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**CONSERVATION IMPROVEMENT PROGRAMS
ORDERED BY
THE MINNESOTA PUBLIC UTILITIES COMMISSION
1984-1989**

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Since 1984, the Minnesota Public Utilities Commission (the Commission) has required large natural gas and electric public utilities to make significant investments in or expenditures for energy conservation.¹ This primary focus has been accompanied by additional program emphasis such as federally-mandated programs, programs ordered by the Commission in the context of a rate case, as a result of stipulations or investments in renewable resource projects.

What follows is a listing and summary of each of the Conservation Improvement Program (CIP) projects ordered by the Commission under Minn. Stat. section 216B.241 (1986).

One major barrier to conservation is that some consumers are unaware of the specific conservation actions that would reduce their energy bills. In addition, low income families and renters face special difficulties regarding energy use. They may lack the resources needed to invest in conservation improvements, and landlords may make their energy payments, insulating these customers from the benefits of conservation. Commission encouragement through CIP projects may help consumers to overcome some of the barriers to conservation.

Moreover, all ratepayers and society in general benefit if an electric utility is able to avoid future capacity additions. For example, significant environmental benefits can result from reduced electricity demand. However, the benefits of avoiding capacity additions may not be fully reflected in the rates paid by consumers. Commission approved conservation programs can allow those who conserve energy to capture these benefits.

The Commission has proposed rules to use in determining whether a utility investment in or expenditure for conservation is significant. The rules would require the Commission to consider the following information in determining significance:

- * impact of the program on energy consumption;
- * impact of the program on utility rates;
- * number of low income and rental customers benefiting from the program;
- * cost to the utility of the energy saved compared with the cost to the utility of new energy supplies;

¹See Minn. Stat. section 216B.241 (1986).

- * total amount spent on energy conservation, compared with the utility's gross revenues;
- * total customers expected to participate in the program compared with the total customers in the utility's service area;
- * diversity of customer classes expected to participate in the program; and
- * benefits of the program to participants.

Ideas for conservation improvement projects have been received from many sources, including the following:

- * utilities;
- * community-based, non-profit energy service providers;
- * local governments;
- * community action programs;
- * private businesses; and
- * state agencies such as the Department of Public Service and the Commission itself.

For numerous reasons, not all of the proposed projects have been approved by the Commission. In resolving disputes, the Commission balances the need to insure that utilities make significant and effective investments against the need to insure that ratepayers do not pay excessive utility rates. The Commission intends that ratepayers receive full value for the amounts they contribute to conservation programs.

Ratepayers ultimately pay the cost of the CIP projects. Therefore, the Commission has been careful to insure that all ratepayers have an opportunity to participate in the projects. Furthermore, the Commission requires assurance that the projects can achieve their objectives at minimum cost.

The Commission has ordered a wide variety of conservation projects. One of the largest is Northern States Power's (NSP's) electric appliance rebate project. This project encourages consumers to purchase more efficient electric appliances by offering rebates for purchasing more efficient models. During the 1987-88 project year, NSP's actual expenditures for this project were \$3,432,456.

The Commission has also ordered relatively small projects designed to serve small towns and rural areas. In addition to its other projects, Peoples Natural Gas Company has six projects designed specifically to serve small towns and rural areas. Current annual budgets range from \$3,700 in West Concord to \$18,700 in Preston.

CIP projects are continually monitored. Projects that do not meet expectations are discontinued or modified. Projects that have been successful for one utility frequently have been ordered for another. Also, where service areas overlap (i.e. one utility provides electricity, another provides natural gas) or where cooperation yields other benefits, utilities have operated projects jointly.

In addition to the CIP projects, the Commission orders conservation projects as part of general rate cases², as a result of stipulation agreements (e.g. Sherco 3 Stipulation Agreement) and in the case of federally-mandated programs (i.e. Minnesota Energy Conservation Service/Residential Conservation Service Audits).

In addition to energy conservation projects, the Commission has directed several electric and gas utilities to develop a renewable resource pilot project, as required by Minn. Stat. section 216B.241, subd. 2 (1986). The Commission considered numerous potential renewable resource projects and directed that development of wind, solar and biomass projects be pursued. A wind assessment project is being conducted jointly by several electric utilities. The Commission has also approved a wind hardware demonstration project and a solar demonstration project for NSP. Preliminary study on a biomass fuel project has been completed.

The Commission continues to seek new, effective conservation and renewable resource projects that will benefit ratepayers. At the same time, it is committed to maintaining established projects that have proven their worth.

²See Minn. Stat. section 216B.16, subd. 1 (1986).

**CONSERVATION IMPROVEMENT PROGRAMS
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1984-1989**

NORTHERN STATES POWER COMPANY, ELECTRIC UTILITY^{1,2}

1. CHILLER EFFICIENCY IMPROVEMENT PROJECT

Commission Approval - The Chiller Rebate project was initially approved on March 29, 1985. It was renewed for the 1986-87, 1987-88 and 1988-89 CIP years.

General Purpose - The purpose of this project is to offer rebates to customers who purchase more efficient chiller equipment for air conditioning and process cooling. According to NSP, the four major manufacturers of this equipment currently supply chillers ranging in efficiency from 0.58 kW/ton to 0.90 kW/ton.

Steps Involved - The project is marketed through trade allies, direct contact and promotional mailings. The Company provides a \$10/ton rebate to customers purchasing qualifying chillers.

Objectives - The Company anticipated giving 30 rebates in 1987-88. The goal for the fourth quarter of 1988 and 1989 is to provide rebates on an additional 17,000 tons of chilling capacity.

Anticipated Savings

1986-87: NSP forecasted that the Chiller Efficiency project would reduce peak demand by 348 kW to 573 kW. The effect on ratepayers would range from a net penalty of \$94 per kW to a net benefit of \$323 per kW.

1987-88: NSP estimated that the project would reduce peak demand between 433 kW and 1,319 kW and would yield annual energy savings of about 1,000 MWh per year. The net benefit to ratepayers would range from \$30 to \$280 per kW.

1989: Based on project experience, NSP projects summer demand reduction of about 880 kW in each of 1988 and 1989. This project would produce a simple payback of 2 to 6 years for the participant, and would likely be cost effective from the utility perspective.

¹Beginning January 1989, NSP Electric will operate CIP projects on a calendar year basis, instead of using the CIP year, which runs from October 1 to September 30. The approved project budgets for 1989 are 12-month calendar year budgets.

²The Commission approved \$179,000 in administrative costs for NSP Electric for the 1989 CIP year.

<u>Annual Budget</u>	1986-87	1987-88	1989
	\$192,240	\$290,000	\$249,000

2. COMMUNITY ENERGY COUNCIL (CEC) RESIDENTIAL WEATHERIZATION

Commission Approval - The CEC project was initially approved in January 1985. It was renewed for the 1986-87, 1987-88 and 1988-89 CIP years.

General Purpose - The purpose of this project is to provide an alternative method to deliver conservation information. The Residential Conservation Service (RCS) audit is used as the primary source of information.

Steps Involved - This project is operated in eleven communities that have established a weatherization program under the Governor's Community Energy Program. The CEC's provide workshops, lectures, slides, and weatherization demonstrations. The CEC provides an audit as well as weatherization materials for the customer to install.

Objectives - In 1987-88, NSP planned to perform 716 audits and provide weatherization materials for 1,241 households. NSP projects 3,085 participants in 1989.

NSP estimates that 15-20% of project participants will be renters or low income persons.

Anticipated Savings - The savings from audit projects are difficult to quantify, as they depend on the customer's actions in regard to the auditor's recommendations. NSP believes that the CEC project will have approximately the same impact as the RCS Audit project. A 1983 study demonstrates that RCS audit customers reduced their energy consumption by an average of 9.3% annually compared with 6.9% in a non-audited household.

<u>Annual Budget</u>	1984-86	1986-87	1987-88	1989
	\$470,500	\$119,000	\$100,000	\$270,000

2A. CITIZEN/LABOR/FARMER/SENIOR ENERGY COALITION (CLFSEC)

Commission Approval - The Commission approved the CLFSEC project for the 1984-86 CIP year. The project was combined with the CEC project for the 1986-87 CIP year.

General Purpose - NSP provided \$49,000 for a pilot energy conservation education program in Chisago and Rice counties.

CLFSEC operated the project, using its network of volunteers and community resources.

3. GOOD CENTS HOME PROGRAM

Commission Approval - NSP began offering the Good Cents Home project to customers in May 1985. The project was modified and approved as a CIP in 1987-88. It was renewed in 1988-89.

General Purpose - The purpose of this project is to encourage energy efficient and cost effective construction of new electrically heated dwellings.

Steps Involved - NSP works with builders, developers, owners, and realtors to encourage development of energy efficient dwellings. Guidelines are based on a thermal performance standard that varies according to building size.

NSP offers \$1,000 to builders who erect housing that meets Good Cents Home performance standards and agree to open such housing to the public for two weeks.

Objectives - The objective of this project for 1987-88 was to provide service to 180 single family units and 360 multifamily units. The objective of the project for 1988-89 is to serve 160 single family and 480 multifamily dwellings.

Anticipated Savings - NSP hopes to achieve a 60% penetration of electrically heated dwellings constructed in Minnesota. Good Cents thermal performance standards are designed to result in a home that uses 25% less energy than a home built to Minnesota Energy Code requirements. Simple payback is expected to be 5-6 years.

Good Cents is designed to slow the growth of new electric heating load. The project's goal is to reduce the Company's winter demand by 265 kW.

Annual Budget - The Commission approved \$734,400 for expenses incurred in 1985 and 1986.

1987-88	1989
\$161,360	\$180,000

4. ROOFTOP AIR CONDITIONER REBATE

Commission Approval - The Commission approved this project for the 1986-87 CIP year. It was renewed for the 1987-88 and 1988-89 CIP years.

General Purpose - The purpose of this project is to encourage small to mid-sized commercial and industrial customers to install high efficiency rooftop air conditioning units.

Steps Involved - This project consists of cash rebates to commercial and industrial customers who install rooftop or condensing units that meet or exceed specified energy efficiency ratios (EER). NSP's rebate schedules are based upon the number of tons of cooling capacity that are installed and corresponding minimum EERs.

NSP trade allies are made aware of the project so that they can encourage their customers to participate. NSP personnel also promote the project through customer contacts.

In 1988-89, NSP proposed two modifications to this project to increase market response. The first was to offer a tiered rebate schedule to encourage installation of the highest efficiency equipment. The second was to split the rebate equally between the building owner and installing contractor in order to attract contractors to the project.

Objectives - The objective of this project in 1987-88 was to provide 371 rebates. In 1989, NSP proposes to offer rebates on 6,000 tons of cooling capacity.

Anticipated Savings - NSP estimates a 700 kW reduction in summer peak demand in 1988 as a result of this project.

<u>Annual Budget</u>	1986-87	1987-88	1989
	\$288,420	\$299,900	\$325,000

5. COOL STORAGE AIR CONDITIONING PROJECT

Commission Approval - This project was initially approved on March 29, 1985. It was renewed for the 1986-87, 1987-88 and 1988-89 CIP years.

General Purpose - The purpose of this project is to provide rebates for cool storage systems that involve the production and storage of chilled water or ice during low electric demand periods.

Steps Involved - NSP works with trade allies and vendors to educate developers on cool storage technology. It would then offer a rebate for installation of a cool storage system. For 1988-89, NSP has proposed a two-tiered rebate system to give higher rebates per ton on smaller systems.

Objectives - There were no participants in this project in 1987 or 1988. However, NSP anticipates that the changes made in 1988-89 will increase participation. As a result of the project, the Company expects to shift 2,000 kW of 1989 summer peak demand to off-peak.

Anticipated Savings - With rebates, payback for the customer is expected to be one to three years. The average rebate will be approximately \$40,000 per installation. To qualify for a full rebate, the cool storage system must reduce peak demand by approximately .76 kW/ton of cooling requirement.

<u>Annual Budget</u>	1987-88	1989
	\$635,000	\$696,000

A budget of \$500,000 was approved for the 1985-87 period.

