM program potential in its service area for the years 2007 through 2014.

5. If the Total Resource Cost (TRC) test for DSM cost-effectiveness is used instead of the RIM test, there is even more room for the Company to increase

incentives, and additional measures can be added to its DSM program, while at the same time a financing program can be added, as described above.

6. Both the level of DSM potential realized by the Company in the past, and that planned for the future, necessarily affect the magnitude and timing of projected future capacity needs, such as those asserted in the present docket. While it is difficult to determine the quantity of additional DSM available at this time without further information from TECO, it is clear that additional DSM beyond that in the modified DSM Plan is reasonably available, and that further load reductions can be achieved that might further mitigate the need for the proposed plant.

Q. Please summarize your recommendations.

A. In order to assure that the Company both identifies and pursued all the cost-effective DSM program potential in its service area for the years 2007 through 2014 and beyond, the Commission should direct the Company to evaluate all of the DSM that is achievable if both customer incentive levels and the array of DSM measures offered through its programs are increased as much as possible under the TRC test, and at the same time a customer efficiency financing program is offered as part of TECO's DSM programming. The Commission should also:

1. Direct the Company to report in this docket the changes to its reliability analysis that would result from implementing such an expanded DSM program.

2. Waive the RIM test DSM constraint for TECO in light of its apparently mounting capacity needs.

3. Consider approving this expanded TECO DSM program as soon as possible after appropriate review.

Q. What if the Commission is disinclined to relax the RIM test constraint for TECO DSM?

A. In this event, the Commission should direct the Company to evaluate all of the DSM that is achievable if customer incentives are increased as much as possible under the RIM test constraint, and at the same time a customer efficiency financing program is offered as part of TECO's DSM program. The Commission should also direct the Company to report in this docket the changes to its reliability analysis that would result from implementing such an expanded DSM program. Finally, the Commission should consider approving this expanded TECO DSM program as soon as possible after appropriate review.

3. INCREASING DSM IMPACTS UNDER THE RIM TEST CONSTRAINT

Q. Has the Company successfully identified all the cost-effective DSM program potential in its service area for the years 2007 through 2014?

A. Based on my review of their recent Petition to the Commission for modifications to their DSM Plan, I believe the Company has not identified all the DSM potential that would be cost-effective under the constraint of the Rate Impact Measure (RIM) cost-effectiveness test. In the next section of my testimony I will address cost-effective DSM potential that may not pass the RIM test; but in this section I focus on DSM that can pass the RIM test.

Q. Please explain how you conducted this aspect of your review.

A. I relied primarily on the Petition for Modifications to Tampa Electric Company's Demand Side Management Plan, as filed with the Commission on June 15, 2007 (Docket 070375-EG), supplemented by other information provided by the Company and as identified herein. I would like to begin by discussing Appendix C of the Docket 070375-EG Petition, which starts on page 163 and describes the cost-effectiveness screening of each component of the proposed modified Plan. Going through Appendix C, I took note of the prospective benefit-to-cost (B/C) ratio under the RIM test as estimated for each option through the Company's screening analysis.

Q. What did you observe about the RIM test results?

A. I observed that the result for each option was well above 1.0, the level at which a program becomes cost-effective under this test. For eight residential energy efficiency options, for example, the RIM test results ranged from a low of 1.2 for the low-income weatherization program to a high of 1.9 for the residential wall insulation measure. For 14 commercial/industrial options, the RIM test results

ranged from 1.2 for two commercial cooling measures to over 2.0 for the occupancy sensor (a lighting measure).

Q. What do these results mean to you?

A. To me, these results mean that the Company should increase the incentives it provides to customers to participate in all of its programs, as this would be likely to result in increased customer participation and thereby to greater total savings in annual energy use and peak demands.

Q. Please explain your conclusion.

A. Incentives to help defray the cost of conservation measures or the extra costs of more efficient equipment are intended to increase customer investment in energy efficiency by making it more affordable. The incentives to customers that are provided in Company DSM programs are a cost element in a RIM test framework. In order to capture a larger amount of DSM potential, the incentives should be increased until costs equal benefits. Looking at the RIM test, the B/C should be at 1.0, and not above that level.

For example, the Company screening of the "residential wall insulation" measure assumes a customer incentive that equals only 14 percent of the total cost of this measure. Yet its RIM "score" is 1.9. Clearly, the incentive for customers to install this measure could be increased above this low level, until the RIM result falls to 1.0.

Another example comes from the commercial lighting area, where the proposed incentive for occupancy sensors amounts to 2 percent of customer costs, yet the RIM result is over 2.0. Again, the incentive for customers to install this measure could be increased above the proposed level, until the RIM result falls to 1.0.

The same procedure should be followed for every program.

