PUBLIC SERVICE COMMISSION OF NEVADA

IN THE MATTER of the application of	)
SIERRA PACIFIC POWER COMPANY, for	)
Approval of its Three-Year Action Plan for its	)
Gas Demand-Side Programs	)

Docket No. 05-10021

Direct Testimony of Timothy Woolf

On Behalf of The Nevada Bureau of Consumer Protection

Regarding the Sierra Pacific Power Company's Gas Demand-Side Management Plan

February 22, 2006

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1. INTRODUCTION AND QUALIFICATIONS

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

A. My name is Timothy Woolf. I am the Vice-President of Synapse Energy Economics, Inc, 22 Pearl Street, Cambridge, MA 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 TW-1. Electric power system planning and regulation have been a major focus of my professional activities for the past twenty-three years. In my current position at Synapse, I investigate a variety of issues related to the electric industry; with a focus on energy efficiency, demand-side management (DSM), renewable resources, environmental policies, and many aspects of consumer protection.

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

A. Before joining Synapse Energy Economics, I was the Manager of the Electricity Program at Tellus Institute, a consulting firm in Boston, Massachusetts. In that capacity I managed a staff that provided research, testimony, reports and regulatory support to state energy offices, regulatory commissions, consumer advocates and environmental organizations in the US. Prior to working for Tellus Institute, I was employed as the Research Director of the Association for the Conservation of Energy in London, England. I have also worked as a Staff Economist at the Massachusetts Department of Public Utilities, and as a Policy Analyst at the Massachusetts Executive Office of Energy Resources. I hold a Masters in Business Administration from Boston University, a Diploma in

Economics from the London School of Economics, a BS in Mechanical Engineering and a BA in English from Tufts University.

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

A. I am testifying on behalf of the Nevada Bureau of Consumer Protection (BCP).

Q. Have you testified previously before this Commission?

A. Yes, in September 2001 I testified before this Commission on behalf of the BCP with regard to the Nevada Power Company's Demand-Side Management Plan, in Docket No. 01-7016.

Q. Have you been involved in DSM activities in Nevada recently?

A. Yes, since 2001 I have been an active participant in the Nevada DSM Collaborative, on behalf of the Bureau of Consumer Protection.

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 review and critique the Sierra Pacific Power Company's (the Company) Gas Demand Side Management (DSM) Plan. The BCP's primary goal in this docket is to ensure that the gas DSM programs are cost-effective and will provide meaningful benefits to gas customers. The BCP also seeks to ensure that the gas DSM programs are well-designed, include appropriate efficiency measures, and cover the appropriate number of customers and customer types.

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary conclusions.

A. My primary conclusions include the following:

- The BCP generally supports the overall concept of the Company ramping up gas DSM programs at this time. Cost-effective gas DSM programs will help reduce customer's bills, lower the overall cost of providing gas services, help

mitigate the risks associated with fossil-fuel price increases, reduce air emissions and help improve the local economy in northern Nevada.

- The Company's Gas DSM Plan is poorly documented, and does not contain sufficient information to properly assess the advantages and disadvantages of the proposed programs. I received an updated Gas DSM Plan on Friday, February 17, 2006 via e-mail. This was only two business days before this testimony was due, on February 22, 2006. This updated Gas DSM Plan apparently provides some important supplemental information, but was not provided in time for me to review it.

- I have not been able to make a determination as to whether the proposed gas DSM programs are cost-effective. The updated Gas DSM Plan indicates that the programs are cost-effective, but as noted above this updated plan was provided to me only two business days before this testimony was due, which did not provide me sufficient time to review the Company's assumptions and analysis.

- The proposed gas DSM programs are generally well-designed, and cover some of the critical efficiency measures for existing residential gas customers. However, there are several key gas efficiency measures that are not included in the proposed programs.

- The proposed gas DSM programs do not serve as many customer types as they should. In particular, they do not address the residential new construction market, nor do they provide any efficiency opportunities for commercial customers.

