1997 Demand Side Management Report

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1. INTRODUCTION

Purpose of Report

The purpose of this report is to provide an overview of Demand Side Management (DSM) activity for Newfoundland Light & Power Co. Limited (the "Company") during 1997.

The Company filed its initial DSM report in response to Order No. P.U. 1 (1990) and has filed annual reports on the progress of DSM activities since 1992. The Board expanded on the DSM reporting requirements in Order No. P.U. 7 (1996-97), stating: "*The Applicant shall continue to file DSM progress reports annually, indicating the validity of individual programs and documenting their impact on conservation, valley filling, peak shifting, peak clipping and strategic load growth; their impact on minimizing customer rates; and their impact on next generation planning."*

Definition of Terms

Hereafter, the following terms will be used to describe various entities and activities described in this report:

"Board" refers to the Board of Commissioners of Public Utilities;
"Company" refers to Newfoundland Light & Power Co. Limited;
"DSM" refers to Demand Side Management; and
"Hydro" refers to Newfoundland & Labrador Hydro.

DSM Objective

The intent of DSM programs, in the Company's view, is to manage the demand side use of electrical energy in order to minimize electricity rates. Once the demand and energy impacts of individual DSM programs are measured, the costs and benefits of the programs are analyzed from the perspectives of participants, non-participants and total resources.

II. FOCUS OF DSM

During 1997, the Company revisited its focus on electric heat load retention. During late 1996 and early 1997, it became apparent that there was a decrease in competitive pressures from other fuel suppliers. Further, analysis of energy sales growth projections has reduced concerns of an overall sales decline and associated rate increases, at least for the immediate future.

The primary focus for 1997 was one of improving customer service and the value customers receive from electrical energy.

III. 1997 ACTIVITIES

The activities for 1997 are described below under the general categories of: Load Shape Improvement Programs, DSM Research Projects and Customer Energy Services and Programs.

Load Shape Improvement Programs

Wrap Up For Savings and the Curtailable Service Option were the two DSM programs quantitatively measured as having an effect on load shape in 1997. These programs improve the Company's load factor by reducing demand for energy during time of system peak. Load Shape Programs positively affect load shape and have the potential of deferring capital expenditures and associated customer costs by making more effective use of the electrical system.

Wrap Up For Savings: The objective of this program is to improve energy efficiency, enhance the comfort level of electrically heated homes, and increase customer satisfaction with the value they are receiving from electricity. The program offers customers rebates to upgrade insulation in basements, crawl spaces, and attics. Energy Consultants meet with customers to provide advice on insulation and how to properly upgrade.

***Results*:** The load shape impacts of this program are conservation and peak clipping. Improved insulation and air sealing tend to reduce both demand and energy both at the time of system peak and throughout the remainder of the heating season. The program also functions as a load retention mechanism as increased customer satisfaction with electric heating will likely ensure continued customer usage of electric space heating.

The Wrap Up For Savings program results in an average peak reduction of 1.14 kW per home for a total peak decline of 359.1 kW in 1997. Approximately 3,700 kWh of energy was conserved per customer for a total savings of 1,165,500 kWh in 1997.

- Total number of customer projects completed in 1997: 332
- Number of Wrap Up loans issued through Power Smart: 68

The costs and benefits of this program were analyzed from the perspective of participants, non-participants, and total resources.

In 1997, the DSM program tests indicated benefit to cost ratios as follows:

Participants Test[1] :	4.64
Rate Impact Test[2] :	1.00
Total Resource Cost Test[3] :	3.69

1997 Costs:	Labour[4]	$ 2,322
	Consulting	0
	Materials	2,621
	Other[5]	37,072
	Total	$42,015

Curtailable Service Option: The objective of this rate option is to provide an incentive to large commercial customers to reduce electrical demand during system peak when requested by the Company. Large commercial customers are offered a credit on their electric bill for curtailing their load to help reduce the Company's system peak. The option is available to general service customers who can curtail load by at least 330 kVA. Participants who curtail their load upon the request of the Company receive an annual credit on their electric bills at the end of the winter season.

***Results*:** This project has a peak clipping impact on the load shape. Results for the last complete heating season were submitted to the Board in a report dated April 15, 1997, entitled *1997 Curtailable Service Option Report*. In summary, ten commercial customers participated in the Curtailable Service Option in the 1996/1997 winter heating season and were asked to curtail on ten occasions. This option provides between 4 MW and 5 MW of curtailable load to the Company. The actual results depend on both the number of successful curtailments for each request and the coincidence of the curtailable customer's peak energy usage with the Company's peak energy use.

The Company is currently developing a revised methodology that will be used to update the credit for the 1998/99 winter season.

1997 Costs:	
Labour	$ 4,203
Telephone rentals	5,228
Curtailment credits	82,544
Total	$91,975

1 A *Participants Test* is used to determine if a DSM program minimizes the overall energy costs for users.

2 A *Rate Impact Test* is used to determine whether the program minimizes rates for non-participants.

3 A *Total Resource Cost Test* is used to determine if a DSM program minimizes the overall cost of supplying energy. As such, the Total Resource Cost Test is a test of the program's impact on generation planning.