6. APPLIANCE REBATE PROJECT

Commission Approval - NSP has operated its Appliance Rebate project under the authority of the Commission since March 1, 1982. The project was approved as a CIP for 1986-87 and was renewed for the 1987-88 and 1988-89 CIP years.

General Purpose - The purpose of this project is to encourage the purchase of energy efficient electric appliances by offering cash rebates to purchasers of appliances in the top 15% of energy efficiency.

Steps Involved - Purchasers of qualifying refrigerators, refrigerator/freezers, water heaters, room and central air conditioners apply to NSP for the rebate. NSP has proposed modifying its rebate schedules in anticipation of the Federal Appliance Standards that will come into effect in 1990-92.

Objectives - The objective of this project in 1987-88 was to provide 20,000 rebates. For 1989, NSP has projected 30,750 rebates.

Anticipated Savings - NSP forecasted annual demand reductions of about 4,700 kW and energy requirement reductions of about 5 million kWh, as a result of this project. In 1988-89, NSP revised this forecast to annual demand reductions of 4,013 kW.

<u>Annual Budget</u>	1986-87	1987-88	1989
	\$2,084,690	\$1,436,555	\$2,270,000

7. LIGHTING EFFICIENCY IMPROVEMENT PROJECT

Commission Approval - NSP's Lighting Efficiency Improvement project was initially approved on May 9, 1985, for two years, subject to a one-year interim evaluation by the utility. It was renewed for 1986-87, 1987-88 and 1988-89.

General Purpose - The purpose of this project is to encourage commercial and industrial customers to purchase more efficient equipment for existing lighting systems and to install efficient lighting equipment in newly constructed buildings.

Steps Involved - NSP offers rebates to customers who purchase energy efficient fluorescent lamps (including screw-in models), fluorescent lamp ballasts, and install more efficient lighting systems.

NSP cooperates with equipment manufacturers and distributors to promote the project. Lighting surveys are used to educate customers on lighting standards and lighting system designs. Personal contacts by NSP representatives and direct mail are used to promote the project with selected target groups such as schools or office buildings.

Objectives - In 1986, NSP provided a total of 993 rebates with an associated kW reduction of 3,987 and kWh reduction of 17,965,051. The total demand reduction resulting from the project is expected to be 11.7 MW.

Anticipated Savings - NSP estimates that efficiency improvements of up to 25% can be achieved by installing more efficient fluorescent lamps and ballasts. NSP's analysis also indicates that this project is expected to be cost effective from the perspective of the utility and participating customers.

<u>Annual Budget</u>	1986-87	1987-88	1989
Rebates	\$ 750,000	\$655,350	\$1,202,250
Administration	<u>335,000</u>	<u>305,000</u>	<u>300,000</u>
	\$1,085,000	\$960,350	\$1,502,250

8. MOTOR EFFICIENCY IMPROVEMENT PROJECT

Commission Approval - NSP's Motor Efficiency Improvement project was initially approved in 1986. It was renewed for 1987-88 and 1988-89.

General Purpose - This is a cash rebate project designed to encourage commercial, industrial, and farm customers to choose high-efficiency motors when making motor purchases. It also

provides cash incentives to dealers to promote high efficiency motors.

Steps Involved - Rebates are \$2.00/HP for new motors and \$7.00/HP for replacing motors that are currently in operation. To encourage dealers to stock and market energy efficient motors, NSP also offers rebates of \$.50/HP to motor distributors. NSP plans to market the rebate project through motor distributors and customer contact.

Objectives - NSP administered 54 rebates in 1987-88 and expects activity to triple in 1989 due to more vigorous promotion on its part.

Anticipated Savings - In 1987, this project reduced peak demand by 214 kW and overall consumption by 856,000 kWh. For the calendar years 1988 and 1989 combined, NSP estimates that the project will reduce peak demand by 1,000 kW.

<u>Annual Budget</u>	1986-87	1987-88	1989
	\$114,000	\$121,000	\$121,000

9. COMMERCIAL AND INDUSTRIAL (C&I) ENERGY CHECK-UP PROJECT

Commission Approval - The C&I Energy Check-up project was approved for the 1984-86 CIP year.

General Purpose - The purpose of this project was to provide energy audits to medium-size C&I customers whose monthly electric demand was between 25 and 500 kW.

Steps Involved - NSP or a qualified independent auditor provided a comprehensive energy audit to C&I customers, using computerized audit techniques. The audit helped customers identify and evaluate energy use measures, such as load management, conservation, and energy substitution that could be beneficial to their business. The Energy Check-up was also useful for directing customers to other NSP conservation projects, such as the Lighting Efficiency project.

Objectives - NSP proposed to deliver 500 C&I Energy Check-ups by 1987.

Annual Budget - The approved 1984-86 CIP budget for this project was \$400,000.

10. COMMERCIAL AND INDUSTRIAL AUDIT PROJECT

Commission Approval - The C&I Audit project was approved for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The purpose of this project is to efficiently provide audits and conservation information to various sizes of commercial establishments.

Steps Involved - This project is a follow-up to the C&I Energy Check-up and consists of two types of audits that help identify and promote energy savings. Both types will be targeted to demand-billed customers with average monthly peak demands of up to 1,000 kW.

The Energy Check-up is designed for customers using 25-1,000 kW. A computer-assisted audit software system is used for the Energy Check-up. The minimum charge for the Energy Check-up is \$100. A second, less detailed audit called a Quick-Check Audit will be offered to customers with average monthly peak demand loads of less than 25 kW.

For non-demand-billed customers using less than 2,500 kWh monthly, NSP will provide a generic energy conservation booklet.

The Check-ups are promoted through direct mail, telephone and personal solicitations. Chain stores and trade organizations are also contacted to promote the audits.

Objectives - NSP plans to provide 216 Energy Check-ups in its Minnesota service area in 1988. NSP also proposes to deliver 677 Quick-Checks and 677 Do-It-Yourself audits in 1988.

Anticipated Savings - NSP estimates that a Check-up participant's average annual cost savings from measures planned and taken will be \$2,000 to \$3,000. NSP also projects savings of 65 million kWh and a corresponding 8,750 kW demand reduction as a result of the Energy Check-up. NSP does not have data to project savings from the Quick-Check and Do-It-Yourself audits.

<u>Annual Budget</u>	1987-88	1989
	\$407,500	\$377,000

11. COMMERCIAL AND INDUSTRIAL END-USE STUDY PROJECT

Commission Approval - The C&I End-use study project was approved for the 1987-88 CIP year. It was renewed in 1988-89.

General Purpose - The purpose of this project is to collect C&I customer end-use data, to aid in development, administration and evaluation of conservation projects.

Steps Involved - NSP will survey a random sample of C&I customers, using a phone/mail/phone process, and visiting sites for a sample of customers over 1 MW. NSP proposes to administer this survey every 3 years in order to maintain current trends in consumption, end-uses and fuel mixes.

The project involves survey research design, questionnaire design, survey administration, customer account aggregation, data base development and sampling procedures.

Anticipated Savings - NSP stated that the C&I End-Use Study will have an indirect effect on peak demand and average consumption through its positive input to conservation projects.

<u>Annual Budget</u>	1987-88	1989
	\$300,000	\$25,000

The Commission also approved a budget of \$64,000 for this project for the last quarter of 1988.

12. RESIDENTIAL AUDIT SERVICES PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The purpose of this project is to improve energy efficiency of existing homes by providing a service that can be tailored to the needs of individual homeowners and renters.

Steps Involved - The Residential Audit Services project includes three audits: the RCS audit, Walk-Through audit, and Do-It-Yourself audit.

The RCS audit is a federally mandated program that offers detailed audits for multifamily dwellings up to four units and apartments in which heating fuel is individually metered.

The Walk-Through audit includes an on-site visit and provides a checklist of recommendations, including conservation savings, costs and payback.

The Do-It-Yourself audit uses the QUEST energy analysis program. Customers answer a questionnaire and are provided with a computer analysis of energy end-uses, costs and savings of various conservation measures, and other conservation information.

Objective - The objective for 1987-88 was to complete 4,510 QUEST audits, 1,825 Walk-Through audits; and 1,662 RCS audits. The objective for 1988-89 is to complete 1,000 Do-It-Yourself audits, 1,000 Walk-Through audits, and 4,000 RCS audits.

Anticipated Savings - As mentioned above, RCS audit customers reduce their energy consumption by an average of 9.3% annually compared with 6.9% in a non-audited household.

<u>Annual Budget</u>	1987-88	1989
	\$614,000	\$400,000

13. VOLUNTARY TIME-OF-DAY RATES PROJECT

Commission Approval - The Time-of-Day Rates project was approved for the 1987-88 CIP year. On October 14, 1988, the Commission ordered NSP and the DPS to re-evaluate this project and file the results of the re-evaluation within 30 days.

General Purpose - The purpose of this project is to convert General Service customers to time-of-day (TOD) rate schedules. This is to encourage customers to shift their energy use from peak to off-peak periods.

Steps Involved - NSP will identify customers with load-shifting potential and analyze their likely savings on TOD rates. NSP will contact customers personally to offer the TOD project.

Objectives - In 1987-88, the objective of this project was to convert 165 customers to TOD rates. In 1988-89, NSP also hopes to convert 165 customers to TOD rates.

Anticipated Savings - NSP estimates that as a result of this project 175 kW of demand will be shifted from peak to off-peak hours.

Annual Budget - In 1987-88, the Commission approved a budget of \$102,000 for this project.

14. MINNEAPOLIS ELECTRIC CONSERVATION PILOT PROJECT FOR LOW INCOME HOUSEHOLDS

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed in 1988-89.

General Purpose - The purpose of this project is to provide general information on electric conservation to Energy Assistance recipients and to provide intensive conservation and budgeting assistance to households that are high users of electricity.

Steps Involved - NSP proposes to offer four components under this project. They are:

1. Distribution of informational brochures on conservation and identification of high electricity users;
2. Project Choice Workshops that will present information on cost effective conservation measures, and distribute individualized payment plans;
3. Electric Energy Audits; and
4. Follow-up services and feedback that will include information to help participants reach the goals of the audit; minor appliance interventions and retrofits; and, if necessary, additional budget counseling.

Objectives - In 1987-88, the objective was to provide service to 800 high electric use households. NSP plans to provide workshops for 800 high electric use households and conduct 700 audits and follow-up services in 1989.

NSP reports that 100% of participants will be low income and estimates that 45% will also be renters.

Anticipated Savings - NSP estimates that participants will derive energy savings of 10%. NSP also expects that this project will improve the Company's cash flow by having an impact on late or missed payments.

<u>Annual Budget</u>	1987-88	1989
	\$84,500	\$91,000

15. MINNEAPOLIS ENERGY CONSERVATION PILOT PROJECT FOR SMALL BUSINESSES, NON-PROFITS AND TAX-EXEMPT ORGANIZATIONS

Commission Approval - This pilot project was approved for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The purpose of this project is to provide energy conservation services to small commercial businesses, non-profit organizations and tax exempt organizations in the City of Minneapolis.

Steps Involved - NSP plans to conduct a Needs Assessment Study for these markets. The study will identify ownership patterns; payment and metering patterns; finances and cash flow; and an analysis of electric use. The actual services offered will be developed based on the findings of the study; however, this

project will generally provide Quick-Check audits, education on energy conservation, and facilitate the installation of conservation measures.

Objectives - In 1987-88, the objective was to administer 200 Quick-Check audits. In 1988-89, NSP plans to administer 200 Quick-Check audits and provide follow-up services where appropriate.

Anticipated Savings - NSP estimates that this project could yield average energy savings of 8% on the energy bills of participants.

<u>Annual Budget</u>	1987-88	1989
	\$48,400	\$37,000

16. WELL WATER CHILLER EFFICIENCY IMPROVEMENT PROJECT

Commission Approval - The Well Water Chiller project was approved for the 1986-87 CIP year. This project was incorporated into the Chiller Efficiency Improvement project in 1988-89.

General Purpose - NSP proposed to offer the Well Water Chiller project to C&I customers to improve the efficiency of large chiller equipment used in well water air conditioning applications and to promote well water installations where these systems are economically and environmentally feasible.