- The Technology Assessments program is not necessary and does not provide meaningful benefits to the Company, its DSM programs, or to its customers.

- The gas DSM program budgets for 2007, 2008 and beyond could be expanded to capture a larger portion of the gas efficiency opportunities available in Northern Nevada. Additional budgets could be used to (a) include additional

efficiency measures in the current programs, (b) serve additional customer types, and (c) expand the proposed programs to serve additional customers.

Q. Please summarize you primary recommendations.

A. I recommend the following:

- I recommend that the Commission establish a regular, periodic gas DSM planning and reporting process. The process would include (a) an Annual Gas DSM Plan to be filed in the autumn of each year, describing the plans for the subsequent year, (b) an Annual Gas DSM Report to be filed in the spring of each year, describing the activities and results from the previous year, and (c) an Annual Monitoring and Verification Plan describing how the Company plans to monitor and verify each of the gas DSM programs. Each of these documents should include standardized reporting requirements, formats and tables, in order to streamline the production and review of critical DSM data.

- If the Company presents sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective, then I recommend that the Commission approve the gas DSM program budgets for 2006. With the exception of the budgets for the Technology Assessment program, which should not be approved.

- If the Company presents sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective, then I recommend that the Commission require the Company to expand the proposed gas DSM programs for 2007 to include additional measures and serve additional customer types.

- If the Company does *not* present sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective, then I recommend that the Commission require the Company to revisit its program designs and assumptions in order to develop gas DSM programs that are cost-effective.

- The Commission should require the Company to file a 2007 Gas DSM Plan by the autumn of this year. The Commission should specify that the 2007 Gas

DSM Plan should (a) investigate opportunities for offering additional efficiency measures and programs, and (b) seek opportunities to increase the DSM program budget to at least 0.7 percent of retail gas revenues by 2007, and to at least 1.0 percent of retail revenues by 2008.

3. GAS DSM PROGRAM DOCUMENTATION

Q. Does the Company's filing in this docket provide adequate documentation of the proposed gas DSM programs?

A. No. The Gas DSM Plan, and the direct testimony of Lawrence Holmes that accompanies it, includes very little information to support the gas DSM programs and activities.

Q. In what way is the Gas DSM Plan insufficiently documented?

A. The gas DSM Plan does not include many key pieces of information that the Commission, the BCP and others need to properly review the programs. In one of the most egregious examples, the Plan does not include the results of the cost-effectiveness analysis from the perspective of the Utility test, and yet the Company is asking that the Utility test be used to demonstrate that the programs are cost-effective. (Company Response to Discovery Request BCP 1-12.)

There are several other key pieces of information missing from the Gas DSM Plan, including:

- The Plan does not include a breakout of how the budgets will be spent, in terms of administration, contractor, marketing, rebates, and monitoring and evaluation costs.
- The Plan does not include a discussion of how the budgets for each DSM program were determined, or how the number of customers served was determined.
- The Plan does not present the key assumptions used in the economic analysis of the DSM programs.

- The Plan does not present the results of the economic analysis of the DSM programs from the perspective of the Utility test, the Participant test, the Ratepayer test, or the Societal test.
- The Plan does not describe how the Company determined the rebate levels for the DSM programs.
- The Plan does not describe how the Company intends to market and deliver the DSM programs.
- The Plan does not describe how the Company intends to coordinate the three gas DSM programs with each other, or how to coordinate the gas DSM programs with the electric DSM programs that it operates.

Q. Why is it important that the Company's gas DSM Plan include such information?

A. The information listed above is essential for the Commission, the BCP or anyone else to determine if the proposed programs are cost-effective, are well-designed, will provide benefits to gas customers, and are in the public interest in general. This information is routinely provided by electric and gas utilities in other jurisdictions, and should be considered standard practice for any DSM regulatory filing. Without some of the information listed above it is very difficult, if not impossible, for the BCP to make a finding as to whether the proposed gas DSM programs are reasonable or prudent.

