

ELECTRIC ADVISORY COMMITTEE
04/20/2016

The regular meeting of the Electric Advisory Committee was called to order at 6:00pm by Electric Superintendent Mike Furmanski in Room 102c of City Hall.

Present: Glendon Brown, Ann Bissell, John Anthony, Tim Wilson and John Mellinger.

Absent: None

Also Present: Mike Furmanski-Electric Superintendent, Ron Beauchamp-Council Liaison, member of the media.

APPROVAL/ADJUSTMENTS TO THE AGENDA - None

CONFLICT OF INTEREST DECLARATIONS - None

NEW BUSINESS

#1 ELECTION OF OFFICERS:

Tim Wilson made a motion to nominate John Anthony to be the Chair of the Committee. Ann Bissell seconded the motion. John Anthony started discussion that he would accept the Chairman position with the idea that it would rotate on a yearly basis so all will be involved. Anthony made a motion that the Chair position be a 1 year position and Glendon Brown seconded the motion. Motion passed with all ayes.

John Anthony took over as Chairman at this point. Anthony nominated Ann Bissell to be Vice-Chairman and then take over as chairman after his one year term. A motion was made by Anthony for Ann Bissell to be Vice-Chairman. The motion was seconded by Glendon Brown. The motion passed with all ayes. Bissell accepted the position of Vice-Chairman.

#2 UPDATE-ELECTRIC DEPARTMENT-GENERAL OPERATIONS:

Electric Superintendent Mike Furmanski gave an update on departmental operations. The following items were reviewed:

- Pole changeouts being done in the City by our department personnel and MJ Electric doing the work that was bidded out.
- Department personnel doing cutout (fuse holders) replacements throughout the City. The porcelain cutouts are found to have a design failure and fall apart. Most of these cutouts are from the early 2000's. Cost of the cutouts is approximately \$100 each.
- Mike reported talking with Tripp from Nexterra about energy costs and where they are at and where they are headed. Prices were ranging from \$54 to \$55 for '21-'22. Still

waiting on capacity prices. A representative from Great Lakes Utilities will be here on May 6th to meet with us also.

- Reported he was at an ATC meeting in Marquette this week. Discussed with Brett French the Holmes/old MEAD Road Project and he projected it would be up and going in June or July.
- Reported meeting with the insurance company last week. City not in agreement with the insurance company's number. More information will be supplied to them and the parties will be meeting again in the near future.

There was discussion amongst members about the City's current and future energy demands. Meiers coming in with raise it some, however with a mine closure looming, the ore dock demand will be lower.

#3 UPDATE-ESCANABA NORTH SUBSTATION:

Superintendent Mike Furmanski updated the EAC on the progress of the new Escanaba North Substation as follows:

- Furmanski reported that he was working with our consultant, Krause, in Chippewa Falls the week of March 25th.
- Reports Krause is 80% complete with prints. Furmanski worked with him on some of the design and Krause did put some choices in front of him.
- June or July of 2016 will be the start of in-ground work.
- ATC will start their work in November and begin stringing line in December.
- On line target date of January 2017.
- Bids not released by Krause as of yet, however potential bidders are more than likely aware of the bids to be coming.
- ATC will tie into the Escanaba 2 line @ 20th Avenue North and 19th Street.
- New sub will tie in 4 same feeders that come from the plant.
- Power plant sub will be down most of the 2017 summer to make improvements.

#4 UPDATE-SOLAR GARDEN PROJECT-FEASIBILITY STUDY:

Superintendent Mike Furmanski along with committee member, Glendon Brown, presented to the EAC the progress of the solar garden feasibility study as follows:

- Money for the solar garden is being made possible through funds that have been collected each month on the customers bills for renewable energy. This money must be spent on renewable energy credits or do a renewable energy project
- **Handout #1: Preliminary Escanaba Electric Sales and Peak Load/Trends & Analysis (through 2014-2015 Data)** was handed out and gone over as a group.

- **Handout #2: Specific request for the EAC and Council to support an internal staff and volunteer feasibility study of the Community Solar Garden concept, with the following deliverables at the completion of the study in 5 months.** Bullet points on this handout were also reviewed with members and discussed.
- Discussion on site venues and requirement needed at those venues.