The participation and energy and demand impacts which TECO now projects for each program assume the parsimonious incentives described above. All else equal, increasing the customer incentives will increase these program impacts.

Q. But shouldn't the RIM result be above 1.0, in order to help reduce rates for customers?

A. No, even if the RIM test is used, the aim should not be to reduce rates. The purpose of DSM is to reduce total energy resource costs and environmental impacts going forward, If the RIM is at 1.0, this objective is furthered without any overall rate increase. In a later section of my testimony I urge that the Commission to focus on a broad cost-effectiveness criterion such as the TRC test, because requiring that each DSM program pass the RIM test constrains the ability of utilities to reduce total energy resource costs and environmental impacts for all ratepayers going forward. My point here is that even if the RIM test is the focus, the Company can and should increase customer incentives in all its programs in order to more fully exploit DSM potential.

Q. Is there anything the Company can do to increase DSM impacts, besides increasing customer DSM incentives?

A. Yes, there is. In reading the DSM program descriptions in Appendix B of the Docket 070375-EG Petition for DSM modifications, I did not see any description of financing services to help customers pay for their DSM measures costs over time. Discussions with the company confirmed that no such services are currently available. Under a financing program, the utility or a third party lender advances the money needed by the customer to invest in qualifying DSM measures. The

customer then repays this money through the utility bill, with interest. The repayment schedule is sufficiently long that the customer comes out ahead each month -- that is, the expected electric bill savings from the efficiency measures are greater than the loan repayments.

An on-bill financing program would increase participation in Company DSM programs, but would not add any utility costs (other than for initial set-up of the program). Thus, the costs of DSM would not be greater from a RIM perspective, but customer participation and electricity saving impacts would be greater.

Q. Should the Company develop a customer financing program such as you describe?

A. Yes, the Company should do so for the reasons I have given. The Company might create a financing program of its own design, as some utilities have done. Alternatively, the Company might make use of an existing financing approach that has already been developed and has been pilot tested at a number of utilities. Here I refer to the Pay As You Save® system developed by the Energy Efficiency Institute. The PAYS® system enables building owners or tenants to obtain and install money-saving energy efficiency products with no up-front payment. Those who benefit from the resulting savings pay for the products through a tariffed charge on their utility bill. Like a loan, PAYS allows for payment over time. However, should an occupant move, the obligation to repay remains with the account meter until discharged. So unlike a loan, the customer's PAYS obligation ends if occupancy ends. I recommend that the Company explore the PAYS option, since this may be the most expeditious way to establish a financing program. At the website http://www.paysamerica.org/ more information about PAYS may be obtained.

4. INCREASING DSM IMPACTS BASED ON TOTAL RATEPAYER BENEFITS

Q. Has the Company identified all the DSM program potential that is cost-effective from a total resource cost (TRC) perspective in its service area for the years 2007 through 2014?

A. Based on my review of their Docket 070375-EG Petition, I conclude that TECO has not identified all such potential.

Q. Please explain how you arrived at your conclusion.

A. In Appendix C of the Petition, the Company reports cost-effectiveness screening results from the TRC perspective. In this screening, however, they assume the same low customer incentives that made it possible for each program to pass the RIM test, as described above.

However, broader cost-effectiveness tests, such as the TRC test, would permit much more adequate incentives, such as are employed by the electric utilities elsewhere which have achieved the greatest reported cost-effective DSM impacts in the nation. Customer incentive levels at utilities with comprehensive TRC based DSM programs often average about fifty percent of the incremental cost of the measures, and can be as high as 90 percent of the cost for targeted programs and markets.

In Appendix E of the Company's Petition in Docket 070375-EG, the Company summarizes the DSM impacts it projects through 2014. One simple way to increase impacts that TECO could achieve in this period through the programs it has proposed is to substantially increase each customer incentive. An initial estimate of the increase to DSM savings from increased incentives would be to multiply projected impacts per program by the ratio of an increased

incentive to the presently proposed incentive.

In Exhibit __ (DN-2), I list the Company's and my proposed incentives as a percentage of customer costs to participate, and show the ratios of the two sets of incentives. The table does not include commercial load management/demand response or standby generators, but a similar approach could be taken to those programs as well. The residential incentives I propose are often two to three times those proposed by the Company. My proposed commercial/industrial incentives are generally two to nine times those proposed by the company. If the customer participation and energy savings impacts increase by the ratios of these incentive changes, total DSM achievements will be about four times those projected from the programs in their current form.

I plan to calculate those increased impacts as soon as the Company provides the specific participation and energy and demand impacts which they project for each program. Those projections were not included in its Petition in Docket 070375-EG, but have been requested by SACE through discovery in the present docket. SACE has also requested that the Company perform these calculations. I hope to have the results of the calculations before the time I appear to defend this testimony.