4 Labour for brochure. (Labour for administering rebates and answering inquiries on the program is included in the cost of Customer Energy Services & Programs.)

5 Rebates for insulation purchases.

DSM Research Projects

DSM research projects are conducted (1) to test the costs and benefits of potential programs through the analysis of small-scale pilots or demonstration projects and (2) to research customer acceptance of innovative products.

During 1997, the Company carried forward the Direct Load Control Program and the Innovative Electrical Systems Program.

The status of each project is as follows:

Direct Load Control: The project was installed in 1995 and continued in 1996. The objective was to evaluate the technical, financial, and customer acceptance of controlling residential water heaters to reduce system peak. Six hundred and sixty residential customers participated in this demonstration project and received $20 per year as compensation for allowing the Company to install and activate the controllers.

***Results*:** A January 1997 evaluation of the Virginia Waters residential Direct Load Control Program indicated that, using historical costs, the benefit to cost ratios were:

Participant's Test	98.8
Rate Impact Test	0.55
Total Resource Cost:	0.73

On an incremental basis, an estimate of the benefit cost ratios are:

Participant's Test:	195.04
Rate Impact Test:	1.00
Total Resource Cost:	1.57

In light of these mixed results, the uncertainty associated with the estimated costs used in the incremental analysis and the significant expenditures that would be involved in expanding the program beyond the pilot stage, expansion plans were put on hold. In December 1997, we informed participating customers that the company did not intend to activate the control program during the 1997/98 season and thus no incentive would be paid for 1997.

Currently, 630 switches remain in operation. The Company will continue to maintain the existing infrastructure and continue to monitor the potential for reactiviation of the project.

During 1997, the project was approved for an R & D tax credit.

Innovative Electric Systems: The objectives of this project were (1) to learn about the performance of such systems in the Newfoundland environment and (2) to establish customer/supplier relationships which helped to ensure customers received the expected energy-efficiency and performance levels from their systems through proper installation.

Residential Heat Pump Pilots: (Cost: $10,530)

The Company completed its involvement in the following pilot projects: a ground source heat pump system (St. John's), an air source heat pump (St. John's), and an ocean-coupled closed loop heat pump (Burin).

Commercial Heat Pump Pilots: (Cost: $42,020)

The Company was involved with the initial design of a ground source heat pump system for an education facility in Corner Brook. The customer decided not to complete this project after the water yields from new wells were substantially less than the test well.

The Company continued its involvement with a ground source heat pump system for a recreational club house in St. John's. This system involved a 29-ton water heat pump and two 750 foot wells.

The Company also continued its involvement with two small commercial customers: a church in St. John's and a medical clinic in Burin. These projects involved demand control initiatives with air source heat pumps. The objective is to evaluate the technical costs and customers' acceptance of controlling the heating load. Both customers remain on Rate 2.1 on condition that the Company can control the electrical demand. Performance will be reported in the 1998 DSM Report.

Commercial Heating, Ventilation, & Air Conditioning (HVAC): (Cost: $3,368)

Originally, the Company planned to develop and distribute an information package on commercial HVAC systems to hospitality businesses across the province. A brochure published by Natural Resources Canada on HVAC systems was found that met the objectives of educating customers on air conditioning and ventilation systems and was added to the Company's list of available literature. The brochure was distributed to all members of Hospitality Newfoundland.

Load Research: (Cost: $18,454)

The Company is collecting the data tabulated on select heat pumps and R-2000 customers. Data is currently being obtained from the load research recorders to determine the energy consumption and peak demands during the 1997/98 heating season.

R-2000 Model Home - Advertising and Promotional: (Cost: $51,945)[6]

The Company built and promoted an energy efficient, R2000, all-electric model home in conjunction with Eastern Newfoundland Home Builders Association. The home had many special features including superior insulative qualities and an innovative ground source heat pump.

Approximately 550 people viewed the home during the open houses scheduled throughout the summer of 1997. Part of the promotion included a three-part video series that aired on local cable television. The video is also being used by Energy Consultants to educate new home builders/buyers on R2000 construction. The house was sold after the promotional campaign and proceeds from the sale were applied to its construction cost.

***Results*:** The impact on the system varies for each type of technology. Promoting energy-efficient heating systems and ventilation systems has the potential for load retention, peak clipping, and energy conservation, while promoting air conditioning has a valley filling effect. Once the load research is obtained, it will assist in determining the potential impact of these technologies on system load shape.

Customer Energy Services and Programs

The Energy Management and Customer Service Departments were merged in 1997. This change was made to provide for a more efficient use of resources and improved customer service.

The Customer Service Department provides assistance and information to customers on a variety of customer and energy related matters. These services and programs affect load shape either directly by affecting the use of electricity or indirectly by influencing the use of products that have the potential to affect load shape.