Steps Involved - One-time cash rebates of \$10 per ton were offered to customers who installed chillers that met or exceeded specified efficiency levels. NSP used manufacturers, contractors, and customer contacts to promote and market the project. NSP estimated that 80% of the target market would participate in the Well Water Chiller project.

Anticipated Savings - NSP estimated that its reduction in peak demand as a result of this project would range from 132 kW to 222 kW. NSP's calculations indicated that this project would be cost effective to the utility.

Annual Budget - The Commission approved a budget of \$35,450 for this project for 1986-87.

17. CITYWIDE ADVISORY COMMITTEE ON HOME IMPROVEMENT EDUCATION (CACHIE) PROJECT

Commission Approval - The CACHIE project was approved for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide home improvement education to homeowners and renters in the City of Minneapolis to teach basic housing repair and maintenance, including conservation.

Steps Involved - NSP has been running CACHIE as a non-CIP project since 1984. CACHIE sets up classes in Minneapolis that deal with housing repair and maintenance. In 1988-89, NSP proposes to hold 20 classes that deal specifically with conservation. NSP will charge \$3.50/class, with a 50% discount to low income people. CACHIE uses teachers from NSP and Minnegasco, and works closely with the Self-Reliance Center and the Minneapolis Energy Office.

Objectives - NSP plans to provide conservation information to 400 homeowners, landlords and tenants in 1988-89.

Anticipated Savings - Educational programs are difficult to quantify. Actual savings will depend on what measures are implemented by project participants. However, at a cost to NSP of \$7.50/person, NSP states that this is a very cost effective method of providing conservation information.

Annual Budget - The Commission has approved a 1989 budget of \$3,000 for this project.

18. DEMAND SIDE MANAGEMENT (DSM) POTENTIAL STUDY PROJECT

Commission Approval - This project was approved for the 1988-89 CIP year.

General Purpose - The purpose of this project is to enable NSP to make more informed project decisions and contribute to the cost effectiveness of CIP projects beginning in 1990.

Steps Involved - NSP plans to complete the following tasks in the fourth quarter of 1988 and 1989:

1. Establish a central base of existing end-use load data and identify requirements for developing additional data.
2. Compile additional data from available NSP survey and audit databases, concentrating on information to become available from the C&I End Use Study and the C&I Audit Services project.
3. Develop, test and begin applying applications software and analysis procedures that will estimate end-use load shapes and peak demand contributions by major electric end uses.

Objectives - NSP proposes to perform 1,000 complimentary Energy Check-up audits in 1989. Of these, 840 will be conducted in Minnesota. Audit recipients will be selected on a random basis to ensure the statistical integrity of the sample.

Anticipated Savings - NSP proposes that the result of this study will be a 10% improvement in the cost effectiveness of CIP projects.

Annual Budget - The Commission approved a 1989 budget of \$189,000 for this project.

19. TECHNOLOGY RESEARCH STUDY PROJECT

Commission Approval - The Commission approved this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide further information on the economic and technical feasibility of offering a heat pump water heater project, a sunscreen project and a water heater efficiency project.

Steps Involved - For the Heat Pump Water Heater project, NSP proposes to research economic and technical aspects of heat pump water heaters and analyze a variety of applications.

For the Sunscreen project, NSP proposes to conduct a national search for information on positive energy savings resulting from the use of sunscreens.

For the Water Heater Research project, NSP proposes to investigate the impact of time clock-controlled water heaters on demand-side management.

Annual Budget - The Commission approved a fourth quarter 1988 and 1989 total CIP budget of \$103,000 for this project.

NORTHERN STATES POWER COMPANY, GAS UTILITY

1. LOW INCOME HOUSE DOCTOR PROJECT

Commission Approval - The Commission approved the House Doctor project for the 1987-88 CIP year. It was renewed in 1988-89.

General Purpose - The objective of the House Doctor project is to reduce infiltration into homes of participating households by 25% or more.

Steps Involved - NSP solicited bids from community groups located within its service area to perform House Doctor services. The Company contracted with two vendors, Ramsey Action Programs (RAP) and Neighborhood Energy Consortium-Energy Resource Center to provide the services.

House doctor work includes, but is not limited to: caulking and weatherstripping, sealing of bypasses, heating system safety check, furnace tune-up, electric water heater blankets, checking for gross heat losses, minor insulation and repair work.

Objectives - NSP proposed to perform 418 House Doctors in 1987-88. The Neighborhood Energy Consortium and Energy Resource Center will provide 134 House Doctors in 1988-89. Beginning in 1988-89, RAP House Doctors will be included as part of a separate project (see Project 4B).

Anticipated Savings - NSP anticipates a 10% heating expense savings per participating household.

Annual Budget - The approved project budget for 1987-88 was \$200,000. The Commission approved a budget of \$70,000 for 1988-89.

2. ENERGY RESOURCE CENTER (ERC)

Commission Approval - This project was initially approved as a pilot utility conservation investment program on April 3, 1981. It was approved under the CIP process for 1986-87, 1987-88 and 1988-89.

Beginning in 1988-89, NSP contracted with the City of St. Paul to administer all of its conservation projects within the city, with the exception of RAP projects.

General Purpose - The ERC was created in 1981 as a public-private partnership of the City of St. Paul and NSP. It provides innovative energy financing and outreach services to NSP natural gas customers in St. Paul and surrounding communities.

The ERC coordinates and administers financing programs available from the Minnesota Housing Finance Agency (MHFA), the federal government, the City of St. Paul, Community Development Block Grants, the Exxon Oil Overcharge funds, and private foundations.

Steps Involved - The following programs have been approved:

a. Single Family Loan Program

This project provides loans to single family homeowners for appropriate conservation improvements. Principle is provided by MHFA and the Community Development Block Grant program. The ERC markets the programs and originates the loans. Each loan is purchased upon approval by the MHFA and is serviced by a separate loan servicing company. The loan is used to finance major weatherization projects recommended by an energy audit. These projects may include wall insulation, storm window replacement, and heating system replacement.

b. Rental Financing and Technical Assistance Program

The ERC offers low-interest financing and technical assistance services to rental property owners in NSP's gas service territory. Capital is provided through the MHFA Rental Energy Loan Program and a grant from the St. Paul Foundation as well as a joint bond sale between the cities of St. Paul and Minneapolis.

c. Outreach and Technical Information Service

NSP's information service, "Ask NSP", routinely directs customers to the ERC with questions on energy efficiency and financing programs. The ERC provides educational services to interested groups through its operation of the NSP Learning Center in St. Paul.

d. Administrative Support Services

The ERC staff works with loan servicing agents, trustees, and NSP staff to monitor loan repayment, fund balances, quarterly program reports, and compliance with program guidelines and procedures.

e. Proposed Pilot Commercial Financing Project

The ERC will develop and administer a pilot commercial energy improvement financing program for small commercial properties in NSP's gas service territory. The primary task of this project is to investigate and develop an information base needed to implement a small commercial financing program.

f. Furnace Repair Deferred Loans Project

This project will be limited to low income participants. The

project is intended to serve as a lender of last resort for Low Income House Doctor participants whose furnaces are found to require repair or replacement to meet minimum safety standards.

g. Multifamily Conservation Services Project

This project will provide technical assistance to non-profit organizations and owners of multifamily rental property. The technical assistance consists of low cost energy audits and the provision of a list of "guaranteed" contractors, whose reliability and work quality the Center certifies. The project will also provide low interest loans to help landlords bring their property into compliance with the City's energy efficiency standards for rental housing.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$165,000	\$165,000	\$71,250

(The 1988-89 budget includes \$41,450 for the fourth quarter of 1988 and approval of \$30,000 for deferred loans.)

3. **ST. PAUL NEIGHBORHOOD ENERGY CONSORTIUM (NEC)**

Commission Approval - The NEC project was initially approved by the Commission on January 11, 1985. It was renewed for 1986-87, 1987-88 and 1988-89.

General Purpose - The purpose of this project is to provide audits, workshops and energy plans to low to moderate income customers.

Steps Involved - The NEC operates workshops, energy audits, and post-audit supplementary assistance for residents of St. Paul. The workshops address a variety of conservation topics and include instruction for energy auditors, weatherization contractors, and community-based organizations.

NSP paid NEC \$300 each for a series of workshops performed in 1986-87 and 1987-88. Audits that were provided to low to moderate income households were supplemented by an energy plan that further specified the audit recommendations and guided the household to additional assistance resources.

In 1988-89, NEC will offer audits for a \$10 fee to residential customers living in buildings of four or fewer units. The auditor will visit the customer's home, examine the structure and heating system, determine the customer's energy use patterns, and provide an analysis of the household's conservation potential.

Objectives - NEC expected to complete 1,500 to 1,600 audits during the 1986-87 CIP year. For the 1988-89 CIP year, NEC will complete 1,800 audits. Approximately 62% of the participants will be low to moderate income and 26% will be renters.

Anticipated Savings - Annual heating cost savings are expected to average 14% per participant.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$125,000	\$140,600	\$132,500

This project also had a budget of \$505,000 for the 1984-86 CIP year.

4. **RAMSEY ACTION PROGRAM (RAP) PROJECT (1985-87)**

Commission Approval - The Commission initially approved the RAP project on January 11, 1985. The project was renewed for the 1986-87 CIP year.

General Purpose - The purpose of this project was to provide total home weatherization services to low income persons who are not being adequately served by existing programs.

Steps Involved - RAP provided audits and audit supplements to low income persons. NSP paid RAP \$72 for each audit performed and \$30 for each energy plan performed for low to moderate income households. RAP weatherized and insulated homes of low income customers in the targeted area, using NSP grant funds when funds from other organizations were not available.

NSP provided RAP with \$475,000 for the weatherization and insulation grants. The grants to low income homeowners are in the form of zero-interest, deferred payment loans that are forgiven after a 5-year period.

Annual Budget - For 1984-86, the Commission approved a total project budget of \$1,000,000. MECS audits and the MHFA's Solar Energy Bank program were included under the project.

The approved budget for the 1986-87 RAP project was as follows:

Administration	\$ 37,500
Matching grants/loans	375,000
Unmatched grants/loans	100,000
Audits/Energy Plans	30,000
MECS Audits	<u>20,000</u>
	\$562,500

4A. RAMSEY ACTION PROGRAM (RAP) PROJECT (1987-88)

Commission Approval - This project was renewed but substantially modified for the 1987-88 CIP year.

General Purpose - In 1987-88, the Commission modified the RAP project, eliminating the weatherization and audit portions and providing only a deferred loan program.

The loan program is restricted to furnace replacement loans for low income participants. NSP stated that this would not be cost effective but is required for safety reasons. NSP stated that faulty furnaces must be replaced to make the House Doctor service effective.

Steps Involved - In 1987-88, NSP proposed an average cost per furnace replacement of \$1,500.00. The \$1,500 cost consists of \$1,300 for installation costs and \$200 for administrative costs.

Objectives - RAP proposed providing deferred loans for 70 furnace replacements in 1987-88.

Annual Budget - In 1987-88, the Commission approved a total project budget of \$105,000.

4B. RAMSEY ACTION PROGRAM (RAP) HOUSE DOCTOR AND FURNACE REPLACEMENT DEFERRED LOAN PROJECT

Commission Approval - This project is a combination of two previously separate projects. This project was approved for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide House Doctor services similar to those described in the Low Income House Doctor project to residents in the balance of Ramsey County (outside of the City of St. Paul).

Steps Involved - RAP will provide energy audits, air infiltration evaluation and reduction and a furnace clean/tune-up. Where needed, heating systems will be repaired or replaced.

Objectives - NSP proposes to provide 217 energy audits and House Doctor visits. The RAP estimates that 65 of those visits will also require furnace repair or replacement.

Anticipated Savings - NSP estimates that participants will achieve heating cost savings of 8.3% to 13.5%.

Budget - The approved budget for this project for 1988-89 is \$247,685.