Q. Did the discovery responses and additional information provided by the Company help improve the documentation?

A. I was able to obtain much of the information I needed for this testimony through discovery requests. However, some of the key information with regard to the economic analysis was not provided to me in time to incorporate into my testimony. I received an updated Gas DSM Plan, including updated and significantly expanded versions of the project data sheets, on Friday February 17, 2006. This was only two business days before my testimony was due, on February 22, 2006. Because of the need to review the information, formulate conclusions, re-draft my testimony, and allow my client to review the testimony, I

did not have enough time to incorporate this important new information into my testimony.

Therefore, I have been unable to prepare a complete assessment of the gas DSM programs in this testimony. In particular, I was unable to assess the Company's economic analysis of its gas DSM programs. I discuss this issue further in Section 4 of my testimony.

Furthermore, the need to rely upon discovery responses is an inefficient and burdensome way to gather data that should be provided as standard practice. Gathering and reviewing the data required unnecessary time and effort, and put me at a disadvantage because of the turnaround time required to obtain information. This disadvantage is particularly burdensome because in some cases follow-up discovery requests were required in order to get all the information necessary.

Q. What do you recommend the Commission do in this proceeding with regard to gas DSM program documentation?

A. The Company's filing represents a fresh start for gas DSM programs in northern Nevada. I recommend that the Commission use the opportunity in this docket to develop the standards and protocols for what information should be provided on an on-going basis to support the review, approval, and modification of gas DSM programs over time. Establishing such standards and protocols now will help streamline the regulatory review of gas DSM programs in the future, will make for more efficient regulatory oversight of gas DSM programs, and will allow the Commission, the Company and intervenors to focus on the more substantive issues related to gas DSM.

Q. What specifically do you recommend the Commission require with regard to standards and protocols for gas DSM regulatory filings?

A. I recommend that the Commission establish a regular, periodic gas DSM planning and reporting process. This process would include at least the following components:

- The Commission should require that the Company file an Annual Gas DSM Plan in the autumn (e.g., September 1) of each year. The Annual Gas DSM Plan would include all the information necessary for the Commission and others to review the gas DSM activities, programs and budgets proposed for the subsequent three years. The regulatory review of these annual plans would be designed to be completed well before the end of each year, in order to give the Company guidance on program budgets and designs for the subsequent year.

- The Commission should require the Company to file an Annual Gas DSM Report in the spring (e.g., April 1) of each year. The Annual Gas DSM Report would provide all the relevant information regarding the gas DSM activities that occurred during the past year. Such information is critical for regulatory review of DSM programs over time, and will be instrumental in supporting the Annual Gas DSM Plan.

- The Commission should require the Company to file an Annual Monitoring and Evaluation (M&V) Plan each year. This plan should be filed in conjunction with the Annual Gas DSM Plan in the autumn of each year, and would be used to demonstrate how the Company plans to monitor and verify each of the programs contained in the Annual Gas DSM Plan. The results of the M&V Plan would be used to create the inputs and results presented in the Annual Gas DSM Report.

- Each of these documents should include standardized reporting requirements, formats and tables. This approach will make it easier for the Company to prepare the reports, by knowing in advance what is required, and will make it easier for the Commission and others to review the reports, by ensuring that all necessary information is available and easy to access. Nevada Power Company has already agreed to work out such standard formats and tables for their electric DSM programs, with input from the BCP and the Commission Staff. The same, or similar, formats can be used for the gas DSM programs.

Q. Are your recommendations regarding the gas DSM planning and reporting process consistent with the Gas Resource Planning Regulations?

A. Yes. The Gas Resource Planning Regulations (NAC 704.953 through NAC 704.973) require the Company to file a Gas Resource Plan every three years. One of the components of that Resource Plan is a three-year plan of action. (The Company's Gas DSM Plan does not directly reference the Gas Resource Planning Regulations, but I assume that the Gas DSM Plan is the equivalent of the Company's most recent three-year plan of action.)

