

PKM

Electric Cooperative

NEWS

January/February 2014



A high-wire act

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help - page 3

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solar - pages 9-10

Was it cold enough for you?



CHARLES RIESEN
Manager
PKM Electric Cooperative

On the cover

Aerial line workers hang from a structure arm while they work on the Center to Grand Forks Transmission Line. The line is being constructed by Minnkota Power Cooperative, our wholesale power provider.

I will step down from the “climate change” soapbox for a couple of issues of the *News*, but I won’t let someone claim that “the science is settled” or man-made CO₂ has caused the recent run of sub-zero temperatures, and I may have to go back to it. I have a pen and I have a phone.

The weather, propane prices and load control are items I hear being discussed in and out of the office. My formative years were not spent in Minnesota and recent winters have been on the mild side, but 1977 was not that long ago and I recall nearly 100 days when the temperature didn’t get above zero. In retrospect I guess that was some time ago. It was also the time some of the climate experts were talking about the “coming ice age.” I know I said I wasn’t going there. The point is the recent cold is unsettling, uncomfortable and more costly, but it is far from unusual for Minnesota. More, it is quite typical.

Cold weather, or in our case more typical Minnesota weather, has caused more energy usage, electricity, propane and fuel oil. Many PKM member-owners have dual heating although we have seen a number of member-owners switch to using propane for space heating because of a marginal price advantage. While propane has had to deal with supply and pricing issues recently, many of those member-owners are returning to “off-peak” electric. Fortunately, our supply is local and pricing remains the same as last year.

Colder weather and more electric usage

does require more load management. As of this writing, we are near 180 hours of load management for dual heating. Minnkota Power Cooperative (our wholesale power provider) has bought in the wholesale market when it is advantageous to do so, and has thus far eliminated more than 250 hours of control and the wind generators in North Dakota have eliminated hundreds more. The forecast for load management at the start of the heating season was for 250 hours of control and we should be pretty close to that estimate.

We did find that wind power while having some advantages also has limitations that we were previously unaware of. The wind turbines “trip-out” when temperatures drop to 22 below, which was not an issue in recent years due to the mild winters. Of course, winds more than 50 mph cause the blades to feather to prevent damage, as has always been the case.

Your member-owned electric system has performed quite well thus far this winter. We have had many sub-zero windy days that are conducive to conductor breaks and resultant outages. We are glad that maintenance is paying dividends. We did have a coating of ice that caused concern, but a couple of days of sun and no wind aided in dodging that potential bullet.

The days are longer, temperatures will warm and conversations will turn to things other than weather. Your member-owned cooperative will remain your reliable and lowest cost supplier for space heating and stationary energy needs.

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January/February 2014

The PKM News (USPS 417060) Vol. 68, No. 1 is published six times a year, February, April, June, August, October and December by PKM Electric Cooperative, Inc., 406 N. Minnesota, Warren, MN 56762. Periodicals postage paid at Warren, MN. Subscription 25¢/year for members \$2.50/year for non-members. POSTMASTER: Send address changes to PKM Electric Cooperative, Inc., P.O. Box 108, Warren, MN 56762-0108.

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Next Board Meeting

Tuesday, February 25, 2014

Officers and Directors

President Ronald Reitmeier
 Vice President Blake Owens
 Secretary-Treasurer Gordon Bernstrom
 Directors Michael Beaudry,
 Jeffrey Folland, Steve Goodwin, Jerod Hanson,
 Wayne Malm, and Tom Woinarowicz
 Manager Charles Riesen
 Editors Deb Copp, Jeff Rustad

We need your help!

Comment period for proposed GHG rule for new power plants open

PKM Electric Cooperative is asking its members to help join the fight against onerous proposed carbon regulations.

The U.S. Environmental Protection Agency has launched a 60-day public comment period on its proposed emissions standards for carbon from new power plants. The proposal was placed in the Federal Register on Jan. 8.