Q. Is there other ways to estimate the DSM potential that is cost-effective from a TRC perspective but would be left untapped by the Company's proposal?

A. Yes, there are. One way is to consider a major recent study, *Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demands*, was published by the American Council for an Energy-Efficient Economy (ACEEE Report Number E072, June 2007). This report is attached as Exhibit __ (DN-3). I have reviewed this report, which appears to be a rigorous study by

respected professionals in the energy field, including personnel from the Florida Solar Energy Center. I am relying on this report, in part, for my opinions in response to this question.

The ACEEE report found that by 2013, statewide annual electricity consumption could be reduced by 7183 GWH and summer peak demand by 1375 MW, through DSM type activities by the electric utilities. An additional summer peak demand impact of nine percent was identified as achievable through utility demand response type activities. In evaluating DSM opportunities, some of the measures ACEEE used are additional to those included in TECO's programs. In addition, ACEEE's customer participation targets and savings projections were based on a broader cost-effectiveness perspective.

I apportioned results from the ACEEE study to the TECO area based on TECO's percentage of statewide electricity consumption and summer peak demand, which is about 8.5 percent in each case. While such a scaling involves some approximations, it can for the basis for an opinion about whether TECO has underestimated DSM potential in its service area. TECO projects a year 2013 impact of 110 GWH from its expanded DSM, according to the testimony in this docket of Mr. Bryant. By contrast, the ACEEE identified potential for that year is some 600 GWH, over 500% more. And compared to TECO's projected year 2013 summer peak impact of 78 MW from its expanded DSM, the implied ACEEE identified potential for that year is 534 MW, well over 600% more. (TECO's winter peaks are somewhat higher than their summer peaks, but winter peak impacts are not readily available from the ACEEE study.)

In sum, the ACEEE report clearly suggests that more aggressive utility DSM informed by a more adequate cost-effectiveness test could realize far more

DSM potential in the TECO area than the Company has so far proposed.

At a more detailed level, the ACEEE report also underscores the inadequacy of the Company's proposed customer incentives for efficient commercial lighting. As Exhibit __ (DN-2) shows, the Company's proposed incentives for major lighting measures are only seven percent of the customer's costs to install such measures. Yet efficient commercial lighting has been a major source of cost-effective electric DSM savings realized around the country. In the ACEEE study of Florida efficiency potential, over half of the savings potential identified in the existing commercial building stock comes from lighting efficiency gains (ACEEE, page 11). Through its parsimonious incentives, TECO is clearly losing major opportunities to save electricity used for commercial lighting.

The ACEEE study also includes a number of efficiency measures that do not appear to be included in the Company's proposed Modified DSM Plan at all. In the residential market, for example, it includes fluorescent lights in lieu of conventional lights (included by TECO only in a low-income program), Energy Star refrigerators, Energy Star dishwashers, heat pump water heaters, highest efficiency storage water heaters, and front-loading clothes washers. These are all measures that are low to moderate in cost in relation to the electric energy which they save over their lifetimes, and they appear in many electric utility DSM programs.

Q. Is there any other way to estimate the DSM potential that is cost-effective from a broader cost-effectiveness perspective, but would be left untapped by the Company's proposal?

A. Yes. It is interesting to compare the magnitude of energy savings and demand reductions that the Company expects to realize from its Modified DSM Plan with the level of achievements that leading utilities realize and plan for. By leading utilities, I mean electric utilities which field comprehensive DSM initiatives that are cost-effective based on a broader screen such as the TRC or Utility test. Under its DSM Plan, TECO would achieve annual incremental savings impacts of about 11 GWH/year, 9 MW summer peak reduction/year, and 10 MW winter peak reduction/year. These impacts as a percent of the utility's loads are very low, a small fraction of a percent in each case. Even on a cumulative basis over nine years through 2013, the impacts are low. In that year, the energy savings from DSM Plan program activity from 2005 forward would only be one-half of one percent of the projected sales in 2013, and the winter and summer demand impacts would only be about 1.6 percent in each case.

Exhibit __ (DN-4) consists of two tables. The first lists energy efficiency savings reported by utilities, all of which have saved a greater portion of electric energy use from one year's worth of DSM than TECO would attain based on several years through 2013. The second lists a mix of achieved and planned peak demand impacts from one year's worth of DSM, all which again are several times greater than TECO's. To me, these achievements and plans by utilities in a variety of regions are indicative of what TECO could strive to achieve if its programming were more adequate and, in particular, if it were freed from a RIM test constraint.

