JAN 03 2000

Date of Report: December 31, 1999

1/14/00 Revisions Comming

Date of Next Status Report: ~~December 31, 99~~Final Report
Date of Workprogram Approval:
Project Completion Date: ~~June 30, 2000~~ December 31, 1999.
THE WORK PROGRAM SUBMITTED CALLED FOR A JUNE 30, 2000 COMPLETION DATE, BUT THE APPROPRIATION LANGUAGE DEFAULTED TO THE GENERIC JUNE 30, 1999 COMPLETION DATE. DUE TO THE NATURE OF MUNICIPAL BUDGET CYCLES, IT IS HIGHLY LIKELY THAT AN EXTENSION WILL BE REQUIRED TO ALLOW THE FOUR SUSTAINABLE DEVELOPMENT PROJECTS TO BE COMPLETED AND THE MATCHING FUNDS TO BE EXPENDED.

ML 1999, CHAPTER No. 231, Sec. 16
Subd. 25. Carryforward

(a) The availability of the appropriations for the following projects is extended to June 30, 2000:

Subdivision 12, paragraph (a) , sustainable development assistance for municipalities through electric utilities;

LCMR Work Program 1997

I. ~~Project Title:~~ ~~Sustainable Development Assistance for Municipalities through~~ Electric Utilities

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Total Biennial Project Budget:

$ LCMR	$240,000.00	**$ Match**	$250,000
- $ LCMR Amt. Spent (12/31/99)	$240,000.00	**$ Match Spent (2-projects)**	$410,000
= $ LCMR Balance	$0	**= $ Match Balance**	$410,000

A. Legal Citation: ML 97, Chap. 216, Sec. 15, Subd. 12(a)
Appropriation Language: This appropriation is from the future resources fund to the commissioner of administration for an agreement with the Minnesota Municipal Utilities Association to provide decision-making tools, technical information, and expert assistance to advance sustainable renewable energy and energy efficiency developments and implement demonstration projects in at least four communities. This appropriation must be matched by at least $250,000 in nonstate money.

B. Status of Match Requirement: All matching funds will be contributed by the utilities participating in the demonstration projects and their customers. These utilities and their customers will match LCMR funds at least dollar for dollar.

II. Project Summary: Generation of electricity from fossil fuels contributes heavily to emissions of mercury, acid rain precursors, and greenhouse gases, all of which have major environmental impacts on Minnesota. Municipal utilities provide 13% of the electricity consumed in the state, and serve nearly 650,000 Minnesotans in 126 cities. Yet the typical municipal utility has only about 1200 customers and only a handful of employees. Developing renewable energy and energy-efficiency projects can be an overwhelming task for these utilities. This project will assist municipal utilities in planning and implementing sustainable renewable energy and energy efficiency projects.

Municipal electric utilities statewide will be assessed to determine which communities have the greatest potential for near-term sustainable development. Sophisticated decision-making tools and technical resources will be developed by the Minnesota Municipal Utilities Association and its cooperators. These tools and expert assistance will be made available to municipalities in a coordinated, convenient form through MMUA, relieving individual utilities of redundant and prohibitively costly development work. Using these tools, MMUA and the cooperators will assist municipal utilities in implementing at least four sustainable development projects that will reduce environmental degradation and boost the local economy. The municipal utilities and their customers will match LCMR funds at least dollar for dollar. These pilot projects will demonstrate the value of sustainable development tools and assistance, and are expected to lead to ongoing financial support of these services by the municipal utilities themselves.

III. Progress Summary:

February 6, 1998

-The process of gathering initial information from our municipal members is complete. The energy efficiency and renewable energy survey and its' support documentation are attached. A comparison of representative purchased power contracts and the potential for rate impact through energy management are attached. The purchased power comparison and the energy management survey data have provided us with initial guidelines for marketing sustainable development/energy efficiency to our members. Whereas some utilities' purchased power will encourage spending on energy conservation, some will not. Data privacy is a growing concern with our members as we move closer to a restructured utility environment. With that in mind, we shaped our purchased power comparison to cover purchase scenarios rather than individual utilities.
-Our next step will be to verify what existing services are available from their respective power agencies, which services they use and what gaps can be filled by sustainable methods. Within a climate of change will be a unique opportunity to incorporate more aggressive energy management strategies into business/marketing plans.

