

## **LCMR 2006 Project Abstract**

For the Period Ending June 30, 2008

**PROJECT TITLE:** Laurentian Energy Authority Biomass Project

**PROJECT MANAGER:** Terry Leoni

**AFFILIATION:** General Manager, Virginia Public Utility

**MAILING ADDRESS:** PO Box 1048, 618 Second Street South

**CITY / STATE / ZIP:** Virginia, Minnesota 55792

**PHONE:** 218-748-7564

**E-MAIL:** leonit@vpuc.com

**FAX:** 218-748-7544

**WEB PAGE ADDRESS:** www.vpuc.com

**LEGAL CITATION:** ML 2006, Chap.243, Sec.20, and Subd.4.

**Total Biennial LCMR Project Budget:      LCMR Appropriation:      \$400,000**

**Appropriation Language:** Subdivision 10, I (energy) Laurentian Energy Authority Biomass Project \$200,000 in fiscal year 2006 and \$200,000 in fiscal year 2007 are appropriated to the commissioner of commerce for an agreement with Virginia Public Utility to lease land and plant approximately 1,000 acres of trees to support a proposed conversion to a biomass power plant.

### **OVERALL PROJECT OUTCOME AND RESULTS:**

The project resulted in 1,368 acres of hybrid poplar plantations being planted as a closed loop renewable biomass fuel source for the Laurentian Energy Authority's (LEA) Biomass Project. 35 MWh of electricity will be produced and sold to Xcel Energy to meet a state mandate for renewable energy. The Trust Fund appropriation was used to purchase trees (slips/whips developed by the University of MN, Duluth NRRI – hybrid poplar NM-6), tree planting, and for plantation land leasing on this 1,368 acres. LEA funded all technical assistance, crop care maintenance, and farming. Two separate plantations in Aitkin and Koochiching Counties totaling 1,368 acres were partially funded by the Trust Fund grant and partially funded and LEA.

The Trust Fund grant was also being used as a 50% non-federal match to the latest federal earmark/appropriation request. All of the Trust Fund funding was used directly to establish the initial and important plantings of the closed loop biomass crop. The success of the project depends upon growing a large portion of the fuel supply over the long term and successfully applying the work of the U of M's Natural Resource Research Institute (NRRI) and others on short rotation woody crops to real world production of fuel to large scale commercial projects.

The project assists the State of Minnesota's goal of 25% renewable fuels by 2025. Further it builds on the Federal Government's push to create one billion tons annually of renewable biomass fuels. The research and implementation is being accomplished under the U of M NRRI's direction with assistance from the USDA, Forest Service and is being done under the U.S. Department of Energy guidance and review.

### **PROJECT RESULTS USE AND DISSEMINATION:**

LEA will assemble all data, costs, slips, care, and maintenance records for the 1,368 acres of plantation and this data will be available on paper from the Laurentian Energy Authority. All data, which has been under the auspices of the U of M NRRI with assistance from the USDA Forest Service, will be shared and turned over to them for determining ongoing and the long-term results. The U.S. Department of Energy is providing guidance and review.

# LCMR 2006 Final Work Program Report

**Project Completion Date:** June 30, 2008

## I. PROJECT TITLE: Laurentian Energy Authority (LEA) Biomass Project

**Project Manager:** Terry Leoni

**Affiliation:** General Manager, Virginia Public Utility

**Mailing Address:** PO Box 1048, 618 Second Street South

**City / State / Zip:** Virginia, Minnesota 55792

**Telephone Number:** 218-748-7564

**E-mail Address:** leonit@VPUC.com

**FAX Number:** 218-748-7544

**Web Page address:** www.vpuc.com

<b>Total Biennial LCMR Project Budget:</b>	<b>LCMR Appropriation:</b>	<b>\$ 400,000</b>
	<b>Minus Amount Spent:</b>	<b>\$ 400,000</b>
	<b>Balance:</b>	<b>\$ 0</b>

**Legal Citation:** ML 2006, Chap.243, Sec.20, Subd.4.

**Appropriation Language:** Subdivision 10, I (energy) Laurentian Energy Authority Biomass Project \$200,000 in fiscal year 2006 and \$200,000 in fiscal year 2007 are appropriated to the commissioner of commerce for an agreement with Virginia Public Utility to lease land and plant approximately 1,000 acres of trees to support a proposed conversion to a biomass power plant.