Q. In this section of your testimony, you are identifying DSM potential that TECO would leave untapped due at least in some part to its reliance on the RIM test constraint. Why do you believe the Company and the Commission should not focus on the RIM test in this case?

A. If the Commission relied on a broader test, particularly the TRC test or the Utility Cost test, as its primary indicator for DSM going forward, it would pave the way for more DSM leading to greater reductions in the total revenue requirements of electric utilities and to reductions to the total of electricity bills paid by all customers over time. This would reduce the state's total costs for energy services, while increasing the environmental benefits from DSM. This issue is also addressed by the authors of the ACEEE report. See Exhibit __ (DN-3), page 18.

Q. If the Commission adopts a broader test for DSM, and TECO can as a result increase its customer incentives as well as the array of efficiency measures it promotes through DSM, would there still be a role for the financing services to help customers pay for their DSM measures costs, such as you discussed earlier in your testimony?

A. Yes, there would be a role for such services. For TECO to offer a financing program such as PAYS would make it easier for customers to participate and would amplify even further the effects of an enhanced DSM program.

5. DSM IMPACTS ON THE COMPANY'S 2013 CAPACITY NEED

Q. What capacity need has the Company identified in this docket?

A. In his testimony, Mr. Smotherman states that the Company has identified a requirement for an additional 482 MW of firm supply resources in Summer 2013, and 576 MW of firm supply resources in Winter 2013. The need identified by Mr. Smotherman may take account of the year 2013 DSM impact projections from the Company's proposed modified DSM Plan, which as identified in the testimony of Mr. Bryant are 78 MW and 84 MW, respectively.

Q. Would additional DSM beyond what the Company has proposed reduce the magnitude of the capacity needs the Company has identified?

A. I believe that it would. For example, I indicated earlier that the ACEEE study implies that a total reduction of 534 summer peak MW may be achievable in the TECO area through cost-effective utility energy efficiency and demand response programs. At a reserve margin requirement of 20%, such a decrement would obviate the need for 640 MW of summer capacity.

I also expect that calculation of the additional DSM achievable through increased customer incentives, particularly if the RIM test constraint is relaxed, will show that summer and winter peak demand reductions above the levels described by the Company's new DSM projections are attainable.

Q. Have you performed an overall evaluation of the need for Polk Power Plant Unit 6?

A. No, I have not evaluated the Integrated Resource Planning modeling and the economic analyses performed by the Company to demonstrate the need for the proposed Polk Unit 6. I have limited my evaluation to the question of whether the Company has identified all of the cost-effective DSM program potential in its service area for the years 2007 through 2014, as is asserted by Mr. Bryant. For the reasons described above, I believe the

Company has not succeeded at identifying all of this potential or at including it in its proposed DSM Plan. By including additional achievable DSM in its Plan, the Company could reduce the capacity need in response to which it has proposed Polk Unit 6.

Q. Based on your findings, what would you recommend to the Commission in this docket?

A. My overall recommendation is that the Commission act to encourage more aggressive and effective DSM programs from TECO. Had TECO achieved greater DSM impacts in the recent past, this would have reduced the firm supply requirements it now foresees. Similarly if TECO achieves greater DSM impacts in the future than it now plans, this will affect future evaluations of capacity needs. The link between success at demand-side DSM and the level of capacity need in the future is inexorable. The Commission should act to accelerate the pace of future DSM and tie these actions to its determination in this docket, whether or not Polk Power Plant Unit 6 is found necessary.

Q. How specifically might the Commission act to accelerate the pace of DSM?

A. I would recommend that the Company be directed to evaluate all of the DSM that is achievable if both customer incentive levels and the array of DSM measures offered through its programs are increased as much as possible under the TRC test, and at the same time a customer efficiency financing program is offered as part of TECO's DSM programming. The Commission should also:

1. Direct the Company to report in this docket the changes to its reliability analysis that would result from implementing such an expanded DSM program.

2. Focus in this case on a broad DSM cost-effectiveness criterion such as the TRC test, and not exclusively on the RIM test.

3. Consider approving this expanded TECO DSM program as soon as possible after appropriate review.

Q. What if the Commission is not willing to focus on a broad cost-effectiveness test such as the TRC test for TECO DSM?

A. In this case, the Commission should direct the Company to evaluate all of the DSM that is achievable if customer incentives are increased as much as possible under the RIM test constraint, and at the same time a customer efficiency financing program is offered as part of TECO's DSM program. The Commission should also direct the Company to report in this docket the changes to its reliability analysis that would result from implementing such an expanded DSM program. Finally, the Commission should consider approving this expanded TECO DSM program as soon as possible after appropriate review.

