

APPENDIX A: NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM, CENTRAL MINNESOTA INDUSTRY BREAKDOWN

Industry Code	Industry Code Description	Becker			Benton			Cass			Crow Wing			Hubbard			Mille Lacs		
		Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments
		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual	
-----	Total	86,155	365,888	887	82,446	373,606	895	28,765	139,423	903	126,218	570,292	1,986	22,097	104,503	545	52,554	232,416	717
11----	Forestry, fishing, hunting, and agriculture support	0	0	4	0	0	1	358	1,699	17	0	0	5	357	1,419	16	181	723	4
21----	Mining										152	799	3				0	0	2
22----	Utilities	0	0	1				0	0	3	1,563	6,388	8	0	0	3	0	0	2
23----	Construction	2,646	16,502	140	11,435	69,199	192	2,578	14,149	144	14,067	73,712	295	1,789	10,330	92	5,482	24,772	125
31----	Manufacturing	12,754	51,883	39	31,119	130,527	68	1,197	4,842	40	18,540	78,416	106	5,699	27,015	34	13,208	56,443	54
42----	Wholesale trade	1,901	7,484	36	7,832	32,738	56	1,476	7,180	28	4,747	20,911	74	601	2,466	15	1,557	7,668	26
44----	Retail trade	8,209	33,741	159	8,326	37,546	129	4,080	18,869	166	21,030	93,688	372	3,284	15,199	104	4,422	19,469	118
48----	Transportation & warehousing	2,101	8,355	36	1,729	8,229	41	183	920	18	1,848	7,875	34	112	608	13	1,367	3,588	22
51----	Information	819	3,066	13	1,414	5,815	15	349	1,599	6	5,728	24,068	46	397	1,659	10	668	2,608	11
52----	Finance & insurance	1,432	5,860	44	1,270	5,270	40	1,557	6,971	31	6,022	25,822	124	1,069	5,229	19	1,518	6,795	32
53----	Real estate & rental & leasing	0	0	34	945	4,267	25	645	3,049	30	1,184	6,053	93	0	0	17	212	928	20
54----	Professional, scientific & technical services	1,475	9,109	57	1,611	7,248	49	964	4,624	35	10,461	44,438	123	338	1,488	31	464	2,410	28
55----	Management of companies & enterprises	0	0	2	1,729	8,266	4	0	0	5	514	1,978	10				0	0	3
56----	Admin/support, waste mgt, remediation services	0	0	30	2,915	13,350	38	344	2,401	38	2,029	10,472	83	0	0	13	293	1,154	24
61----	Educational services	0	0	2	0	0	2	822	3,481	7	718	2,936	9	0	0	2	0	0	5
62----	Health care and social assistance	9,881	43,344	66	6,858	28,175	62	4,461	19,516	64	26,135	115,761	146	5,288	23,506	44	11,104	50,748	54
71----	Arts, entertainment & recreation	0	0	18	0	0	13	4,321	20,616	22	729	4,416	48	0	0	10	1,957	9,386	21
72----	Accommodation & food services	1,895	9,325	78	2,072	9,304	54	2,975	19,117	150	6,340	33,972	194	858	5,375	68	8,010	36,149	64
81----	Other services (except public administration)	4,951	25,123	124	2,544	10,593	105	1,895	8,048	94	3,744	15,780	204	717	3,175	51	1,408	6,518	100
95----	Auxiliaries										0	0	2	0	0	2			
99----	Unclassified establishments	0	0	4	0	0	1	24	60	5	1	173	7	0	0	1	0	0	2

		Morrison			Otter Tail			Todd			Wadena			Wilkin			SUMMARY - TOTALS		
Industry Code	Industry Code Description	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments	Payroll (\$1,000)		Total Establishments
		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual		1st Quarter	Annual	
-----	Total	42,424	190,775	848	92,732	408,433	1,633	25,022	106,025	499	26,356	116,528	463	8,485	36,840	174	593,254	2,644,729	9,550
11----	Forestry, fishing, hunting, and agriculture support	63	260	6	0	0	8				0	0	3	0	0	2	959	4,101	66
21----	Mining	0	0	3	0	0	2	0	0	2	0	0	1	0	0	2	152	799	13
22----	Utilities	0	0	4	0	0	9	0	0	2	0	0	2	0	0	1	1,563	6,388	35
23----	Construction	2,405	17,083	124	4,008	24,898	224	727	3,565	50	886	5,838	76	179	1,011	15	46,202	261,059	1,477
31----	Manufacturing	13,115	58,016	53	23,817	106,014	85	12,712	53,302	45	4,733	20,141	18	0	0	4	136,894	586,599	546
42----	Wholesale trade	1,294	5,534	31	3,471	15,677	71	808	3,430	20	3,377	13,818	26	1,908	9,166	23	28,972	126,072	406
44----	Retail trade	6,054	26,819	140	11,406	50,501	280	2,317	10,721	92	3,262	15,054	89	961	4,031	27	73,351	325,638	1,676
48----	Transportation & warehousing	1,022	4,320	52	1,731	7,572	61	862	3,486	31	776	3,933	16	79	407	9	11,810	49,293	333
51----	Information	368	1,540	10	2,947	13,149	34	149	609	6	757	3,394	9	103	460	3	13,699	57,967	163
52----	Finance & insurance	1,821	8,311	48	3,798	15,875	100	1,588	5,933	28	924	3,953	26	439	1,756	16	21,438	91,775	508
53----	Real estate & rental & leasing	0	0	12	468	2,246	56	0	0	19	49	219	8	0	0	4	3,503	16,762	318
54----	Professional, scientific & technical services	979	3,058	29	2,303	10,284	89	382	1,717	28	325	1,408	21	0	0	6	19,302	85,784	496
55----	Management of companies & enterprises	0	0	1	0	0	2	0	0	1	0	0	2				2,243	10,244	30
56----	Admin/support, waste mgt, remediation services	516	2,610	35	1,562	8,119	51	0	0	9	228	1,054	18	0	0	2	7,887	39,160	341
61----	Educational services	873	3,702	9	832	3,307	8	0	0	2	0	0	3				3,245	13,426	49
62----	Health care and social assistance	8,600	36,675	61	19,316	83,873	143	3,280	13,563	35	9,009	39,039	43	3,130	12,565	16	107,062	466,765	734
71----	Arts, entertainment & recreation	126	824	17	549	2,876	37	0	0	8	0	0	7	0	0	8	7,682	38,118	209
72----	Accommodation & food services	1,638	7,814	95	2,513	13,191	148	616	3,030	42	669	2,911	37	348	1,442	16	27,934	141,630	946
81----	Other services (except public administration)	2,015	8,883	115	3,262	13,291	214	1,005	4,025	76	649	2,664	54	266	1,043	22	22,456	99,143	1,159
95----	Auxiliaries				0	0	2	0	0	1	0	0	1				0	0	8
99----	Unclassified establishments	1	33	3	0	0	9	0	0	2	2	19	3				28	285	37

APPENDIX B: CENTRAL CERTS MEMBERS

First Name	Last Name	Organization/Affiliation
Alan	Judd	Community Ed, Staples/Motley
Bob	Manning	Crosby/Ironton Schools District
Brad	Knight	Citizen and builder
Chad	Moyer	KWAD - Wadena Radio
Chuck	Knierim	Sustainable Farming Association Central Chapter
Cindy	Keller	Itasca State Park
Daniel	Evans	Cass Lake Visitor Information Center and Chamber of Commerce, White Earth
David	Winkelman	The Water Foundation
Duane	Strunk	Brainerd Audubon
El	Haus	St. Cloud School District
Gerald	Breid	UM Central Region Partnership
Gordon	Stobb	Central MN Ethanol Coop
Greg	Chester	Cass Lake Area
Herman	Hendrickson	Whole Farm Coop, Long Prairie
Jason	Edens	Rural Renewable Energy Alliance
Jay	Idzorek	GreenRange Renewable Energy
Jennifer	Stockinger	Brainerd Dispatch News
Jennifer	Hawkins	Region 5 Development Commission
Jim	Chamberlain	Sustainable Farming Association Central Chapter
Jim	Keller	Itasca State Park
Joel	Haskard	University Minnesota Regional Sustainable Development Partnerships, CERTs
Kari	Tomperi	Wadena SWCD
Kathy	Bussard	Crosby/Ironton Schools District
Kristen	Blann	Sustainable Farming Association Central Chapter
Larry	Glassman	Farmer, private wind turbine owner
Linda	Lawrie	Crosby/Ironton Schools District
Lisa	Katzenmeyer	Walker Chamber of Commerce
Lissa	Pawlisch	University Minnesota Regional Sustainable Development Partnerships, CERTs
LuAnn	Nelson	Medtronic
Mary	Harrison	Wadena Co Commissioner
Mel	Wiens	Sustainable Farming Association Central Chapter
Mike	Vacek	AVP, Community Federal
Mona	Roth	Park Rapids Headwater's Humane Society
Norm	Krause	Central Lakes Ag Center, Minnesota Rural Electric Association
Paul	Beckel	Wadena, wind power interest
Phil	Hunsicker	1000 Friends of Minnesota
Ray	Gildow	Central Lake Ag College
Rin	Porter	Browerville Blade
Sally	Shearer	UM Central Region Partnership
Sharon	Rezac Andersen	Central Region Partnership
Shirley	Judd	Legacy Garden
Steve	Nelson	Cross Lake area, sustainable development
Steve	Waller	Central Lakes Ag College
Susanne	Hinrichs	UM Central Region Partnership
Tim	Pavek	Todd-Wadena Coop
Vince	Crary	Extension Educator, New York Mills
Wayne	Warzecha	St. Cloud School District, SEE Coordinator

APPENDIX C: CERT MEETING – AGENDAS AND SUMMARIES

Central Region CERTs Meeting

Central Lakes Agricultural Center

November 12, 2003

2:00 pm - 4:30 pm

Goals for the meeting:

- Gain knowledge and understanding of CERTs purpose and process
- Interact with participants about the region's renewable and clean energy initiatives/projects
- Collectively generate potential outcomes from CERTs process
- Understand expectations and timelines of serving on CERTs Team
- Determine interest in continued participation in CERTs

2:00 Welcome and Overview of the Meeting (Lissa and Norm)

2:15 Introductions (Sharon)
Name and Location
What is your background or interest in energy issues?

2:45 What is CERTs? (Lissa)

3:00 Group Discussion

- ✓ What are existing energy projects in the area and how can CERTs be most productive in the Central Region?
- ✓ What other groups could/should be collaborators?
- ✓ Expectations of CERTs in Central Minnesota

3:30 Break

3:40 CERTs possible outcomes and Potential Timelines

- ✓ Central region CERTs to meet quarterly
- ✓ Smaller interest groups to meet at their discretion
- ✓ Begin CERTs process by assessing regional energy use, conservation opportunities, and exploring the best options for renewables
- ✓ Develop a strategic regional plan based on assessment and existing activity related to energy in the region

4:10 Expectations of CERTs and Potential Timeline

4:25 Closing remarks (Lissa and Norm)

4:30 Closure of meeting

**Central Region CERTs Meeting Summary
December 12, 2003
Central Lakes Agricultural Center**

Meeting started out with a welcome from Norm Krause and we moved directly into introductions.