March 31, 1999

-In moving ahead with Deliverable –2 and Deliverable –3 we came to the conclusion that developing tools and implementation with members should happen at the same time. The electric industry is changing faster that anyone could imagine several years ago. The motivation by many utilities for doing either energy efficiency programs or renewable programs has either been put on hold or canceled entirely. With many of our members cutting staff or contemplating selling their municipal utility, the idea of setting aside a budget for energy services has been a hard sell.

However, we were able to tie energy services as an enhancement to Key Account Services and additional value added services. By working closely with several of our members we have been able to tailor energy services to a changing environment and create template programs for energy efficiency and renewable. These will include Lighting Programs, Motor Programs, Air Conditioning Programs, Load Management Programs and Custom Assistance on individual situations. Also, we will have created a step-by-step manual for Wind development in a municipal community and are working to include Alternative Energies (i.e. wind, photovoltaics, and fuel cells) at the MMUA Municipal training field in Marshall.

After completing a program update on 2/11/98 with John Velin and Susan Thornton, we will be altering the date for Deliverable-2 to June 30, 1999. We will be presenting many of the results of developing Devilerable-2 at our summer conference.

July 23, 1999

Completed Deliverable-2 requirements and will be working to complete Deliverable-3. By combining the two processes we have and developing the municipal tools at the same time as assisting individual members. We have been able to focus our efforts on the most likely technologies that will work individual situations. We have developed two complete projects with Marshall Municipal Utilities as Case Study-1. We have developed a Managed Lighting Retrofit Program with utility financing and an Air Conditioning Rebate and Design Program. Both of these have been turned in on deliverables-2. We also assisted in developing rebate forms for a Motor Program to supplement training done by the Department Of Energy's Motor Challenge Program. At this time I don't feel that a full-blown motor program would be a valuable tool. NEMA standards have already pushed motor production to very high efficiency levels.
Moorhead will be Case Study-2 with an internal look at all of the steps required to bring wind generation to a small community. Case Study 3 will involve a evaluating dispersed generation and load management techniques used to control rising purchased power costs. Case study 4 will be the development of a Renewables Training Center at MMUA's line worker training field. The focus will be in training line workers in the skills needed to service a quickly growing renewables industry. At this point we have a $50,000 commitment (blades and gearboxes) from NEG Micon in Marshall, MN.

Energy services will continue to be an uphill battle. Recent legislation has exempted some industrial customer classes from CIP charges and regulatory

leadership from DPS is uncertain over future directions. Many of our members are entering a wait and see attitude.

December 31, 1999 - Final Report

Deliverable – 3 will continue to be a growing and evolving project. Our members on going projects have invested over $400,000 in energy efficiency and energy management projects. These projects have involved lighting retrofits, air conditioning programs, motor programs, load management programs and renewable energy programs. For example, one lighting project has saved over 370kW, one heating project removed 180kW boiler and a load control project will target 2000 kW of peak load. MMUA will continue to build on these projects and market additional services.

In October of 1999 MMUA was awarded Demonstration of Energy Efficient Developments (DEED) grant by the American Public Power Association to begin development of a renewable energy training curriculum to be offered to line personal at MMUA's training center in Marshall MN. MMUA will be working with Minnesota West Technical Colleges and Industry leaders to develop training workshops to familiarize utility personal with renewable generation. This project is funded part-time thru 2000.

MMUA will continue to provide energy services and develop new services on a fee-for-service arrangement. Utilities will be facing many challenges as restructuring emerges, and our services will change as needed to the meet the demands. However energy efficiency and conservation will always play a major part in our service offerings.

IV. Outline of Project Results:

Result 1. Assess Sustainable Development Potential

LCMR Budget:	$15,605	LCMR Balance:	$0
Match Budget:	$0	Match Balance:	$0

Completion Date: February 8, 1998

Municipal electric utilities statewide will be assessed to determine which communities have the greatest potential for near term sustainable development.

- Sources and costs of purchased power and self-generated power will be assessed for representative Municipal Power Agencies (MPAs) to determine the economic context within which renewable and energy efficiency projects must be evaluated in each region of the state.
- A sample of municipal electric utilities will be surveyed concerning anticipated need for new capacity, rate structures, revenue fraction from potentially vulnerable large customers and other factors, to determine which utilities have the greatest potential in the near term for renewable energy supply, rate reduction through energy efficiency programs, economic development through efficiency assistance to large customers, or other sustainable development initiatives.