Q. Does this conclude your testimony?

A. Yes, it does.

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Synapse Energy Economics Inc., Cambridge, MA. *Senior Consultant,* 2007 - present.
Analysis and consulting on energy policy, climate change, renewable energy, energy efficiency, comsumer advocacy, environmental compliance and technology and business strategy within the energy industry.

Independent research, analysis, and consulting, 2002 – present.
Energy work includes efficiency studies, rate design, performance-based ratemaking, renewable energy, technology assessment, cost benefit analysis, design and evaluation of demand-side load response and efficiency programs, and policy analysis.

Tellus Institute for Resource and Environmental Strategies, *Vice President and Director*, 1977-2002.
Energy consulting on myriad topics. Led Industrial Eco-Efficiency (E2) Initiative to promote integrated assessment of pollution prevention and energy efficiency. The Initiative created software for financial analysis of projects within firms, and the *E2 Financing Directory*, a U.S. EPA data base of resources for New England businesses seeking financing for E2 projects.

State University of New York at Albany, Allen Center and Graduate School of Public Affairs, *Associate Professor,* 1974-1978

Rensselaer Polytechnic Institute, Department of History and Political Science, *Assistant Professor,* 1973-1974.

Department of Environmental Conservation, Albany, New York, *New York Civil Service Public Administration Intern,*1973.

EDUCATION

Clark University, (A.B.)
University of Chicago
Massachusetts Institute of Technology, (Ph.D.)

EXPERT TESTIMONY*

Rate Design & Cost Allocation
Before:
Nevada Public Service Commission, docket 94-7001 (1995)
New Jersey Board of Public Utilities, docket ER02080506 (2003)
New York Public Service Commission, case 91-E-1185 (1991)
Ontario Energy Board, H.R. 24 submission (1996)
Rhode Island Public Utilities Commission, docket 2036 (1992)
Utah Public Service Commission, docket 02-057-02 (2002).

Energy Efficiency & Renewable Energy
Before:
Colorado Public Utilities Commission, dockets 99A-377EG (1999), 00A-008E (2000)
Delaware Public Service Commission, docket 94-83 (1995)
Maine Public Utilities Commission, docket 91-213 (1992)
New Jersey Board of Public Utilities, dockets EX04040276 (2004), GR01040280 (2001), EX99050347 (2000 and 1999), EE98060402 (1998), EX94120585U (1998), ER97020101 (1997)
North Carolina Utilities Commission, docket E-100 (1990)
Ohio Public Utilities Commission, cases 91-700-EL-FOR (1993), 92-708-EL-FOR (1992)
Ontario Energy Board, EBROs 497 (1998), 495 (1997), 487 (1994)
Utah Public Service Commission, docket 01-035-01 (2001)
Vermont Public Service Board, docket 5330 (1990)
Wisconsin Public Service Commission, dockets 05-CE-117 (2002), AP7 (1995)

*Testimony listed here was defended before agencies noted. Testimony that was filed but not heard is listed in the next section. List of testimony prior to 1990 available upon request

PUBLICATIONS, PAPERS & REPORTS

2007: **Independent Administration of Energy Efficiency Programs: A Model for North Carolina.** A Synapse Energy Economics report to Clean Water for North Carolina. Senior author.

2005: **New Jersey's Proposed Renewable Portfolio Standards Rule: Analysis and Recommendations**. Report to: New Jersey Division of the Ratepayer Advocate.

2005: **Emerging Technologies for a Second Generation of Gas Demand-Side Management.** Draft report to: Enbridge Gas Distribution Inc. and Union Gas Ltd. Senior author.

2004: **Policy & Program Actions: Buildings & Facilities.** For the Stakeholders of the Rhode Island Greenhouse Gas (GHG) Process to develop the RI Climate Change Action Plan.

2002: **Final Report on Energy Efficiency and Renewable Energy.** Report of the Air Pollution Prevention Forum to the Western Regional Air Partnership.

Development Of Options: Scoping Paper. For the Working Group on Buildings & Facilities of the Rhode Island GHG Process. Senior author.

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2001: **"Load Response: New, or Déjà Vu?"** in *Electricity Journal*, vol. 14, no. 4, May. Co-author.

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"The Role of Regulators in Promoting Energy Efficiency and Renewable Technologies," in *Pace Environmental Law Review*, vol. 18, no. 2.

2000: **Measuring Results from Climate Change Programs: Performance Indicators for GEF.** Global Environmental Facility Monitoring and Evaluation Working Paper 4. Co-author.

Institutional and Governance Issues V.1: Planning Approaches. A Thematic Review published by the World Commission on Dams. Principal author.

Best Practices Guide: Integrated Resource Planning for Electricity. US Agency for International Development and the Institute of International Education, Washington, D.C. Co-author.