5. RESIDENTIAL CONSERVATION SERVICE (RCS) AUDITS

Commission Approval - This project was approved in 1986-87. It was renewed for 1987-88 and 1988-89.

General Purpose - The purpose of this project is to provide the standard RCS audit required by Minnesota Statutes Sec. 216B.165.

Steps Involved - NSP plans to administer this project through community organizations. The budget requested by NSP includes all audit costs except NEC billings and NSP labor costs.

Annual Budget - The Commission approved this project at NSP's proposed budget of \$150,000 for 1987-88. In 1988-89, the Commission approved a budget of \$12,500 for this project.

6. ST. PAUL RENTAL ENERGY EFFICIENCY ENFORCEMENT PROJECT (SPREE)

Commission Approval - SPREE was approved for the 1986-87 CIP year. It was renewed for 1987-88.

General Purpose - Under this project the City of St. Paul enforced state minimum standards for energy conservation in rental housing. Energy audits provided technical information needed by city inspectors to enforce the state rental standards.

The target population was 100% rental and almost 100% low income. This project was designed to increase the energy efficiency of housing units occupied by renters and low income families.

Steps Involved - The City enforced the state standards in response to complaints. When a complaint was received, the appropriate enforcement officer performed an audit on the building. The audits proposed for this project were similar to the MECS audits. The audit results showed the building's compliance or non-compliance with each standard. The enforcement officer then issued orders to bring the building into compliance.

Objectives - The City anticipated that 50 buildings would be retrofitted in 1986-87 and 100 buildings would be retrofitted in 1987-88.

Anticipated Savings - The City estimated that \$20,500 in savings would be achieved in 1986-87, and \$39,000 would be achieved in 1987-88. The City's analysis indicated that the project would cost effective to participants and cost effective to the utility. The majority of participants, at least 88%, have an income less than \$12,000.

<u>Annual Budget</u>	1986-87	1987-88
	\$20,200	\$22,290

7. TWIN CITIES NEIGHBORHOOD HOUSING SERVICE, INC. (TCNHS)

Commission Approval - The Commission approved the TCNHS project in 1986-87. It was renewed for 1987-88 and 1988-89.

General Purpose - The TCNHS is a non-profit cooperative of four incorporated NHS programs. The TCNHS has proposed a weatherization rehabilitation project to coordinate energy conservation and home rehabilitation for low to moderate income families in the Dayton's Bluff and West Side areas of St. Paul.

Steps Involved - Under the proposed project, \$1,000 worth of materials are provided at no cost to homeowners, who are expected to pay the cost of installation by a contractor.

The project is designed to assist residents that are considered low income according to the guidelines of the U.S. Department of Housing and Urban Development, but do not qualify for weatherization assistance under the RAP guidelines. Thus, the project avoids duplicating RAP's weatherization project while serving people at the next rung of the economic ladder.

Project activities consist of the following: initial planning, marketing, intake, processing applications, determining weatherization and rehabilitation needs of households, writing a scope of work, receiving bids, choosing a contractor, installing materials, inspecting the installation, and servicing loans.

Anticipated Savings - All of the NSP supplied funds are used directly for weatherization material. Therefore, the amount spent on this project will directly increase the energy efficiency of participant's homes. NHS stated that NSP has agreed to provide gas meter readings before and after the weatherization work to aid in the evaluation. NSP expects an average heating expense savings of 20% per participant.

<u>Annual Budget</u>	1986-87	1987-77	1988-89
	\$33,600	\$33,000	\$35,000

The NHS also has other funds available: \$450,000 for a revolving loan fund and a \$33,600 grant from the St. Paul Foundation for 30 homes. In addition, participating homeowners will spend approximately \$60,000 to install the weatherization materials. The TCNHS stated that, in 1987, a 15 to 1 leveraging is possible for the proposed NSP grant.

8. ST. PAUL URBAN LEAGUE PROJECT

Commission Approval - The Commission approved this project for the 1984-86 CIP years. It was not renewed.

General Purpose - Under this project the Urban League provided energy audits and neighborhood energy workshops with outreach for low income residents of the Summit-University neighborhood in St. Paul. This neighborhood is not served by the NEC.

Annual Budget - The approved budget for this project was \$54,450.

9. TOOL-LENDING LIBRARY PROJECT

Commission Approval - The tool-lending library was approved by the Commission for the 1984-86 CIP year. It was not renewed.

General Purpose - The Tool Lending Library loaned weatherization tools to low income customers in St. Paul.

Annual Budget - NSP's annual contribution to the Library's budget was \$30,000.

10. OUTSTATE RESIDENTIAL PROJECT

Commission Approval - This project was approved in 1987-88. It was renewed for 1988-89.

General Purpose - The purpose of this project is to provide a heating system clean and tune to energy assistance customers in Moorhead, Minnesota.

Steps Involved - NSP has contracted with the Clay-Wilkin Opportunity Council to administer this project. Furnace services will consist of a safety inspection, cleaning, and tune-up, with repair or replacement of furnaces that do not meet minimum safety standards.

Objectives - In 1987-88, there were 115 participants and 22 furnace replacements. In 1988-89, the Council anticipates 125 participants; approximately 22 are expected to require furnace replacement.

Anticipated Savings - NSP estimates that participants will achieve a 7% savings from the tune-up and a 7-10% savings from the audit portion of the project.

Annual Budget - In 1987-88, the Commission approved a budget of \$46,840 for this project. The Commission approved a budget of \$50,000 for this project in 1988-89.

11. NEW NON-METROPOLITAN RESIDENTIAL PROJECT

Commission Approval - The Commission ordered NSP to offer this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide conservation education and free furnace services to low income customers outside the Twin Cities metropolitan area.

The project will be similar to the Clay-Wilkin Outstate Residential project but will be offered to customers in another non-metropolitan community.

Annual Budget - The Commission approved an initial budget of \$25,000 for this project.

12. COMMERCIAL/INDUSTRIAL AUDIT PROJECT

Commission Approval - The Commission approved this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to offer energy audits to commercial customers not currently covered by NSP Electric's C&I audit project.

Steps Involved - NSP Gas will offer the NSP Electric Quick-Check audit to customers in East Grand Forks and Moorhead, Minnesota. The audit will be free and conducted by a state-certified energy auditor.

Objectives - NSP will conduct 80 audits in each community.

Anticipated Savings - NSP estimates that annual heating cost savings will be 6-10% per participant.

Annual Budget - The Commission has approved a total 1988-89 budget of \$20,000 for the project, or \$10,000 for each community.

13. COMMERCIAL AND INDUSTRIAL END USE STUDY PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year.

General Purpose - The purpose of this project was to collect information that could be used to investigate opportunities for cost effective conservation projects directed at C&I customers.

Steps Involved - NSP collected information pertaining to customer end uses, fuel use, business characteristics, and building characteristics. Additional samples of NSP Gas customers were

included with the NSP Electric C&I End Use Study to achieve a statistically valid sample of gas customers.

Annual Budget - The Commission approved a budget of \$12,500 for this project in 1987-88.

14. NEW COMMERCIAL/INDUSTRIAL PROJECT (TO BE DEVELOPED)

Commission Approval - The Commission ordered NSP to develop this project during the 1988-89 CIP year. The project is to be included in the Company's May 1989 filing.

General Purpose - NSP recently completed a commercial and industrial end-use study intended to assist the Company in developing conservation programs for these classes. The data from that study, together with an examination of the CIP experience of other gas utilities, will enable the Company to develop commercial projects in addition to the ones currently in operation.

Annual Budget - The Commission approved a 1988-89 budget of \$5,000 for this planning project.

MINNEGASCO³

CITY OF MINNEAPOLIS PROJECTS

1. OPERATION INSULATION PROJECT

Commission Approval - Operation Insulation was approved for the 1984-86 CIP year. It was renewed in 1986-87, 1987-88 and 1988-89. (This project was approved as part of the NEW project in 1984.)

General Purpose - The aim of this project is to encourage and assist residential building owners with major insulation work. The project was expanded to include installation of energy efficient heating systems.

Steps Involved - The project includes an audit, consultation, completion of conservation work, and a post-installation inspection. For rental property owners, the project also includes the "House Doctor" service. Two community energy organizations are directly involved in this project. The Self-Reliance Center conducts the energy audits and completes the City of Minneapolis rental energy code inspections.

Objectives - During 1986-87, the Company estimated that the project would serve a total of 3,400 households. For 1987-88, Minnegasco anticipated completion of insulation work for 1,900 households and House Doctor retrofits for 1,100 households. For 1988-89, the Company expects this project to serve 675 low income households and 2,400 rental households.

Anticipated Savings/Payback - The Operation Insulation project involves short payback periods because CIP funds are used to leverage \$500 to \$2,000 in additional funding for each participant. The Minneapolis Energy Office (MEO) estimates that energy savings for insulation jobs will average between 12% and 20%. For the House Doctor portion of the project, the MEO estimates average savings from 8% to 15%.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$349,549	\$350,392	\$250,637

³In addition to individual project budgets, the Commission approved \$262,000 for administrative costs in 1986-87; \$178,000 in 1987-88; and \$150,000 in 1988-89.

2. MULTIFAMILY PROJECT

Commission Approval - The Multifamily project was first approved for the 1984-86 CIP year. It was renewed in 1986-87, 1987-88 and 1988-89.

General Purpose - The purpose of this project is to foster steam and hot water heating system modifications in existing multifamily dwellings and to promote the use of low-flow shower heads and vent dampers.

Steps Involved - The project includes a workshop, an audit, completion of the heating system work, and a post-installation inspection. Recommended improvements include outdoor thermostat resets and cutouts for hot water systems, air venting and boiler cycle length controls for steam systems, and other measures. The majority of retrofits will be performed on hot water systems within the City of Minneapolis. The Self-Reliance Center will conduct the majority of audits. Building owners will pay the full cost of all improvements while CIP funds will cover energy audits, project promotion, and administration.

Objectives - In 1986-87, 300 multifamily audits were to be performed and 200 hot water and 15 steam retrofits installed. In 1987-88, Minnegasco estimated completion of 300 audits, installation of 175 heating system retrofits, and installation of 100 House Doctor retrofits. The Company estimates that the project will benefit 2,550 households in 1988-89.

The project is designed to be used 100% by low income families and individuals and renters. Thirty percent of the renters are expected to be below 125% of the federal poverty level.

Anticipated Savings/Payback - Based on pilot program results, Minnegasco estimates a 20% energy savings per building, a .9 year payback period on CIP funds, and a one to two year payback period on participant funds. Taken together, these estimates indicate that the project will be cost effective.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$133,755	\$105,431	\$419,635

3. PROJECT CHOICE (FORMERLY LOW-INCOME PROJECT)

Commission Approval - The Low Income project was originally approved for the 1984-86 CIP year. It was renewed in 1986-87 as the Low Income Coordinated Energy Services (CES) project, and in 1987-88 and 1988-89 as Project Choice.

General Purpose - The purpose of the project is to provide comprehensive energy services to low income households.

Steps Involved - The project will consist of five major strategies:

1. a House Doctor audit;
2. the education and motivation of households to develop and practice energy efficient lifestyles;
3. the utilization of available public resources for assistance with energy bills, such as the Minneapolis Community Action Agency's (MCAA) Energy Assistance Program and Salvation Army Heatshare;
4. the utilization of available public programs (such as the MCAA's Department of Energy Weatherization program, the Minneapolis Energy Bank, and other deferred and low-interest loan programs) to implement recommended weatherization work; and
5. negotiation of monthly budget plan between the household and Minnegasco, to enable households to stay current with their natural gas bills. Minnegasco has tailored portions of this project to address homeowners, renters, and public housing residents.

The Self Reliance Center conducts energy audits and educational visits, and provides House Doctor visits where recommended. The services of the MCAA, the Urban Coalition, the Salvation Army/Heatshare and other community organizations would also be coordinated with the Low Income CES project.

Objectives - In 1986-87, Minnegasco claimed a total of 900 low income households would attend workshops and a total of 510 structures would be weatherized. In 1987-88, Minnegasco estimated that 800 households would benefit from workshops and that 250 structures would be weatherized. In 1988-89, the project is expected to serve 1,075 households.

