

**BEFORE THE  
NOVA SCOTIA UTILITY AND REVIEW BOARD**

**IN THE MATTER OF** *The Public Utilities Act*, R.S.N.S., 1989, c. 380, as amended

— and —

**IN THE MATTER OF** an application to approve Nova Scotia Power Incorporated's  
Demand Side Management Plan

**EVIDENCE FILED BY DAVID NICHOLS**

**On behalf of:**

**The Utility and Review Board Staff**

**March 17, 2008**

**Synapse Energy Economics  
22 Pearl Street  
Cambridge, Massachusetts 02139 USA  
1-617-661-0599**

## TABLE OF CONTENTS

1. INTRODUCTION .....	1
2. THE PORTFOLIO OF NEW DSM PROGRAMS .....	5
3. EVALUATION, MONITORING, AND VERIFICATION .....	10
4. THE SETTLEMENT AGREEMENT .....	12

### List of Exhibits:

DN-1 Background and Qualifications

## 1. INTRODUCTION

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.**

A. My name is David A. Nichols. My business address is Synapse Energy Economics, Inc. (“Synapse”), 22 Pearl Street, Cambridge, Massachusetts 02139, USA. I am a senior consultant at Synapse.

**Q. PLEASE DESCRIBE YOUR BACKGROUND AND EXPERIENCE.**

A. For three decades, I have professionally assessed the costs and benefits of energy conservation and load management to utility ratepayers; designed energy conservation programs; evaluated conservation programs of electric utilities, gas utilities, and state agencies; and analyzed utility cost recovery claims associated with energy conservation and load management programs. I have presented analyses on these matters in testimony before regulatory commissions in Ontario, in two dozen U.S. states, and before the U.S. Federal Energy Regulatory Commission. I have also worked in other energy areas such as rate design, resource planning, and renewable resources.

In April 2007, I joined the Synapse team assisting the Staff of the Utility and Review Board (“UARB” or “the Board”) in its collaboration with Nova Scotia Power, Incorporated (“NSPI” or “the Company”) relating to preparation of the most recent NSPI Integrated Resource Plan (“IRP”). I have been similarly engaged in the Staff collaboration with the Company that has led to the development of the NSPI Demand Side Management Programming Plan (“DSM

1 Plan”) before the Board in this proceeding. Further information on my  
2 background and experience is provided in Exhibit DN-1.

3

4 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
5 **PROCEEDING?**

6 A. I am responding to the DSM Plan and accompanying evidence filed with the  
7 UARB by the Company on January 31, 2008.

8

9 **Q. DOES YOUR TESTIMONY HAVE A PARTICULAR FOCUS?**

10 A. Yes. My testimony focuses on the portfolio of new demand-side programs  
11 proposed in the Company’s Programming Plan (*Final Collaborative Report: DSM*  
12 *Programming Plan 2008-2010 and Framework to 2013*, A Joint Report of NSPI,  
13 UARB Staff and Consultants, Volume III, January 31, 2008). I review and assess  
14 the proposed scope and cost of these programs. My review includes the  
15 Company’s request for Board approval of certain “Early Action” programs. It  
16 also includes the Company’s proposed approach to evaluation, monitoring, and  
17 verification (“EM&V”) activities relating to the effectiveness and effects of the  
18 proposed programs.

19 Additionally, I comment on the settlement agreement between the  
20 Company and eight other parties that was filed with the Board on March 5, 2008.

21

22 **Q. WHAT IS THE BACKGROUND TO THE DEVELOPMENT OF THE**  
23 **COMPANY’S DSM PLAN?**

1 A. The Preferred Plan identified in NSPI’s 2007 Integrated Resource Plan (“IRP”)  
2 included a very substantial amount of new DSM. In particular, it included new  
3 energy efficiency resources sufficient to virtually flatten electric load growth over  
4 the planning horizon used in the IRP. The IRP report indicated that it is unknown  
5 how fast new DSM can be introduced effectively and economically in Nova  
6 Scotia. However, the Action Plan in the IRP report stated that NSPI would  
7 initiate the development of a comprehensive DSM program aimed at realizing the  
8 energy efficiency potential indicated in the Preferred Plan.