The Gas Resource Planning Regulations allow the Company to file an amendment to its three-year plan of action. My recommendation above for an Annual Gas DSM Plan is consistent with this provision of the Planning Regulations. However, it goes one step further by formalizing a schedule for the filing of amendments, whereby amendments are filed every year and are filed in the autumn of each year in order to allow time for regulatory review before the beginning of the next year.

The Gas Resource Planning Regulations also require the Company to file an annual report of the supply of gas (NAC 704.9705). This annual report must include "a report on the status of each facility and each conservation and load management program in the approved 3-year plan of action" (NAC 704.9705(2)(a)). My recommendation above for an Annual Gas DSM Report is consistent with this requirement of the regulations.

4. GAS DSM PROGRAM COST-EFFECTIVENESS

Q. Have you been able to review the Company's economic analysis of its gas DSM programs?

A. No. I reviewed the economic analysis included in the original Gas DSM Plan. However, as described in Section 3 of my testimony, this plan did not include sufficient information to properly review the economic analysis.

Q. Did the Company provide an updated economic analysis?

A. Yes. On February 17, 2006, I received an email from Larry Holmes with an updated Gas DSM Plan, including updated and significantly expanded project data sheets. However, as described in Section 3 of my testimony, I did not have sufficient time to review the updated Gas DSM Plan. Based on my brief preliminary review, it appears as though most of the changes in the updated Gas DSM Plan are in the economic analysis, including the assumptions regarding avoided gas costs.

Q. Have you been able to make any definitive findings regarding the economic analysis of the gas DSM programs?

A. No. The updated Gas DSM Plan and the accompanying project data sheets provide very different economic results than the original Gas DSM Plan. Before I can make definitive findings regarding the economic analysis of the gas DSM programs I will need additional time to review the updated Gas DSM Plan.

5. GAS DSM PROGRAM DESIGN

Q. Are the Company's gas DSM programs generally well designed?

A. In general, yes. There are several aspects to the program designs that indicate that the programs are well designed and are likely to provide important benefits to customers. In particular:

- The programs target residential space heating and water heating measures, which are the two largest sources of residential gas demand.
- The programs offer financial incentives and direct installation practices, which are often necessary to overcome the market barriers to efficiency measures.
- The gas DSM programs will be coordinated and delivered in conjunction with the Company's electric DSM programs. This approach improves the efficiency of program delivery and customer implementation.

- Both the Weatherization and the Hot Water Heater Blanket programs will be implemented through the existing infrastructure and delivery channels for the electric DSM Low Income Weatherization program.

Q. Are there any ways in which the DSM program designs can be improved?

A. Yes. The primary opportunity to improve upon the Company's proposed program designs is to expand upon them. First, the existing programs could be expanded to include additional gas efficiency measures. Second, the Gas DSM Plan could be expanded to include additional programs to serve additional types of gas customers.

Q. Please describe how the Gas DSM Plan programs could be expanded to include additional gas efficiency measures.

A. There are several residential gas efficiency measures that are readily available that are not included in the Company's proposed gas DSM programs. These include:

- Low-flow showerheads, faucet aerators and pipe insulation to improve the efficiency of gas water heating.[1]
- Programmable thermostats, to improve the efficiency with which gas space heaters operate.
- ENERGY STAR clotheswashers, to reduce the demand for gas water heating.
- High-efficiency water heaters, to replace old inefficient gas water heaters.

Q. Please describe how the DSM plan could be expanded to include additional programs to serve additional types of gas customers.

A. The proposed gas DSM programs do not address some key customer types. In particular, they do not address new residential homes, and they do not provide any energy efficiency services for commercial customers.

