

APPENDIX E

OTP APPENDIX – MINN. R. 7849.0290

7849.0290 – CONSERVATION PROGRAMS

A. the name of the committee, department, or individual responsible for the applicants energy conservation and efficiency programs, including load management;

Otter Tail Power Company’s Market Planning Department is responsible for energy conservation and load management programs.

B. a list of the applicant’s energy conservation and efficiency goals and objectives;

- Per the Company’s 2004/2005 CIP Biennial Plan, the goal is 2.578 megawatts and 10.991 megawatt-hours for 2005. These figures have been approved by the Department of Commerce.
- Per the Company’s recently proposed 2006/2007 CIP Biennial Plan, the goal is 3.443 megawatts and 12.589 and 12.594 megawatt-hours for 2006 and 2007. These figures are proposed, and at this time have not been approved.
- Per the Company’s DSM program, the goal is 14.564 megawatts of additional controlled load installed in 2005.

C. a description of the specific energy conservation and efficiency programs the applicant has considered, a list of those that have been implemented, and the reasons why the other programs have not been implemented;

Residential Programs

Residential energy conservation programs considered and implemented in Minnesota:

Residential Electric End Uses	<i>Programs Considered</i>	Programs Implemented	Reasons for Not Implementing or Closing ^(1*)
Air Conditioning	Air Conditioning Rebates, Air Conditioner Control, Air Conditioning Recycling	Air Conditioning Rebates, Air Conditioner Control	Expense overhead for air conditioning recycling; window units not cost-effective

¹Decisions to not implement or close programs were made based on data available at that time. Programs may be revisited as markets and circumstances change.

Irrigation	Irrigation electric energy evaluation, Microscheduler	Irrigation electric energy evaluation, Microscheduler	Limited participation
Lighting	Lights 2000, Change a Light, Residential Catalog, Torchiera Turn-In, Lamp Collection and Disposal	Lights 2000, Change a Light, Residential Catalog Lamp Collection and Disposal	Torchiere turn-in numbers were low for our service territory Lamp collection now done by private agencies and county
Refrigeration	Refrigerator/Freezer Recycling, (Energy Star) Refrigerator/ Freezer Rebates, Low-income refrigeration cleaning, low-income refrigerator/freezer replacement	Refrigerator/Freezer Recycling, Low-income refrigeration cleaning, Low-income refrigerator/freezer replacement	Recycling expensive, high admin, salvage focus instead of recycling Energy Star rebates were not cost-effective Low income refrigeration cleaning ineffective
Space Heating/cooling	Low-Income Weatherization Programs (House Therapy), Electric Space Conditioning Rebates (Geothermal and Air Source), New Construction Rebates Deferred load programs: RDC, thermal storage Interruptible load programs: Dual fuel Variety of rates	Low-Income Weatherization Programs (House Therapy), Electric Space Conditioning Rebates (Geothermal and Air Source), New Construction Rebates Deferred load programs: RDC, thermal storage, Interruptible load programs: Dual fuel Variety of rates	
Streetlighting	Retrofit of MV6 to HPS9	Retrofit of MV6 to HPS 9	Market saturation
Water Heating	HotPacks, Insulation Jacket, Rebates, Controlled water heating Low-income water heater replacement	HotPacks, Insulation Jacket, Rebates, Controlled water heating Low-income water heater replacement	Not cost-effective
Pricing	Power Stat Pre-Paid Program, Low-income electric rates	Power Stat Pre-Paid Program	Regulatory hurdles
Other / General	Appliance Aid, FarmPower Rebates, Farm Energy Analysis, Walk-through	Appliance Aid, FarmPower Rebates, Farm Energy	Non cost-effective

	Audits, Flood Aid Rebates, Model Home Project	Analysis, Walk-through Audits, Flood Aid Rebates, Model Home Project	No participation Non cost-effective Ineffective Time period elapsed Non cost-effective
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Commercial Programs