9  
10 **Q. IS THE LEVEL OF ENERGY SAVINGS IN THE IRP’S PREFERRED**  
11 **PLAN ACHIEVABLE?**

12  
13 A. In my opinion the level of energy savings from new DSM represents a resource  
14 that it will be challenging to realize, and which can be achieved. The recent U.S.  
15 *National Action Plan for Energy Efficiency* states that well-designed energy  
16 efficiency programs are “delivering annual energy savings on the order of 1  
17 percent of electricity and natural gas sales” (USDOE and USEPA 2006, page ES-  
18 4). Utilities or program administrators that have reported incremental annual  
19 electric energy savings impacts of one percent or more in one or more year since  
20 2000 include the two major Connecticut utilities, several Massachusetts utilities,  
21 Efficiency Vermont, Seattle City Light (Oregon), Sacramento Municipal Utility  
22 District (California), the three major California utilities, and utilities in  
23 Minnesota. In fact, savings at or above the 2 percent level have been achieved by

1           some, such as San Diego Gas & Electric Co. (California) and Interstate Power &  
2           Light Co. (Minnesota).

3

4   **Q.    HOW IS THE BALANCE OF YOUR EVIDENCE ORGANIZED?**

5    A.    The next section discusses the portfolio of new DSM programs proposed in the  
6           DSM Plan. The subsequent section discusses evaluation, monitoring, and  
7           verification activities. The final section comments upon the settlement  
8           agreement.

## 2. THE PORTFOLIO OF NEW DSM PROGRAMS

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

**Q. WHAT ARE THE CHARACTERISTICS OF A COMPREHENSIVE DSM PROGRAM?**

A. As far as energy efficiency is concerned, a DSM program includes demand-side initiatives to encourage customer adoption of cost-effective measures that increase the efficiency with which electricity is used. A comprehensive approach strives to tap all cost-effective energy efficiency by developing initiatives aimed at all end-use markets where there is significant untapped efficiency potential. Thus it includes initiatives to market energy efficiency to the industrial, commercial, and residential markets, and to market segments within these major market sectors.

**Q. WHAT ARE THE MAJOR CATEGORIES OF NEW ENERGY EFFICIENCY PROGRAM IN NSPI'S PROPOSED DSM PLAN?**

A. The major program categories in the DSM Plan are as follows:

- Residential Efficient Products, promoting a variety of energy-efficient consumer technologies.
- EnerGuide for Existing Houses, promoting efficiency measures affecting space and water heating in existing electrically heated housing units.
- Low Income Program, promoting efficiency measures affecting space heating, water heating, and other end uses in existing electrically heated housing units.

- 1           • EnerGuide for New Houses, promoting efficiency measures  
2           affecting space and water heating to the developers and  
3           purchasers of new electrically heated housing units.
- 4           • Commercial and Industrial Prescriptive Rebates, using  
5           standardized rebate incentives for efficient technologies to  
6           promote customer adoption of efficient lighting measures, as  
7           well as efficiency measures affecting a range of other electric  
8           end-uses.
- 9           • Commercial and Industrial Custom Rebates, providing  
10          customized information and incentives to promote customer  
11          adoption of a range of efficiency measures.
- 12          • Small Business Direct Install Lighting, providing efficient  
13          lighting retrofit services to businesses with less than 100 kW  
14          demand.
- 15          • Commercial and Industrial New Construction, using a variety  
16          of information, assistance, and incentives to induce the  
17          developers of new facilities to incorporate high levels of energy  
18          efficiency into the design and construction of buildings.
- 19          • General Education and Outreach, comprised of a variety of  
20          approaches to help all types of consumers understand  
21          efficiency and to access NSPI and other efficiency programs.
- 22          • Development and Research, whereby NSPI will monitor new  
23          technology and program developments of promise, and



1                   conduct targeted research in support of its energy efficiency  
2                   efforts.

3                   These programs are all described in the DSM Programming Plan.

4

5   **Q.    IS THE NSPI DSM PLAN COMPREHENSIVE?**

6   A.    Yes, it is. It includes energy efficiency programs targeted to all the major market  
7           sectors. It also includes programs that are tailored to particular market segments,  
8           such as the residential efficiency program that would target households of lower  
9           income, and the “direct installation” lighting program that would target  
10          commercial/industrial enterprises of small to medium size. It targets new  
11          construction as well as existing facilities. It also includes cross-cutting support  
12          programs, such as education and outreach services.