Individuals present at the meeting included:

Norm Krause
Chuck Knierem
Sharon Rezac Andersen
Linda Lawrie
Bob Manning
Michael Demchik
Tim Pavek
Greg Nolan
Kari Tomperi
Rin Porter
Brad Knight
Shirley Judd
Jerry Breid
Susanne Hinrichs
Lissa Pawlisch

Following introductions Lissa presented a brief overview of CERTs, its origins, and LCMR desired results.

As a group we discussed the following four questions:

1. What are the existing energy projects in the region?
2. How can CERTs be most productive in the Central Region?
3. What other groups could be collaborators?
4. What are your expectations of CERTs in Central Minnesota?

The four questions yielded a great dialogue. The major themes and results, listed in no particular order, are summarized below.

Existing Projects:

- Solar hot water heaters in Backus, MN – Jason Edens of the Renewable Energy Alliance is working to install solar in low-income housing.
- WesMin RC&D biofuel grant; working with hybrid poplar (Dean Schmidt)
- Sustainable Farming Association (SFA) Central Chapter would like to partner with CERTs on demonstration projects, using design and installation of sites as classes
- Detroit Lakes (tower on hill)
- Cass Lakes wind project on superfund site
- Moorhead and Jamestown wind projects
- Wellspring wind purchasing
- MNSCU owns a 300-acre research and demonstration site, potential for demonstrations for the greenhouse, for lighting, or others
- Solar Home Tours in the region: American Solar Energy Society
- Methane Digester in Wadena
- Conservation at Trust Jois McMillian – Deerwood, MN (in operation)
- Conservation planning process underway at Central Minnesota Ethanol Coop

Opportunities for:

- Wind power on mine dumps to generate electricity (need to evaluate wind resource)
- Greater wind testing in the area with towers of various heights
- Solar thermal to heat homes and businesses – incorporate changing technologies (concrete slab piping)
- Improved use of passive solar including trees for shade

- Improved insulation
- Education – at all levels including K-12, hand-on applications, etc.
- Addressing periods of peak use during summer – load management
- Conservation Improvement Program Opportunities
- Promoting closed-loop geothermal applications for heating and cooling
- Providing a consumer evaluation group to consider costs over time of particular technologies (like lightbulbs, dishwashers, etc).
- Looking at a variety of resources and opportunities, not just favorites
- Integrated biorefineries (MDA Tom Nolan)
- Using existing opportunities/equipment/resources in different ways
- Taking an inventory of “non-traditional” things/application that allow a broad analysis that welcome new functions
- Vertical wind power generators
- Providing a forum/resource for people with interest in energy issues, an access point to information
- Providing a list of Central Region contractors that can do energy efficiency/renewable energy projects
- Waste wood use/recycling – tremendous potential in waste wood – could be using in grain drying or home heating
- Buying corn for local energy
- Tax incentives
- Bring in external investors

Related concerns/Systems approach:

- Appropriate tree planting to take advantage of heating and cooling benefits in addition to minimizing snow drifting (which in turn minimizes the amount of plowing), ex: Browerville to Staples
- Improve farming practices to provide windbreaks and habitat
- Transportation and heating fuels
- Need PV cells that store energy
- Soil and Water and MNDOT “Living Snow Fence” program
- Utilize natural gas storage areas for compressed air energy storage or hydrogen storage
- Give a longer terms perspective to technology development
- Tie-in energy issues with tourism – generation options have different impacts on natural resources

Suggested Goals:

- Projects: hands-on education and community service opportunities, education in classroom settings, actual projects that get done
- Action Oriented
- Complete projects that make economic sense

Potential collaborators that should be involved:

- Schools
- Municipals
- Energy businesses
- Tribal communities – Dan Evans from White Earth, Dave McInerny from Leach Lake (tribal forester), someone from MilleLacs
- Chamber of Commerce
- Other Municipal/cooperative utilities – GRE covers nearly 2/3 of region, the other major players are Minnkota and Ottertail but there are some municipals and member cooperatives that would like to be directly involved
- Someone from Central Minnesota Ethanol Plant in Little Falls, Minnesota
- Legislators – Carrie Ruud, Cal Larson, Dallas Sams, Terry Westrom, Mary Ellen Otremba

Notecards:

Everyone present also listed resources they used, or were aware of, that might help the group on notecard. These included:

- Chris La Forge out of Wisconsin
- Crow Wing Power

- Mid America Energy, Brainerd
- Dean Schmidt, Wes Min RC&D
- Lee Ann Buck, MN Association of Soil and Water Conservation Directors
- Jim Ayres, NRCS (Fergus AO)
- Michael Sparby, AURI (Morris)
- Solar Energy Society
- Sierra Club
- Great River Energy
- Clean Water Action
- Environmental Defense Fund
- Electric Cooperatives

Other thoughts:

CAP student: Could draw from St. Cloud State, Bemidji, or Central Lakes Ag (Engineering). Would like the student to have GIS experience. Would make sense to include an inventory of specific regulations that impact renewable by county and also review public information (permits) to follow activity. We plan to engage this student at the next meeting to ensure that research moves in the desired direction.

We hope to partner with the Todd-Wadena Electric Cooperative and Itasca-Mantrap Cooperative throughout this process and utilize their exiting inventory and resources to further the CERTs process in the region. The student researcher(s) will work with these organizations to ensure that we collect the necessary information and maintain an open dialogue throughout the process.

Lastly, although we probably won't do much touring during January, there may be opportunities to tour some of the renewable energy sites in the Central Region during the spring meeting. We have a couple of places in mind already, but let us know if you have other ideas.

At the close of the meeting we set another meeting date and assigned a few tasks.

The next meeting will be **Thursday, January 29th, 2004 at 5:30pm**. It will be held at the Central Lakes Agricultural Center and we'll plan to order pizza.

Before the next meeting please:

- Complete your survey and submit it to Lissa (address listed on email)
- Review the project list provided herein and add other projects as appropriate
- Review the existing resource list and add others you use
- Contact other potential participants/interested person you know and invite them to the next meeting

AGENDA Central Region CERTs Meeting

January 29th, 2004

Central Lakes Agricultural Center

- 5:30 Meeting Begins
Overview of Meeting Goals:
- Review existing energy use data for Region (Lissa to assemble)
 - Create plan of attack for assessment
 - Create working group to spearhead project work and develop action plan (and possibly also one around education if these remain the priorities – will need to be flexible here)
 - Set other priorities (1 or 2) to guide team activities and focus
- 5:35 Introductions
- 5:45 Review existing Energy Use Data (who are utilities, how much energy, etc)
- 5:55 Set a course of action for assessment
- Basic elements
 - What other items should be included?
 - Who should be used as resources?
 - Tasks: Who will do what by when?
- 6:25 Discussion: What are other team priorities?
- 6:45 Break: PIZZA
- During break I would like everyone to review the existing project list, resource list, and CERTs contact list. Please add in other projects you know about, other resources you use, and fill in/add to the contact list
- 7:00 Split according to priorities – Develop action plans, approaches, guiding principles for subgroups
- 7:30 Report back to group – Are there common themes, guiding principles, synergies?
- 7:45 Set date for next meeting and discuss topics for meeting
- 8:00 Adjourn

Central Region CERTs Meeting Summary

January 29th, 2004

Central Lakes Agricultural Center

Meeting began at 5:30. It was COLD.
Norm and Sharon welcomed the group.

Lissa gave two quick announcements. First, the Central Region was awarded additional funds from the Blandin Foundation (approximately \$18,000). Second, the Central Region will soon have three students from the University of Minnesota Morris working together to do the inventory portion of the Energy Plan for both the Central and West Central Regions.

We moved into introductions – those present at the meeting included:

Sharon Rezac Anderson
Susanne Hinrichs
Brad Knight
Sally Shearer
Bob Manning
Linda Lawrie

Shirley Judd
Tim Pavek
Norm Krause
Rin Porter
Kathy Bussard
Mike Demchik

A copy of the student work plan was handed out. If there are things that should be added to the inventory please be sure to let Lissa know. As discussed during the meeting, there is interest in also looking at natural gas use due to obvious concerns with natural gas consumption during the winter months as a heating source. There were a few other suggestions that will be addressed later in the summary.

A few of the other handouts included a resource bibliography (which is available electronically for those that are interested), a few draft proposal ideas, some conservation information, duplicates of handouts from the first meeting, and a summary of the energy use data for the region. If you missed any of these handouts, please let Lissa know, and she will send additional copies to you.

Lissa quickly reviewed some energy use data for the region. The numbers came from the Department of Commerce Utility Data Book, but Tim and Norm thought that perhaps the categories had been mixed up. That said, it did present an interesting picture of use in the region – we'll have to work on the errors. Generally speaking energy use (consumption) by sector is fairly similar (the four sectors used are non-farm residential, farm, commercial, and industrial). There are however many more non-farm residential and farm customers than there are industrial customers. In terms of overall consumption, the Central Region consumed 4,234,790 MWh in 2000 and 4,380,512 MWh in 2001. Broken down by county, the three highest consumers were Benton, Crow Wing, Otter Tail. Energy consumption appears to outpace its population figures (based on overall state rankings); this is likely related to St. Cloud and the number of commercial businesses and structures that bump up consumption figures.

Much of the generation that is done in the Central Region is done with hydro. Several of the cooperative and municipalities also have small oil units. The majority of energy used in the region is imported.

We then discussed a number of potential project proposals that had come up since the last meeting. Norm presented a draft proposal for a portable biomass unit that would be used as a crop dryer, could be used to heat the new greenhouse at the Ag Center, and could use some of the wood waste from the area, or even the hybrid poplars grown adjacent to the Center.

A number of proposal were made in absentia, so my apologies if I didn't get them quite right. First, Jason Edens suggested working collaboratively to do solar thermal installations and use the installations as hands-on community workshops. He also suggested a biodiesel project that utilized used waste vegetable oil as a fuel for space heating using fuel oil. Lastly, he suggested the CERTs region take advantage of the Solar Showmobile – a youth built mobile solar generator that can be used to power small events and as a teaching tool for schools.

Second, Chuck Knierem and Greg Nolan have been putting together some ideas with the Sustainable Farming Association to offer community-based classes that would focus on installing technologies (like PV-systems) and implementing demonstration projects offering the actual installation as a training session.

Dan Evans is hoping to evaluate the wind resource of the Cass Lake area with the hope of putting up wind turbines on a former superfund site. This is similar to the project that Bob, Linda and Kathy are looking at to install turbines on top of "slag mountains" in the Crosby area as a potential revenue generator for public projects and local non-profits. It seems that both of these sort of projects could also include a demonstration of how you set up a monitoring tower, how to read the data, how to interpret the data and decide whether or not you have a good wind resource, etc.