The scoop: If finalized, the proposed rule would regulate greenhouse gas (GHG) emissions, including carbon dioxide, from new power plants under the Clean Air Act's provisions for new source performance standards (NSPS). Once the rule was published on Jan. 8, it began the official comment period (comments due March 10).

What you can do: Go to action.coop

to sign up with the National Rural Electric Cooperative Association (NRECA), make a comment and learn more about the new power plants proposal and other EPA proposals that would impact our rates. Though PKM and our wholesale energy provider, Minnkota Power Cooperative, face a more significant battle when the proposed rule for existing power plants comes out later this year, NRECA wants members to sign up and comment at action.coop about the rule and also wants to prepare and get infrastructure in place for the proposed existing power plants rule.

What people are saying about the rule: Jo Ann Emerson, CEO of the National Rural Electric Cooperative Association (NRECA), recently drew attention to the important role access to all fuels plays in the reliability and affordability of electricity in America. She believes coal plants should remain a vital part of the U.S. energy mix.

"We must be deliberate and purposeful with our energy policy to avoid depriving cost-conscious American families and businesses the affordable, reliable energy they count on as a basic component of everyday life," she said in a NRECA release. "The competitiveness of the U.S. economy depends upon options when it comes to energy

and the regional, economic and demographic differences demand flexibility and freedom when deciding which fuels will keep us moving forward."

John Graves, environmental manager for Minnkota, has said "although the administration has said that coal is part of the energy future, this rule if finalized as proposed, will effectively stop coal from being used as a fuel for new power plants."

How would it impact the coal-based Milton R. Young Station, Minnkota's major source of energy?

This rule wouldn't directly impact the Young Station. It's only for new power plants. However, regulations for new power plants must be promulgated before proposed regulations for existing power plants can be published and eventually finalized. The proposed existing power plants rule could have a significant impact on electric rates.

Some believe that the purpose of the proposed rule for new power plants is only so EPA can set up for more expansive regulations that will cover the nation's existing fleet of power plants. After all, EPA says very few new coal-

based power plants will be built in the future.

Why the proposed new power plants rule isn't feasible for coal-based plants:

The rule relies on carbon capture and storage (CCS) technology. There is no commercially viable CCS technology. EPA is betting that the technology will be developed. However, the Clean Air Act requires that the technology be commercially viable at the time the regulations are put in place.

What's next: Comments on the proposed rule for new power plants will be taken until March 10. EPA also is working on those proposed NSPS guidelines for GHG emissions for existing power plants, due by June. That is the proposed rule that could potentially have a significant impact on electric rates.

WWW.ACTION.COOP

TELL THE EPA TO
RECONSIDER ITS "ALL-
BUT-ONE" APPROACH

This is an important issue. For PKM Electric Cooperative members who do not have Internet access, come to our offices and we can help you get to action.coop and sign up.



RENEWABLE ENERGY



NUCLEAR POWER



NATURAL GAS



CLEAN COAL

Sub-zero temperatures, high market prices force load control



Off-peak heating consumers of PKM Electric have experienced a jump in load control hours in late December and early January due to a combination of high loads, extremely cold temperatures, low wind production and expensive wholesale power market prices.

The widespread extreme cold weather has driven electric loads to high levels not seen in the Midwest for many years. With temperatures dropping to 20 and 30 below zero across the region for several days, Minnkota Power Cooperative, our wholesale power provider, made a reasonable and economical choice to control the off-peak loads and avoid costly power market purchases.

“Because of these extreme low temperatures and the high demand

for electricity, power prices in the wholesale marketplace were well above Minnkota’s economical purchase price,” said Todd Sailer, Minnkota energy supply manager.

Before controlling off-peak loads, Minnkota first looks to purchase energy from the wholesale power market. When power cannot be obtained economically, Minnkota and the associated systems choose to control off-peak electric systems. The load management program protects consumers from skyrocketing market prices and prevents the need to build new power plants just to serve peak loads.

“The cost to purchase and deliver power to the associated systems can change at a moment’s notice,” Sailer said. “Load management is a vital tool for Minnkota to use to keep wholesale

power prices competitive.”