Commercial energy conservation programs considered and implemented in Minnesota:

Commercial Electric End Uses	Programs Considered	Programs Implemented	Reasons for Not Implementing or closing (²)
Space heating/cooling	Electric Conditioning (Geothermal and Air Source), Deferred load programs: RDC, thermal storage, Interruptible load programs: Dual fuel Plan Review Variety of rates	Electric Conditioning (Geothermal and Air Source), Deferred load programs: RDC, thermal storage, Interruptible load programs: Dual fuel Plan Review Variety of rates	
Lighting	Area Lighting, Commercial Lighting Rebates, Lamp Collection and Disposal, Street Lighting	Area Lighting, Commercial Lighting Rebates, Lamp Collection and Disposal, Street Lighting	Lamp collection now done by private agencies and county Market saturation
Refrigeration	Commercial Refrigeration Rebates Small commercial	Commercial Refrigeration Rebates Small commercial	Not cost-effective

²Decisions to not implement or close programs were made based on data available at that time. Programs may be revisited as markets and circumstances change.

	refrigeration cleanup	refrigeration cleanup	
Cooking	Commercial Rebates	Commercial Rebates	
Process	C&I Energy Grants	C&I Energy Grants	
Motors	Motor Rebates	Motor Rebates	
Other / General	Commercial Energy Analysis & Recommissioning, Municipal Aeration Study, Vending Miser, Plan Review	Commercial Energy Analysis & Recommissioning, Municipal Aeration Study, Vending Miser, Plan Review	Limited market Market saturation

Additional CIP Program Incomplete Developments - 1997 to 2005

- Ice Bear Cooling Thermal Storage—Small Commercial Direct Impact

The Ice Bear is a system is based on thermal storage technology that uses energy during off peak hours to charge an ice storage system. During peak hours the ice storage system is used to cool the building, theoretically shifting demand from summer peak periods to nighttime off-peak periods. This technology has been available in large commercial and industrial applications for years, but the Ice Bear has been one of the first attempts at expanding to the small commercial and residential markets.

Reasons for incomplete development:

- Initial research indicated questionable availability for mass promotion to the residential and small commercial markets at this time.
- Latent cooling abilities of this system aren't very strong, and capability for latent cooling in our humid climate is essential for comfort.
- Further examination by outside sources verified our concerns.
- Market for less expensive, but effective, summer time load control is not yet saturated and still fairly immature in our traditionally winter peaking market.

Energy Star Roofing—Commercial/Industrial Direct Impact

This program proposed offering cash incentives for customers to upgrade roofing with white, reflective roofing to reduce cooling loads in the summer.

Reasons for incomplete development:

- Climate considerations—our service territory and market characteristics lead to large heating loads and relatively small cooling loads.
- Market considerations—our smaller towns don't lend to the 'urban heat island' effects like large metro areas.
- Net energy effects—A closer look into other utility energy roofing programs revealed some uncertainties in the net energy use effects with heating penalties factored in.
- Snow loads—roofing contractors we consulted with indicated concerns about increased snow loads on old buildings.

Flat Panel PC Display Monitors—Commercial/Industrial/Residential Direct Impact

This program would have offered cash incentives to customers along with educational and promotional strategies to increase the market share of flat panel display monitors as opposed to CRT display monitors.

Reasons for incomplete development:

- Too many other non-energy related benefits influenced market (more desk space, less reflective glare, more attractive, lighter, less storage space.)
- Market was already shifting to flat panel displays.
- Market share for flat panel displays was almost doubling every year from 1998 to 2000 and was expected to reach grow from less than 5% in 2004 to 20% by 2005. PC Magazine published figures even more discouraging for use of CRT monitors beyond 2002. Growth reflected little need for offering incentives to switch over to this technology.
- Prices were already dropping.

Cold Climate Heat Pump

This program proposed including the new, developing cold climate heat pump technologies as a system eligible for rebates in the existing Space Conditioning Program or possibly as it's own program with higher incentives.