With all of these projects, it would also be interesting to include how you go about deciding if this sort of project is right for you, what factors to consider, and how to go about doing the planning prior to installation.

PIZZA BREAK

When we got back together we started discussing what goals the CERTs team should have. A number of ideas came forward that led to a set of goals the group would work toward. The ideas that were shared included the following:

- Most people want the convenience of flipping a switch and getting light. A LOT can be done with conservation and education around conservation – there is significant room for improvement in conservation efforts.
- Target peak loads – if we implement ways to reduce peak consumption and focus on baseload, we minimize the need to build new capacity. Conservation can target both lifestyle choices (behaviors) and technical improvements (such as efficient water heaters, smart house wiring, and compact fluorescent light bulbs).
- Lots of programs for children – K-12 educations, but kids still leave the lights on. Behavior can be harder to change – also the problem that for many lights = safety.
- Looking at overall energy needs, it appears that needs are growing beyond what can be accomplished with small distributed generation.
- People won't change their lifestyle until the price structure changes.
- Half of Todd-Wadena water heating is controlled (utility regulates when the water is heated), but not all other coops in the Central Region have the same structure (many have fewer that are controlled). In Brown Co. nearly 90% are controlled via a simply radio signal.
- Public sector areas are hurting – what can be done to help control costs.
- Provide demonstrations for anyone and everyone to attend.
- Hook CERTs students in with science teachers in local schools to get projects going that could provide on-going education opportunities within the schools.
- Target building and trade industries. These people play a role in advising people and if the education isn't getting to providers, it simply creates another hurdle. Should look at existing codes – natural gas and electric companies will currently give you better ideas for efficiencies than contractors, but there also aren't many building inspectors so contractors don't have an incentive to do what's right.
- Educational efforts can target a variety of audiences from children, adults, consumers, producers and trades people. Where do you get the most bang for your buck?
- Architectural firms will often ask what are your goals – if it's only about saving \$\$, then you also have to think about whether it's important to save a few dollars today or many over the lifetime of the building.
- Can be less expensive to do smart buildings than smart houses (scale difference).
- Should examine if there are ways, perhaps via taxes, to invest in your home and its conservation measures, such as added insulation.
- Should look at economics of incentives regarding demand under certain price structures.
- Need to be a real resource – but how can we do that? Provide an energy center? Showcase demonstrations that show people what's happening on the ground? Model for classrooms? Bring students over? Have kids do energy audits of their own homes? Work with SFA on energy fair? Invite knowledgeable organization to come share with group?

The goals or areas that the group decided to focus on are:

Conservation ↔ Education ↔ Action Projects ↔ Big Picture

The arrows are supposed to represent the way in which the group felt that all of these things are interconnected. No element is stand-alone – they all interrelate. Education will tie in with all of these things; action projects will include conservation projects and renewable energy projects (all with education components). The Big Picture will help create a broader vision for energy use and generation that will guide the Strategic Energy Plan, but also help inform projects and educational opportunities.

For the next meeting, Rin, Tim, Mike, Sharon, and Lissa will be working to put together an interactive session that addresses conservation and education. We will invite speakers, like someone from the Cold Climate Housing groups to talk about pertinent issues for home owners and builders, someone to discuss how to give market advantage to conservation improvements (like some sort of label or placard for businesses). The group will firm up their ideas and then work with the Minnesota Project to get funding for speakers, etc.

Mike, Norm, Linda, Bob, Kathy, and Shirley committed to work on “Action Projects” for the next few months. This will include flushing out ideas that they already have and firming up requirements to demonstration projects in place (outlining financial needs, timing requirements, how to integrate education components, when to do them).

Tim and Brad are going to work with the students over the next few months to discuss what other things they should be working on to make sure we really get a big picture perspective for the energy plan.

NEXT MEETING IS APRIL 22nd – EARTH DAY!!!

The meeting will again be held at the Central Lakes Agricultural Center and is scheduled to begin at 5:00pm.

Other upcoming events include a Firewood Processing session scheduled for March 27th in Browerville-Long Prairie. Mike will send out further details of this and regarding a Bundling session scheduled for earlier in March.

Central Region CERTs Meeting Agenda

April 22nd, 2004 – Earth Day

5:00 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

- 5:00 Introductions and Welcome: Sharon Rezac Andersen, UM Central Region Staff
- Overview: Lissa Pawlisch, Clean Energy Resource Team Coordinator
- 5:15 Central Region Renewable Energy Resources – Libby Jensen, UMM Student and CERTs Research Assistant
- 5:35 Central Region Renewable Energy Project Updates
 Gordon Stobb, Secretary, Central MN Ethanol Coop
 Norm Krause, Director, Central Lakes Ag Center-Bio Mass
 Jason Edens, Rural Renewal Energy Alliance-Solar Energy
 Others
- 6:10 Break for Healthy Earth Day Food
- 6:25 Conservation Work Group Report
 Tim Pavek, Member Services Manager, Todd-Wadena Electric Cooperative
 Mike Demchik, UM Extension Service, Brainerd Regional Office
- 6:40 Selecting Priorities and Action Steps
- Review of what we discussed last meeting
 - Based on the conservation group report, where should we begin?
 - Where can the education group initiate its efforts?
 - What renewable energy demonstrations/education efforts/initiatives should we start with?
 - When should we have our next meeting? Come back in May or later with material developed and then plan to do outreach over the summer? Meeting again in August?
- 7:30 Meeting Adjourns

Looking forward to seeing you all there!!!

Wind monitoring towers

Solar-PV training (May 6 — Photovoltaic Electric Systems: A Primer for Code Officials, MP-RETW, Cragun's Resort, Brainerd, 9am-1pm, contact Dean Talbott, 218-722-5642)

Other workshops? Community Wind Workshop funding

Central Region CERTs Meeting Agenda

April 22nd, 2004 – Earth Day

5:00 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

We started with a wonderful dinner of local foods (thank you, Sharon!).

Sharon gave a brief welcome at about 5:20. Lissa gave a quick overview of what we hoped to accomplish during the meeting. Then we did introductions.

Those present at the meeting included:

Sharon Rezac Andersen, Brad Knight, Shirley Judd, Norm Krause, Mike Demchik, Jason Edens, Lissa Pawlisch, Libby Jensen, Cynthia Pansing, Gordon Stobb, Alan Judd, Dona Mindemann, Kari Tomperi, Jay Idzorek, Leif Underdahl

Central Region's Renewable Resources – An Overview

Following introductions, Libby Jensen, UMM Student and CERTs Research Assistant, gave an overview of the work she's done to assess the Central Region's Renewable Energy Resources. Libby reviewed the information she's put together regarding wind resources in the region. It appears that Wilkin, Ottertail and Becker generally have the best wind resources, but the geographic spread of the monitoring stations leaves some gaps. Libby mentioned that the Department of Commerce is currently looking for a new wind-monitoring site on the border of Todd and Wadena Counties (see flyer that Lissa sent to list serve).

Libby reviewed the existing hydro facilities in the region and discussed the potential for new hydro development in the Central region (low, despite good river resources in the area, perhaps some potential to refurbish old facilities, but that can also be difficult). It was noted we should add the Park Rapids site that the Central Region previously tried to recondition to the list (dammed but not producing power), and Libby suggested that the two Army Corp of Engineers' sites that are dammed but not producing power be further examined.

With regard to biomass, Libby presented the data she had but added a caveat about the data source (Oak Ridge National Laboratory data, doesn't appear to be quite complete and cannot track down the author to gather specifics about what materials were used in quantifying each resource). Biomass stimulated much discussion. Mike Demchik thought the numbers looked high. There was discussion about how biomass is utilized as a fuel including via combustion into electricity, as a heat source (substitute for natural gas), as a biofuel following liquefaction (ethanol), and as a gas following gasification. Biomass use makes sense once the resource is concentrated because of its multiple possible uses, its usable extracts, and reusable waste products. Lastly the team discussed the use of vegetable oil as a source for biofuel. Examples were given about a school in South Carolina gathering oils from a slaughterhouse and the potential for waste oils from McDonalds, which uses 500 gallons/week.

Central Region Renewable Energy Project Updates

Gordon Stobb, Central Minnesota Ethanol Coop. Gordon gave an overview of what's happening at the ethanol plant regarding their anticipated incorporation of finely chipped hardwood (waste wood) as a fuel. To replace all their natural gas use, the plant will need 300 tons/day of waste wood, which they anticipate buying for \$22/ton delivered (at 30% moisture content or less). The Coop actually estimates that within 25 miles of the facility there is enough biomass waste to fuel 5 facilities like theirs, and they may even look at burning old rail ties in the facility. The new biomass gasifier system should be operational within 16-18 months (depending upon financing). Central Minnesota Ethanol Coop's use of biomass will help the plant control its fuel costs by eliminating the need for natural gas and will also help the plant generate 50-75% of its own electricity requirements. They are currently working to sell their green credits to a utility.

Norm Krause, Director, Central Lakes Ag Center-Bio Mass. Norm gave an overview of the biomass dryer project. Central Lakes Ag Center would like to employ a portable grain drying system that would be powered by biomass (like barley straw and corn stalks they have available on site). This system could also be used to potentially heat the greenhouse (as could a number of other sources like passive solar, group source heating, etc.).

Jason Edens, Rural Renewal Energy Alliance-Solar Energy. Jason described the three main projects the Rural Renewal Energy Alliance works on including 1) Solar Assistance, 2) Youth Training, and 3) Sun Dog Solar Contracting (contracting service for solar installations). In general the organization strives toward making renewable energy accessible to people of all income levels. The Solar Assistance Program provides and installs solar heating equipment for low-income households and thereby helps these households lower their energy bills. The Youth Training Program involves at-risk youth in solar installations and also provides the Solar Show Mobile as a mobile solar electric and solar heating project that students can use to teach and other and power fairs and events.

Jay Idzorek, GreenRange Renewable Energy, gave a quick presentation about the solar powered (via solar panels charging a DC marine battery) lawn mower he brought along and about his work with Leif to make biodiesel from waste vegetable oil they collect from local restaurants.

Conservation Work Group Report

Mike Demchik reported on behalf of his group that also included Rin Porter and Tim Pavek. They put together a number of tables that describe all of the energy use sectors in the region, and highlight the opportunities for conservation in each of the sectors. Generally speaking they saw several big opportunities:

- Education for residential customers/users
- Government buildings

- Training installers (curriculum development)
- Working with business and companies

Selecting Priorities and Action Steps

We quickly reviewed what was discussed at the last meeting (the diagram of conservation, education, big picture, and action projects all working in tandem with one another).