Sailer said that even with the recent cold temperatures, end-of-season load control totals will still be near the pre-season estimate of 250 hours.

All members are encouraged to check their backup heating systems, especially those who use propane or fuel oil. Sailer said members with a well-maintained backup heating system should not notice a difference in comfort level when their off-peak heating system is controlled. “The transition between the two systems should be seamless,” he said.

Nominating committee appointed

At its December meeting, the board of directors of PKM appointed a committee to nominate candidates for the board of directors, to be voted on by the members at the annual meeting on April 1, 2014.

The nominating committee will meet prior to March 7. Members who

may have an interest in being a candidate for the board of directors should inform the committee of your interest.

The bylaws of the cooperative provide for two additional methods to become a candidate for the board of directors. If it is felt a potential candidate was not given due consideration by the committee, or did not contact the committee prior to its meeting, a member can become a candidate by having 15 or more members place his/her name in nomination by petition and delivering same to the cooperative 20 days prior to the annual

meeting. The bylaws provide further for nominations to be made from the floor at the annual meeting.

Members appointed to the committee are:

Russ Steer, Euclid
Kevin L Johnson, Alvarado
Brian Kasprick, Angus
Al Lundeen, Karlstad
Glenn Barret, Warren
Jim Sollund, Karlstad
Shawn Bubb, Alvarado
Charles Hayek, Halma

Apply now for a PKM scholarship



Scholarship applications available at local high schools or at the PKM office.
Application deadline: April 15, 2014

Requirements:

- Individuals in PKM’s service area who are members of the cooperative, their spouses or children.
- Applicants planning to attend an accredited postsecondary educational institution in pursuit of their initial postsecondary degree. These institutions could include technical colleges, universities or colleges.
- Eligible applicants include high school seniors, active college students enrolled in an accredited institution in pursuit of their initial degree and nontraditional students who are initiating or resuming their education in pursuit of their initial postsecondary degree. Nontraditional students include “older than average students” or individuals who did not begin a program after high school. This could also include students whose first postsecondary degree was interrupted.

Board meeting highlights

November and December

A regular meeting of the board was held Tuesday, Nov. 26, 2013.

Ron Reitmeier, president who presided, called the meeting to order. At 8:03 a.m. an executive session was requested and the board went into executive session.

At 9:28 a.m. the president returned the meeting to regular order.

Upon calling the roll, the secretary reported that all directors with the exception of Blake Owens were present.

Director Woinarowicz reported on MREA activities, indicating that the budget presented earlier this fall is in the process of being revised and will be mailed out shortly.

Director Folland reported on the recent activities of the Minnkota Power Cooperative board of directors, indicating that action has been taken to raise the wind power surcharge 1 mill beginning April 1, 2014.

The manager reported on his attendance to the NRECA Safety Summit referencing break-out sessions and programs reinforcing the elements required to build a safety culture.

The manager of operations presented the monthly safety report indicating no accidents and no lost time. The MREA safety meeting was held on Oct. 30, 2013, with the topic being, "Troubleshooting Secondary Systems."

The manager of operations and other management staff and the manager presented their reports to the board of directors responding to questions that their reports elicited.

At this time in the meeting, CFC Regional Vice President Terilyn Wallis presented to the board of directors CFC's Key Ratio and Trend Analysis for 2012. During the presentation Mrs. Wallis responded to questions from the staff and board of directors.

Acting on a request from the board of directors the manager presented a detailed listing of accounts receivable/open accounts to the board of directors.

The assistant manager reviewed with the board of directors the 10-Year Financial Forecast and responded to questions from the board.

The manager presented to the board of directors a new policy bulletin No. 9-1 entitled, "Line Maintenance, Inspection and Construction Policy." The manager stated the genesis of this policy is to comply with FEMA regulations and to detail the objectives and procedures for constructing underground and overhead power lines at the cooperative.