Reasons for incomplete development:

- The systems had not yet been tested extensively for performance and reliability in the cold climates of northern Minnesota.
- Availability was uncertain and consequently became a concern.

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- Equipment life expectancy was a concern.

Radiant Barrier Clad OSB Roof Sheathing—Residential Direct Impact

Potlatch contacted Otter Tail Power Company about the possibility of offering CIP incentives to customers installing this reflective roofing material. The material consisted of a reflective foil layer between the shingles and the OSB roof sheathing.

Reasons for incomplete development:

- Research indicated cooling savings only on homes in California—climate drastically different than ours in northern Minnesota.
- The study talked of applications in unvented roofs—something we don't see a great deal of.
- We had the same concerns about overall impacts to energy usage and the heating penalties in the winter.
- Consultation with outside sources verified the same concerns.

Torchiere Lamp Turn-in—Residential Direct Impact

This program would have worked much like our existing Change a Light, Change the World campaign, but would educate customers about the benefits of CFL torchieres and offer incentives to actually turn them in for cash rebates on CFL torchieres to replace existing halogen torchiere lamps.

Reasons for incomplete development:

- Market characteristics—consultations with industry experts revealed that turn-in events work best in large metro areas.
- Cost effectiveness—We felt the opportunities did exist in our service territory, but the high costs of educating and promoting enough to get cost effective participation and energy savings would have been too high. Essentially, our sunk costs of promoting the program would be much higher due to the many smaller communities we serve as opposed to serving one large metro area.

Shade Tree/Windbreak program—residential direct impact (not immediate)

The program would have offered residential customers incentives for planting shade trees and windbreaks around their homes and properties.

Reasons for incomplete development:

- No immediate impacts—changing an incandescent lamp to a CFL will result in an immediate savings for the investment from both the program participant and the utility. We felt planting small trees would not provide energy and demand savings for at least ten years into the future.
- Administration—the program would have taken administrative resources that we don't have to educate customers on proper energy efficient landscaping techniques, to coordinate plantings with customers, to recruit and develop a network of tree nurseries, and to randomly verify energy efficient landscape completions.
- Focus—We believed customers would always purchase trees, but decided to focus our efforts more on educating customers on proper energy efficient landscaping techniques and theories than on offering cash incentives to purchase trees that this particular market segment would have likely purchased anyway.

Adjustable Speed Drives

This program would have shifted incentives for ASD's from our C&I Grant program to a new program just for ASD installations.

Reasons for incomplete development:

- Staff felt it was too difficult to show an average energy savings for ASD installations.
- The somewhat low quantity of ASD incentives processed through the C&I Grant program didn't warrant development costs into a new ASD Program.
- The C&I Grant program is better suited to capture the unique cost, savings, and incentives calculations for ASD installations.

D. a description of the major accomplishments that have been made by the applicant with respect to energy conservation and efficiency;

Otter Tail Power Company has separated out the accomplishments into two separate areas – energy conservation programs (CIP) and demand-side management programs.

Energy Conservation

Energy conservation programs are only implemented in Minnesota. The annual figures shown below are for the entire CIP portfolio. Aggregate figures are also shown, based on measure lifetimes.