Based on conversations held during the meeting it seemed that several items were rising to the top:

- Need to identify who our audiences are and how to target them – *Brad and Keri working on this and the next item, anyone else? Dona?*
- Should audit education programs that are already available/happening to figure out where ideas about renewable energy and energy efficiency resources and technologies can fit into already existing structures (this could be anything from Science Fairs, to programs at local community colleges, to trades trainings, to local events)
 - Work with community colleges for education in trades
 - Offer opportunities for construction trade students to tour sites with renewable energy installations and improved energy efficiency applications
 - Set up displays at upcoming events over the summer (i.e., instead of creating our own event, go where events have already been scheduled as a way of targeting people). Examples: Home and Garden Shows, Horticultural Day (Aug 19th, event for vendors), Windy River Renewable Energy Fair (@ Morrison, sponsored by Sustainable Farming Association)
 - Draw on existing content for educational materials, and compensate those who provide it
- Run demonstrations at the Ag Center – like biomass, solar, wind demonstrations at the greenhouse (could be demo for technologies and nurseries) – *Shirley, Jason, Jay working on this*
- Need to nail down biomass numbers (work with NRRI, Keith Jacobson at DNR) – *Lissa will work with Mike to coordinate*

Meeting officially adjourned at about 7:45 pm, but people stayed around until about 8:30 pm.

Others to Contact (*Lissa and Sharon*)

County and economic development people
 Farmers Union
 Community Action Agencies
 Local Chambers of Commerce

Upcoming Events

May 6, 2004 – Solar-PV training — Photovoltaic Electric Systems: A Primer for Code Officials, MP-RETW, Cragun's Resort, Brainard, 9am-1pm, contact Dean Talbott, 218-722-5642

May 12, 2004 – Harvesting and Marketing Forest Biomass, Grand Rapids area De monstration at Grand Rapids School Forest, 8:30am-3:30pm, contact Mike Demchik, 218-828-2332 (see flyer distributed to list serve)

August 27, 2004 – Central Region Annual Meeting – An Event and Demonstration (including the Solar Show Mobile and hopefully something at the Greenhouse) at Central Lakes Ag Center

We set out next meeting date for **June 2, 2004**, once again to be held at the Central Lakes Agricultural Center.

Central Region CERTs Meeting Agenda

June 2nd, 2004

5:00 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

Meeting Purpose:

- Review what small groups have accomplished since last meeting
- Finalize action plans for summer
 - ✓ Develop specific action plans to get demonstration projects up and running over the summer
 - ✓ Come to consensus about audience, what materials to display, and when/where to display them

5:00 pm Welcome and Introductions (opportunity for brief announcements)

5:15 pm Report on the Energy Smart America Conference

5:30 pm Working Group Reports and Discussion

- Discussion of Demonstration Project Plan – What other resources do we need?
- Discussion of Audience, Displays/Outreach Materials and Events to Target – Examples to review, Content Needs

6:20 pm Revisiting Conservation – Where does it fit in with the demonstration and outreach efforts?

6:40 pm Review CERTs Budget (target spending)

7:00 pm Wrap-up (review of summer targets, set next meeting date)

7:10 pm CERTs Progress Report (feedback from team)

7:30 pm Adjourn

Please come prepared to determine how the Central Region CERTs Team can be an integral part of the UM Central Region Annual Event, August 27th: Healthy Life and Landscapes.

Central Region CERTs Meeting Summary

June 2nd, 2004

5:00 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

Welcome, Introductions and Announcements

Those present included:

Lissa Pawlisch

Amanda Bilek

Shirley Judd

Gordon Stobb

Mike Demchik

Rin Porter

Tim Pavek

Norm Krause

Chuck Knierim

Jim Chamberlin

Paul Embeckel

Sharon Rezac Andersen

Announcements

Sharon reminded everyone of the UM Central Region Partnership meeting on August 27th, 2004. She is hoping that CERTs will have a demonstration project at this event.

Mike Demchik gave a quick summary of the Biomass Bundler Class in Grand Rapids, Minnesota. Sounds like all of the demos had tremendous turnout and were wild successes.

Energy Smart America Conference – Review

Rin Porter reviewed her five highlights from the conference.

- 1) Performance contracting – ability to have contractors retrofit buildings and then take payment based on savings generated from energy efficiency improvements.
- 2) Energy efficiency education in Iowa – got kids involved, educated them and then allowed them to badger their parents into making improvements.
- 3) Geothermal heating and cooling (ground source heat pumps) – rather than using an air exchange, use pumps that circulate fluid underground (better approach in cold climates like Minnesota).
- 4) Small Wind projects – lots of smaller wind projects (3 kW, 5 kW, 10 kW) being looked at/worked on in Texas
- 5) Soybean products – soybeans can make almost anything, from soy/biodiesel, to rust remover, to hand soap, to carpet backing

Lissa briefly mentioned her highlight, which was the concept of demand response. Demand Response allows energy conservation/cuts in energy use to bid against generation proposals in short-term requests for kW or MW capacity. It requires bidders proposing to cut their own energy use (thus offsetting the need for additional generation) to have mechanisms in place that will ensure they cut their load the required amount. The case study presented at the meeting highlighted how a cement plant in New York is using Demand Response as an innovative way for its business to compete against traditional energy generators.

Working Group Reports

The Greenhouse, report from Shirley Judd

There is still the possibility of heating the proposed greenhouse with solar energy. CERTs is allocating \$200 to complete the design for the system. A ballpark figure for heating the greenhouse with solar and some ground source heating (with storage) is around \$6,000 - \$10,000. Could also add PV panels to operate the pumps, lights, and other electric materials in the greenhouse. The glitch at this point is the permitting for the greenhouse. A structural engineer must approve the design for the greenhouse itself before the Central Lakes Ag Center is able to put it up and there are limited funds available to pay for these services.

Audience, Outreach, and Displays – a Discussion

Kari and Rin shared their thoughts. Lissa shared hers and relayed a few thoughts from Brad.

Regarding audience, we discussed the dilemma regarding the need for consumers to demand products before suppliers would supply them, and the need to have suppliers make products available so that consumers can purchase them. This makes deciding who to target problematic and in many ways you need to hit both sides.

Kari stressed the need to educate consumers regarding the opportunities for products and then convince consumers to pay for the products. Kari also provided a few resources the group may be interested in reviewing including...

In our group discussion about this, Mike suggested that we should find the research that looks at why some people have done projects and why others haven't. Most of the data we see is based on cost savings, but we need to understand what else influences people (psychological barrier).

Opportunities for outreach abound. Chuck Knierim, Jim Chamberlin, and Amanda Bilek all discussed ways for CERTs to become involved in the 4th Annual **Windy River Energy Fair**, which this year is combined with the Morrison Co. Fair (July 28 – Aug 1). Several organizations are already partnering to organize the event, include the Sustainable Farming Association and Water Foundation. They are still looking for other partners and still have exhibit space available. Organizations involved with the fair are currently exploring the idea of putting up a permanent large wind installation at the Morrison Co Fair site (visible from Hwy 10). As part of the fair, they are hoping to have a Legislative Session that would involve sitting senators, congresspersons, and congressional candidates. We suggested this forum be interactive and a bit of time for stump speeches. It will be held on Saturday afternoon.

Building on this idea, we discussed having a presence at other county fairs in the region. Several people signed up to staff a booth at some of the fairs in the region. We thought it would also be wise to contact the 4-H groups and Lions Clubs to see if they might also be willing to help staff an energy booth. We would like to have a display for these events (the Minnesota Project is working on these) as well as a CERTs brochure. We spent a bit of time critiquing an example brochure (the Minnesota Project is also working on this). In addition to the written materials everyone felt we need to get something else to really draw people over to us. There were a few ideas:

- 1) A solar panel that runs a camper TV (possible other idea would be solar panel that runs a lawn-mower as we know that Jay Idzorek has done that).
- 2) Get a small generator with a bicycle and have people try to power a 60-watt bulb vs. a compact fluorescent (compare the amount of effort it takes).
- 3) We discussed giving away compact fluorescents or a solar battery charger for anyone who would fill out a brief survey (thought we could ask a few questions about what it would take for people to do ... maybe change all their light bulbs, join a green pricing program, etc.) **I NEED IDEAS FOR THE SURVEY.**
Lissa is working on getting light bulbs from GRE.

We also discussed the idea of putting together a Renewable Energy and Conservation Tour. Five lucky participants have been appointed to work on this effort: Rin, Gordon, Norm or Tim, Jason, and Lissa. We are planning to meet Thursday July 8th at 5:30pm to discuss this further. We thought there could be a number of stops ranging from solar homes, to some on the custom homes that highlight energy efficiency, to the Ethanol Plant. Todd-Wadena Electric Coop already does a renewable energy tour with its cooperative members. We may be able to use a few of their ideas.

Updates on Other Projects/Proposed New Projects

Norm shared the idea of looking at the old ethanol plant in the region as a possible location for making biodiesel. One could harvest the vegetable oil/waste oil from the region, process it into biodiesel, and run local school buses on biodiesel blends. Currently Central By-Products collects the waste oil from fryers in the region. We need to gather more details about how this could work.

Norm also said he would figure out what other information we need to assess the feasibility of a portable grain dryer (e.g., what information do we need to move it forward, how much would it cost). There are a few people that have worked with biomass-fired grain dryers before (Vance Morrey). We thought it might be nice to have someone come talk with the group about how it would work.

Gordon gave us an update on the Little Fall Ethanol Plant. The board voted to approve the biomass project depending upon the financing. Lenders want a loan guarantee for the renewable resources (wood waste from a supplier out of Onemia and a company in Omaha Nebraska that will supply railroad ties).

Wrap Up

Our next meeting (Small "Tour" Group) is scheduled for **July 8th, 5:30**. Anyone interested in helping to plan a regional tour is welcome.

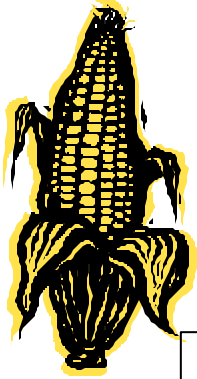
Our next BIG meeting will be **August 27th**, in connection with the UM Central Region Partnership event at the Central Lakes Ag Center. We will have a CERTs display and demonstration (perhaps the design for the greenhouse) as well as some time to meet after the event is over.

We ended the meeting by taking 20 minutes to complete the CERTs Progress Report (feedback from team). We should have results by the next meeting.

Adjourned at 7:30.

Events to Staff and Volunteer Names

We will follow up with everyone who has signed up to participate. All dates other than the Hubbard Co. fair will be after our July CERTs meetings, so we will have a bit more time to prepare. Sharon will have at least a display and brochures for the Hubbard Co. fair.