Discussion continued when Bissell questioned if there were any other projects possible for renewable energy money than a solar farm. Anthony questioned who pays/who benefits and what is the investment to homeowners and businesses. Brown pointed out that a net metering policy needs to be looked at so all are treated fairly-those who buy and those who don't. Furmanski pointed out that the dollars can stay as they are and we can just buy RECs with it, but with solar, we can reduce the amount of RECs we need to buy. Bissell expressed concern that she has heard from people who wonder why rebates to customers can't be made with the money instead.

No further discussion.

GENERAL PUBLIC COMMENT – None

COMMISSION/STAFF COMMENT:

Anthony asked members if 6pm on the 2nd Wednesday is still good with everyone for meetings. Furmanski brought up possibly changing it to 4pm instead of 6pm. Discussion back and forth ended with a motion being made to change the meeting time from 6pm to 4pm at least for the next July 13th meeting by John Anthony and seconded by Glendon Brown. Motion was passed with members still in attendance, John Anthony, Ann Bissell, Tim Wilson and Glendon Brown.

MEETING ADJOURNED: 7:45PM.

APPROVED:



John Anthony, EAC Chairman



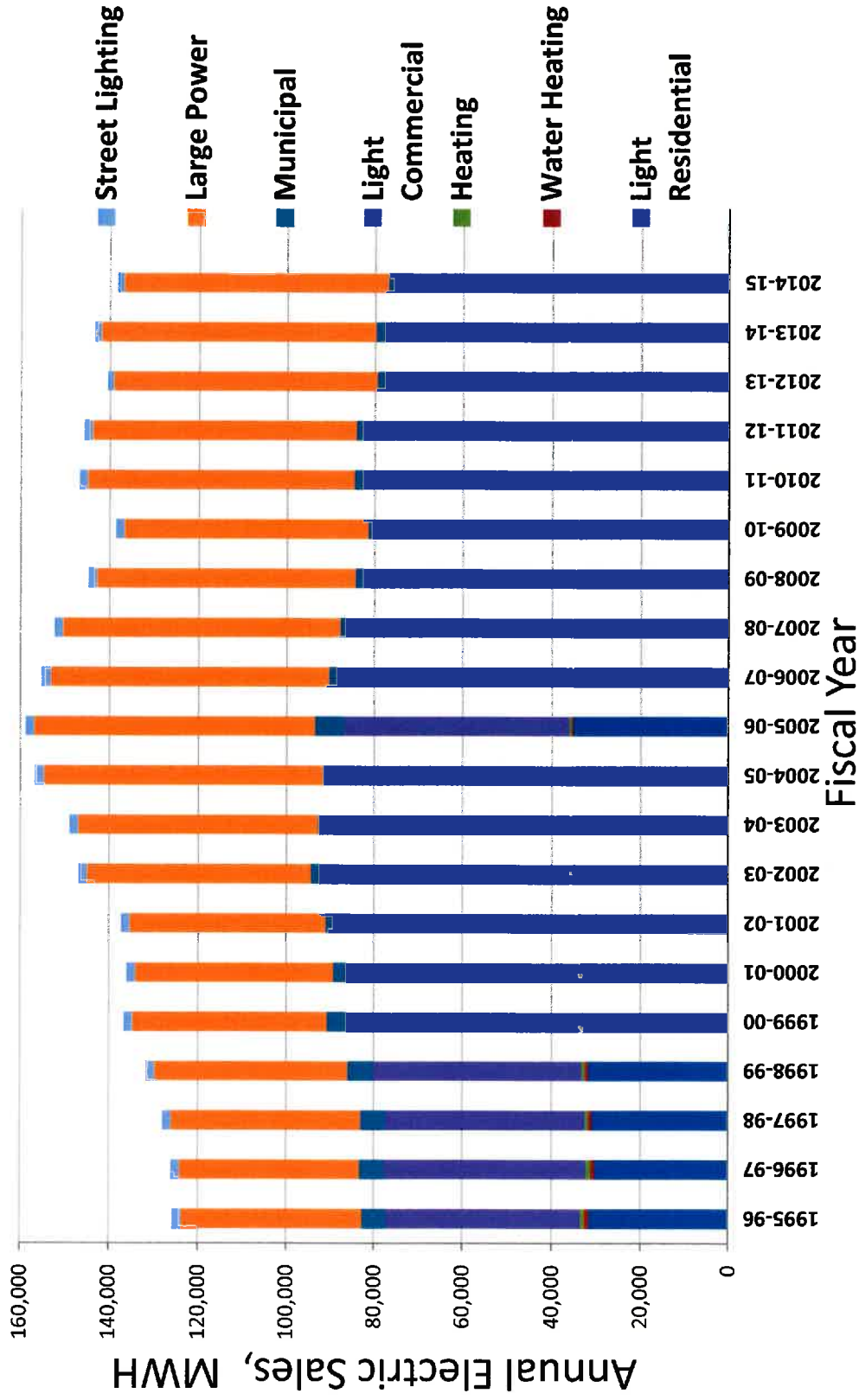
Mike Furmanski, Electric Superintendent

ATT #1

Preliminary Escanaba Electric Sales and Peak Load Trends and Analysis (through 2014-2015 Data)