The manager discussed with the board of directors neighboring cooperative activities on solar and asked the board of directors for direction to initiate PKM's own experimentation. The board of directors

instructed the manager to monitor activities of the neighboring cooperatives and report at a later date.

The board discussed the Financial Policy No. 2-4. The manager was questioned on several provisions of the policy; specifically, the provision of the policy that states operating and capital budgets to be presented to the board for approval no later than December of each year. Following discussion it was the desire of directors that December be changed to October. The manager was questioned if this would be possible. The manager stated that realistically a budget could be presented at any time, but closer to the end of the year would provide more accuracy.

A special meeting of the board was held Friday, Dec. 27, 2013.

Ron Reitmeier, president who presided, called the meeting to order. Upon calling the roll, the secretary reported that all directors with the exception of Tom Woinarowicz were present.

Director Folland reported on a recent meeting of the Minnkota Power Cooperative board of directors, indicating a budget that is performing ahead of expectations.

The Secretary/Treasurer Gordon Bernstrom reported on a meeting of the Square Butte Electric Cooperative board of directors providing information on the Center to Grand Forks 345-kV line.

The chairmen from the three committees who met in December addressed the board on committee activity concerning budgets and safety.

The directors discussed the fall member meetings indicating the drop off in attendance and the need to find a new formula that would encourage and activate attendance.

The manager of operations presented the monthly safety report indicating no accidents and no lost time. He discussed with the board of directors a meeting with the MREA Loss Control director and the cooperative's safety committee meeting, which included the board of directors' safety & health committee.

The management staff and the manager presented their monthly reports to the board of directors and responded to their questions.

The manager informed the directors that according to the bylaws it would be necessary to appoint a committee on nominations for nominating candidates for those directors whose terms expire at the 2013 annual meeting, which will be held April 1, 2014.

The president informed the directors of 2014 ACRE and REPAC contributions.

The manager discussed a meeting of the FEDAC Board of Governors; wherein, the distribution of \$1.2 million was discussed

resulting in each member of FEDAC receiving a check for \$150,000. The manager further stated that this is a balance sheet transaction since it is a dividend from the original investment.

The manager was informed that his salary would be adjusted by 2 percent for 2014. The manager thanked the board for its consideration and declined to accept the offer.

The manager stated that Policy Bulletin No. 2-4, which was discussed with a resolution at the November meeting, has now been retyped and is presented as Policy Bulletin 2-4.1. It was suggested that the board reaffirm their earlier action with the new policy number.

The manager presented the operating budget to the board of directors with his comments and those of the board's operations/planning committee.

The manager then presented the 2014 capital budget to the board of directors. The board's operations/planning committee and vehicles/equipment committee provided comments on the capital budget. The manager responded to questions from the board of directors. There was some discussion on how to budget for new services. The manager responded that it was certainly more art than science, but is primarily based on past performance with some statistical smoothing.

The manager discussed with the board of directors the possibility for amendments to the bylaws of the cooperative; specifically, a provision to allow for modern technology to hold a board meeting should it be desirable or become necessary. Bylaw amendments should be considered as soon as possible to be included with the notice of the annual meeting and drafting by the board's legal counsel.

The manager discussed with the board of directors the District 1 MREA meeting coming up Jan. 21. District 1 has had one of its directors resign and there are at present two candidates for that position. The District 1 meeting will have an out of sequence election for director at the Jan. 21 meeting.

The president presented the 990 questionnaire forms and handed them out to the directors and the manager.

The manager reminded the board of directors of the SmartHub feature that is being used by some neighboring cooperatives that allows members to view their electric bills on handheld devices, provide for a payment and a means of communications with the cooperative. The manager stated that the initial cost for this feature is approximately \$6,000 with a monthly charge for maintaining the service. Cooperatives who have instituted the SmartHub feature are saying member participation is as high as 25 percent.

A high-wire act

Stringing thick cable onto a 140-foot-tall tower is a job guaranteed to generate its share of white-knuckle moments. But aerial crews working on the Center to Grand Forks Transmission Line Project make the high-wire act look like another day at the office.