Join Us as We Take an Energy Education Bus Tour and Experience Geothermal Heating, Biofuels, Solar, Wind And Energy Efficiency Development in Central Minnesota

Through CERTs (Clean Energy Resource Teams)

Friday, November 5th, 2004

Schedule/locations

8:30 a.m.	Registration at <u>Central MN Ethanol Coop</u> located at 17936 Heron Road in Little Falls
9 a.m.	<u>Tour of Central MN Ethanol Coop and Q/A time</u> with Kerry Nixon, CMEC General Manager and Cecil Massie of Sebesta Blomberg
11 a.m.	Board the bus for an educational road trip to Brainerd
11:45 a.m.	<u>Tour of Brainerd Elementary School</u> in Nisswa to hear about their Energy Efficiency Project and related educational materials with Jeff Schiltz of Johnson Controls and teachers and staff from the Brainerd Public Schools
12:45 p.m.	Lunch at the School
1:15 p.m.	Board the bus to the Water Foundation
1:45 p.m.	<u>Tour of Conservation Campus</u> with David Winkelman to view several buildings that showcase a variety of renewable energy and conservation technologies
3:00 p.m.	Board the bus to return to Little Falls

Energy Education Bus Tour Goals:

- *To gain first hand knowledge about current renewable energy projects in the region and hear about the experiences of people living and working with renewable energy resources*
- *To hear from local energy experts and developers on the nuts and bolts of these renewable energy projects*
- *To learn more about energy efficiency projects underway in the region and how educators are integrating these projects with educational curriculum*



To participate, please **REGISTER** with **Lissa Pawlisch**, CERTs Coordinator at: **612-624-2294** or e-mail **pawl0048@umn.edu**. Please indicate whether or not you plan to ride the bus and join us for lunch when you register. The first 40 respondents will get a seat on the bus.

Registration Deadline is November 1st.



CERTS is a partnership among:

Minnesota Department of Commerce, Minnesota Project, University of Minnesota Regional Sustainable Development Partnerships, USDA Resource Conservation & Development

Summary Central Regions CERTs Energy Education BusTour –
November 5th, 2004
Central Minnesota, multiple locations

Stop 1: Central MN Ethanol Coop (CMEC) in Little Falls, Minnesota – speakers Kerry Nixon, CMEC General Manager and Cecil Massie of Sebesta Blomberg..

Sharon Rezac Anderson of the UM Central Region Partnership kicked off the day with a brief introduction and overview of the day's activities.

Kerry Nixon then gave an overview of ethanol plants. Currently there are 83 ethanol plants in operation in the US, with 14 more being built and 100 more in planning stages. Although California and New York are kicking demand up, the concern is that there will be overbuilding and more supply out there than demand. The surviving plants will be the low-cost providers. With new EPA permitting forcing CMEC out of compliance and natural gas prices going through the roof, CMEC looked into the feasibility of a biomass plant. By burning wood waste from the surrounding area they would be able to satisfy the EPA, lower their energy costs substantially and better serve their members. They expect the payback from their capital costs to be three years, after which they will be completely free of natural gas costs, saving themselves around \$3.5 million on natural gas costs per year; this also avoids the common knock of ethanol that you are using fossil fuels to make renewable fuel. They will also create enough electricity to match about 30% of their usage, all of which will be channeled back into the grid.

After a tour of the ethanol plant, Cecil Massie of Sebesta Blomberg, who is working with the plant on the biomass conversion, said that the demand for natural gas—and thus the prices—have risen sharply; what used to be peak demands in winter are now the base demands in summer. The biomass plant's generation of electricity and steam heat will be a triple win: It will help clean up the environment, it will help the local economy by keeping energy dollars local, and it will be good for the ethanol plant, by protecting it from high natural gas prices and potential shortages. It is also a very effective and nearly perfect "closed loop" system. The thermal energy efficiency of coal is around 30%, whereas the biomass and ethanol plant will be at around 70%.

Notes about the Central MN Ethanol Coop: CMEC takes 8,315 semi loads of corn per year and produces 21,000,000 gallons of ethanol each year. Annual energy use is currently around \$3 million of natural gas and \$1 million of electricity. For more information about the Central MN Ethanol Coop, visit www.centralmnethanol.com

Stop 2: Nisswa Elementary School– speaker Jeff Schlitz, Educational Account Executive for Johnson Controls.

The Central region CERTs Energy Education Bus Tour's next stop was Nisswa Elementary School, where we were greeted by Jeff Schlitz from Johnson Controls, as well as Earl and Bud from the schools facilities and engineering department. The whole school's energy system is set up so that each area/room can be monitored remotely. The heating system works via a Heat Wheel concept, where waste heat energy – from computers, lights, bodies — is all captured, thus saving the school the costs of using supplemental heat and energy, and perhaps having to use a larger boiler. Simple pictures display if rooms are in their "comfort zones" –between 68-72 F—so, for example if the lunch room gets to hot with peak amounts of bodies and kitchen heat, the system will adjust heating vents to close slightly. If a room begins to get to cold, the heating vents will open. The school was retrofitted with wide ducts so they wouldn't have to drop the ceiling to much, and the payback for the capital costs will be in 3 to 5 years. All performance contracts are on 10 year periods and Johnson Controls provides guarantees. Note: Jeff suggested we take a look into West Wood Elementary School, the 1st LEED certified school in the state (LEED= Leadership in Energy & Environmental Design www.usgbc.org/LEED) as well as Elk River, which is an Energy Star community and has four of the five Energy Star certified buildings in the state (www.energystar.gov). Not only is the system installed by Johnson Controls more energy efficient, it is far better air quality. The carbon monoxide levels are much lower so the students (and teachers) are much less sleepy, thus helping the students to learn better.

Teacher Sam Malone then talked about the Energy Action Challenge for students K-3, a project through Johnson Controls and the National Energy Foundation www.nefl.org. The grade appropriate curriculum teaches children how to conserve energy. They even form "energy patrols" that go around checking classrooms and leaving tags on unoccupied rooms; red if the lights are still on and green if the lights are turned off. The children love the activity, rotate who gets to be on patrol each week, and saved the school \$400 on electric last year.

Tour participants enjoyed a nice lunch while listening to the presentations. For more information, visit www.johnsoncontrols.com

Stop 3: The Water Foundation Conservation Campus – speaker David Winkelman

Tour participants were treated to a tour of the geodesic domes that make up the Water Foundation. The Eco-Domes Center is constructed using the latest technologies to conserve energy, building materials and water, as well as reduce pollution. No fuel is burned, no waste is produced and no water is polluted by their operations. Solar, wind and geothermal power were all on display, as well as composting toilet systems, recycled plastic lumber, thermal ceiling tile, water flow forms, recycled paving products and many other innovative and energy efficient products. David Winkelman, aka “The Bog Frog,” gave a lively presentation. For more information, visit www.bogfrog.com & www.hopshop.net.

The meeting ended with everyone piling back onto the bus to complete their evaluations. Results will be shared at the next meeting.

Thanks for terrific day!

Central Region CERTs Meeting Agenda
December 2nd, 2004
5:30 pm – 7:30 pm
Central Lakes Agricultural Center, Staples, MN

Meeting Goals:

- Set project priorities for the team capitalize upon
- Develop a concrete list of tasks that must be completed to achieve each project priority
- Set timelines and assign tasks – move to ACTION

Schedule

5:30 pm Introductions
5:40 pm Follow up from the Tour – What did we learn?
6:00 pm Other recent highlights/events/announcements
6:10 pm Set Project Priorities – What ideas can we translate to Action?
6:45 pm Develop a list tasks to get projects off the ground
7:30 pm Adjourn

Central Region CERTs Meeting Summary
December 2nd, 2004
5:30 pm – 7:30 pm
Central Lakes Agricultural Center, Staples, MN

Introductions

We kicked off the meeting with Introductions. Present included:

Rin Porter, Browerville Blade
Sally Shearer, UM Central Region Partnership
Michael Hamp, Park Rapids Shelter
Gordon Stobb, Central MN Ethanol Coop
Mel Wiens,
Norm Krause, Central Lakes Ag Center
Sharon Rezac Andersen, UM Central Region Partnership
Lissa Pawlisch, UM RSDP, CERTs

Regrets from:

Jennifer Hawkins, Region 5 Development Commission
Mike Vacek, Community Federal
Jason Edens, Rural Renewable Energy Alliance

Announcements

CERTs is having an all-team Conference on Monday, February 28th, 2005 at the St. Cloud Civic Center. Entitled “Clean Energy Resource Teams: Tomorrow’s Energy in Communities Today” the conference seeks to bring folks together from all over the state to learn from one another. For more information see www.cleanenergyresourceteams.org.

The UM Central Region Partnership just funded a Solar Thermal Project for the Rural Renewable Energy Alliance.

What we learned from the Tour

- Demonstration really brings things to life
- Tremendous learning opportunity
- Chance to create opinion leaders – sends out a ripple
- Like how the magnitude of projects changed throughout the tour – from a very large-scale industry to things you could do in your own home

- Showed how kids can be change agents. In Muscatine, Iowa kids went home and did energy audits; maybe this could be done in Brainerd as well.

Project Ideas

- Do Seminars and/or Tours for contractors – take them to see all the new, more efficient, design features
- Make a list of energy efficiency projects and then develop a to do list of options to share with people on tours
- Could use the upcoming CERTs conference as a starting place to spin off mini-seminars and mini-tours
- Work with a grade in schools to provide materials to do demonstrations
- Could create an incentive program for contractors to be on a select list/to do projects at municipal buildings
- Have them outline the “right steps”
- Get the market place to do the work
- Look into Rebuild Minnesota
- Have a list of solar and wind contractors, why not energy efficiency contractors?
- Feature options for people to get involved in their community
- What is being built in each area – what are they doing – for every county find one thing being built
- Do press releases and develop certificates (deliver certificates as a photo op)
- Give an award to the biomass plant
- Write in comments for the Environmental Assessment at the Biomass Plant
- Encourage more E-85
- Get more stories on the radio (Chad Moyer)
- Organize on-site visits to installation of solar heating systems
- Send Jason to do a demonstration with the solar show mobile at every schools
- Get involved in the Agriculture Days at all the schools in the region – Soil and Water Conservation Districts do this in all the schools; CERTs could have a booth
- Get involved in Energy Month at all the schools in the region (or the Conservation Day)

Project Priorities

- Tour of Homes and Facilities in the Region
- Give out awards to facilities, homes, projects, and contractors
- Intervene in upcoming construction projects to ask what efficiency/conservation measures are being undertaken in new buildings
- Provide handouts/materials to guide people toward what they could do to make a difference

Task Lists

See excel spreadsheet.

Next Meeting

Set for Thursday, January 27th, 2005, 5:30-7:30 in Backus, Minnesota.