The project is designed to be used 100% by low income and rental customers. All participants have incomes under 125% of the federal poverty line.

Anticipated Savings/Payback - Minnegasco indicates that the payback period for CIP funds spent on the project will be about 3.7 years. Households with house doctoring alone save about 7.4% of previous natural gas use, while households that have major weatherization work plus house doctoring save about 22.6%.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$338,847	\$363,167	\$99,855

4. RESEARCH AND TESTING PROJECT

Commission Approval - This project was approved for the 1986-87 CIP year. It was renewed for 1987-88 and 1988-89.

General Purpose - The purpose of this project is to develop reliable information on energy conservation technology for use in developing conservation strategies. Thus far, efforts have focused on low cost modifications to heating systems in multifamily buildings.

Steps Involved - Minnegasco works with the City of Minneapolis in selecting and conducting energy conservation research projects. Project results are analyzed for application to other projects and communities.

Objectives - In 1987-88, research topics included: multifamily boiler tune-ups, two-pipe steam to hot water conversion, front-end modular boilers, and the end uses of energy in multifamily buildings.

In 1988-89, research topics included: the comparative efficiency of different multifamily hot water heating systems, the seasonal efficiency of multifamily boilers, and the natural gas usage patterns of low income households.

Research efforts are expected primarily to benefit low and moderate income tenants, who make up the majority of renters in multifamily buildings.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$90,996	\$95,674	\$62,047

5. ON-GOING EVALUATION PROJECT

Commission Approval - The Commission approved the On-going Evaluation project for the 1986-87 CIP year. It was renewed for 1987-88. Beginning in 1988-89, there will not be a separate evaluation project; instead, each CIP project will have an evaluation component.

General Purpose - Under this project, Minnegasco determines the effectiveness of its various CIP projects and provides information to maximize the quality and cost effectiveness of projects.

Steps Involved - The project analyzes energy use and the savings achieved using the PRISM program developed at Princeton University. On May 14, 1985, the Commission approved the use of the PRISM program in Minnegasco's evaluations.

Objectives - The following evaluations are either completed or ongoing: Project Choice, Operation Insulation, the effectiveness of foundation insulation, and the effectiveness of major improvements to heating systems in multifamily buildings. In addition, the MEO will assist Minnegasco in analyzing evaluation data for CIP projects implemented outside the City of Minneapolis.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$64,794	\$60,336	\$42,826

6. ENERGY BANK FINANCING PROJECT

Commission Approval - The Commission approved the Energy Bank project for the 1984-86 CIP year. It was renewed for 1986-87.

General Purpose - The Minneapolis Energy Bank was established by the City of Minneapolis Energy Office to provide below-market rate loans for energy conservation improvements. Energy Bank funds, provided by the City of Minneapolis, were used to finance the completion of work for the Operation Insulation project. Minnegasco originated, administered and serviced the loans.

Steps Involved - Energy Bank loans were available to all Minnegasco customers in Minneapolis who were owner-occupants of their buildings and who had adequate credit histories. The Minneapolis Energy Office was responsible for Energy Bank promotion, loan processing and communication with applicants. Loans were offered at up to \$5,000 for single-family dwellings, \$7,500 for two to four unit buildings, and \$1,000 for self-installed improvements. Loan payments are made with monthly gas bills. Similar loans were made available to landlords of rental units.

Objectives - During the 1986-87 period, the Energy Bank provided a total of 1,200 loans, 550 to homeowners and 650 to landlords. Approximately 400 loans were for renters who are below 125% of the federal poverty level.

Anticipated Savings - Minnegasco asserted that payback periods for energy conservation measures funded by the Energy Bank would range from 1.8 to 2.6 years.

Annual Budget - The total 1986-87 budget for the Energy Bank project was \$97,659.

7. NEIGHBORHOOD ENERGY WORKSHOP (NEW) PROJECT

Commission Approval - The Commission approved the Neighborhood Energy Workshop project for the 1984-86 CIP year.

General Purpose - NEWs were designed to provide residents with technical and financial assistance for conservation actions.

Steps Involved - The first step was to hold a meeting at which neighborhood residents viewed an audio-visual presentation on low-cost/no-cost conservation measures, learned about energy use habits, and had the opportunity to schedule an appointment for an audit of their home.

After the audits were performed, homeowners received information on weatherization improvements and a free package of weatherization materials. After group sessions, residents returned to their homes where technicians offered on-the-spot assistance, answered questions and made recommendations about major weatherization.

The Low-Income project, the multifamily project, and Operation Insulation were part of the NEW project in 1984-86.

PROJECTS OUTSIDE THE CITY OF MINNEAPOLIS

8. HOME ENERGY CHECK-UP (HEC) PROJECT

Commission Approval - The HEC was approved for the 1986-87 CIP year. It was renewed in 1987-88 and 1988-89.

General Purpose - This project provides conservation education and low cost conservation materials to renters and low income customers.

Steps Involved - The Home Energy Check-up (HEC) project consists of four steps: (1) a quick, practical energy audit; (2) the installation of basic infiltration reduction measures, with hands-on instruction about weatherization techniques; (3) a discussion of available funding sources; and (4) an opportunity for follow-up discussion between auditor and participant. At the time of the check-up, the auditor distributes a weatherization kit worth \$20 to \$30.

Minnegasco signs standard agreements with participating municipalities. Each participating municipality markets its program, determines participant eligibility, and ensures contractor performance and customer satisfaction. Also, each participating municipality contracts with local personnel to perform the check-ups. Minnegasco, in turn, provides funding (at

\$80 or \$90 per participant) to cover costs of the project.

Objectives - For 1986-87, Minnegasco proposed to renew its contract with the City of Brainerd for a total of 500 Check-ups. Minnegasco estimated it would contract for 850 to 1,063 HECs during this period. For 1987-88, Minnegasco signed agreements with Alexandria, Little Falls, New Hope, Shakopee, Carver County and Washington County. An estimated 1,145 low to moderate income households would be served with Minnegasco's proposed level of funding.

For 1988-89, Minnegasco estimated it would complete 1,935 HECs in 12 communities. The Commission also approved an additional 350 HECs to be administered by the Self-Reliance Center. It is likely that the City of Bloomington will be added during the 1988-89 CIP year.

Anticipated Savings/Payback - Minnegasco's objective for the HEC project is to reduce a household's energy consumption by 5%-10% while increasing the resident's comfort and quality of life. Minnegasco estimates first-year savings to be \$23-\$46, implying a payback period of 1.7 to 3.7 years.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$85,000	\$96,000	\$209,514

9. PROJECT AIR (FORMERLY HOUSE DOCTOR PROJECT)

Commission Approval - The House Doctor project was approved for the 1986-87 CIP year. It was renewed for 1987-88. In 1988-89, the project was renewed but renamed Project AIR.

General Purpose - The project reduces air filtration in homes by weatherstripping, applying void filler, insulating attic accesses, and providing similar low cost infiltration procedures.

Steps Involved - Using a blower door to identify sources of air leakage, air infiltration is reduced by 30%-40%. Weatherization measures include: caulking, weatherstripping, sealing attic bypasses, and other related measures. Optional non-infiltration measures include repair and replacement of attic rim joist and hatch insulation; improving heating and domestic hot water system efficiencies; insulating hot water heaters; and other measures.

Minnegasco signs an agreement with a community and commits to providing approximately \$400 per household to the community. The community is responsible for marketing the project, determining household eligibility, and ensuring contractor performance and customer satisfaction.

Objectives - For 1986-87, Minnegasco proposed to serve approximately 250 low income households under the project. For 1987-88, an estimated 280 low-income households were served. For 1988-89, the Company will complete 295 evaluations in 9 communities.

Anticipated Savings/Payback - Minnegasco's objective for the House Doctor project is to reduce air infiltration by 30%-40%. Minnegasco originally projected an average energy consumption reduction of 15% per participant. However, an evaluation submitted early in 1988 suggests that this level of savings may not be attainable.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$206,400	\$114,000	\$115,561

10. PROJECT CHOICE

Commission Approval - This project was approved as a pilot project for the 1988-89 CIP year.

General Purpose - This project provides comprehensive energy services to low income households in communities outside the City of Minneapolis.

Steps Involved - See Project Choice (#3) under City of Minneapolis projects.

Objectives - The Company is working with West Hennepin Human Services to identify community agencies that might administer the project. The targeted communities are Crystal, Brooklyn Center, Golden Valley, and Robbinsdale. The Company anticipates 250 participating households in 1988-89.

Annual Budget - The approved 1988-89 budget for this project is \$30,000.

11. NEW CONSTRUCTION REBATE PROJECT

Commission Approval - This project was approved as a pilot project for the 1988-89 CIP year.

General Purpose - This project will foster the efficient use of energy in new commercial construction by providing rebate incentives to developers and building owners.

Steps Involved - Rebate levels are tied to specified efficiency targets. These targets are roughly twice as stringent as the standards in the Minnesota Energy Code.

Participants must qualify under both building eligibility and performance requirements. Rebates will be provided after construction is completed and buildings and appliances are certified to meet efficiency standards. Rebates will range up to \$7,500 per building.

Annual Budget - The approved 1988-89 budget for this project is \$125,000.

PEOPLES NATURAL GAS COMPANY

1. WEATHERIZATION ON WHEELS (WOW) PROJECT

Commission Approval - The Commission approved WOW for the 1984-86 CIP year. It was renewed for 1986-87.

General Purpose - The WOW project involved a specially-outfitted van that traveled throughout Peoples' service area to offer energy workshops to rural communities. Peoples stated that this approach is the most effective means of supplying weatherization information to the 87 primarily rural communities that it serves in Minnesota.

Steps Involved - WOW workshops were designed to educate participants about various energy conservation measures and practices, to demonstrate proper installation of materials (using training modules), and to allow for hands-on practice by participants. The van contained models of an attic, a wall, various windows, and a door for demonstrating topics such as caulking, weatherstripping, insulation, and ventilation. A limited number of weatherization kits with retail values of approximately \$40 were given as door prizes to workshop participants. The workshop presenter encouraged workshop participants to sign up for MECS audits.

Objectives - After the WOW program was made available to Peoples' communities in late August of 1985, 13 workshops were requested (through March 8, 1986). In addition, the WOW van participated in a fair exhibit in Hoyt Lakes on July 30, 1985.

Anticipated Savings - Peoples estimated that persons who followed through with installing weatherization materials should receive a savings of approximately \$52-\$75 annually.

Annual Budget - Peoples' filing indicated expenditures of \$5,566 for the WOW project during 1985 and \$8,767 since project start-up. Peoples budgeted approximately \$6,200 during 1986 and approximately \$6,000 in subsequent years.

2. CANNON FALLS ENERGY EFFICIENCY PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The purpose is to combine the Home Energy Check-up (HEC) and "House Doctor" retrofit into a single visit, called a "Residential Energy Retrofit" (RER).

Steps Involved - This project is sponsored by local citizens comprising the Cannon Falls Energy Council. RER services include sealing of leaks and retrofitting of equipment, up to a maximum cost of \$200 per household. In an attempt to target those homes with the greatest need for energy improvements, RERs are performed only on homes built prior to 1970.

Objectives - In 1987-88, Peoples estimated it would perform 250 RERs and an additional 100 HECs. During 1988-89, Peoples plans to perform 125 RERs and an additional 50 HECs. The Company estimates that 25% to 30% of the project participants will be senior citizens, disabled persons, low income persons, or renters.

Anticipated Savings - Peoples estimates that participants in this project will save 10% in heating costs by having an HEC, and 15% by having an RER. The participants pay no fee for the service.

Annual Budget - The proposed budget commitment to this project for 1987-88 was \$9,250. The approved budget for 1988-89 is \$8,750.

3. HOUSTON ENERGY ACTION TIME PROJECT (HEAT)

Commission Approval - The HEAT project was approved for the 1987-88 CIP year.

General Purpose - The purpose of this project was to provide energy information and weatherization kits to Peoples' customers in the Houston County Area.