Deliverables:

- Assessment of power sources and costs for a representative sample of agencies
- Survey results

Result 2. Develop Decision-Making Tools and Technical Resources

LCMR Budget:	$114,506	LCMR Balance:	$0
Match Budget:	$0	Match Balance:	$0
Completion Date: June 30, 1999			

Decision-making tools and technical resources will be developed by the Minnesota Municipal Utilities Association (MMUA) and its cooperators to assist municipal utilities in planning and implementing sustainable development.

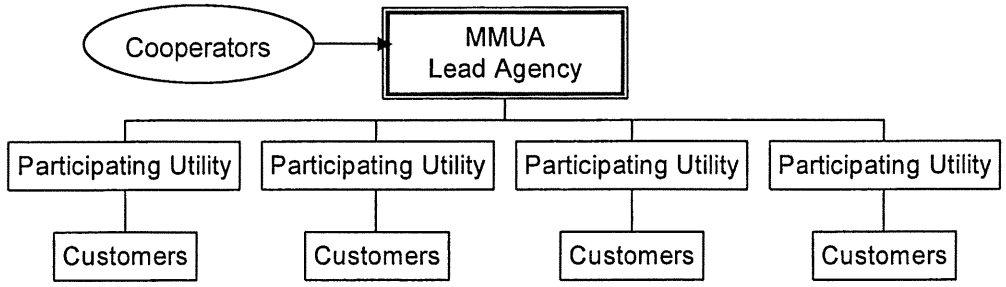
- Sophisticated energy and economic modeling services provided by Economic Research Associates using IMPLAN, RIMS II, OPTIONS and other software will enable municipalities to assess the direct and indirect impacts of sustainable development on their communities, on rates, and on utility revenue requirements.
- A simple but complete step-by-step outline, manuals, and statistical support services provided by MMUA, the Center for Energy and Environment (CEE) and Christopher Reed Consulting (CRC) will enable municipalities to survey their customers and characterize energy use and customers' previous energy-efficiency activity in their communities.
- Costs, energy savings and peak demand impacts will be compiled for key energy efficiency technologies to enable municipal staff to assess their suitability to meet their conservation and load management objectives.
- Technical, administrative and marketing assistance will be provided by MMUA, CEE and CRC in the form of turnkey efficiency programs that can be readily customized to address issues such as local variations in incentives. Program design and materials will be developed as part of Result 2. Training, assistance in obtaining citizen input, and other services will be provided to the demonstration project utilities as part of Result 3.
- A feasibility assessment will be conducted to identify renewable resources with strong near-term potential for municipal utilities in Minnesota. These may include, for example, utilization of wind energy in areas of the state with outstanding wind resources or co-firing of waste biomass by municipal utilities that are self-generating and are located in areas of the state with underutilized wood waste or agricultural waste. Technical assistance will be provided by MMUA, CEE and ERA to assist utilities participating in the demonstration projects in conducting more in-depth assessments of the suitability of renewable resources for their resource needs as part of Result 3.

Deliverables:

- Economic modeling tools customized with data for Minnesota
- Guidelines for promoting and excelling in energy efficiency and renewable energy services in a changing utility environment

- Statistical support services provided to utilities requesting them
- Cost and savings data for key energy-efficiency technologies
- Program design and materials for turnkey efficiency programs
- Step-by-step outline for municipal wind development

Project Structure



Result 3. Implement Sustainable Development Projects

LCMR Budget:	$109,889	LCMR Balance:	$0
Match Budget:	$250,000	Match Balance:	$410,000

Completion Date: June 30, 2000.

Using the aforementioned tools, MMUA and the cooperators will assist municipal utilities in implementing at least four sustainable development projects that will reduce environmental degradation and boost the local economy. The specific projects implemented will depend on the interests and needs of the participating utilities. Examples of the types of projects which could be implemented include:

- one-stop service for small "main street" businesses to specify and install energy efficiency improvements, overcoming market barriers for this segment including high transaction costs (business owner time and resources), limited access to capital, lack of expertise and risk aversion,
- services for low income customers to reduce energy costs and improve comfort,
- efficiency improvements to municipally owned buildings,
- engineering assessment and installation of
    - wind turbines,
    - waste biomass co-firing equipment in existing steam plants,
    - photovoltaics in remote locations.

These utilities and their customers will match LCMR funds at least dollar for dollar. The pilot projects will demonstrate the value of sustainable development tools and assistance, and are expected to lead to ongoing financial support of these services by the municipal utilities themselves.

Deliverables:

Four completed sustainable development projects.

V. Dissemination: All of the software, manuals, workshops, electronic databases and support services developed under Result 2 will be available to all MMUA member utilities. Regular articles in the monthly *MMUA Resource* newsletter will highlight project accomplishments and tools and services available to members.