Central Region CERTs Meeting Agenda
January 27th, 2004
5:30 pm – 7:30 pm
Central Lakes Agricultural Center, Staples, MN

Meeting Goals:

- Review task lists and what we've accomplished since the last meeting
- Review which tasks remain and how we will get those done
- Learn more about the Rural Renewable Energy Alliance Solar Heating Project
- Plan an Earth Day Energy Tour

Schedule

5:30 pm	Introductions
5:40 pm	Announcements – CERTs Conference in St. Cloud, Draft Central Region Strategic Energy Plan
5:50 pm	Updates on Regional Projects <ul style="list-style-type: none">✓ Update from Jennifer Hawkins on the Region 5 Development Commission's Value-added Ag Group✓ Update from Gordy on the Little Falls Ethanol Plant✓ Possible update from Sharon and Norm on proposed ethanol plant in Wadena
6:10 pm	Review and Update of Task Lists <ul style="list-style-type: none">✓ Contacts regarding building projects – how did it go?✓ 10 Questions to ask builders – suggested modifications?✓ List of projects in the region✓ Blandin funds and Contract for work✓ Any task items we missed last time that should be added? Example: Idea from Mike Vacek about engaging Little Falls School District in efficiency upgrades - could be included in the building projects initiative
6:50 pm	Presentation from Jason Edens
7:10 pm	Plan for an Earth Day Bus Tour
7:30 pm	Set next meeting date and Adjourn

The CERTs group has really appreciated everyone's efforts working on the task lists and the media attention the team has received from both Kristen and Rin. Keep up the great work everyone!

Summary Central Region's CERTs Meeting
January 27th, 2005
Staples, Minnesota
5:30 PM to 7:30 PM

Attendees: Brad Knight, Herman Hendrickson, Sally Shearer, Rin Porter, Gordon Stobb, Norman Krause, Jason Edens, Joshua Meyer, Jennifer Hawkins, Kristen Blann, Sharon Rezac Andersen, David Winkelman, Melissa Pawlisch, Joel Haskard

Meeting Goals:

- Review task lists and what we've accomplished since the last meeting
- Review which tasks remain and how we will get those done
- Learn more about the Rural Renewable Energy Alliance Solar Heating Project
- Plan an Earth Day Energy Tour

Introductions

Introductions were made and food was served. People were asked to register soon for the CERTs Conference in St. Cloud February 28th, and can do so on-line at www.cleanenergyresourceteams.org/conference-home.html. Lissa and Joel updated the group that the Central Region Strategic Energy Plan draft was coming along and would be sent out soon for comments and suggestions.

Updates

Jennifer Hawkins, Economic Development Director for the Region 5 Development Commission, spoke about the economic opportunities for Central MN in energy production through biomass, biodiesel and ethanol as well as alternative agriculture and organic production. Michael Sparby from Agricultural Utilization Research Institute (AURI, www.auri.org) presented at their last meeting. The commission's next meeting will be in March, where they hope to focus on one project. Herman brought up that it might be interesting to do a compare/contrast between Amish farms and more conventional farms to evaluate their energy needs and usage. Agro-forestry in Todd County was also mentioned.

Gordy Stobb gave an update on the Little Falls Ethanol Plant. The Environmental Assessment Worksheet (EAW) was approved! Unfortunately, it was very difficult and time-consuming working with the Minnesota Pollution Control Agency (MPCA), and there seems to be a real barrier between the policy that the Governor is putting forward and the agencies that actually carry it out. The Central MN Ethanol Co-op in Little Falls produces 20 million gallons of ethanol each year and is looking to completely replace their natural gas usage with biomass.

The group focused on the Task Lists created earlier, including finding a building being built in each county and targeting it for greater energy conservation, as well as highlighting a project from each county to celebrate. The group discussed that Central CERTs needs a logo, and maybe kids could get involved with the design. They also decided that award-winning projects should be given certificates and also potentially signage as well. Rin, David, Kristen, Brad and Sharon will work together to create the logos/ awards. David suggested Central CERTS get a membership into the MN Builders Association as a way to easily access and communicate with builders in the area.

In looking over the "10 Questions for Builders & Architects" sheets created recently, David and others suggested that information about insulation and air infiltration be added, as well as mentioning septic systems. Also "soft start" control systems save energy when turning on electrical systems. Norm was going to pass the conservation list on to the Staples Hospital. (*Note: Joel is updating the list of questions and send them out the list serve.*)

Lissa gave an update that Rin Porter will be contracted to help advance Central Region projects using some funding from the Blandin Foundation.

In talking about a list of projects in the region, it was noted that Walker is interested in a Wind Farm outside of the city limits. Brad noted that there is a hill out side of town that might be an ideal location. A couple of residents in the area near Walker have put in small wind projects. Itasca Mantrap put in geothermal heating and has received good publicity. The Walker Animal Hospital is putting in solar and geothermal systems. Jason indicated that he could provide a general list of solar projects in the region (both off-grid an grid-tied).

Sharon and Rin gave an update about several churches and schools that are in various stages of considering energy efficiency upgrades and energy conservation measures.

Presentation- Rural Renewable Energy Alliance (RREAL)

Jason Edens from the Rural Renewable Energy Alliance (RREAL) <http://www.rreal.org/index.html> gave a presentation about their Solar Assistance program that provides solar heat to low-income families. Between 20-25 solar hot air systems will be installed in the next 2 years. The program is only targeted for people on the federal fuel assistance program, and provides solar hot air in a forced air system. The systems have a 1-5 year payoff, empower families and provide carbon savings. RREAL also works with at-risk youth, giving them hands-on experience working with renewable energy. After answering questions, the two were given a nice round of applause for all the good work they are doing.

Earth Day Tour

Plans are firming up for this year's Earth Day Tour. The tour will happen Friday, **April 22nd, 2005**, from 9AM to 4PM. The tour will start at the Walker Animal Hospital, where we will see the renewable energy projects installed by Steve & Jane Ekholm. Then we will drive just south of Walker to see the wind turbine put in by Larry & Carol Glassman. After that we head up to Itasca State Park to see the new Mary Gibbs building, and finally over to White Earth to see Margaret Ponsford's house that Jason and RREAL recently worked on. The tour will conclude back at the Walker Animal Hospital.

The next Central Region meeting will be in Staples on Thursday **March 31st, 2005**, from 5:30 to 7:00 PM.

Meeting adjourned.

Central Region CERTs Meeting Agenda

March 31st, 2005

5:30 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

Meeting Goals:

- Finalize details for April 22nd tour
- Review accomplishments on task lists since last meeting
- Discuss new and emerging possibilities

Schedule

5:30 pm	Introductions
5:40 pm	Reflections on the CERTs Conference in St. Cloud, Discussion of Windy River Energy Fair
6:00 pm	Review and Update of Task Lists
6:30 pm	<i>Discuss upcoming tour: finalize remaining details, discussion items for bus (items from Strategic Plan: barriers and opportunities, vision for future), Bog Frog media blitz, etc.</i>
7:00 pm	Update from Rin
7:15 pm	Update about possible boiler conversion at Central Lakes Ag College
7:30 pm	Adjourn

Central Region CERTs Meeting Agenda

March 31st, 2005

5:30 pm – 7:30 pm

Central Lakes Agricultural Center, Staples, MN

Introductions

Lissa Pawlisch, CERTs; Joel Haskard, CERTs; Sharon, UM Central Region Partnership; Tim Pavek, Todd-Wadena Electric Coop; Rin Porter, Browerville Blade & Verndale Sun; Sally Shearer, UM Central Region Partnership; David Winkleman, Bog Frog; Kristen Blann, Windy River Fair

Comments/Reflections on the CERTs Conference in St. Cloud

- Bringing people together to share is great learning opportunity and way to get people to network
- Good variety of speakers, good overview of different initiatives
- Well-run and well-organized
- Almost too many good things to be able to see all of it
- Great to see things getting in the ground
- Loved the forager

- Explore ways for the regions to present what they are doing next year – if people from region are presenting, then they should have someone from their team moderating; would be good to have a way for the regions to present what they are working on
- Could do more about the telling of a whole project start to finish/tell the struggle
- Give depth and breadth to event by assembling a list of projects in region that are built, installed, in process so that regions compete and then do a presenter from that group (related: create a statewide database of projects around the state, people could search them and do a tour – The Green Pages at the hopshop.net)

Windy River Renewable Energy and Sustainable Agriculture Fair – 5th Annual!

Done by SFA in Todd/Morrison County area. Last year was the first year they had it at the Morrison County Fair; it will be there again this year. Have an application to put a wind turbine up there (through MN Power). Talking to folks about workshops, sponsorships, etc. Probably do workshop publicity in mid-May and plan to market workshops to specific audiences. Want to do a biodiesel workshop on doing biodiesel conversion, one on home restoration/lake shore restoration. Will also cover the agriculture side of thing (grazing, etc.) Other workshop ideas:

- Composting floor on barn – makes it a better soil amendment/garden amendment and bedding – could be good market opportunity – could be an idea and concurrent workshops for ag and energy
- Water quality – connections between renewable energy and ag... every lake in MN has a mercury warning on it mostly from coal plants
- Keep in mind funky ideas – good frog bad hog... solar music player

Review and Update of Task Lists

- *Discuss upcoming tour: finalize remaining details, discussion items for bus (items from Strategic Plan: barriers and opportunities, vision for future), Bog Frog media blitz, etc.*
- Revamped tour schedule
- Media starts next week
- Want to start bus discussion with why people are there (introductions), what they see happening in your own communities, what's their interest is.
- Barriers and opportunities – weave that in with people's projects – why they liked this site, why not, why they've done it or not
- Survey/Evaluation on bus ride home

Update from Rin

- Outline about how to find out about building projects, numbers for planning departments, etc. – can also go through newspapers in community
- Wadena County Board – planning for jail and courthouse, Rin working on Jail energy efficiency – there is a county jail in Wilkin County. They want to use geothermal but are choking on cost cause they haven't thought of how much they will save in the long run. Hubbard County is also doing a jail. Browerville School may be doing something
- Energy Design Conference Update from Rin: recycling building materials to save on waste and costs – Ramsey County Public Works Building – software MN check to evaluate your buildings (google)
- Let's do a logo – idea for the “C” from periodic table with carbon and clean energy, could connect Central Minnesota CERTs with a get idea of carbon cycle enhanced. Need tag line of Clean Energy Resource Teams: Helping Communities Determine their Energy Future
- Award processes for new projects and a “Hall of Fame” for older ones

Emerging Opportunities

- Maybe a wind turbine at Central Lakes Ag Center? Could educate people about financing and payback as well as tie in with energy costs. It would be great to do it in partnership with Todd Wadena Coop
- Conservation Security Program, USDA Rural Development funds – should consider in the future.

Other Notes

Norm named president of the Minnesota Rural Electric Association. Congratulations Norm!



Join Us as We Take an Energy Education Bus Tour to Celebrate Earth Day!