[1] The Company notes that it "will be evaluating" these measures as part of the Weatherization program, but makes no commitment to include them. (Company response to Discovery Request BCP 1-22.)

Q. Please summarize the opportunities for addressing the residential new construction market.

Residential new construction is a critical market segment for energy efficiency services, because this segment represents a "lost opportunity" – i.e., if the energy efficiency savings are not achieved at the time of home construction, they will be much less cost-effective and will probably never be achieved in the future. In addition, there is a relatively large amount of residential new construction in the Company's service territory. Furthermore, residential new construction programs are good candidates for combining gas and electric efficiency savings, and the Company is in a good position to provide a combined gas and electric efficiency program for new homes because it sells both gas and electricity.

Q. Are there likely to be significant opportunities for providing gas DSM programs to commercial customers?

Yes. In its Gas DSM Plan, the company notes that commercial customers represent only 10% of their total customer base. (Sierra Pacific Power Company Natural Gas DSM Plan, page 2.) While this is true, it is important to recognize that sales to commercial customers represent roughly 40% of total retail gas sales. (Sierra Pacific Power Company, Annual Report, 2004)

Q. Does the Company provide any explanation for why its programs are not bigger or more comprehensive?

A. Indirectly, yes. In response to discovery requests, the Company notes that 2006 and 2007 are considered to be "pilot program years," which will be used to gain experience and information for designing programs in future years. (Company Response to Discovery Requests BCP 1-08 and BCP 2-05.) The implication is that the Company is not ready yet to serve more customers, or to address additional efficiency end uses.

Q. Do you find this justification compelling?

A. No. While it is true that 2006 is the first year of gas DSM program implementation, and utilities typically require some time to ramp up DSM program delivery, it is also true that the Company has considerable experience in planning and implementing electric DSM programs, and that the gas DSM

programs will be implemented along with (or through) the electric DSM programs. In the Project Data Sheets for the Weatherization and the Water Heater Blanket programs, the Company notes that it has experience with these activities through the electric DSM programs. (Direct Testimony of Lawrence Holmes, Exhibit A and Exhibit B.)

While it may be reasonable to allow the Company to use 2006 to begin ramping up its gas DSM programs, there is no reason why it cannot consider full-scale mature programs for 2007 and beyond.

Q. Do you have any additional concerns with the programs included in the Gas DSM Plan?

A. Yes. I am concerned that the Technology Assessment program is not an efficient or necessary use of gas DSM funding. Several of the measures listed for investigation in this program are already commercially available and frequently used in utility DSM programs. The only real benefit I see in this program is that the Company will be investigating the costs and benefits of adding additional measures to its gas DSM programs. While I agree that this is valuable work, and recommend above that additional measures should be investigated, I do not agree that a separate efficiency "program" be set up for this purpose. Instead, this type of investigation should be included in the Company's administration and planning budgets.

Q. What do you recommend with regard to the proposed gas DSM program designs?

A. As described above in Section 4 of my testimony, the Company has not provided sufficient information in time for me to review the economic analysis of its gas DSM programs. If the Company presents sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective, then I recommend that the Commission approve the gas DSM program designs. With the exception of the Technology Assessments program, which should be reduced to investigating the costs and benefits of including commercially available efficiency measures into future DSM programs, and should be included as part of on-going administration and planning activities.

I also recommend that the Commission require that the Company investigate opportunities for expanding the gas DSM programs for 2007 and beyond. The Company should investigate including additional measures in the proposed programs, as well as new programs such as those addressing residential new construction and commercial customers.

6. GAS DSM PROGRAM BUDGETS AND LONG-TERM PLANNING

Q. Are the proposed gas DSM program budgets for 2006 reasonable?

A. In general, yes. The 2006 gas DSM budget of $820,000 is equal to roughly 0.5% of annual gas retail revenues. This budget is low relative to other utilities offering gas DSM programs. Exhibit TW-2 presents the results from a recent survey of gas utility DSM programs in the United States. Note that the Company's budget of roughly 0.5% of retail revenues is lower than most other gas utilities offering DSM programs. However, this is the first year of gas DSM activities by the Company, and it is reasonable to allow the Company a little time to ramp up their programs.