Taking to the skies by helicopter, these skilled workers have been moving one pole at a time across 250 miles of North Dakota prairie this year. When the line is complete in spring 2014, it will transmit electricity at 345,000 volts from northwest of Bismarck, N.D., to Grand Forks. From there, the energy will be delivered throughout the Red River Valley and beyond.

The \$350 million project is being completed by Minnkota Power Cooperative, our wholesale power provider, to help ensure that stable, reliable electricity is available in our region for many years to come.

Helicopters are used to minimize the impact of construction on local communities, farmland and the environment. They also reduce the use of heavy machinery and other vehicles on the ground and shorten the project's overall schedule.

Minnkota contracted Wisconsin-based Michels Corporation to construct and erect the poles, while Haverfield Aviation of Gettysburg, Pa., is connecting the wire on the structure.

So what's it like working 100 feet in the air on these structures?

"At first it was nerve-racking, especially jumping from the structure arm to the ladder," said Marc Poulin, 21, one of the aerial line workers on the Project. "But now the height doesn't bother me too much because I know I'm all strapped in."

Poulin suits up each workday in a full-body harness, which he attaches to the helicopter while flying and then secures to the structure. When there's a moment of downtime, it's hard not to enjoy the view.

"It's nice when you're up there and you have the time to look around. It's pretty peaceful," Poulin said.

Back on the ground locals are treating the Vermont native like a celebrity. For many, it's the best show in town.

"I think that's the coolest part about the job," Poulin said. "People stop and watch. They want to talk with you. I even had this old couple who took pictures with me."

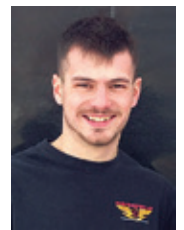
'It's all finesse'

Andrew Rannigan, 28, is one of the helicopter pilots orchestrating the aerial display. He starts his day at a landing zone near the construction site, loading tools and equipment into the Hughes MD 500 chopper.

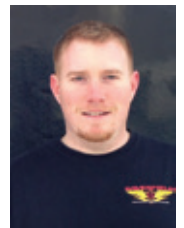
Aerial line workers such as Poulin are attached to the helicopter using a long orange rope, which essentially serves as a giant umbilical cord. Rannigan glides and hovers mere feet from the tower, allowing the line workers to reattach themselves and their tools to the horizontal structure arm.

"It's something that most people don't see every day," Rannigan said. "It's really a very safe operation. We know where the structures are and we're not moving very fast. It's not about speed, it's all about finesse."

Line stringing is completed in



Marc Poulin



Andrew Rannigan

Aerial line workers position themselves on a 140-foot-tall Center to Grand Forks Transmission Line structure.

three steps. First, workers thread a guide rope through a pulley block. Once the rope is in place, crews attach a smaller steel cable to it and pull that line through. The steel cable is then attached to the heavy transmission cable, which is pulled back the other way and hooked into place.

Hand and head signals help Rannigan respond to the needs of the 10-person crew. While they work, he is busy repositioning line workers and delivering tools and supplies from the landing zone. When the structure is done, he picks up the ladder with the line workers on it and flies ahead 1,000 feet to the next structure.

“When we first started this job, it took us a whole day to do one structure,” Rannigan said. “Now, when the weather cooperates, we’re doing eight to 10 structures a day.”

Weather is the biggest factor in how much work gets done each day, Rannigan said. Too much wind or precipitation can stall the project for days at a time.

“The procedures are always the same, but there are other elements that are always changing,” Rannigan said. “It seems like no two structures are ever exactly alike.”

Similar to Poulin, Rannigan, who lives in Virginia, has noticed the extra attention on the CGF Project.

“We have people who stop their car on the side of the road and they get out and talk to us,” he said.

When asked if people ever tell him he’s crazy, Rannigan said, “That’s usually the first thing that comes out of their mouth.”