Through CERTs (Clean Energy Resource Teams)

Friday, April 22, 2005

Schedule/Locations

9:00 AM	TOUR starts at Walker Chamber of Commerce, 205 Minnesota Avenue West, Walker, MN
10:15 AM	Visit Glassmann wind turbine
10:45 AM	Board the bus to Hubbard
11:30 AM	Tour Hubbard United Methodist Church geo-thermal system
12:15 PM	Travel to Park Rapids
12:25 PM	LUNCH at Sharon's in Park Rapids
1:00 PM	Travel to Lake Itasca Visitors Center, joined by naturalist Connie Smith Cox
1:30 PM	Tour energy efficient Mary Gibbs Dining Facility at Mississippi Headwaters
3:00 PM	Travel from Lake Itasca back to Walker
4:00 PM	Tour ends



To participate, please **REGISTER** with **Sharon Rezac Andersen**, Central Region Partnership at: **877-997-7778** or **e-mail rezac003@umn.edu**.
When registering, please indicate whether or not you plan to ride the bus and join us for lunch. The first 40 respondents will get a seat on the bus.
Registration Deadline is April 18th.



CERTS is a partnership among:

Minnesota Department of Commerce, Minnesota Project, University of Minnesota Regional Sustainable Development Partnerships, USDA Resource Conservation & Development

For more information about renewable energy and energy efficiency projects underway around the state, please see: <http://www.cleanenergyresourceteams.org/casestudies.html>

Summary Central CERTS Tour Earth Day, April 22, 2005

Tour Participants

El Haus, St. Cloud School District
Wayne Warzecha, St. Cloud School District
Paul and Mary Beckel, Wadena citizens, interested in wind energy
Sally Shearer, UM Central Region Board
Jim and Cindy Keller, Itasca State Park
Sharon Rezac Andersen, UM Central Region Partnership
Lisa Katzenmeyer, Walker Chamber of Commerce
Shirley Judd, UM Central Region Partnership
LuAnn Nelson, Medtronic
Steve Nelson, Cross Lake sustainable development projects
Marilyn and George Holter, interested in energy efficiency in business and wind power
Greg Chester, Cass Lake
Dan Evans, Cass Lake
Larry Glassman, farmer, wind turbine owner
John Lovelett, solar and wind powered cabin owner in Pennington
Kristen Blann, Sustainable Farming Association

Walker Chamber of Commerce

Paul Richards from Widseth Smith Nolting, an architectural firm working in the Central Region, kicked off the day with a description of the sustainable building designs that had been integrated in the Walker Chamber building.

On the Bus

After seeing the Walker Chamber facility we boarded the bus to Larry Glassman's. On our way we passed the Walker Animal Hospital that has solar shingles installed on its roof and has a ground source heat pump installation.

On the bus we heard from Wayne Warzecha about the Schools for Energy Efficiency Program he coordinates for the St. Cloud Schools. More information about their program can be retrieved from: A few key highlights from their program included:

- Examine lighting in buildings
- De-lamping to get lighting right amount more efficient lighting, 1,000 watts light to gym \$11,000 a year for 52,000 watts
- Energy star into buildings top 25% of nationwide. Plaque with school board recognition.
- Fee for small personal refrigerator
- Energy hog

Larry Glassman's 20 kW turbine

Mr. Glassman has a 20kW turbine that was installed in 2004 by the Water Foundation. The turbine is located adjacent to an open field and sells power directly to the grid. Because Mr. Glassman's project is <40kW capacity, it qualifies for net metering. Net metering allows qualifying facilities to receive the average retail rate for the power they produce. Mr. Glassman receives a 7.3 cent/kWh payment from Great River Energy. The turbine cost \$43,000 to install. Mr. Glassman says he couldn't have made the project work without the incentives, although the turbine has been working extremely well except for one mechanical failure in October 2004 where the motor froze up. He is indeed so pleased with how it's working that he's working hard to encourage others to install them as well.

Hubbard United Methodist

At Hubbard United Methodist church the team heard from Dennis Bergran of the church's Building Committee. He walked the team through the process the Building Committee went through before deciding to install a geothermal system. When they first started evaluating their options, they didn't really know anything about heating systems so they began visiting other churches to learn about their successes and failures. They decided to go with a ground source heat pump system, also known as a geoexchange system, because it was consistently cost competitive for them to install, cheaper to operate, and easier to maintain. Indeed, as Dennis mentioned, the EPA says that geoexchange systems are the most energy efficient, environmentally clean space conditioning systems available.

The church used the Faulk Brothers as their contractor. They needed 265,000 BTUs to heat the building so they have 30 wells, spaced 10 feet apart filled with food grade propylene glycol. They previously paid around \$3,300-\$3,600/year to heat the church. In their new building they anticipate paying around \$1700/year. At this rate of savings they anticipate a 7 to 8 year payback (it's a little longer than other systems because they still have a dual fuel system that requires them to have backup propane). The stability of their heating costs is critically important to the church.

Sharon Rezac Andersen's Home

For lunch the tour stopped at UM Central Region Partnership Executive Director's, Sharon Rezac Andersen's, lovely home for lunch. They learned about the project Sharon and her husband have done to remodel their home and make it more energy efficient while also eating a delicious lunch.

Itasca State Park

Itasca State Park is the state's first park. When arriving at the park the team was joined by Connie Smith Cox, a Park Naturalist at Itasca State Park to hear all about their buildings' sustainable design features. The team started at the Jacob V. Brower Visitor Center, a facility for which Itasca State Park received funding in the 2000 State Bonding Bill. The building was carefully sited and utilized the only big pine trees removed to site the building. The building also incorporates bio-friendly paints and carpet and bio-composite countertops and linoleum.

The facility also incorporates many energy saving design features including:

- Walls that are insulated with an R-value of 24.¹ The Visitor Center is approximately 30% more efficient than required by Minnesota's energy code.²
- The roof above the main space of the Visitor Center is built with 12-inch thick structural insulated panels with an R-value of 50.
- The wood windows are energy efficient and use insulated glazing (two layers of glass) with low-E coatings to help reduce energy use.
- The floor is well insulated and has hot water pipes running through the concrete that heat the building through radiant heat.
- All the light fixtures are energy efficient fluorescents except the Exhibit and Store spotlights. Even the exit lights use LED bulbs with a life expectancy of 25 years.
- Low flow toilets are used to conserve water in the restrooms.

Following the Jacob V. Brower Visitor Center stop the group toured the construction site of the new Mary Gibbs Dining Hall that will be located at the headwaters of the Mississippi. The entire facility will be built with sustainably forested wood and has incorporated native plant vegetative islands throughout the parking lot to utilize, catch and filter excess surface water runoff. The parking lot even recycled the asphalt from the old parking lot. The Mary Gibbs Dining Hall will utilize many of the same energy efficiency technologies utilized in the Jacob V.

Brower Visitor Center and will also include:

- High-efficiency gas-fired furnaces
- High-efficiency condensing units
- Recovery of waste heat from the freezer/cooler condensers to preheat domestic hot water
- Ambient light-sensing lighting dimming
- Nearly 90% natural lighting

Tour Wrap-Up

After visiting the Itasca State Park, the team headed back to Walker Chamber of Commerce. It was an educational and fun way to celebrate Earth Day.

¹ R is the measure of the resistance to the flow of heat through a substance. The higher the R-value, the better.

² Cornwall, Bruce R. 2002. *Building for the Environment, Building for the Future*. Minnesota Department of Natural Resources brochure.

APPENDIX D: METHODS USED TO COLLECT UTILITY DATA

As part of the current energy usage assessment several data sources were used. Initially data was compiled from the Department of Commerce's *Utility Data Book*. This data is broken down in several tables. The Central CERTs team drew on four primary tables from the *Utility Data Book*. These included "Table 4: Minnesota Electric Consumption in 2000 (Megawatt Hours)", "Table 5: Number of Minnesota Electric Customers in 2000", "Table 8: Minnesota Electric Consumption in 2000 by County", and "Table 9: Electric Generating Plants Serving Minnesota in Calendar Year 2000". In addition to these tables, data was collected directly from utility websites, personnel, and documents.

To gather information directly from regional utilities several different methods were pursued. First, student researchers used the Internet to find contact information for utilities. Contact information was easily found for investor-owned utilities and cooperatives. It was more difficult to find contact information for municipals. To find municipal utility information, students often relied upon previously gathered contact information including the Energy Administration Information website, which had a link to utility contact information for all utilities in the United States (although somewhat dated, it did provide some additional contact information).

After gathering contact information, students then contacted those utilities with email addresses, via email. This worked well for many of the utilities however if no information was received, students then called the utilities. Most utilities were able to direct students to the right person to gather the information needed. Many of the utilities contacted were happy to give out the information that the students were requesting as they understood the importance of community involvement.

The primary obstacles in gathering utility information related to collecting data from Municipal utilities. Many cities with municipal utilities don't have a full-time person for electricity or those that do have full-time staff for utilities are also in charge of other tasks such as water and Internet. These individuals are therefore profoundly busy and very difficult to contact.

APPENDIX E: QUESTIONS FOR BUILDERS AND ARCHITECTS

Be Sure Your Building is Environmentally Sound A List of Questions to ask Builders and Architects Prepared by the Central Region Clean Energy Resource Team

- 1) What are you doing to incorporate passive solar design/daylighting?
 - ✓ See “Daylighting for Commercial, Institutional, and Industrial Buildings”: <http://www.eere.energy.gov/consumerinfo/factsheets/cb4.html> and “Passive Solar Heating, Cooling, and Daylighting”: http://www.eere.energy.gov/RE/solar_passive.html.
 - ✓ Solar tube tubular skylights can be an excellent source of natural lighting. Some Frequently Asked Questions about this technology are answered at <http://www.skylightguys.com/faq>. Information about how to install a tubular skylight can be found at <http://www.lowes.com/lkn?action=noNavProcessor&p=Improve/InstallTubularSkylight.html&ht=true>
- 2) What are you doing with regarding to energy efficiency lighting?
 - ✓ See “Frequently Asked Questions about Lighting Commercial Facilities”: <http://www.energy.state.or.us/bus/light/FAQ.htm>. This is a GREAT site and includes information about how to save reduce lighting costs by using efficient lights, like T-8s instead of T-12s and replacing old lights with compact fluorescents (CFLs) or LED (low-energy diode) technology.
 - ✓ **T8 Lights** - T8 lights produce an efficacy of up to 100 lumens per watt, the highest efficacy of any fluorescent light. They will not operate on standard ballasts rated for T12 lights. T8 lights use less of the toxic materials found in larger fluorescent lights, They require a T8 compatible ballast to operate.
 - ✓ **Compact Fluorescent Lights (CFLs)** - These lights are designed to replace many frequently used incandescent bulbs. They can be used to reduce energy use and power demand by over 70 percent. The lights have a lifetime of at least 10,000 hours and the light produced is similar in appearance to that of an incandescent light. Frequent cycles of short operation hours may however significantly reduce light life.
 - ✓ http://www.eere.energy.gov/EE/buildings_lighting.html is also a good site that provides links to all sort of building lighting information.
- 3) Are you planning to use energy efficient appliances? www.energystar.gov
- 4) Are you planning to use Low-E windows or planning to have windows with a U factor of 0.35 or less?
 - ✓ **Low-emittance (Low-E) coating:** Microscopically thin, virtually invisible, metal or metallic oxide layers deposited on a window or skylight glazing surface primarily to reduce the U-factor by suppressing radiative heat flow. A typical type of low-E coating is transparent to the solar spectrum (visible light and short-wave infrared radiation) and reflective of long-wave infrared radiation.