13

14   **Q.    YOU HAVE ADDRESSED THE SCOPE OF THE DSM PLAN. IS ITS**  
15          **LEVEL OF EFFORT ADEQUATE IN LIGHT OF THE SUBSTANTIAL**  
16          **AMOUNT OF ENERGY EFFICIENCY RESOURCES IN THE**  
17          **COMPANY’S PREFERRED RESOURCE PLAN?**

18   A.    Yes. The DSM Plan includes two time periods, with detailed consideration of  
19          new energy efficiency activity for this year through 2010, and a projection of  
20          potential DSM activity in the subsequent three years, through 2013. During the  
21          period through 2013, the cumulative DSM impact is “catching up” at an  
22          increasing rate with the energy and demand savings reflected in the IRP’s  
23          Preferred Plan, as further detailed in the Programming Plan. The level of impact  
24          in NSPI’s DSM Plan reflects the judgment of its DSM consultants, Summit Blue,

1 as to how rapidly the utility can effectively “ramp up” energy efficiency activity  
2 from present levels. In my experience, it does take several years for utilities or  
3 other program administrators to substantially increase their DSM impacts.

4

5 **Q. IS THE PROJECTED COST TO RATEPAYERS OF NSPI’S DSM PLAN**  
6 **REASONABLE?**

7 A. Yes. The bulk of the costs of the Plan are built up from the costs of financial  
8 incentives and information services that would be offered to participants to  
9 motivate them to adopt program measures. This is similar to the situation with  
10 other North American energy efficiency programs of which I have knowledge –  
11 the main driver of program administrator costs is the inducements and services  
12 that the utility or other administrator must offer to energy users in order to  
13 substantially impact markets.

14 It is always desirable to use programming strategies that can deliver  
15 targeted savings at the lowest cost to ratepayers. But what those programming  
16 strategies are can only be determined through cumulative experience with DSM in  
17 local markets. For now, the levels of utility incentives and services that Summit  
18 Blue has proposed are similar to levels that have “worked” for other utilities in  
19 terms of producing significant DSM program participation and thereby, energy  
20 savings. This in my view is a reasonable way to begin.

21

22 **Q. DOES NSPI PROPOSE TO BEGIN ITS DSM EFFORT SOON?**

23 A. Yes. In its January 31 filing, the Company specifically asks the Board for  
24 authority to move forward with three new DSM programs even in advance of the

1 hearing scheduled for April, 2008. These three energy efficiency programs are  
2 Small Business Direct Install Lighting, Commercial and Industrial Custom  
3 Rebates, and the Low Income Program that I discussed previously. Assuming this  
4 request granted, as I hope will be the case, the Company can begin to move  
5 forward in three very different market segments, and realize resulting initial  
6 savings in 2008. Since these initiatives require three different program delivery  
7 strategies, it is ambitious for the Company to begin as soon as possible with them.  
8 It is also appropriate for the Company to begin now, given the desirability of  
9 “catching up” with the DSM energy and demand impacts included in the IRP’s  
10 Preferred Plan.

1                   **3. EVALUATION, MONITORING, AND VERIFICATION**

2

3   **Q.    IS IT IMPORTANT TO EVALUATE, MONITOR, AND VERIFY THE**  
4   **RESULTS OF ENERGY EFFICIENCY PROGRAMS?**

5   A.    Yes, it is critical to do so. The effects of energy efficiency programs are not so  
6        evident as the effects of supply-side resources, or even the effects of demand-side  
7        load management. It is necessary to ascertain how programs are being received  
8        by customers and other market actors, what energy-efficiency behaviors and  
9        investments the programs are causing, what their bottom-line impacts on  
10       electricity usage levels are, and how those bottom-line results relate to the costs of  
11       the programs. To obtain all of this information, an on-going program of  
12       evaluation, monitoring, and verification (“EM&V”) is needed.

13

14   **Q.    HAVE YOU REVIEWED THE EM&V ACTIVITIES PROPOSED IN**  
15   **NSPI’S DSM PLAN?**

16   A.    Yes, I have. The Plan proposes that NSPI procure the services of a recognized  
17        DSM evaluation consultant to carry out a series of “process” evaluations (which  
18        assess how well a program is being delivered to and received by markets) and  
19        “impact” evaluations (which use systematic analyses to identify the incremental  
20        electricity savings properly attributable to DSM programs). The descriptions of  
21        particular program categories in the Programming Plan identify EM&V activities  
22        specific to each type of program.