Paper, "What's A Policy Maker To Do?" Western Regional Air Partnership Air Pollution Prevention Forum, Scoping of Energy Efficiency. San Francisco, May.

Paper, "State Renewable Energy Policies." Spring 2000 Conference of the National Pollution Prevention Roundtable.

***Reducing Peak Demands Through Customer-Side Initiatives*.** Report to Citizens Utility Board, Chicago. Tellus Study 00-061. Senior author.

1999: **Regulatory Incentives for Demand-Side Management.** Report to the West Kootenay Power Company Demand-Side Management Committee. Tellus Study 98-211.

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Paper, "Auditing Performance in a 'Standard Offer' Efficiency Program," in Evaluation in Transition. Proceedings of the 1999 International Energy Program Evaluation Conference, pp. 649-656. Co-author.

1998: **Incentive Rate Regulation and Integrated Resource Planning.** Pre-filed testimony on behalf of the Regroupement national des Conseils régionaux de l'environnement du Québec. Co-author.

Incentives for DSM Performance. Pre-filed testimony on behalf of Enbridge Consumers Gas; Ontario Energy Board EBRO 497-01, Exhibit C, Appendix D.

Energy Efficiency in Colorado: Progress and Potential. Report to the Governor's Office of Energy Conservation and Management. Tellus Study 98-002/C1.

Gas Energy Efficiency Technologies: Cost-Effectiveness Screening. Report to the Massachusetts Division of Energy Resources. Tellus Study 96-180/C. Senior author.

Institutional Conservation Program Process Evaluation Report. Report to the Ohio Department of Development, Office of Energy Efficiency. Tellus Study 95-247. Co-author.

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1996: **Article, "Gas Utility Portfolio of Market-Oriented DSM,"** in *Strategies*, vol. 7, no. 3.

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demand-side management issues in a Public Service Electric & Gas Co. matter that was settled. Prepared for the Division of the Ratepayer Advocate. Tellus Study 95-101.

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Paper, "Industrial Demand-Side Management in Transition," in *Partnerships, Productivity, and the Environment,* Proceedings of the ACEEE 1995 Summer Study on Energy Efficiency in Industry, Volume II, pp. 197-208.

1994: **Evaluation of Pacific Gas & Electric Company's Interruptible Bidding Program.** Report to the Advisory and Compliance Division, California Public Utilities Commission. Tellus Study 93-136. Project Manager.

Report to the Staff of the Arkansas Public Service Commission Concerning SWEPCO's Proposed Promotional Practices. Tellus Study 92-153C. Co-author.

Reviews of Metropolitan Edison Co., Pennsylvania Power & Light Co. and Pennsylvania Electric Company 1995 Demand Side Management Filing. Prepared for the Pennsylvania Office of Consumer Advocate. Tellus Study 94-071. Co-author.

Review of Union Electric Company's Electric Utility Resource Planning Compliance Filings. Prepared for the Missouri Office of Public Counsel. Tellus Study 93-254. Co-author.

1993: **Advertising Costs in Demand-Side Management Programs.** Report to Corporation Commission Staff, Phoenix, Arizona. Tellus Study 93-103. Principal investigator.

Economic Opportunities Through Energy Efficiency and the Energy Policy Act of 1992. Jefferson City: Environmental Improvement and Energy Resources Authority. Report to the Missouri legislature pursuant to House Concurrent Resolution 16. Co-author.

Integrated Resource Planning Concepts and Approaches. Report to Hydro-Québec and the Public Interest Groups and Associations. Tellus Study 92-155. Co-author.

Proposed Rules Governing Integrated Resource Planning for Electric and Natural Gas Utilities Regulated by the State of Kansas. Tellus Study 92-105. Co-author.

Gasco Integrated Resource Plan Report. Before the Public Utilities Commission of Hawaii, docket No. 7261. Prepared for The Gas Company of Hawaii. Tellus Study 92-181. Co-author.

1992: **Evaluation of Public Service Electric & Gas Demand-Side Management Resource Plans,** docket no. EX-90040304. Report to the New Jersey Rate Counsel Division, Department of Public Advocate. Tellus Study 92-055. Principal investigator.

Evaluation of Atlantic Electric DSM Resource Plan, docket no. EX90040304. Report to the N.J. Rate Counsel. Tellus Study 92-055B. Principal investigator.

Paper, "Bidding for Performance: The Large Commercial Gas Conservation Program at Wisconsin Gas Company," in *Implementation of Demand-Side Management*, Proceedings of the National DSM Implementation Conference, pp. 84-90. Bala Cynwyd, PA: Synergic Resources Corporation, 1992. Principal author.

1991: **Paper, "Gas Substitution in Electric Utility DSM,"** in *Proceedings: 5th National Demand-Side Management Conference.* Palo Alto, CA: Electric Power Research Institute, Report EPRI CU-7394, pp. 231-234.