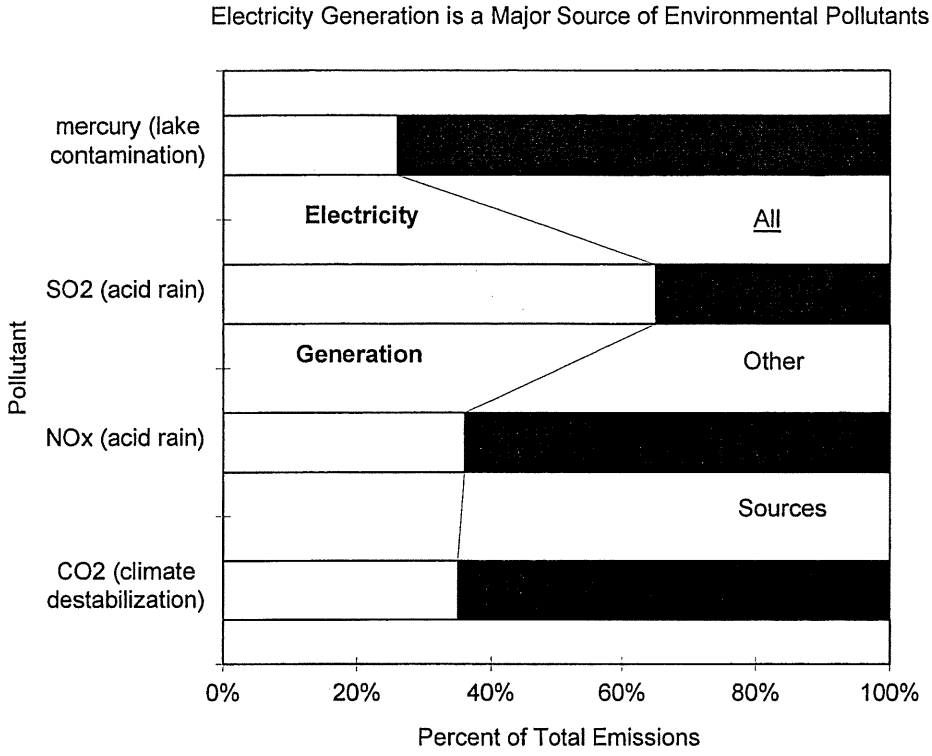
VI. Context:

A. Significance: The consumption of electricity has major environmental impacts on Minnesota. Generation of electricity from fossil fuels accounts for at least 26% of all mercury emissions in the state, which contaminate the state's lakes and fish. Nationally, electricity generation is the source of 65% of all SO_2 emissions and 36% of all NO_x emissions, both of which are precursors to acid rain that acidifies Minnesota's lakes and reduces the growth rate and health of our forests. Electricity generation also accounts for at least 35% of all emissions of CO_2, the main greenhouse gas responsible for global climate destabilization. If real progress is to be made in preventing environmental degradation, energy efficiency and renewables must be a primary focus of electricity utilization.

In 1994, municipal utilities sold 6,450,000 Megawatt-hours of electricity in Minnesota, providing 13% of the electricity consumed in the state.[1] Most of this power came from coal-fired power plants. Municipal utilities serve nearly 650,000 Minnesotans in 126 cities throughout the state. Although in the aggregate municipal utilities play a significant role in electricity sales to the state, the median municipal utility operates in a city with a population of 2,173 and has only 1,171 customers and $1,160,000 in annual revenues. Developing renewable energy and energy-efficiency projects can be an overwhelming task for these utilities, which typically have only a handful of employees and limited technical expertise in these areas. In addition, municipal utilities have concerns about the financial impact of renewable energy and energy efficiency projects on their customers. In reality, however, properly designed renewable and energy efficiency initiatives are sustainable developments that can provide positive economic and environmental returns to both customers and the community. For example, in a previous project, partially funded by the Minnesota Department of Public Service, Moorhead Public Service (MPS) implemented energy efficiency programs for "Main Street" businesses and industrial customers that substantially reduced electricity use and emissions. Because of the structure of MPS's purchased power contracts, a structure which is shared by a significant number of municipal utilities in the state, the reduction in electricity use also had a favorable impact on net utility costs. The first year after receiving the type of services

[1] Minnesota Department of Public Service. *1996 Energy Policy and Conservation Report, Draft.* P. IV-7. St. Paul, MN.

proposed here, the City of Moorhead increased its budget for energy efficiency by 87% or $125,000.