**II. & III. FINAL PROJECT SUMMARY:** The project will result in 1,368 acres of hybrid poplar plantations being used as a closed loop renewable biomass fuel source for the Laurentian Energy Authority's Biomass Project. 35 MWh of electricity will be produced and sold to Xcel Energy to meet a state mandate for renewable energy. Even though the legislation requires 1,000 acres of plantation, the LEA committed to plant and fund 1,368 acres between July 1, 2006 and June 30, 2008. The LCMR appropriation has been used to purchase trees (slips/whips developed by the University of MN, Duluth NRRI – hybrid poplar NM-6), tree planting, and for plantation land leasing on this 1,368 acres, while LEA will fund all technical assistance, crop care maintenance, and farming. Thus, two separate plantations in Aitkin and Koochiching Counties totaling 1,368 acres will be partially funded by the LCMR grant and LEA.

**The Laurentian Energy Authority (LEA) is a joint venture of the municipal, public utilities of Virginia and Hibbing, Minnesota. LEA received Minnesota Pollution Control Agency permits, project financing, and Minnesota Public Utility Commission approval to construct and operate 35 MWh of combined renewable heat and power biomass facilities.**

**\$87 million was invested repowering the Virginia and Hibbing coal plants with new renewable biomass boilers and new wood fuel handling equipment. 71 jobs were retained in aggregate between the two sites and 65 new jobs will be created farming, logging and transporting this renewable biomass fuel. This renewable biomass totaling nearly \$11 million annually will come from a 75 mile radius of the two plant sites thereby displacing a major portion of over \$7 million in coal acquired and burned from the State of Wyoming. The output from the two renewable energy plants will serve 3,600 commercial and residential customers, along with sales of renewable electricity to Xcel Energy, pursuant to a 1994 legislative mandate to Xcel Energy.**

**A portion of the renewable biomass fuel must come (by legislation) from closed loop biomass plantations. To that end, LEA has invested in and planted a nursery and almost 1,400 acres of hybrid plantations. A Phase I federal appropriation of \$1,237,500 to fund research and development for hybrid poplar plantations and new biomass fuel gathering techniques has been acquired. In addition to the Phase I appropriation a federal earmark of \$1,000,000 has been identified to further this plantation activity.**

**The LCMR grant is also being used as a 50% non-federal match to the latest federal earmark/appropriation request. All of the LCMR funding was used directly to establish the initial and important plantings of the closed loop biomass crop. The success of the project depends upon growing a large portion of the fuel supply over the long term and successfully applying the work of the U of M's Natural Resource Research Institute (NRRI) and others on short rotation woody crops to real world production of fuel to large scale commercial projects. It is pioneering work that will advance renewable biomass projects as the State of Minnesota increases its legislative goal to achieve 25% renewable fuels by 2025. Additionally, the LCMR grant will implement the previous research from the Phase I federal appropriation.**

**The LCMR grant meets perfectly the State of Minnesota's goal of 25% renewable fuels by 2025. Further it builds on the Federal Government's push to create one billion tons annually of renewable biomass fuels. The research and implementation is being accomplished under the U of M NRRI's direction with assistance from the USDA Forest Service and is being done under the U.S. Department of Energy guidance and review.**

#### IV. OUTLINE OF PROJECT RESULTS:

**Result 1:** Lease and Plant 640 acres of hybrid poplar on plantation land.

**Description:** Lease 640 acres of plantation land in Aitkin County (Twp 49N, R24W and Twp 48N, R25W) for FY 2007 at \$43.00 per acre. Purchase slips/whips: 1,361 slips/whips/acre @ \$0.10 of NM-6. Plant 640 acres at an average price of \$119.1515 per acre.