Steps Involved - This project had two components, the Senior Citizen Energy project and the Home Energy Check-up. In the Senior Citizen Energy project, an energy coordinator visited households to provide free energy information and free weatherization installation. The Home Energy Check-up project provided other households with a free energy audit and a free weatherization kit.

Objectives - Peoples estimated that the Senior Citizen Energy project would serve 100 households. The HEC project would serve 200 households.

Anticipated Savings - Peoples estimated that energy savings per participant will average 4% per year.

Annual Budget - Peoples' proposed budget commitment for this project for 1987-88 was \$16,000.

4. ROCHESTER ENERGY WELLNESS PROJECT (ALSO CITY OF ROCHESTER PROJECT)

Commission Approval - This project was approved for the 1986-87 CIP year. It was renewed for 1987-88 and 1988-89.

General Purpose - The aim of the project is to disseminate information through an energy audit to increase public awareness of the simplicity and cost effectiveness of many conservation options.

Steps Involved - The project is twofold. The basic project offers a home energy audit (MECS), done by a certified energy auditor contracted through Peoples. The second part is the House Doctor program for senior citizens and disabled persons carried out by a trained senior citizen.

Objectives - For 1988-89, the objectives are to offer 75 MECS audits and install 75 weatherization kits. The MECS audits are available to all Rochester residents. The House Doctor program is available to senior citizens and disabled persons only.

Anticipated Savings - Peoples estimates the average savings at 4%. Services are free to senior citizens and disabled persons. Other residents are charged \$10 for the MECS audit.

Annual Budget - Peoples' proposed budget commitment to this project for 1987-88 was \$7,595. The approved budget for 1988-89 is \$6,000.

5. WEST CONCORD CITIZENS AWARE OF RESOURCES AND ENERGY (CARE)

Commission Approval - The Commission approved CARE for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The aim of this project is to save energy and encourage a sense of unity, purpose and commitment to future community improvements through Home Energy Check-ups and weatherization kit installation.

Steps Involved - The Home Energy Check-up consists of an energy consultation, an energy audit, the implementation of sample infiltration measures, and a follow-up phone call or visit. A more intensive energy consultation and a weatherization kit is available to senior citizens and disabled persons.

Objectives - For 1988-89, Peoples plans to provide 54 MECS audits and 54 weatherization kits. Approximately 10-20% of the participants will be senior citizens, renters, or low income or disabled persons.

Anticipated Savings - Peoples estimates that energy consumption will be reduced by 5-10% in 200 residential buildings over the two years of the project. The dollar savings will range from \$28 to \$56 per year per household.

Annual Budget - Peoples' proposed budget commitment to this project for 1987-88 was \$3,740. The approved budget for 1988-89 is \$3,240.

6. MAHUBE COMMUNITY COUNCIL, INC. PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The purpose of the project is to pre-inspect gas heating equipment in the homes of low income persons, senior citizens and disabled persons residing in Becker County. The pre-inspection looks for safety, reliability and efficiency.

Steps Involved - A trained repair person will pre-inspect the furnace, clean, tune-up and install parts such as vent dampers in the furnace. MAHUBE Community Council's trained heating system inspector will perform a post-inspection.

Objectives - Peoples plans to service 57 households in 1987-88 and 57 households in 1988-89 at an average cost of \$250 per household. At least 90% of the project funds will be targeted at low income households.

Anticipated Savings - Average projected savings per household are 10%. The participants will pay no fee for the service.

Annual Budget - Peoples' proposed budget commitment to this project for 1987-88 was \$15,105. The approved budget for 1988-89 is \$15,000.

7. SOUTHEAST MINNESOTA CITIZENS ACTION COUNCIL (SEMCAC), INC. FURNACE CHECK PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - The goal of this project is to provide low income customers with inspection of and necessary work on their furnaces. The Furnace Check project will be operated in conjunction with SEMCAC's Weatherization program and dovetail into the available funding for more comprehensive weatherization work.

Steps Involved - SEMCAC coordinates the application process. The actual work done on the furnaces will be determined by the SEMCAC energy technicians, who are all certified by the Minnesota Department of Jobs and Training, and carried out by area contractors certified in mechanical systems. Since the Furnace Check project will run in conjunction with the Weatherization program, it will be possible to pursue the more expensive types of retrofits at no cost to the eligible customer.

Objectives - The objectives are to perform 70 pre/post-inspections and 33 furnace tune/clean/upgrades. All project participants will be persons whose income is below 138% of the federal poverty income guidelines.

Anticipated Savings - Peoples expects average savings of 8-10%, depending upon the type of furnace work done.

Annual Budget - Peoples' proposed budget commitment to this project for 1987-88 was \$18,500. The approved budget for 1988-89 is \$13,000.

8. COMMERCIAL NON-PROFIT PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was renewed in 1988-89.

General Purpose - The aim of the project is to assist non-profit commercial account customers reduce their natural gas consumption.

Steps Involved - Funding may include but is not limited to the following: furnace clean and tune; installation of vent damper; installation of caulking, weatherstripping, insulation, etc.; and installation of a new furnace or water heater. Conservation expenditures will be limited to \$1,500 per building or matching funds on a 50/50 basis for conservation improvements that exceed \$1,700 will be considered as the budget allows.

Objectives - Prospective participants are in Peoples' Chatfield and Worthington districts. The local ratepayers will benefit along with society as a whole as reduced energy bills will allow more funding for the non-profit organization's programs.

Anticipated Savings - Energy savings will vary between 4% and 20%. Participants are not charged unless they require 50/50 matching funds for amounts over \$1,700.

Annual Budget - The Commission approved a budget of \$15,000 for this project in 1987-88. The approved budget for 1988-89 is \$17,000.

9. CITY OF PRESTON SAVE PROJECT

Commission Approval - The Commission approved this project for the 1986-87 CIP year.

General Purpose - Under this project, Peoples provided MECS energy audits and weatherization kits to households in the City of Preston.

Steps Involved - The SAVE project was marketed through the local media, including local newspaper and television ads; referrals from County Social Services, local churches, SEMCAC; and presentations to senior citizen groups. MECS-certified auditors delivered the energy audits and assisted in installing the weatherization kits. A blower door was made available to participants as part of the marketing strategy. In at least 10% of audited homes, a follow-up inspection was conducted to ensure proper installation of materials.

Objectives - Peoples planned to serve 300 households with this project. The City focused its efforts on senior citizens, low income households and handicapped persons.

Anticipated Savings - Peoples expected to reduce household energy consumption by 7-10%, with dollar savings of \$52-\$75 per household.

<u>Annual Budget</u>	1986-87
Salaries/wages	\$12,000
MECS Training	700
Weatherization kits	<u>6,000</u>
TOTAL	\$18,700

10. WORTHINGTON NEIGHBORHOOD ENERGY WORKSHOP (NEW)

Commission Approval - The Commission approved the NEW project for the 1984-86 CIP year.

General Purpose - The NEW project was similar to Minnegasco's neighborhood energy workshop project. NEWs were designed to provide residents with technical and financial assistance for conservation action.

Steps Involved - The NEW project provided energy audits, packets of conservation materials and neighborhood energy workshops to 500 residents of Worthington.

Annual Budget - Peoples proposed a budget of \$40,000 for 1984-86.

11. LACRESCENT PROJECT

Commission Approval - The Commission approved this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide energy audits and weatherization kit installation for all classes of LaCrescent citizens.

Steps Involved - The project will be promoted through newspaper articles, notices on water bills, phone calls, presentations and posters. A local citizen will be trained to conduct energy audits and install weatherization kits.

Objectives - The goal for this project in 1988-89 is to offer 75 audits and weatherization kit installations and to carry out additional weatherization on 25 low income homes. Peoples estimates that 28% of the project participants will be low to moderate income persons and 15% will be renters.

Anticipated Savings - Peoples anticipates savings from 2% to 7% for the audit and weatherization kit installation. For the additional weatherization, Peoples anticipates savings between 3% and 15% based upon the depth of the project components installed. Participants receive this project free of charge.

Annual Budget - The approved 1988-89 budget for this project is \$13,000.

12. LAKEFIELD HOME ENERGY AWARENESS TRAINING (HEAT) PROJECT

Commission Approval - The Commission approved this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to provide Home Energy Check-ups for all residents of Lakefield, with a special effort being made to encourage the participation of senior citizens, low income persons, disabled persons and renters.

Steps Involved - The HEC consists of a consultation with the homeowner/renter on their energy concerns, a quick audit, a blower door test, installation of weatherization materials, post blower door test, flue gas analysis, and a follow-up contact. To encourage participation, three presentations will be made to senior citizen groups, weatherization of eligible homes will be coordinated with the Community Action Council, and additional weatherization of target group homes will be completed.

Objectives - The objective for 1988-89 is to offer 100 HEC audits and weatherization kits. Peoples estimates that 40-45% of the project participants will be senior citizens, disabled persons, low income persons or renters.

Anticipated Savings - The savings are estimated to be between 2% and 7% upon installation of the weatherization materials. There is no charge to participants.

Annual Budget - The approved 1988-89 budget for this project is \$6,000.

12. UNIVERSITY/COLLEGE PILOT PROJECT

Commission Approval - The Commission ordered the Company to develop this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to develop either a cost-effective conservation pilot project or a method for surveying and evaluating the predicted and actual energy savings of Peoples' CIP projects. Peoples' is to utilize the resources of educational institutions within its service area in developing the project.

Annual Budget - The Commission initially approved a minimum budget of \$2,000 for this project.

13. ADDITIONAL PROJECT

Commission Approval - The Commission ordered the Company to develop an additional project for the 1988-89 CIP year.

General Purpose - The Department of Public Service (DPS) is a valuable resource for utilities planning CIP projects. For this reason, the Commission ordered Peoples to work with the DPS to develop an additional project.

The Commission suggested the following projects: Commercial Energy Audit Project, Gas Furnace/Boiler Project, Water Heater Conservation Project, Construction Conservation Project, Rating of Multifamily Housing Project, and Appliance Rebate Project.

Annual Budget - The Commission initially approved a budget of \$10,000 for this project, noting that the amount could be increased if required.

OTTER TAIL POWER COMPANY (OTP)

1. RESIDENTIAL DEMAND CONTROL PROJECT

Commission Approval - The Commission approved this project for the 1984-86 CIP year. It was renewed for 1986-87, 1987-88 and 1988-89.

General Purpose - This project allows OTP to automatically interrupt service to appliances during periods of peak demand. The goal is to reduce the utility's need to purchase or generate additional power during peak periods, while reducing the customer's energy expenses.

Steps Involved - To participate in the project, customers must acquire a Residential Demand Control unit. The Company provides these units under a 48-month lease, with monthly payments of \$12, after which the customer may purchase the unit for \$1. Installation costs range from \$150 to \$250, with the Company providing a \$100 cash rebate upon installation. The Company covers metering and radio receiver costs without charge. Participating customers may select the appliances to which service will be interrupted, and they qualify for special Residential Service-Controlled Demand rates.

Objectives - OTP originally hoped to have 5,000 Minnesota customers on residential demand control after five years of project operation. However, OTP now believes that figure was too optimistic. The Company projects that 85 new households will join the project in 1988-89, bringing total project participation to 1,273 households.

Anticipated Savings - The Company's preliminary research indicated that the average on-peak demand reduction from a demand controller is about 4 kilowatts (kW) per installation. The savings to OTP from controlling 4 kW of peak demand ranges from \$355 to \$434.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$152,368	\$142,595	\$42,942

2. RADIO CONTROL WATER HEATER PROJECT

Commission Approval - The Commission approved the Water Heater project for the 1984-86 CIP year. It was renewed for 1986-87 and 1987-88.

General Purpose - This project provides the Company with control over water heating loads and gives the customer efficient service at the lowest possible energy costs.

Steps Involved - Water heating is the second highest residential use of electricity in the OTP service area. Radio control units enable OTP to control customer's hot water heating during periods of peak demand or when an emergency occurs. The installation of the control equipment qualifies the household to a \$2 per month billing credit. OTP covered the full cost of \$150 to supply and install the radio control units for low income and rental customers. Other customers paid \$50 for relays and wiring. OTP supplied the radio control and connection, at a cost of approximately \$100.