23                The DSM Steering Committee, comprised of Company and UARB Staff,  
24        would manage the EM&V function, periodically using a competitive solicitation

1 to procure the DSM consultant. At the same time, the Company is also  
2 establishing a “tracking” data base to account for all DSM activity, and its  
3 estimated impacts, from the outset. These EM&V activities and processes are, in  
4 my view, appropriate for the task at hand.

5  
6 **Q. THE DSM PLAN REFERS TO INDEPENDENT VERIFICATION OF DSM**  
7 **IMPACTS. COULD YOU EXPLAIN THIS ASPECT OF EM&V?**

8 A. Yes. Under the DSM Programming Plan NSPI has filed, it is proposed that the  
9 impacts of NSPI’s new DSM programs upon electricity usage be reviewed and  
10 verified periodically for the UARB Staff. The Plan proposes that the UARB  
11 retain an independent savings verification contractor whose work would be  
12 directed by the UARB Staff. The fundamental task of the contractor would be to  
13 review, audit, and verify claimed savings and to make recommendations.

14 The function of the verification contractor is to review, verify, and if  
15 necessary adjust savings data and estimates, not to create them *de novo*. UARB’s  
16 verification contractor would review the DSM data tracking system used by NSPI,  
17 and the electricity savings estimates incorporated in the tracking system and  
18 submitted annually to the UARB by NSPI. The verification contractor would  
19 review all of the methods used by NSPI to estimate electricity savings for DSM  
20 programs, including review of impact evaluation studies conducted by the  
21 evaluation contractor as described previously. The idea of independent  
22 verification was proffered by Stakeholders during discussions of the draft DSM  
23 Plan. I think it adds a desirable element of accountability, and urge the UARB to  
24 approve and implement it.

1 **4. THE SETTLEMENT AGREEMENT**

2

3 **Q. HAVE YOU REVIEWED THE SETTLEMENT AGREEMENT BETWEEN**  
4 **THE COMPANY AND EIGHT OTHER PARTIES?**

5

6 A. Yes, I have.

7

8 **Q. HOW DOES THE SETTLEMENT AFFECT THE LEVEL OF NEW DSM**  
9 **EFFORT?**

10

11 A. The DSM Plan provides a proposed level of effort, as measured by the budget for  
12 DSM programs, for 2008 through 2010. The settlement would leave the level of  
13 effort for 2010 open for now. For the period 2008-2009, the level of budget in  
14 the Settlement is the same in aggregate as in the DSM Plan. Projected aggregate  
15 energy savings resulting from 2008 and 2009 programs are virtually the same.

16

17 **Q. HOW DOES THE SETTLEMENT AFFECT THE SCOPE OF THE DSM**  
18 **PLAN?**

19 A. Since the settlement speaks for itself, I will comment only selectively on  
20 its effects, as follows:

- 21
- 22 • Three major “Early Action” programs would still be implemented as early  
23 as feasible, as proposed in the DSM Plan. These are the Small Business  
24 Direct Install Lighting, Commercial and Industrial Custom Rebates, and  
Low Income programs that I discussed previously. Indeed, the budget for

1           these programs would be increased. There would be a number of  
2           modifications to the programs that would not affect their basic goals and  
3           structure. However, the modification to the Commercial and Industrial  
4           Custom program that would establish an “energy savings account option”  
5           strikes me as one which may not enhance the overall effectiveness of, and  
6           customer understanding of, that program. Utilities and other program  
7           administrators in other jurisdictions have been able to effectively  
8           implement extensive energy efficiency measures in all sizes of facility  
9           using the flexibility that a standard custom program approach inherently  
10          provides. While I do not see this option as a positive enhancement, the  
11          most important thing is that this program move forward soon, with or  
12          without the option.