Comments of Pennsylvania Office of Consumer Advocate on the Pennsylvania Power and Light Company Demand-Side Management 1991 Plan. Tellus Study 90-201D. Principal investigator.

Improved Energy Efficiency Through Building Standards: An Opportunity for Long Island. Report to Long Island Power Authority. Tellus Study 90-028/BC. Co-author.

Long Island Power Authority Comments on the LILCO 1991-92 and 1990 Long Range Electric Conservation & Load Management Plan. Tellus Study 90-028. Principal investigator.

1990: **Conservation and Capacity Optimization Alternatives to the PGT/PG&E Gas Pipeline Project.** Report to the California Public Utilities Commission. Tellus Study 90-003. Co-author.

Savings from the Smart Money Program: An Audit of the 125 MegaWatt Demand Reduction. Report to Wisconsin Electric Power Company and the Wisconsin Public Service Commission. Tellus Study 89-127. Principal investigator.

Paper, "Tracking Results in Demand-Side Management Programs," in *Demand-Side Management Conference*. Toronto: Canadian Electrical Association, pp. 344-356.

Paper, "Tracking Activity and Results in DSM Programs," in *Proceedings, ACEEE 1990 Summer Study on Energy Efficiency in Buildings,* pp. 6.109-6.118. Principal author.

Article, "The Conservation Utility: A New Institutional Approach," in UNEP's *Industry and Environment Review*, Vol. 13, No. 2. Co-author.

List of publications & papers prior to 1990 available upon request.

OTHER PROFESSIONAL ACTIVITY

2007 — Consultant to Nova Scotia Utility and Review Board for Nova Scotia Power's electric integrated resource planning process.

2001-2007 — Technical consultant to the Rhode Island Department of Environmental Management for the state's greenhouse gas process and *Climate Change Action Plan.*

1996-2007 — Consultant to the New Jersey Division of Rate Counsel for:

- New Jersey Clean Energy Council;
- New Jersey Energy Master Plan;
- Governor's Renewable Energy Task Force;
- comments on draft electricity & gas restructuring legislation;
- advice to Consumer Protection Task Force (restructuring issues);
- evaluation of off-tariff rate agreements; and
- evaluation of gas and electric utilities' DSM cost recovery.

1994-99; 2004-5 — Consultant to Enbridge Gas Distribution Inc. (Ontario) for development and implementation of natural gas demand-side energy efficiency plans and programs.

2004-5 — Consultant to Enbridge Gas - New Brunswick for development of an electric demand-side energy efficiency system for New Brunswick.

2002-3 — Consultant to the Western Regional Air Partnership for the Air Pollution Prevention Forum's *Final Report on Energy Efficiency and Renewable Energy* and supporting technical analyses.

2002 — Presentation to National Association of Energy Service Companies, Mid-Year Conference, Chicago.

2002 — Lead instructor, U.S. Agency for International Development (USAID) training

	courses in Electric Resource Planning and Demand-Side Management. Bangalore and Jaipur, India.
2002	Instructor, USAID training course in Integrated Resource Planning. Jakarta, Indonesia.
1999	Lead instructor, USAID training course in Electric Resource Planning at Tellus Institute, Boston.
1998	Presentation to the Advisory Committee on Resource Planning of the Québec Energy Board, Montreal.
1998	Panelist, Pollution Prevention & Energy Efficiency Training Session, Pollution Prevention Roundtable Conference, Cincinnati.
1996	Consultant to the Kentucky Attorney General—technical assistance on utility cost recovery for demand side management programs.
1995-1998	Consultant to Massachusetts Division of Energy Resources for development of policy, program and cost-effectiveness frameworks for gas utility demand-side management.
1995	Consultant to Nevada Office of Advocate for Customers of Public Utilities for assessment of Sierra Pacific Power integrated resource plan, docket 95-5001.
1994-98	Consultant to The Gas Company of Hawaii for development of DSM programs.
1992-95	Technical agent to the commissioners, District of Columbia Public Service Commission, Formal Case No. 917, phases I and II.
1993-4	Consultant to the Staff of the Arkansas Public Service Commission for review of the integrated resource plans of three electric utilities.
1993	Technical agent to the commissioners, D.C. Public Service Commission, Formal Case No. 929.
1992-93	Consultant to Ohio Office of Consumers' Counsel for training of staff and assessment of utility integrated resource plans.
1990-93	Consultant to Long Island Power Authority for implementation of conservation programs and participation in New York PSC cases 28223, 91-E-0382, and 92-E-0291.
1992	Consultant to Minnesota Office of Attorney General for assessment of Northern States Power integrated resource plan, docket E-002/RP-91-682.