Poulin was quick to add, “Either that or, ‘whatever you get paid it isn’t enough.’ ”

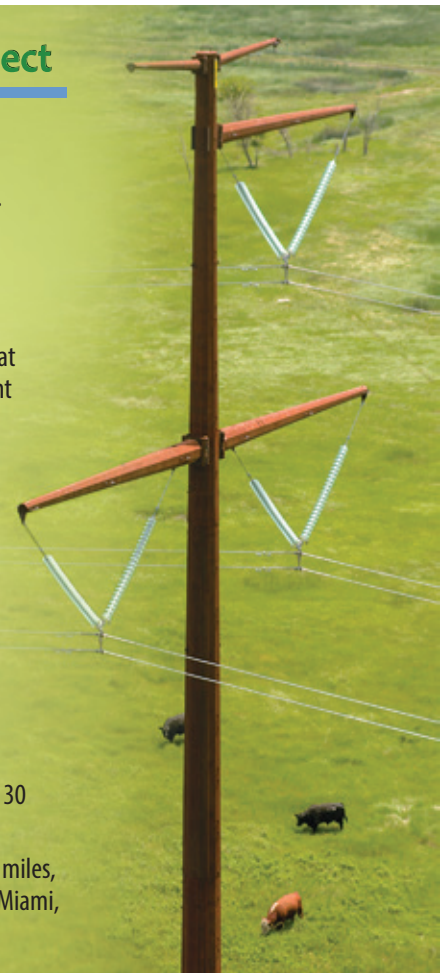


Aerial line workers hang from a structure arm while they work on the Center to Grand Forks Transmission Line. The line is being constructed by Minnkota Power Cooperative, our wholesale power provider.

Center to Grand Forks Project

INTERESTING STATS

- 1.4** – Average cost per mile in millions.
- 2** – Construction years.
- 125-140** – Average height in feet of structure poles.
- 212** – Number of contractor personnel at height of construction (equivalent to city of Grygla, Minn.).
- 250** – Line miles.
- 350** – Cost of the line in millions.
- 330** – Tons of reinforcement steel.
- 1,334** – Tower structures.
- 3,850** – Number of semi-trailer loads of material.
- 3,930** – Conductor arms.
- 16,065** – Bird flight diverters.
- 96,700** – Cubic yards of concrete (could fill 30 Olympic size swimming pools).
- 11,246,890** – Feet of wire (equivalent to 2,130 miles, or the driving distance between Miami, Fla., and Grand Forks).



Trading Post

For Sale

1987 Indy Sport, runs good, \$500. Call Jeff at 218-773-2595.

Rules

Ads for PKM members only. Limit your ads to two items. No commercial ads. Submit ads by the 18th of Jan., March, May, July, Sept. and Nov.

Statement of Nondiscrimination

This institution is an equal opportunity provider and employer. If you wish to file a Civil Rights program complaint of discrimination, complete the USDA Program Discrimination Complaint Form, found online at http://www.ascr.usda.gov/complaint_filing_cust.html, or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, by fax (202) 690-7442 or email at program.intake@usda.gov.

Statistical and financial report

Year-to-date: December 2013

	Last Year	This Year	Budget
Total income	\$ 12,675,955	\$ 12,343,774	\$ 12,198,000
Total expense	\$ 11,842,075	\$ 12,321,084	\$ 11,744,000
Net margins	\$ 833,880	\$ 22,690	\$ 454,000
Total kWh sold	118,876,747	130,120,766	107,900,000
Avg. kWh sold per member	2,170	2,946	
Delivery cost per kWh purchased	6.92¢	6.80¢	
Avg. sale price per kWh	10.6¢	9.48¢	
Percent kWh sales increase	9.1%	9.4%	
Members billed	3,662	3,710	
Miles of line in service	2,243	2,247	
175 watt MV lights	1,520	1,502	
400 watt MV lights	94	94	
100 watt H.P.S.	849	867	
250 watt H.P.S.	87	87	