On the other hand, the Company should not need a lot of time – e.g., more than one year – to ramp up the gas DSM programs, because most of them are being delivered through the electric DSM programs that are relatively mature.

Q. Do you take any exception to the 2006 gas DSM program budgets?

A. Yes. As noted above in Section 5 of my testimony, I believe that the Technology Assessments program is not an appropriate use of gas DSM funds. Therefore, I recommend that this program be eliminated and that its budget be shifted to one of the other gas DSM programs. That would be a more legitimate use of those funds and will result in direct gas efficiency savings. The Company should still investigate the costs and benefits of including additional efficiency measures into its gas DSM programs, but the costs associated with this type of investigation should be included in its administration and planning budgets, not in a separate program.

Q. Are the proposed gas DSM program budgets for 2007 reasonable?

A. No. The proposed gas DSM program budget for 2007 is the same as the budget for 2006. Given the potential benefits from these gas DSM programs, the budgets should be expanded in future years.

As noted above in Section 5 of my testimony, there are several measures and programs that could be used to expand the proposed gas DSM programs. Such an expansion of the gas DSM programs and budgets would put the Company in line with some of the other leading gas utility DSM programs, as indicated in Exhibit TW-2. I recommend that the Company work toward the goal of increasing its gas DSM program budget to equal roughly 0.7 percent of retail revenues by 2007 and roughly 1.0 percent of retail revenues by 2008.

By waiting until 2007 to expand its gas DSM programs, the Company will have additional time to investigate the potential for additional efficiency measures and programs, and to prepare a regulatory filing that fully documents and supports such an expansion.

Q. What do you recommend with regard to the proposed gas DSM program budgets for 2006?

A. As described above in Section 4 of my testimony, the Company has not provided sufficient information in time for me to review the economic analysis of its gas DSM programs. If the Company presents sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective, then I recommend that the Commission approve the gas DSM program budgets for 2006. With the exception of the budgets for the Technology Assessment program, which should not be approved.

Q. What do you recommend if the Company does not present sufficient evidence in this docket to demonstrate that the proposed gas DSM programs are cost-effective?

A. If the Company does not present sufficient evidence in this docket to demonstrate that the proposed gas DSM programs cost-effective, then I recommend that the Commission not approve the Gas DSM Plan, the program designs, or the program

budgets. Instead, the Commission should require the Company to revisit the program designs, assumptions and economic analysis in order to develop gas DSM programs that are cost-effective.

As indicated in Exhibit TW-2, many other gas utilities have been able to design and implement highly cost-effective gas DSM programs. On average these utilities have been able to develop programs with benefit cost ratios (based on the TRC test) of 2.4. Such high benefit cost ratios indicate that there are a variety of cost-effective gas DSM opportunities for Sierra Pacific to pursue.

Q. What do you recommend with regard to the proposed gas DSM program budgets for 2007?

I recommend that the Commission require the Company to file a 2007 Gas DSM Plan by the autumn of this year, as described above in Section 3 of my testimony. The Commission should require that the 2007 Gas DSM Plan (a) investigate opportunities for offering additional efficiency measures and programs, and (b) seek opportunities to increase the program budget to at least 0.7 percent of retail gas revenues by 2007, and to at least 1.0 percent of retail revenues by 2008.

Q. Why is it important that the Commission make a finding and a recommendation on 2007 and 2008 gas DSM budgets at this time?

A. Commission guidance in this docket will have a significant impact on the Company's efforts to implement gas DSM programs over the next several years. I asked the Company through discovery what its plans were for expanding the programs after 2006 and 2007. The response is informative:

> A decision will be made on maintaining, expanding, or deleting the projects in the proposed gas DSM program based on the results of the programs over the next 18 months. While a specific decision criteria has not been established it will include as minimum customer participation, savings as validated by M&V, and the cost effectiveness of the projects. *The decision will also be based PUCN guidance, support and continued approval*. (Company Response to Discovery Request BCP 2-06, emphasis added.)