CIP Savings and Expenditures -- Minnesota Only

Otter Tail Power Company

1992 - 2004

CIP Year	Annual KWH	Aggregate KWH (based on measure lifetime)	Annual KW	Aggregate KW (based on measure lifetime)	Annual CIP Spending	Aggregate CIP Spending
1992	4,284,548	4,284,548	1,010	1,010	\$793,002	\$793,002
1993	7,371,451	11,655,999	1,903	2,913	\$1,419,874	\$2,212,876
1994	9,177,166	20,833,165	2,943	5,856	\$1,067,207	\$3,280,083
1995	11,970,185	32,803,350	3,434	9,290	\$1,603,473	\$4,883,556
1996	13,470,907	46,274,257	2,513	11,803	\$1,585,598	\$6,469,154
1997	17,957,861	63,307,100	2,760	14,442	\$1,591,258	\$8,060,412
1998	10,175,545	72,558,174	2,373	16,691	\$1,521,266	\$9,581,678
1999	10,258,589	81,915,611	2,180	18,679	\$1,579,010	\$11,160,688
2000	13,302,713	94,963,467	2,075	20,711	\$1,843,790	\$13,004,478
2001	10,533,420	105,316,910	2,244	22,922	\$1,918,475	\$14,922,953
2002	10,131,511	113,444,953	1,935	24,459	\$1,545,358	\$16,468,311
2003	13,681,770	122,528,207	2,984	26,354	\$1,703,663	\$18,171,974
2004	10,991,151	131,082,743	3,555	28,878	\$1,783,288	\$19,955,262
Total	143,306,817	900,968,484	31,909	204,008	\$19,955,262	\$39,910,524

Demand-Side Management

Demand-side management programs are implemented throughout Otter Tail Power Company's service territory. The annual figures shown below are for additional controlled-load installations.

Additional Controlled Load -- System Wide						
Otter Tail Power Company						
1999 - 2004						
Additional Controlled Load Installed by Customer Class						
	1999	2000	2001	2002	2003	2004
Residential	4,792	6,750	9,017	7,975	10,290	11,689
Commercial	4,932	6,183	11,457	9,666	12,560	6,838
Total	9,724	12,933	20,474	17,641	22,850	18,527
Additional Controlled Load Installed by Load Type						
	1999	2000	2001	2002	2003	2004
Dual Fuel	5,370	6,571	15,087	11,939	13,795	9,898
Heat Storage	1,156	2,845	1,922	2,891	4,658	3,992
Residential						
Demand Control	1,789	2,023	2,616	2,008	2,556	2,356
Water Heating	1,409	1,494	850	802	1,841	2,281
Total kw	9,724	12,933	20,475	17,640	22,850	18,527

E. a description of the applicants future plans through the forecast years with respect to energy conservation and efficiency, and

Certain end uses and their more efficient retrofit technologies are reaching market saturation levels. However, the Company continues to look to energy efficiency and demand side management as an integral portion of our overall resource plan. We will continue to devote resources to that end to achieve a cost-effective outcome.

F. a quantification of the manner by which these programs affect or help determine the forecast provided in response to part 7849.0270 subpart 2, a list of their total costs by programs, and a discussion of their expected effects in reducing the need for new generation and transmission facilities.

Energy Conservation and Demand-side Management Budgets			
2005-2007			
	2005 Approved Budget	2006 Proposed Budget	2007 Proposed Budget
Energy conservation (MN only)			
Residential programs	\$465,575	\$500,600	\$503,600
Commercial programs	\$730,100	\$893,800	\$893,800
Low-income programs	\$200,000	\$182,000	\$182,000
Indirect-impact programs	\$184,000	\$189,000	\$189,000
Total – energy conservation	\$1,579,675	\$1,765,400	\$1,768,400
Demand-side management			
Entire service territory	\$898,509	\$944,000	\$992,000
Total Budget	\$2,478,184	\$2,709,400	\$2,760,400

Some effect of existing energy conservation programs is implicit in the forecasts because they are part of the historical data used in the forecast. The true effect of the various programs implemented over the years is extremely difficult to determine, making it near impossible to remove them from the forecast.

Demand-side Management and conservation programs do have an effect in reducing the need for new resource additions. Otter Tail Power Company's July 1, 2005 resource plan filing was developed using a model that successfully performs a side-by-side consideration of demand-side and supply-side resources to identify the most economic plan. Otter Tail Power Company's preferred resource plan projects that 13% of the capacity resources during the 2006-2020 planning period will come from Demand-side Management and Conservation.