- 13          • There would be certain modifications to three other programs. These are  
14          the Residential Efficient Products, EnerGuide for Existing Houses, and  
15          Development and Research programs. The programs would go forward at  
16          budgets equal to or greater than in the filed DSM Plan, and I would expect  
17          the first two to produce useful savings in the 2008-2009 time frame if they  
18          proceed as modified.
- 19          • Four programs would be deferred until after 2009, when it is presumed a  
20          new administrator would be available to implement them. These are the  
21          EnerGuide for New Houses, Commercial and Industrial Prescriptive  
22          Rebates, Commercial and Industrial New Construction, and Education and  
23          Outreach programs. Without these programs, the overall DSM effort will  
24          be less comprehensive through 2009. In particular, delay in starting new

1 construction programs does not strike me as a positive feature of the  
2 settlement. The argument for affecting new construction, when  
3 opportunities for incorporating efficiency into structures and systems from  
4 the start present themselves, is widely understood and accepted among  
5 energy efficiency experts and practitioners. In my view the settlement  
6 would be better if it made room to commence developing the new  
7 construction programs sooner, even if their administration were to be  
8 transferred to a new administrator at some subsequent point.

9

10 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 A. Yes, it does.



## BACKGROUND AND QUALIFICATIONS

David Nichols is a senior consultant with Synapse Energy Economics of Cambridge, Massachusetts, USA. For 25 years Nichols was a vice president of Tellus Institute in Boston. Before that he was associate professor at the State University of New York (Albany).

Nichols works throughout the U.S., as well as internationally. His energy work includes efficiency studies, technology assessment, cost benefit analysis, design and evaluation of demand-side load response and efficiency programs, and policy analysis. He has testified before regulatory commissions in the U.S. and Canada on energy efficiency, renewable energy, rate design, performance-based ratemaking, and other issues. Current and recent work includes:

- Consultant to the New Jersey Division of Rate Counsel for: the NJ Governor's Renewable Energy Task Force, the NJ Clean Energy Council, design and administration of renewable energy and energy efficiency programs, and gas and electric utility recovery of demand-side management costs; as well as off-tariff rate applications. This work has included testimony in several Board of Public Utilities dockets.
- Training of midlevel professionals in India and Indonesia on electric resource planning and demand-side management. This work was done for the U.S. Agency for International Development through the Institute of International Education.
- Comprehensive reports on states' policy and regulatory treatment of energy efficiency and renewable energy for the American Council for an Energy-Efficient Economy, the Colorado Governor's Office of Energy Management, E-Source, and others.
- Study of the achievable potential from new electric energy efficiency and load response measures in Utah, completed for an Advisory Group to the Public Service Commission.
- Heading the team that developed performance indicators for the Climate Change programs (renewable energy and energy efficiency) of the Global Environmental Facility.
- Lead author for the World Commission on Dams' *Thematic Review of Planning Approaches*, focusing on enabling participation in multi-stakeholder planning, avoiding adverse impacts through energy and water conservation, and better siting and operating practices.
- Analyses of utility cost recovery and incentives for ratepayer-funded energy efficiency for the Regional Environmental Councils of Quebec, West Kootenay Power Co., Enbridge Gas Ltd., Southern Alliance for Clean Energy, and others, including related testimony before several regulatory commissions.

Nichols has participated in task forces, advisory groups, collaborative processes, workshops, working groups and settlement discussions on oil, gas, and electric energy efficiency, as well as rate design. In these working group processes he assisted such stakeholders as energy utilities, commission staffs, consumer advocates, energy offices, and environmental agencies.

Nichols' articles have appeared in *Electricity Journal*, *Industry and Environment Review*, *Pace Environmental Law Review*, *Polity*, and conference proceedings published by the American Council for an Energy Efficient Economy, Electric Power Research Institute, and others. He was educated at Clark University, the University of Chicago, and Massachusetts Institute of Technology, where he received his Ph.D.

**Dr. Nichols' Testimony Before Regulatory Commissions**

JURISDICTION	APPEARANCES		JURISDICTION	APPEARANCES	
	<u>DSM</u>	<u>Other</u>		<u>DSM</u>	<u>Other</u>
Arizona		1	New York	2	3
Colorado	2		North Carolina	1	
Connecticut	4	1	Ohio	3	
Delaware	1		Oklahoma		1
Federal Energy Regulatory Commission	2	2	Ontario	3	1
Kansas		3	Pennsylvania	1	
Maine	3		Rhode Island	1	2
Maryland		1	South Carolina	1	1
Massachusetts	3	1	Texas		2
Missouri		1	Utah	1	2
Nevada		2	Vermont	3	1
New Hampshire		1	Virginia	1	
New Jersey	11	2	Wisconsin	2	
				Total DSM	Total Other
				45	27

DSM: Demand-side management, including energy efficiency and demand response.

Other: Other energy analysis (planning, rate design, other).