<b>Summary Budget Information for Result 1:</b>	<b>LCMR Budget</b>	<b>\$ 190,881</b>
	<b>Minus Amount Spent:</b>	<b>\$ 190,881</b>
	<b>Balance:</b>	<b>\$ 0</b>

**Result Status:** *July 1, 2006 to June 30, 2008 LEA has a twenty (20) year lease agreement with landowner Gene McClelland, for 640 acres in Aitkin County. One hundred percent (100%) of the acreage has been planted. There does not appear to be an excessive amount of winterkill due to frost or a late snowfall that exceeded 20 inches in early April. Planting in the ground pre-June 2007 are reaching heights of approximately 20 feet with a base diameter of 2.5 to 2.75 inches. A canopy has formed over these plantings thereby eliminating the need for weed control due to sunlight being blocked at ground level. Harvesting of the pre-2007 plantings should take place in 2011. Those plantings post-June 2007 are approximately 6 to 8 feet in height with a base diameter of 1.0 to 1.5 inches. Cultivating and weed control was required. If all goes well during the summer a canopy is expected thereby reducing the need for weed control until harvest in 2013.*

**Result 2:** Lease and Plant 728 acres of hybrid poplar on plantation land.

**Description:** Lease 728 acres of plantation land in Koochiching County (Twp 151N, R27W) for FY 2007 at \$32 per acre. Purchase slips/whips: 1,361 slips/whips/acre @ \$0.10 of NM-6. Plant 728 acres at an average price of \$119.1515 per acre.

<b>Summary Budget Information for Result 2:</b>	<b>LCMR Budget:</b>	<b>\$ 209,119</b>
	<b>Minus Amount Spent:</b>	<b>\$ 209,119</b>
	<b>Balance:</b>	<b>\$ 0</b>

**Result Status:** *July 1, 2006 to June 30, 2008 LEA has a twenty (20) year lease agreement with landowner Frenzel, Miller, et.al., 728 acres in Koochiching. One hundred percent (100%) of the acreage has been planted. There does not appear to be an excessive amount of winterkill due to frost or a late snowfall that exceeded 20 inches in early April. Planting in the ground pre-June 2007 are reaching heights of approximately 18 feet with a base diameter of 2.5 inches. A canopy has formed over these plantings thereby eliminating the need for weed control due to sunlight being blocked at ground level. Harvesting of the pre-2007 plantings should take place in 2012. Those plantings post-June 2007 are approximately 6 to 8 feet in height with a base diameter of 1.0 to 1.5 inches. Cultivating and weed control was required. If all goes well during the summer a canopy is expected thereby reducing the need for weed control until harvest in 2013.*

**V. TOTAL LCMR PROJECT BUDGET:**

**All Results: Personnel: \$ 0**  
**All Results: Equipment: \$ 0**  
**All Results: Development: \$ 349,184**  
**All Results: Acquisition: \$ 50,816**  
**All Results: Other: \$**

**TOTAL LCMR PROJECT BUDGET: \$ 400,000**

**Explanation of Capital Expenditures Greater Than \$3,500: NA**

**VI. PAST, PRESENT AND FUTURE SPENDING**

**A. Project Partners:** Laurentian Energy Authority. \$400,000.

**B. Other Funds being Spent during the Project Period:** \$671,000 in total from the Laurentian Energy Authority. \$252/acre for plantation care maintenance, \$91/acre for second year plantation care maintenance, and \$156,500 over two years for technical assistance.

**C. Required Match (if applicable): 0**

**D. Past Spending:** \$323,129 for slips, \$83,760 for land lease fees, \$237,134 for technical assistance, and \$5,000 for legal work.

**E. Time:** The plantation is designed for a twenty year life with four harvests. All additional costs after July 1, 2008 will be assumed by the LEA, and thus there will be no further LCMR commitments on these plantations.

**VII. PROJECT PARTNERS:** Laurentian Energy Authority, University of Minnesota - Natural Resource Research Institute, USDA Forest Service, and U.S. Department of Energy

**VIII. DISSEMINATION:** LEA and NRRI will assemble all data, costs, slips, care, and maintenance records for the 1,368 acres of plantation and this data will be available on paper from the Laurentian Energy Authority. There will be no web site. All data, which has been under the auspices of the U of M NRRI with assistance from the USDA Forest Service, will be shared and turned over to them for determining ongoing and the long-term results. The U.S. Department of Energy is providing guidance and review.