Objectives - OTP projected installation of 95 units in 1987 and a total of 643 over a 5-year period. However, only 7 units had been installed as of April 15, 1987. OTP subsequently indicated that the original participation objectives were unattainable and that unspent monies would be transferred to other projects.

Anticipated Savings - OTP estimated that this project would provide a peak demand reduction of 1 kW per water heater controlled, thereby avoiding a cost of \$89 to \$108 per unit.

<u>Annual Budget</u>	1986-87	1987-88
	\$96,450	\$10,388

3. RESIDENTIAL CONSERVATION SERVICE (RCS) PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - Under this project, OTP determines what conservation practices and measures are best suited to a customer's needs.

Steps Involved - RCS audits have been done since 1981 by OTP under the Minnesota Energy Conservation Service (MECS). The project is open to all residential customers for a \$10 fee and consists of a comprehensive energy audit. The auditor visits the customer's home, examines the structure, determines the customer's energy use patterns, and provides an analysis of the household's conservation potential. This analysis addresses all conservation measures the household could undertake, and includes recommendations on which measures will be most practical for that particular household.

Objectives - OTP expected to complete 427 audits in the first year of the project and 100 in the second. OTP expects 5% of the

participants to be low income or rental households.

<u>Annual Budget</u>	1987-88	1988-89
	\$44,055	\$7,820

4. COMMERCIAL AND INDUSTRIAL AUDIT/CONSULTATION PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - Under this project, OTP assists large commercial and industrial customers in conserving energy.

Steps Involved - This project is offered free of charge to large commercial and industrial customers and consists of a comprehensive energy audit and consultation. Services are delivered by a two-person team that analyzes the customer's current usage levels and patterns and identifies areas of potential conservation.

The auditors provide analysis and recommendations on all aspects of the customer's energy use, from load management to lighting and insulation levels. They examine the conservation potential of a wide range of devices and materials, including heat pumps, heat exchangers, piping insulation, and stratification fans.

Objectives - OTP's long term goal is to provide these services to all 554 of its large commercial and industrial customers. The Company anticipates providing 50 audits in 1988-89.

Anticipated Savings - This project should increase the capacity factor of OTP's power plants, forestalling construction of new base load generation.

<u>Annual Budget</u>	1987-88	1988-89
	\$26,022	\$39,090

5. HOUSE THERAPY WEATHERIZATION PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year. It was modified and renewed for 1988-89.

General Purpose - This project will provide comprehensive conservation and weatherization services to low income customers whose primary heating system is electric.

Steps Involved - Local CAPs will deliver the services that will begin with an energy audit and basic conservation information.

The project will provide free weatherization services and materials, and will perform tasks such as insulating foundations and rim joists, installing ceiling fans, replacing inefficient water heaters with efficient models on off peak control, providing Residential Demand Control devices, and moving baseboard thermostats to eye level.

Objectives - The Company expects the project to serve approximately 78 households in 1988-89.

<u>Annual Budget</u>	1987-88	1988-89
	\$116,950	\$150,000

6. SENIOR CITIZEN WORKSHOP/AUDIT

Commission Approval - This project was approved for the 1987-88 CIP year.

General Purpose - The purpose of this project was to address the energy conservation needs of senior citizens.

Steps Involved - The Company conducted six free conservation workshops for senior citizens. Workshop speakers provided basic conservation information and free home energy audits to attendees. Audited households received a \$50 credit toward weatherization materials if their primary heating source was electric.

Annual Budget - The 1987-88 budget for this project was \$12,933.

7. TAKE 5 REFRIGERATOR/FREEZER COMBINATION REBATE PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year.

General Purpose - Under this project, OTP encouraged customers to purchase energy-efficient refrigerator-freezers.

Steps Involved - As part of this project, the Company provided customers with a 5% rebate on the purchase price of efficient refrigerator-freezers. The Company also offered a \$20 incentive payment to the dealer who sold the appliance. Both the dealer and the purchaser completed a questionnaire designed to elicit information on dealer and consumer attitudes toward energy efficient appliances.

Annual Budget - The 1987-88 budget for this project was \$11,332.

8. COMMUNITY ENERGY COUNCIL PROJECT

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed for 1988-89.

General Purpose - This project is a cooperative venture between OTP and Community Energy Councils (CECs) in the Company's service area. The goal of the project is to increase energy efficiency in CEC communities.

Steps Involved - OTP will provide financial support to communities wishing to receive a community energy grant from the state. A community will have to raise funds at least twice the amount of state funding to qualify for the state grant.

Audits will be offered to all residents in a community, but weatherization materials will only be supplied to and installed in low income households. Audits also will be provided to small commercial customers. OTP will provide auditor training and pay a set amount per audit to the communities (\$60 per house, \$25 per apartment, and \$100 per commercial establishment).

Objectives - The Company expects this project to serve 1,075 households and 80 commercial customers in 1988-89. The Company anticipates that at least 220 of the households served will be rental and approximately 30% of the residential participants will be low income.

<u>Annual Budget</u>	1987-88	1988-89
	\$37,268	\$80,177

9. WALK-THROUGH AUDIT PROJECT

Commission Approval - This project was approved for the 1986-87 and 1987-88 CIP years.

General Purpose - The Walk-Through Audit project was a joint venture between OTP and the CAP agencies. The goal was to reach low income and rental customers who generally are not reached by other conservation programs.

Steps Involved - During the Walk-Through Audit, a list of nine energy conservation practices and 25 conservation measures were evaluated. The Walk-Through Audit was a streamlined audit that covered a larger number of no-cost and low-cost retrofits than the MECS audit. Any customer, regardless of income level, who signed up for the audit received a free weatherization kit. The cost of these kits was included as part of the Individualized Energy Consultation project budget (see below).

The CAP agencies selected program participants, made the contact, and performed the audit. All CAP auditors performing the Walk-Through Audit were MECS certified and attended special training sessions. OTP marketed the audit program through monthly bill inserts.

Objectives - For the first year of the project, OTP targeted 700 audits for low income and rental customers at a cost of \$55 per audit.

Annual Budget - The total projected first-year cost to OTP for the audit, report, worksheets, and auditor training was \$43,300. This project was discontinued with Commission approval during the 1987-88 CIP year due to lagging participation rates. Actual expenditures for the 1987-88 CIP year were \$24,000.

10. INDIVIDUALIZED ENERGY CONSULTATION PROJECT (IEC)

Commission Approval - The IEC was approved for the 1986-87 and 1987-88 CIP years.

General Purpose - The IEC project emphasized individually tailored energy conservation education for low income and rental customers.

Steps Involved - The IEC followed the MECS or Walk-Through Audit. The audit determined the conservation measures best suited for the customer. Included in the IEC presentation, were informal booklets, slides, samples of common energy-saving products, and the energy help kit.

Objectives - OTP hoped to perform 700 IECs in the first year of this project at the cost of \$10 per IEC. OTP budgeted for 1,000 energy help kits at a cost of \$10 per kit.

Annual Budget - The projected first-year cost for the IEC project, including the kit, printed material and auditor kit was \$18,300. This project was discontinued with Commission approval during the 1987-88 CIP year, due to lagging participation rates. OTP spent \$6,500 on the project during the 1987-88 CIP year.

11. WATER HEATER JACKET PROJECT

Commission Approval - The Water Heater Jacket project was approved in 1986-87. It was renewed for 1987-88.

General Purpose - This project was designed for low income and rental households that use electrically heated water.

Steps Involved - Water heater jackets were installed if recommended by the CAP auditor at the time of a Walk-Through Audit. Jackets were purchased and installed by CAP agency personnel; however, the CAPs were reimbursed by OTP.

Objectives - OTP proposed to install 700 jackets during the first year of the project.

Anticipated Savings - OTP estimated that a customer could save 15% of the energy used to heat water by installing a jacket. OTP estimated that if a customer paid \$0.04 per kWh and saved 39 kWh per month, the total saving over a 12-month period would be \$18.72.

Annual Budget - The first year cost of the project was \$18,060. The project was discontinued with Commission approval during the 1987-88 CIP year due to lagging participation rates. Actual expenditures for the 1987-88 CIP year were \$4,300.

12. STREET LIGHTING PROJECT

Commission Approval - The Commission approved this project for the 1988-89 CIP year.

General Purpose - The purpose of this project is to replace low efficiency mercury vapor street lights with more efficient high pressure sodium lights.

Steps Involved - 10 to 12 municipalities will participate in this pilot project; however, OTP owns and maintains the municipal lighting systems at issue. Due to new equipment costs, the municipalities will not realize the full cost savings. OTP will realize a peak load reduction, and the municipalities will receive increased lighting without increased cost.

Objectives - The new lights will provide 50% more illumination using 25% less electrical energy.

Annual Budget - OTP's estimated 1988-89 cost for this project is \$56,160.

13. COMMERCIAL/INDUSTRIAL REPLACEMENT PROJECT

Commission Approval - The Commission ordered OTP to file a proposal for one or more new projects by November 1, 1988. At least one of the projects proposed will be directed toward the commercial and/or industrial customer classes.

Annual Budget - The Commission ordered an annual budget of \$75,000 for the new project(s).

MINNESOTA POWER COMPANY (MP)

1. DULUTH NEIGHBORHOOD ENERGY SERVICE (NES) PROJECT

Commission Approval - The NES project was approved for the 1984-86 CIP year. It was renewed for 1986-87 and 1987-88.

General Purpose - Under this project MP paid the NES to deliver MECS audits, neighborhood workshops, and related services in selected areas of Duluth.

Steps Involved - This project was primarily an educational effort. The NES is a community-based energy council uses direct mail, neighborhood referrals, door-to-door outreach, public service announcements, brochures, and newspaper announcements to market its services.

Objectives - NES estimated that 360 households would participate in workshops and 520 would request audits. The goal for the 1987-88 CIP year was to complete 782 audits.

Anticipated Savings - The Commission approved this project because it encouraged conservation activities such as infiltration control measures (e.g. weather-stripping, caulking, and window improvements).

<u>Annual Budget</u>	1986-87	1987-88
	\$44,720	\$63,120

2. LITTLE FALLS HOME ENERGY CHECK-UP (HEC)

Commission Approval - This project was approved for the 1987-88 CIP year.

General Purpose - The purpose of the project was to start a Community Energy Conservation (CEC) project that included energy audits and the installation of weatherization kits.

Steps Involved - The Company paid the Little Falls Energy Committee \$65 for each home energy check-up completed and \$25 for each weatherization kit installed. MP also paid for HECs delivered to low and moderate income customers.

Objectives - MP planned to fund up to 100 HECs. Approximately 20 of the 100 HEC participants were renters.

Annual Budget - This project had a budget of \$9,920 for the 1987-88 CIP year.

3. COMMUNITY ENERGY COUNCIL (CEC) WEATHERIZATION PROJECT

Commission Approval - This project was approved for the 1988-89 CIP year (15-month period beginning October 1, 1988). It is a continuation and expansion of the projects described above.

General Purpose - This project will offer energy conservation workshops and residential energy audits in Little Falls, Fond du Lac, Duluth, Crosby/Deerwood/Ironton, Stearns County, Park Rapids and Hibbing.

Steps Involved - CECs will deliver this project with the financial and technical support of MP. CECs will be responsible for conducting neighborhood energy conservation workshops and performing residential energy audits. Workshop participants will be given weatherization materials and instructions on how to install them.

Objectives - MP estimates that 20% of the participants will be renters and low income customers.

Annual Budget - This project will have a budget of \$142,935 for the 15-month period beginning October 1, 1988.

4. WEATHERIZATION TECHNICAL ASSISTANCE PROJECT

Commission Approval - This project was approved for the 1984-86 CIP year. It was renewed for 1986-87, 1987-88 and 1988-89.

General Purpose - This project will provide equipment to community energy agencies for identifying conservation opportunities and evaluating the quality of weatherization work.

Objectives - MP estimates that 33% of the projected 300 participants for 1988-89 will be low income customers.