April 6, 2016

Escanaba Electric Sales Trends by Category

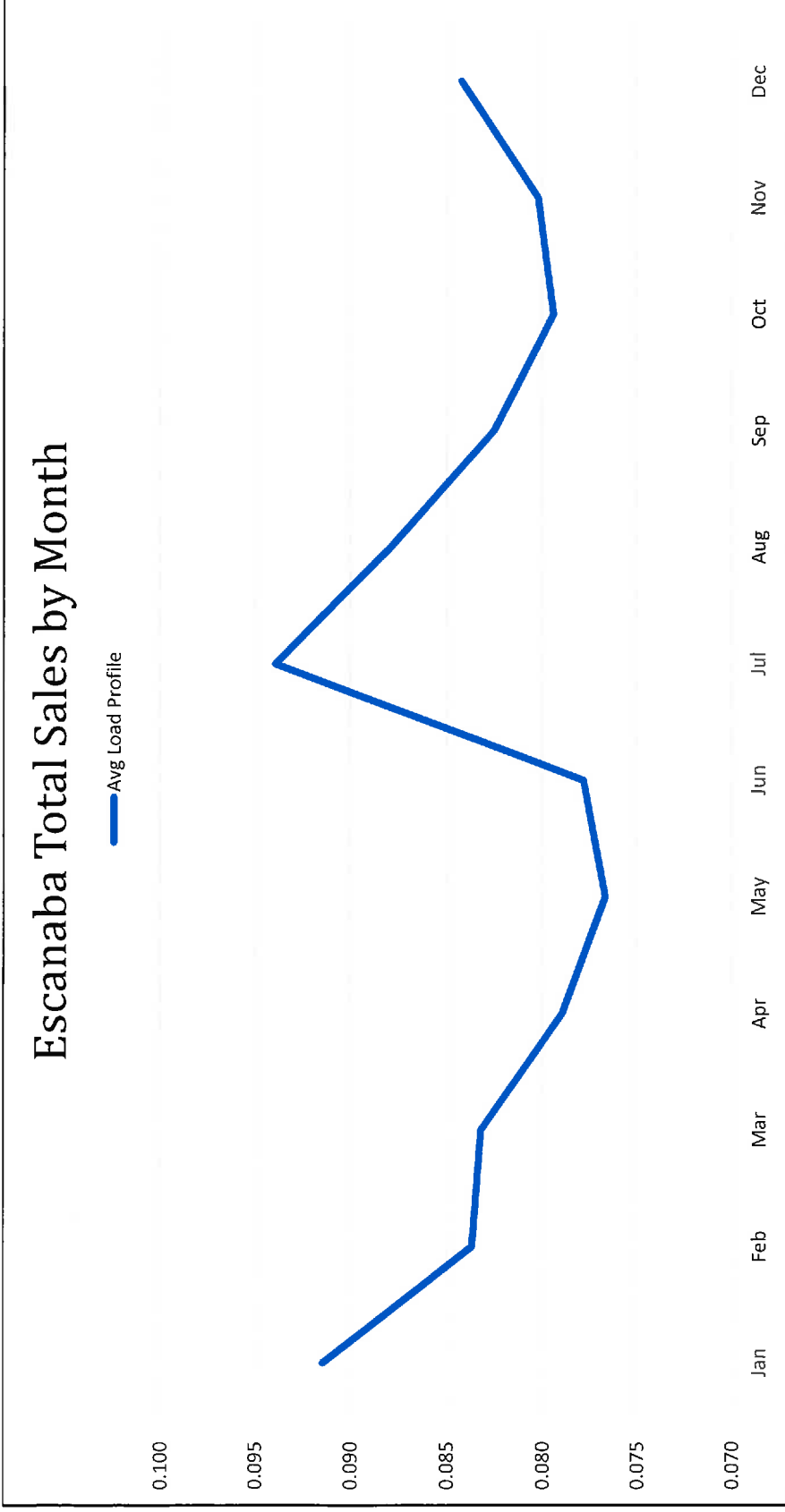


Annual Electric Sales, Overall Trends:

1. Annual electric sales peaked in 2005-6 at 158,817 MWH
2. Since 2005-6, the annual sales in the last 10 years has trended lower with a 12.9% overall reduction to 138,290 MWH in 2014-15, a drop of **20,257 MWH**.
3. In 2012-13,
 - a. Approximately 18 of the largest Light Commercial customers were moved to the Large Power rate category, and
 - b. Approximately 12 of the smallest Large Power customers were moved to the Light Commercial category, to comply with the new electric rate policy.