Clearly, the Commission's guidance on gas DSM activities and budgets will be critical to ensure that the Company pursues all cost-effective gas efficiency opportunities, and seeks to maximize the benefits of these opportunities over time.

Finally, note that it is not too soon to provide general regulatory guidance for 2008 and beyond. DSM programs and activities cannot and should not be ramped up and down from year to year depending upon other priorities of the Company. The most effective and successful DSM programs are implemented over many years, in a long-term planning context, with steady commitment and support from regulators and utilities.

Q. Does this conclude your testimony at this time?

A. Yes, it does.

Timothy Woolf

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PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. Vice President, 1997-present. Conducting research, writing reports, and presenting expert testimony pertaining to consumer, environmental, and public policy implications of electricity industry regulation. Primary focus of work includes electricity industry regulation and restructuring, electric power system planning, energy efficiency programs and policies, renewable resources, power plant performance and economics, air quality, and many aspects of consumer and environmental protection.

Tellus Institute, Boston, MA. Senior Scientist, Manager Electricity Program, 1992-97. Responsible for managing six-person staff that provided research, testimony, reports and regulatory support to consumer advocates, environmental organizations, regulatory commissions, and state energy offices throughout the US.

Association for the Conservation of Energy, London, England. Research Director, 1991-1992.
Researched and advocated legislative and regulatory policies for promoting integrated resource planning and energy efficiency in the competitive electric industries in the UK and Europe.

Massachusetts Department of Public Utilities, Boston, MA. Staff Economist, 1989-1990.
Responsible for regulating and setting rates of Massachusetts electric utilities. Drafted integrated resource planning regulations. Evaluated utility energy efficiency programs.

Massachusetts Office of Energy Resources, Boston, MA. Policy Analyst, 1987-1989. Researched and advocated integrated resource planning regulations. Participated in demand-side management collaborative with electric utilities and other parties.

Energy Systems Research Group, Boston, MA. Research Associate, 1983-1987. Performed critical evaluations of electric utility planning and economics, including production cost modeling and assessment of power plant costs and performance.

Union of Concerned Scientists and Massachusetts Public Interest Research Group, Cambridge and Boston, MA. Energy Analyst, 1982-1983. Analyzed environmental and economic issues related to nuclear plants, renewable resources and energy efficiency.

EDUCATION

Masters, Business Administration. Boston University, Boston, MA, 1993.
Diploma, Economics. London School of Economics, London, England, 1991.
B.S., Mechanical Engineering. Tufts University, Medford, MA, 1982.
B.A., English. Tufts University, Medford, MA, 1982.

TESTIMONY

South Dakota Public Utilities Commission (Docket No. EL04-016). Direct testimony regarding the avoided costs of the Java Wind Project. On behalf of the South Dakota Public Utilities Commission Staff. February 18, 2005.

Rhode Island Public Utilities Commission (Docket No. 3635). Oral testimony regarding the settlement of Narragansett Electric Company's 2005 Demand-Side Management Programs. On behalf of the Division of Public Utilities and Carriers. November 29, 2004.

British Columbia Utilities Commission. Direct testimony regarding the Power Smart programs contained in BC Hydro's Revenue Requirement Application 2004/05 and 2005/06. On behalf of the Sierra Club of Canada, BC Chapter. April 20, 2004.

Maryland Public Utilities Commission (Case No. 8973). Oral testimony regarding proposals for the PJM Generation Attributes Tracking System. On behalf of the Maryland Office of People's Counsel. December 3, 2003.