<u>Annual Budget</u>	1986-87	1987-88	1988-89
	\$2,120	\$1,920	\$21,500

5. TECHNOLOGY TRANSFER PROJECT

Commission Approval - This project was approved for the 1986-87 CIP year. It was renewed for 1987-88.

General Purpose - The purpose of this project was to provide information on low-energy housing technology to builders, remodelers, and energy auditors. The ultimate objective was to increase energy efficiency, while reducing the costs of new construction and home remodeling.

Steps Involved - Included as part of the project were workshops for builders, remodelers, building suppliers, and energy auditors.

<u>Annual Budget</u>	1986-87	1987-88
	\$9,420	\$1,700

6. LOW INCOME ELECTRIC SPACE HEATING PROJECT (LIESH)

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed for 1988-89 (15-month period).

General Purpose - This project will be conducted in conjunction with regional weatherization agencies. The project will provide grants to low income space heating customers for weatherization. The maximum amount for these grants will range from \$1,500 to \$2,000.

Steps Involved - The CAP agencies will use existing weatherization evaluations to determine the improvements to be made.

Objectives - MP's goal is to weatherize 55 homes during 1988-89. All participants will be low income persons; approximately 33% are expected to be renters.

Anticipated Savings - MP estimated that participants will save approximately 10% of their annual energy use.

Annual Budget - The approved 1988-89 (15-month) budget for this project is \$86,420.

7. NEIGHBORHOOD ENERGY WORKSHOP PROJECT

Commission Approval - This project was approved for the 1984-86 CIP years.

General Purpose - This pilot project included neighborhood energy workshops in the City of Aurora. It was offered to those residents who receive natural gas from Inter-City Gas (now Northern Minnesota Utilities) and electricity from MP.

Steps Involved - The project was jointly funded by Inter-City Gas (now Northern Minnesota Utilities), MP, the City of Aurora, and the CEC program operated by the Department of Energy and Economic Development (now the Department of Trade and Economic Development). It was modeled after the Minnegasco neighborhood energy workshops.

Budget - The total budget for this project was \$60,000, approximately \$20,000 of which was contributed by MP.

8. DULUTH HOME ENERGY EVALUATION

Commission Approval - This project was approved for the 1987-88 CIP year. It was renewed for 1988-89 (15-months).

General Purpose - This project will be conducted in conjunction with the Energy Loan Program of the City of Duluth. MP will provide free home energy evaluations to pre-approved loan applicants to help identify the appropriate conservation measures for these customers.

Steps Involved - Low interest loans for energy conservation measures will be made from a revolving fund administered by the Duluth Department of Water and Gas.

Objectives - In the 1988-89 period, MP expects the project to serve 300 customers; approximately 25% will be renters and 20% low income customers.

Annual Budget - The approved 1988-89 (15-month) budget for this project is \$19,940.

9. COMMERCIAL ENERGY AUDIT PROJECT

Commission Approval - The Commission approved this project for the 1987-88 CIP year. It was not renewed in 1988-89.

General Purpose - Under this project, MP provided energy audits to commercial customers.

Steps Involved - Commercial customers with electric space heat demand under 100 kW received a free audit. The audit included on-site inspection of the customer's energy consuming equipment and the building envelope.

Objectives - MP estimated that 5% of eligible customers would be served each year.

Annual Budget - The Commission approved a budget of \$30,000-\$40,000 for the 1987-88 CIP year.

10. COMMERCIAL ENERGY SERVICE PROJECT

Commission Approval - This project was approved for the 1988-89 (15-month) CIP year.

General Purpose - This project will offer three conservation services to MP's commercial customers.

Steps Involved - The three services include: energy management workshops, featuring substantive presentations developed by the Department of Public Service or local technical institutes; commercial energy audits, providing individual assessments of which conservation measures would be the most practical for specific customers; and do-it-yourself energy audits.

Objectives - MP anticipates holding 12 workshops, performing 200 commercial energy audits, and distributing 1,200 do-it-yourself audit packages.

Annual Budget - The approved 1988-89 (15-month) budget is \$73,520.

11. SHARED SAVINGS BANK PILOT PROJECT

Commission Approval - This project was approved for the 1986-87 CIP year.

General Purpose - The purpose of this project was to provide funds to establish a revolving line of credit for two CAPs: the Arrowhead Economic Opportunity Agency, and the Duluth Community Action Program.

Steps Involved - These funds were used to finance energy conservation improvements on electrically-heated homes. MP also provided one-time grants to the CAPs to defray pilot project labor and material expenses. Participants repaid CAP loans in fixed portion to energy cost savings or through set monthly installments. CAPs are repaying the interest-free loans in a mutually-agreed-upon period not to exceed ten years.

Objectives - MP's goal was to serve a maximum of ten households. This project was terminated due to insurmountable problems.

Annual Budget - The Commission approved a budget of \$29,663 for this project for the 1986-87 CIP year.

12. ELECTRIC WATER HEATER REPLACEMENT PROJECT

Commission Approval - This project was approved by the Commission for the 1986-87 CIP year.

General Purpose - The project offered high-efficiency water heaters at cost to those low income customers with inefficient or inoperable water heaters.

Steps Involved - Customers were offered zero-interest financing. Community-based organizations determined household eligibility and the need for existing water heater replacement.

Annual Budget - The Commission approved a budget of \$2,247 for 1986-87.

13. COMMERCIAL ELECTRIC ENERGY END-USE SURVEY

Commission Approval - This project was approved for the 1986-87 CIP year.

General Purpose - The purpose of the project was to collect accurate and definitive consumption data on commercial customers.

Steps Involved - MP designed and conducted a Commercial Energy End Use survey. In addition to energy end use data, the survey addressed factors such as geographic location, building size, employees, fuel types, energy usage, and business classification.

Annual Budget - The Commission approved a 1986-87 budget of \$11,995 for all expenses associated with this project.

14. SUPERINSULATION RETROFIT DEMONSTRATION PROJECT

Commission Approval - This project was approved for the 1984-86 CIP year.

General Purpose - The purpose of this project was to superinsulate one residential building as part of a demonstration project.

Steps Involved - The Duluth Community Action Agency performed the work through a grant from MP.

Annual Budget - The approved 1984-86 budget for the project was \$20,000.

15. WATER HEATER INSULATION PROJECT

Commission Approval - This project was approved for the 1984-86 CIP year.

General Purpose - The purpose of this project was to provide water heater insulation to qualified low income customers.

16. RESIDENTIAL LOAD SURVEY

Commission Approval - This project was approved for the 1984-86 CIP year.

General Purpose - MP collected and analyzed residential electric energy end-use data for use in designing future conservation energy programs.

17. RESIDENTIAL ENERGY SERVICE PROJECT

Commission Approval - This project was approved for the 1988-89 (15-month) CIP year.

General Purpose - This project provides two types of energy audits to residential customers.

Steps Involved - The first audit is the federally mandated RCS audit. This audit provides a comprehensive assessment of a dwelling's conservation potential. The second audit, EnerChek, focuses on electrical usage, and consists of a walk-through audit, a customer interview, and a discussion of how a household's usage patterns affect its electric bill. MP will also furnish EnerChek participants with water heater blankets, water flow limiters, high efficiency fluorescent replacement lamps, and similar conservation materials.

Objectives - MP anticipates performing 600 RCS/MECS audits and 500 EnerChek audits. It is estimated that 20% of project participants will be renters or low income customers.

Annual Budget - The Commission approved a budget of \$107,240 for the 1988-89 (15-month) CIP year.

18. COMMERCIAL AND INDUSTRIAL (C&I) LIGHTING PROJECT

Commission Approval - MP has been ordered to file a C&I lighting efficiency project by December 1, 1988.

General Purpose - The project will be designed to promote high efficiency lighting technology or other energy-efficient technologies among C&I customers.

**NORTHERN MINNESOTA UTILITIES (NMU)⁴, A DIVISION OF
UTILICORP UNITED, INC.**

1. CONSERVATION GRANT PROJECT

Commission Approval - This project was approved for the 1984-86 CIP year. It was renewed in 1988-89.

General Purpose - Under this project, NMU provides grants to low income households for weatherization improvements.

Steps Involved - NMU distributes these funds through qualified non-profit organizations. Approximately 85% of the grants go to residential homeowners; 15% go to renters.

Objectives - The project serves approximately 70 households annually.

Anticipated Savings - NMU estimates that this project will reduce annual consumption by approximately 670 Mcf. The average annual savings based on actual data from the first two years of the project are 9.8 Mcf per participant.

<u>Budget</u>	Annually from 1984-86	1988-89
Grants	\$50,000	\$51,371
Administration & Operation	<u>10,000</u>	<u>7,629</u>
	\$60,000	\$59,000

2. NEIGHBORHOOD ENERGY WORKSHOP

Commission Approval - This project was approved for the 1984-86 CIP year.

General Purpose - The purpose of this project was to conduct neighborhood energy workshops in the City of Aurora, whose residents receive natural gas from NMU and electricity from Minnesota Power.

⁴Northern Minnesota Utilities (previously Inter-City Gas Corporation) was included in the CIP process during 1984-1986. During the 1986-87 and 1987-88 CIP years, NMU had operating revenues under \$50,000,000 so it was not included in the CIP process.

Steps Involved - This project was jointly funded by NMU, Minnesota Power, the City of Aurora, and the Community Energy program operated by the Department of Energy and Economic Development. It was modeled after the neighborhood energy workshops being conducted in Minneapolis using Minnegasco funding.

Annual Budget - The approved budget for the project was \$57,000, approximately \$20,000 of which was contributed by NMU.

3. RESIDENTIAL CONSERVATION SERVICE PROJECT

Commission Approval - This project was approved for the 1988-89 CIP year. NMU has operated this project since 1981.

General Purpose - The purpose of the prproject is to provide energy evaluations and conservation recommendations to customers living in residential buildings of 1 to 4 units, or in larger buildings with individually metered space heating systems so they can make informed energy decisions.

Steps Involved - The auditor visits the customer's home, examines the structure, determines the customer's energy use patterns, and provides an analysis of the household's conservation potential. This analysis addresses all conservation measures the household could undertake, e.g., major weatherization, caulking and weatherstripping, thermostat control, and includes recommendations on which measures would be most practical for that particular household.

Objectives - In 1988-89, NMU expects the project to serve 270 households, of which approximately 5% will be renters and 10% will be low income.

Anticipated Savings - NMU projects fuel savings of approximately 9.5% per participating household.

Annual Budget - The approved 1988-89 budget for this project is \$45,100.

4. FURNACE TUNE-UP PROJECT

Commission Approval - This project was approved for the 1984-86 CIP year. It was renewed for 1988-89.

General Purpose - The purpose of the project is to offer a gas furnace/boiler tune-up and clean to all residential customers for a cost of \$5.00.

Steps Involved - The tune-up will be offered to all residential customers one time during the next two years. Customers are given thirty days to respond to the offer. Customers are permitted to select any participating heating dealer or a NMU service person to perform the tune-up.

Objective - NMU expects a 30% response rate, which amounts to 4,882 participants from May 1988 until December 1989. NMU estimates that 15% of participants will be low income and 10% will be renters.

Anticipated Savings - NMU estimates that energy savings will be 5% of heating costs.

Annual Budget - The approved 1988-89 budget for this project is \$93,740 for 2,441 audits (\$38.40 per audit).

**5. CITIES OF CROSBY, IRONTON AND DEERWOOD (CID) JOINT
COMMUNITY ENERGY COUNCIL PROJECT**

Commission Approval - NMU has been ordered to file a proposal for this project by November 28, 1988.

General Purpose - The purpose of this project is to provide an alternative to the RCS audit.

Steps Involved - The CID Energy Council will provide Home Energy Check-ups (HECs). The HEC will consist of: a quick practical audit; instruction to the homeowner on the installation of weatherization materials; referrals to funding institutions; and a follow-up interview 30-60 days later to determine if conservation measures were undertaken.

Objective - The objective for 1988-89 is to carry out 150 audits in three cities at \$70 an audit for the period January 1, 1989 to December 31, 1989.

Estimated Budget - The approved budget for this project is \$4,000.