Outage charged to:	2013	2012	2011
Minnkota operations	3,112.20	8,052.53	2,153.47
PKM operations	3,704.33	79,782.02	17,869.10
Total	6,816.53	87,834.55	20,022.57

Minutes per member PKM operations year to date: 59.70

Minutes per member Minnkota operations year to date: 50.16

ACH (automatic payment) available March 2014

Consider signing up for automatic payment from your checking or savings account. Starting March 10, 2014, the ACH (automatic payment) option will be available for your convenience. We would still mail your monthly billing statement to you, but you wouldn't have to worry about getting your payment to us in time. We would send the request for funds to your bank on the 10th of the month. This has become very popular now that the AMI system is reading your meter(s) for you. Let us help you save time and money, in addition to saving money for your cooperative. All residential members will be the first to receive ACH authorization forms as bill stuffers with your billing statement.



2013 Service Awards

- Nolan Buchner** – *Apprentice Line worker* 5 yrs.
- Mike Williams** – *Attorney* 5 yrs.
- Blake Owens** – *Director* 10 yrs.
- Scott Slusar** – *Line Sub Foreman*..... 20 yrs.
- Tom Woinarowicz** – *Director*..... 20 yrs.
- Karen Olson** – *Plant Accountant* 25 yrs.
- Mike Schmidt** – *Asst. Manager* 30 yrs.

*Peace of Mind
for Today's World*



Peace of mind – in essence that's really what a security system is all about. Cooperatively owned, we've been providing families like yours with peace of mind since 1999. Because, just like you, we're raising families and working hard for our possessions.

Our customized security systems help guard against intrusion, fire, unexpected flooding, carbon monoxide and much more. If you are interested in experiencing the peace of mind that only a 24/7 monitored security system can provide, please call us for a free consultation at 1-877-751-3902.

Thoughts about solar

With the Minnesota legislative session beginning, we have a concern about possible solar legislation in the coming months.

We hate to keep picking on solar, but some of us paid \$22 last month for just the wind energy surcharge. Wind, of course, was added to our energy mix in part because of Minnesota state mandates.

On the Minnesota Department of Natural Resources (DNR) website one can look at current solar systems the DNR installed at state parks and offices, and it shows when they were installed, cost of install, kilowatt-hour (kWh) production, etc.

As it seems with many government investments into green energy, the paybacks just don't pencil out unless you give a tax credit or require consumers to pay for solar rebates. Remember this is our tax money the state

is spending, and it is just the beginning if we allow this to continue. Not long ago Gov. Dayton publicly criticized Minnkota Power, our power provider, for entering into expensive wind contracts, but wasn't that a government mandate?

The information below comes from the state's own DNR website and offers a glimpse of how solar works in at least one area. It doesn't indicate a good rate of return on the significant investment made to this point. We should ask our government leaders to take a more common sense approach with renewables and other energy issues.

Decisions by government leaders affect us for years; remember they already have the investor-owned utilities paying a tax to help pay for solar rebates. That means consumers, ultimately, are paying for it. Here are the numbers from the state parks and other DNR solar sites:

Location	Installed Cost	Installed Cost per Watt	Date Installed	Size (in kW)	Total Yearly kWh @ 100% Capacity	kWh Generated & Sold	kWh Generated & Consumed	Total kWh Generated	Photo-voltaic Average Capacity	DNR Estimated Annual Savings @ .10/kWh	Simple Payback (in Years)	2013 Generation Simple Payback (in Years)
Afton State Park (Ground)	\$95,543	\$6.39	12/10	15.0	130,979	6,481	12,253	18,734	14.3%	\$1,700	56.20	51.00
Bear Head State Park (Ground)	\$33,200	\$6.04	11/12	5.5	48,151	0	5,253	5,253	10.9%	\$700	47.43	63.20
Big Bog Visitor Center (Roof)	\$47,000	\$12.14	6/11	3.9	33,914	0	4,718	4,718	13.9%	\$470	100.00	99.63
Blue Mounds State Park (Ground)	\$57,748	\$5.77	12/12	10.0	87,673	2,491	10,513	13,004	14.8%	\$1,350	42.78	44.41
Fort Snelling State Park (Roof)	\$23,933	\$6.65	12/10	3.6	31,527	0	3,616	3,616	11.5%	\$380	62.98	66.19
Glendalough Office (Ground)	\$42,630	\$9.52	9/10	4.5	39,277	0	6,461	6,461	16.5%	\$560	76.13	65.98
Grand Portage Visitor Center (Ground)	\$60,330	\$8.20	12/10	7.4	64,450	0	8,315	8,315	12.9%	\$920	65.58	72.56
Great River Bluffs (Ground)	\$35,000	\$8.14	9/10	4.3	37,666	0	5,502	5,502	14.6%	\$570	61.40	63.61
Iron Range OHV Gilbert Office (Ground)	\$77,000	\$11.20	8/10	6.9	60,225	2,525	6,591	9,116	15.1%	\$970	79.38	84.47
Itasca State Park (Roof)	\$119,400	\$3.41	1/13	35.0	306,728	333	29,019	29,352	10.5%	\$4,200	28.43	40.68
Lacqui Parle State Park (Ground)	\$102,550	\$6.37	10/10	16.1	141,026	222	21,095	21,317	15.1%	\$1,800	56.97	48.11
Lake Carlos State Park (Ground)	\$37,500	\$6.51	12/11	5.8	50,461	1,770	5,607	7,377	14.6%	\$780	48.08	50.83

(continued on page 10)

COMMENTARY ARTICLE

Thoughts about solar (cont'd)

(continued from page 9)

Location	Installed Cost	Installed Cost per Watt	Date Installed	Size (in kW)	Total Yearly kWh @ 100% Capacity	kWh Generated & Sold	kWh Generated & Consumed	Total kWh Generated	Photo-voltaic Average Capacity	DNR Estimated Annual Savings @ .10/kWh	Simple Payback (in Years)	2013 Generation Simple Payback (in Years)
Lake Shetek State Park (Roof)	\$73,143	\$5.30	12/10	13.8	120,893	5,675	9,988	15,663	13.0%	\$1,900	38.50	46.70
Nerstrand-Big Woods State Park (Ground)	\$52,100	\$7.24	12/10	7.2	63,038	0	8,754	8,754	13.9%	\$950	54.84	59.52
Sibley State Park (Ground)	\$31,000	\$6.46	12/11	4.8	42,037	0	6,385	6,385	15.2%	\$650	47.69	48.55
St. Croix State Park (Roof)	\$25,000	N/A	N/A	N/A		N/A	N/A	N/A	N/A	\$408	61.27	
Wild River State Park (Roof)	\$56,000	\$5.56	12/12	10.1	88,230	2,339	10,178	12,517	14.2%	\$1,750	32.00	44.74
William O'Brien State Park (Ground)	\$59,400	\$6.00	11/11	9.9	86,724	674	12,499	13,173	15.2%	\$1,300	45.69	45.09
Hibbing Land and Minerals (Ground)	\$122,500	\$7.00	12/13	17.5	153,300	93	564	657	5.0%	\$2,188	55.99	N/A
McQuade Small Craft Harbor	\$25,000	\$12.20	6/9	2.0	17,951	N/A	N/A	N/A	N/A	\$250	100.00	
New Ulm DNR Office (Ground)	\$310,000	\$3.75	1/13	82.7	724,160	3,970	96,163	100,133	13.8%	\$10,000	31.00	30.96
Peterson Hatchery (Ground)	\$51,682	\$6.42	10/10	8.1	70,519	3,604	5,657	9,261	13.1%	\$1,070	48.30	55.81
Tower Area Office (Roof)	\$142,950	\$3.57	11/12	40.0	350,768	0	32,995	32,995	9.4%	\$5,000	28.59	43.32

DNR website: <http://www.dnr.state.mn.us/energysmart/solar/index.html>

Itasca State Park was in operation for 11 months.

Hibbing Land and Minerals was in operation for one month.