- IX. LOCATION:** Field Plantations: **in Aitkin County, 640 acres in Twp 49N, R 24W and Twp 48N, R 25W and in Koochiching County, 728 acres in Twp 151N, R27W.** LEA plant sites are located at Hibbing Public Utility, 1902 Sixth Avenue East, Hibbing, MN and Virginia Public Utility, 618 Second Street South, Virginia, MN. The Plantation sites have been identified above and the LEA business office is located at c/o Virginia Public Utility, 618 Second Street South, Virginia, MN 55792.
- X. REPORTING REQUIREMENTS:** Periodic work program progress reports will be submitted no later than December 31, 2006, July 1, 2007, December 31, 2007, and a final work program report and associated products will be submitted by June 30, 2008.
- XI. RESEARCH PROJECTS:** University of Minnesota Natural Resource Research Institute, USDA Forest Service, and U.S. Department of Energy

Attachment A: Budget Detail for 2006 Projects - Summary and a Budget page for each partner (if applicable)

Proposal Title: Laurentian Energy Authority Biomass Project

Project Manager Name: Terry Leoni

LCMR Requested Dollars: \$ 400,000

- 1) See list of non-eligible expenses, do not include any of these items in your budget sheet
- 2) Remove any budget item lines not applicable

2005 LCMR Proposal Budget	Result 1 Budget:	Amount Spent (date)	Amount Spent (date)	Amount Spent (date)	Amount Spent (date)	Result 2 Budget:	Amount Spent (date)	Amount Spent (date)	Amount Spent (date)	Amount Spent (date)		
	Lease 640 acres of plantation land	31-Dec-06	30-Jun-07	31-Dec-07	30-Jun-08	Lease 728 acres of plantation land	31-Dec-06	30-Jun-07	31-Dec-07	30-Jun-08		
<b>BUDGET ITEM</b>											<b>BALANCE REMAINING FOR</b>	
<b>PERSONNEL: Staff Expenses, wages, salaries</b> – Be specific on who is paid \$, to do what? Make each person paid a separate line item												
<b>PERSONNEL: Staff benefits</b> – Be specific; list benefits for each person on a separate line item												
<b>Contracts</b>												
<b>Professional/technical</b> (with whom?, for what?)												
<b>Other contracts</b> (with whom?, for what?) list out: personnel, equipment, etc.												
<b>Other direct operating costs</b> (for what? – be specific)												
<b>Equipment / Tools</b> (what equipment? Give a general description and cost)												
<b>Office equipment &amp; computers - NOT ALLOWED</b> unless unique to the project												
<b>Other Capital equipment</b> (list specific items)												
<b>Land acquisition</b> (how many acres)												
<b>Land rights acquisition</b>	Lease 640 acres of plantation land in Aitkin County FY 2006 @ \$43.00/acre. Total: \$27,520	8,256	8,256	0	11,008	Lease 728 acres of plantation land in Koochiching County FY 2007 @ \$32.00/acre. Total: \$23,296	6,989	6,989	0	9,318	\$ 0	
<b>Printing</b>												
<b>Other Supplies</b> (list specific categories)												
<b>Travel expenses in Minnesota</b>												
<b>Travel outside Minnesota</b> (where?)												
<b>Construction</b> (for what?)												
<b>Other land improvement</b> (for what?)												
<b>Other</b> (Describe the activity and cost) be specific	Purchase 1,361 NM6 trees/acre @ \$0.10 and Plant 640 acres @ \$119.1515 for FY 2006 on 640 acres located in Aitkin County. Total: \$163,361	49,009	24,505	0	89,847	Purchase 1,361 NM6 trees/acre @ \$0.10 and Plant 728 acres @ \$119.1515 for FY 2007 on 728 acres located in Koochiching County. Total: \$185,823	55,746	27,873	0	102,204	\$ 0	
<b>COLUMN TOTAL</b>		\$190,881	\$57,265	\$32,761	\$0	\$100,855	\$209,119	\$62,735	\$34,862	\$0	\$111,522	\$ 0