1990-91	Consultant to Connecticut Municipal Electric Energy Co-operative. Commercial customer surveys, end-use data base development, and DSM option screening.
1990	Presenter, "Evaluating Residential Conservation Programs," at "Affordable Comfort IV" Conference, Philadelphia.
1990	Consultant to Wisconsin Gas Company: preparation and implementation of gas DSM bid.
1988-90	Independent representative on three-party panel administering Madison (Wisconsin) Gas & Electric Company conservation competition pilot program.

Other professional activity prior to 1990 available upon request.

Exhibit __ (DN-2)

HIGHER DSM INCENTIVES VS. TECO PROPOSED DSM INCENTIVES

TECO Program or Measure	Utility Incentives as Percentage of Customer cost		Alternative vs. TECO
	TECO	Alternative	Ratio
RESIDENTIAL			
Cooling -- efficient heat pump	26	50	1.9
Cooling -- duct repair	82	90	1.1
Shell -- ceiling insulation	20	50	2.5
Shell -- wall insulation	14	50	3.5
Shell -- windows upgrade	20	50	2.5
Shell -- window film	18	50	2.8
Residential new construction	27	50	2.2
Low income weatherization	100	100	1.0
COMMERCIAL/INDUSTRIAL			
Duct repair	31	50	1.6
Solar window film	18	50	2.8
Ceiling insulation	19	50	2.6
Wall insulation	21	50	2.4
Efficient motors	9	50	5.3
Cooling equipment -- direct expansion	20	50	2.5
Cooling equipment -- package terminal air conditioner	20	50	2.5
Cooling equipment -- chiller replacement	9	50	5.5
Lighting -- conditioned space	7	50	7.0
Lighting -- unconditioned space	7	50	7.0
Lighting -- occupancy sensor	2	20	9.6
Refrigeration (anti-condensate)	6	50	9.0
Efficient water heating	17	50	2.9
“Conservation Value” (custom measures)	13	40	3.2

Calculated from Appendix C of TECO Petition, Docket 070375-EG.
TECO incentives are rounded to the nearest whole percent.

Exhibit__(DN-3)
See attached document titled
Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demands (June 2007)

DSM Achievements and Plans of Selected Utilities

Table 1
Annual Electric Energy Savings Realized Through DSM

Jurisdiction or Entity	Annual Savings %	Year(s)	Source
SDG&E (CA)	2.0	2005	SDG&E 2006, *Energy Efficiency Programs Annual Summary*
California	2.0	2001	ACEEE 2004 paper
Southern California Edison	1.7	2005	SCE 2006, *Energy Efficiency Annual Report*
Massachusetts Electric Co.	1.3	2005	MECo 2006, *2005 Energy Efficiency Annual Report Revisions*
Sacramento Municipal Utility District (CA)	1.2	1991 - 1996	Data provided by SMUD
Connecticut	1.1	2005	CT Energy Conservation Mgmt. Board, 2006
Vermont	1.0	2005	Summit Blue, *NSPI Inc.: DSM Report*, 2006
Western Mass. Electric Co.	1.0	1991 - 2001	MA Dept. of Telecommunications & Energy 2003, *Electric Utility Energy Efficiency Database*

Table 3
Actual and Projected Peak Load Reduction Through DSM

Type of Analysis	State/Utility	Period	Average Annual Peak Saving as % of Summer Peak Load	Source
Actual	CT	2003-05	1.5	CT ECMB
Projected (potential study)	CT	2003-12	1.3	GDS Associates 2004
Actual and projected	VT	2003-06	0.8	Efficiency Vermont
Projected (transmission study)	VT	2003-20	0.45	VELCO 2006
Projected (potential study)	New England	2004-2013	4. (2004-08) and 5.8 (2008-13)	Optimal Energy 2004
Projected (IRP)	Avista	2004–08	0.8	LBNL 2006*
Projected (IRP)	BC Hydro	2004–08	1.1	LBNL 2006
Projected (IRP)	PacifiCorp	2004–08	0.5	LBNL 2006
Projected (IRP)	PGE	2004–08	0.7	LBNL 2006
Projected (IRP)	PSCO	2004–08	1.0	LBNL 2006
Projected (IRP)	PSE	2004–08	1.4	LBNL 2006
Projected (IRP)	PG&E	2004–08	1.1	LBNL 2006
Projected (IRP)	SCE	2004–08	1.4	LBNL 2006
Projected (IRP)	SDG&E	2004–08	1.9	LBNL 2006
Projected (IRP)	Sierra Pacific	2004–08	0.5	LBNL 2006

*As reported in LBNL 2006, *Energy Efficiency in Western Utility Resource Plans*