Municipal utilities do have some unique advantages in developing and implementing renewable energy and energy efficiency projects. They have first-hand knowledge of their customers, so they do not require exhaustive market analyses to identify their needs. They are an integral part of the community, so they do not need expensive marketing campaigns to generate participation and support. Because they are owned by their citizens/ratepayers and operated by municipal governments which have a direct responsibility for the public good, they can appropriately apply a broad societal perspective to decision-making. This project will tap the potential of municipal electric utilities to serve as catalysts for sustainable development activities within their communities. The project will make sophisticated decision-making tools, technical information and expert assistance available to municipalities in a coordinated, convenient form through MMUA. These tools and assistance will relieve individual utilities of redundant and prohibitively costly development work and allow them to capitalize on their natural advantages. Using these resources, municipal utility funds will be leveraged to implement at least four sustainable development projects in Minnesota municipalities. This will accelerate sustainable development significantly beyond existing levels, and will lay the groundwork for an ongoing, self-supporting program.

B. **Time:** All results will be completed on or before June 30, 2000.

C. Budget Context:

	July 1995 - June 1997 Prior expenditures on this project	July 1997-June 2000 Project period	July 2000-June -2002 Future expenditures on this project (Note 2)
LCMR		$240,000	$ --
Other State		$ --	$ --
Non State		$250,000*	$200,000
Total	(Note 1)	$490,000	$200,000 (Note 2)

*Participating utilities and customers.

(Note 1) A similar pilot project, more limited in scope, was implemented very successfully on a small scale by the Moorhead Public Service Department (MPS) with the assistance of the Center for Energy and Environment in 1993-94, with a $45,000 grant from the Minnesota Department of Public Service and in-kind contributions from MPS, CEE and others.

(Note 2) After the pilot project described in Note 1, Moorhead increased its annual budget for energy efficiency by 87% or $125,000. The proposed project is similarly expected to lead to ongoing financial support of sustainable development activities by the participating communities in the 2000-2002 biennium. The anticipated future non-state expenditures of $200,000 assume that at least four MMUA member utilities would continue activities initiated through this project or would initiate new activities in the 2000-2002 biennium.

Budget:

MMUA personnel	$94,500
Equipment	$ --
Acquisition	$ --
Development	$ --
Other	
subcontract personnel	$124,519
supplies, expenses, travel	$15,981
county-specific economic data for models	$5,000
Total	**$240,000**

Budget by Agency and Result

	PERSONNEL						GRAND
SUMMARY	CEE	MMUA	ERA	MPS	TOTAL	OTHER	TOTAL
Result 1	$ 8,094	$ 6,450	$ -	$ -	$ 14,544	$ 1,061	$ 15,605
Result 2	$ 56,259	$ 22,800	$ 12,000	$ 11,000	$ 102,059	$ 12,447	$ 114,506
Result 3	$ 27,916	$ 65,250	$ 5,250	$ 4,000	$ 102,416	$ 7,473	$ 109,889
Total	$ 92,269	$ 94,500	$ 17,250	$ 15,000	$ 219,019	$ 20,981	$ 240,000

VII. Cooperation:

The following organizations are cooperators for various aspects of the project. Personnel are subject to reallocation based on the nature of the demonstration projects and personnel expertise.

Organization	Staff	LCMR $, Pct time (3 yrs)
Center for Energy and Environment	Martha Hewett, Sr. Research Analyst (10.3%)	$52,125
	Tom Spielman, Energy Analyst (1.6%)	$5,792
	Karen Linner, Policy Analyst (3.7%)	$10,514
	Mario Monesterio, Energy Analyst (2.6%)	$6,138
	Richard Szydlowski, Sr. Research Engr. (0.5%)	$2,428
	Kathleen Larsen, Marketing Manager (4.2%)	$11,783
	Judy Goepfrich, Administrative (1.3%)	$3,489
Economic Research Associates	Skip Laitner, Principal (4%)	$17,250
CRC	Christopher Reed, (5%)	$15,000

VIII. Location: Attached is a map showing the locations of the 126 municipal electric utilities in Minnesota. These utilities are distributed over all regions of the State.

IX. Reporting Requirements: Periodic workprogram progress reports will be submitted on the following dates:

February 6, 1998
June 30, 1999
~~June 30, 2000~~ December 31, 999

A final workprogram report and associated products will be submitted by ~~June 30, 2000~~ December 31, 999.

X. For Research Projects: Not applicable.