Power Smart Programs: (Cost: $148,479)

Inquiries: The Company answered customer inquiries on energy efficiency and Power Smart programs through its toll-free service. Where necessary, these services were provided in conjunction with Energy Consultant field visits and participating trade allies. In July of 1997, call centre agents were trained to respond to general energy inquiries. This expansion of energy knowledge to the Call Centre has made more agents available to respond to calls and has helped to increase the speed of response. More difficult energy issues are referred to Power Smart Representatives. There were

[6] This expenditure was treated as a non-regulated expenditure.

10,705 calls referred to Power Smart Representatives during 1997. All other inquiries were handled by Call Centre agents.

Financing: The Company provided financing for eligible customers on electric heating systems, heat recovery ventilation systems, electrical upgrades, high performance thermostats, and hot water tanks. Participating customers made payments through their monthly electric bill. A total of 1,602 loans were issued in 1997. (The breakdown was as follows: 928 hot water tanks, 605 electric heating or HRV systems, 68 insulation upgrades, and 1 thermostat installation.) To ensure that non-participating customers are not subsidizing the costs of those obtaining loans, an administration charge is applied to the interest rate. The administrative charge is 1% to 4% depending on the program.

Electric Heating Designs: The Company provided electric heat designs to customers building new homes. These designs indicate sizing for heating systems and estimate costs. The heating design reports also provide customers with recommendations on insulation levels and expected paybacks on the initial investments. The Company completed 574 electric heat designs in 1997.

Thermostat Program: The Company offered a $4 rebate on each purchase of selected high-accuracy thermostats. The purpose is to increase the comfort and satisfaction of electric heat customers by encouraging customers to install highly accurate thermostats. There were approximately 3,300 rebates issued in 1997.

Home/Trade Shows: (Costs: $13,696)
The Company participated in a variety of shows for the purpose of promoting both customer and energy programs and services. Energy promotion centered around educating customers on energy efficient building construction and the wise use of energy. The Company participated in three home/trade shows in 1997. Approximately 1,000 visitors were received.

Energy Consultants: (Cost: $696,276)
Thirteen Energy Consultants, deployed in all operating areas of the Company, were responsible for providing advice on energy issues and servicing customers on a variety of topics in the field. With less emphasis on load retention in 1997, the Energy Consultant role was expanded to include delivery of safety and general consumer information and assessments of damage claims in some regions. As a result, Energy Consultant services are becoming increasingly blended with regional customer services. This structure helps the Company respond better to regional variations in the demand for their services. The following is the breakdown of Energy Consultant contacts by type:

	Residential	Commercial
New Construction	1,357 (24%)	185 (18%)
Efficiency Improvements/ Customer Service	3,777 (67%)	753 (74%)
Conversions	499 (9%)	80 (8%)
	5,633 (100%)	1,018 (100%)

Technical Support: (Cost: $84,779)
Technical Support staff provided technical assistance to Energy Consultants and Power Smart Representatives. Day-to-day functions include liasing with trade allies, performing heating and cooling analyses, and researching tools and equipment for use in the field.

Energy Advertising: (Cost: $42,264)
The Company delivers most of its energy service and program information via brochures and newsletters included with customers' monthly bills. Two brochures covering energy-related promotions and four newsletters (with approximately 20% energy conservation content) were distributed to customers in 1997 at a cost of approximately $7,986[7] . The remainder of energy advertising costs were for ad placements in newspapers, booklets, and radio to promote Power Smart programs and services.

IV. SUMMARY AND OUTLOOK

In 1997, the Company focused DSM activities on customers and energy services.

The Company continues to see load shape improvements from customer participation in two of its programs - Wrap Up for Savings and the Curtailable Service Option. The Company will continue to offer both programs in 1998.

No other DSM activities undertaken by the Company during 1997 had a measurable impact on generation planning. However, the Company believes that a combination of energy packages and customer service offerings that adds value to customers will contribute indirectly to minimizing the cost of generation over the long term.

In the future, the Company will continue to influence the use of electricity through its Customer Energy Services and Programs. These programs are designed to maximize the value of electrical energy by ensuring customers use electricity efficiently and wisely. During 1998, the Company will also continue with its Wrap Up For Savings and Curtailable Service Option as long as all program costs are offset by verifiable cost savings. At this time, the Company has no plan to introduce any new major DSM initiatives. Before any large DSM program is initiated, the program must prove to have verifiable benefits that will accrue to all our customers.

The direction which DSM activities will take in the future will continue to be influenced by load forecasts, competitive pressures and generation cost projections. 1997 saw a number of new generation proposals developed in the province in response to the load requirements of the new Voisey's Bay Smelter. These proposals could have a significant impact on future generation costs and the direction of DSM.

[7] The cost is estimated based on percentage of "energy-related" content for the customer newsletters and bill inserts.

The Company will continuously reassess DSM initiatives to ensure they meet customer requirements. It is the intent of the Company that all customers benefit from the Company's DSM activities either directly as participants, indirectly as non-participants or through improved customer service.