- ✓ **U-factor (U-value):** A measure of the rate of non-solar heat loss or gain through a material or assembly. It is expressed in units of Btu/hr-sq ft-°F (W/sq m-°C). Values are normally given for NFRC/ASHRAE winter conditions of 0° F (18° C) outdoor temperature, 70° F (21° C) indoor temperature, 15 mph wind, and no solar load. The U-factor may be expressed for the glass alone or the entire window, which includes the effect of the frame and the spacer materials. The lower the U-factor, the greater a window's resistance to heat flow and the better its insulating value.
<http://www.efficientwindows.org/energystar.cfm> shows the minimum requirements for Energy Star windows in the Midwest.
 - ✓ For more Window information see <http://www.efficientwindows.org/index.cfm> or http://www.energystar.gov/index.cfm?c=windows_doors.pr_windows or http://www.state.mn.us/mn/externalDocs/Windows_Doors_110802042904_Window&Doors05-03.pdf.
- 5) What kind of insulation are you using? What is the R rating?
- ✓ Commercial buildings only have to be built to R20 and residential to R30—new buildings should shoot for an R50 rating at least.
 - ✓ *R-Factor (Thermal Resistance Factor)* - The National Commercial & Industrial Insulation Standards Manual defines R-Value as - a measure of the ability to retard heat flow rather than to transmit heat. "R" is the numerical reciprocal of C, thus $R=1/C$. Thermal resistance designates thermal resistance values: R-11 equals 11 resistance units. The higher the "R", the higher (better) the insulating value.
 - ✓ For more about R factors, go to <http://www.insulation.org/techs/faq.cfm#11>). Many links for insulation information can be found at:
<http://www.b4ubuild.com/links/insulation.shtml>.
 - ✓ The Department of Energy has a site that suggests what insulation to use depending on your fuel type, location and status of your house
http://www.ornl.gov/sci/roofs+walls/insulation/ins_16.html.
- 6) Have you planned for plenty of fresh air to flow throughout the building?
- ✓ Reduced air infiltration combined with proper ventilation cannot only reduce your energy bills but it can also improve the quality of your indoor air. Outdoor air coming in makes it difficult to maintain comfort and energy efficiency. In addition, air leakage accounts for 25-40% of the energy used for heating and cooling a typical home.
 - ✓ The Department of Energy's Energy Efficiency & Renewable Energy site has an excellent listing of resources at http://www.eere.energy.gov/EE/buildings_envelope.html.
 - ✓ "Considerations for Building a More Energy Efficient Home" can be found at <http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=16&DocumentID=4168>.
- 7) Have you integrated occupancy sensors into your design to minimize energy use in unoccupied rooms?
- ✓ **Energy Stars "Simple Energy Savers"** includes installing occupancy sensors in the proper locations to that lights automatically turn off when no one is present, and back on when they return
(http://www.energystar.gov/index.cfm?c=small_business.sb_simple savers).

- 8) What heating source are you planning to use? Have you thought about ground source heat pumps?
- ✓ For good information on Ground Source Heat Pumps see www.ghpc.org or http://www.nmnrenewables.org/geothermal/heat_pumps.shtml
 - ✓ Note: non-electric heat is typically more efficient than electric heat, but ground source heat pumps, which do use electricity are more efficient than gas.
- 9) Have you thought about using in-floor heating (also referred to as Wirsbo for one of the popular manufacturers)?
- ✓ See “Hydronic Radiant Floor Heating”: <http://www.cmhc-schl.gc.ca/en/burema/gesein/abhose/ce04.cfm> for some descriptions, pictures, general design, installation, and system component information.
 - ✓ Some descriptions from this site include:
 - Radiant floor heating is a method of heating your home by applying heat underneath or within the floor. Comparable to warming yourself in the sun, this type of heating warms objects as opposed to raising the temperature of the air.
 - There are three types of radiant floor heating: hydronic, electric and air. This About Your House document focuses on hydronic (water) radiant floor heating.
- 10) Are you planning on using local, sustainably-harvested wood products? Are you planning to use a percentage of recycled materials in the interior and exterior of the building? Will you recycle the construction debris?
- ✓ Minnesota’s own Community Forestry Resource Center can be found at <http://www.forestrycenter.org/>, and the Forestry Stewardship Council is at <http://www.fscus.org/>.
- 11) Have you planned for water recycling in the building?
- 12) Are you planning to site the facility so as to take advantage of energy efficiencies from landscaping?
- ✓ Please see the document from the Department of Commerce Website http://www.state.mn.us/mn/externalDocs/Energy_Saving_Landscapes_110802040030_Landscaping05-03.pdf. It describes how one should use plants to shade east and west facing windows, NEVER south facing windows. These trees will shade and provide a winter windbreak.

For additional information about energy efficiency buildings please see:

- LEED (http://www.usgbc.org/leed/leed_main.asp). LEED stands for Leadership in Energy and Environmental Design - a green building rating system.
- B3 Project, Buildings, Benchmarks and Beyond. Here are a couple of links to that: <http://www.csbr.umn.edu/B3/index.html> and <http://www.csbr.umn.edu/b3-msbg.html>

APPENDIX F: BUILDING PROJECTS IDENTIFICATION AND TRACKING TIPS

Central CERTs Building Projects Identification & Tracking

Contact Information and Tips

By Rin Porter

COUNTY	COUNTY SEAT	PERMITTING DEPT	MAIN PHONE	CONTACT NAME
Becker	Detroit Lakes	Planning & Zoning	218-846-7314	
Benton	Foley	Dept of Development	320-968-5065	
Cass	Walker	Envir. Svc Dept	218-547-7241	
Crow Wing	Brainerd	Planning & Zoning	218-824-1125	
Hubbard	Park Rapids	Envir. Svcs Dept	218-732-3890	
Mille Lacs	Milaca	Zoning Admin.	320-983-8205	
Morrison	Little Falls	Planning & Zoning	320-632-0170	
Otter Tail	Fergus Falls	Land & Resource	218-998-8095	
Wadena	Wadena	Zoning Admin.	218-631-7604	
Wilkin	Breckenridge	Envir./Zoning	218-643-5815	

Tips for Locating Information about Building Permits

1. Any construction project in Minnesota must have a permit, whether it is a home, office building, septic system, deck, porch, addition, garage, factory, boat dock, etc. A governmental authority issues the permit. Your task is to figure out which governmental entity is the one in charge of the project you are interested in. Usually, the entity will be a city or a county. Sometimes, more than one permit is required, depending on the type of project and its scope.
2. Buildings that are to be constructed or remodeled within city limits must have a permit from the city. These permits are of several types: new home permits, home septic system permits, commercial building permits, commercial sewage permits, etc. We are looking for commercial building permits. You will need to get the phone number for the City Hall of any city you want to check for commercial building permits. The City Clerk is usually the person who knows how to get information on local permits. My experience is that you need to be very polite and very appreciative. But the information is in the public domain, so you have the right to get access to it. If the permit documents are long and complicated, and the Clerk is busy, you may have to go to the City Hall to look at them. It's a good idea to get the names and addresses of the architectural and engineering firms that are doing the building, so you can contact them.
3. Buildings to be constructed or remodeled in a rural area must have a permit from the county. Each county calls its permitting office something different. The counties and the names

of their permit offices are listed in the table above. If the commercial building permit documents are long and complicated, you may have to physically go to the courthouse to look at them. It's a good idea to get the names and addresses of the architectural and engineering firms that are doing the building, so you can contact them.

4. Any building that is going to be built or remodeled on a piece of land with shoreline has to get additional permits from the governmental authority that regulates shoreline on that lake or river. There may have to be a public hearing or other process too. There would be paperwork on all this.

5. Another person who may be helpful is the county auditor. This person arranges the meetings of the county commissioners, including placing items on the agenda, having the minutes typed, keeping the calendar, etc. If the building you are researching is in a rural area covered by county permits, or is a public building that involves county or city bonds, then the auditor will have information about it.

6. Any building project like a courthouse, jail, or school will have been covered by the local newspapers. To find the names and websites of the newspapers, go to the Minnesota Newspaper Association website, www.mna.org. Click on "Minnesota Newspapers" on the left side of the home page, and then look in the alphabet categories that come up, like A-H. Type in the city name, e.g., "Park Rapids" and you will get newspapers that have those words in their title. If you don't get anything there, try the county name, e.g., "Hubbard". Once you get to a newspaper's website, use their search feature to find articles on the school, jail, etc.

APPENDIX G: FLEXIBLE FUEL VEHICLES

The following E85 vehicles are available from your local auto dealer:

Daimler Chrysler

- Selected 2005 3.3L Dodge Caravan, Chrysler Voyager & Town and Country minivans (Fall 2004 production)
- Selected 2004 4.7L Dodge Ram 1500 trucks
- Selected 2003-2004 2.7L Chrysler Sebring Sedans
- Selected 2003-2004 2.7L Dodge Stratus Sedans
- Selected 2003-2004 3.3L Caravan Cargo vans
- All 1998-2003 3.3L Caravan minivans
- All 1998-2003 3.3L Voyager minivans
- All 1998-2003 3.3L Town & Country minivans

Ford Motor Company

- Selected 2002-2005 4.0L Explorers
- Selected 2004-2005 4.0L Explorer Sport Trac
- Selected 1999-2003 3.0L Ranger trucks
- Selected 2000-2005 3.0L Taurus sedans and wagons
- Selected 1995-1999 3.0L Taurus sedans

General Motors

- All 2002-2004 5.3L Suburbans, Tahoes, Yukons, Yukon XLs
- Selected 2002-2004 5.3L Sierra and Silverado trucks (code 5E5 for ordering)
- All 2000-2002 2.2L Chevy S-10 trucks (after 12/99)
- All 2000-2002 2.2L Sonoma trucks (after 12/99)

Isuzu

- All 2000-2002 Isuzu 2.2L Hombre trucks (after 12/99)

Mazda

- Selected 1999-2002 Mazda 3.0L B3000 trucks

Mercedes

- Selected 2003-04 3.2L C320 Serie

Mercury

- Selected 2002-2004 4.0L Mountaineer
- Selected 2001, 2003-2004 3.0L Sables

** Verify E85-compatibility by looking underneath the vehicle's fuel lid.*

These vehicles can use gasoline or the standard 10 percent ethanol blend whenever E85 is not convenient or available. Ask your dealer for more details, or contact Mike Taylor at 651-296-6830 or mike.taylor@state.mn.us.

Source: www.commerce.state.mn.us > Energy Info Center > E85 > E85 Vehicle Directory