Rhode Island Public Utilities Commission (Docket No. 3463). Oral testimony regarding the settlement of Narragansett Electric Company's 2004 Demand-Side Management Programs. On behalf of the Division of Public Utilities and Carriers. November 21, 2003.

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Nevada Public Utilities Commission (Docket No. 01-7016). Direct testimony regarding the Nevada Power Company's Demand-Side Management Plan. On behalf of the Bureau of Consumer Protection, Office of the Attorney General. September 26, 2001.

US Department of Energy (Docket EE-RM-500). Oral testimony at a public hearing on marginal price assumptions for assessing new appliance efficiency standards. On behalf of the Appliance Standards Awareness Project. November 2000.

Connecticut Department of Public Utility Control (Docket No. 99-09-03 Phase II). Direct testimony on Connecticut Natural Gas Company's proposed performance-based ratemaking mechanism. On behalf of the Connecticut Office of Consumer Counsel. September 25, 2000.

Mississippi Public Service Commission (Docket No. 96-UA-389). Oral testimony on generation pricing and performance-based ratemaking. On behalf of the Mississippi Attorney General. February 16, 2000.

Delaware Public Service Commission (Docket No. 99-328). Direct testimony on maintaining electric system reliability. On behalf of the Public Service Commission Staff. February 2, 2000.

New Hampshire Public Service Commission (Docket No. 99-099 Phase II). Oral testimony on standard offer services. On behalf of the Campaign for Ratepayers Rights. January 14, 2000.

West Virginia Public Service Commission (Case No. 98-0452-E-GI). Rebuttal testimony on codes of conduct. On behalf of the West Virginia Consumer Advocate Division. July 15, 1999.

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Massachusetts Department of Telecommunications and Energy (DPU/DTE 97-111). Direct testimony on Commonwealth Electric Company's energy efficiency plan, and the role of municipal aggregators in delivering demand-side management programs. On behalf of the Cape and Islands Self-Reliance Corporation. January 1998.

Delaware Public Service Commission (DPSC 97-58). Direct testimony on Delmarva Power and Light's request to merge with Atlantic City Electric. On behalf of the Delaware Public Service Commission Staff. May 1997.

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Colorado Public Utilities Commission (3I-199EG). Direct testimony on impacts of increased competition on DSM, and recommendations for how to provide utilities with incentives to implement DSM. On behalf of the Colorado Office of Energy Conservation. June 1995.

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Colorado Public Utilities Commission (3I-098E). Direct testimony on the Public Service Company of Colorado's DSM programs and integrated resource plans. On behalf of the Colorado Office of Energy Conservation. April 1994.

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	Program Spending (million $)	Program Spending (% of retail revenues)	Gas Savings (MCF/yr)	Gas Savings (% of gas sales)	MCF/yr Saved Per Million Dollars	Benefit-Cost Ratio (TRC)
Aquila (MN)	2.1	1.4	146,000	0.5	69,000	---
Centerpoint	5.6	0.5	720,000	0.5	129,000	2.6
Keyspan	12	1.0	490,000	0.4	41,000	3.0
Northwest Natural Gas (4)	4.7	0.7	85,000	0.1	18,000	---
NSTAR	3.9	0.8	71,500	0.2	18,000	2.3
PG&E	21.7	0.7	2,040,000	0.7	94,000	2.1
PSE	3.8	0.4	311,000	0.5	82,000	1.9
So Cal Gas	21	0.6	1,100,000	0.3	53,000	2.7
Vermont Gas	1.1	1.6	57,000	1.0	57,000	5.6
Xcel (MN)	4.0	0.7	663,000	0.9	166,000	1.6
Average	*7.9*	*0.8*	*564,000*	*0.5*	*72,700*	*2.7*
Median	*4.3*	*0.7*	*400,500*	*0.5*	*63,000*	*2.4*

Source: Southwest Energy Efficiency Project, *Natural Gas Demand-Side Management Programs: a National Survey*, Suzanne Tegen and Howard Geller, January 2006