4. Approximately **40% of the overall 20,527 MWH sales loss occurred in the Light Commercial category before 2012.**
5. In the last fiscal year, 2014-15, the distribution of annual electricity sales by customer category was as follows:

%	Category
43	Large Power
27	Light Commercial
25	Residential, including water heating and heating
4	Municipal
1	Street Lighting

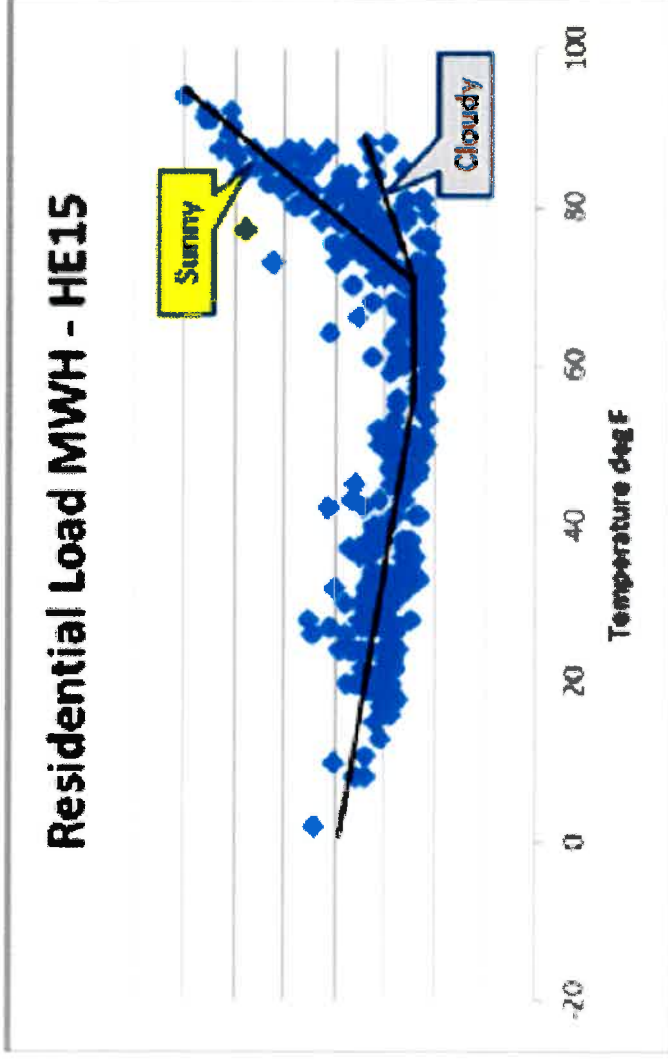
Escanaba Total Sales by Month (Fraction of Total Annual Sales)



Monthly Average MWH Sales Distribution Using 2008-2013 Data
(October 30, 2015 – PSE MISO Module E Forecasts Report)

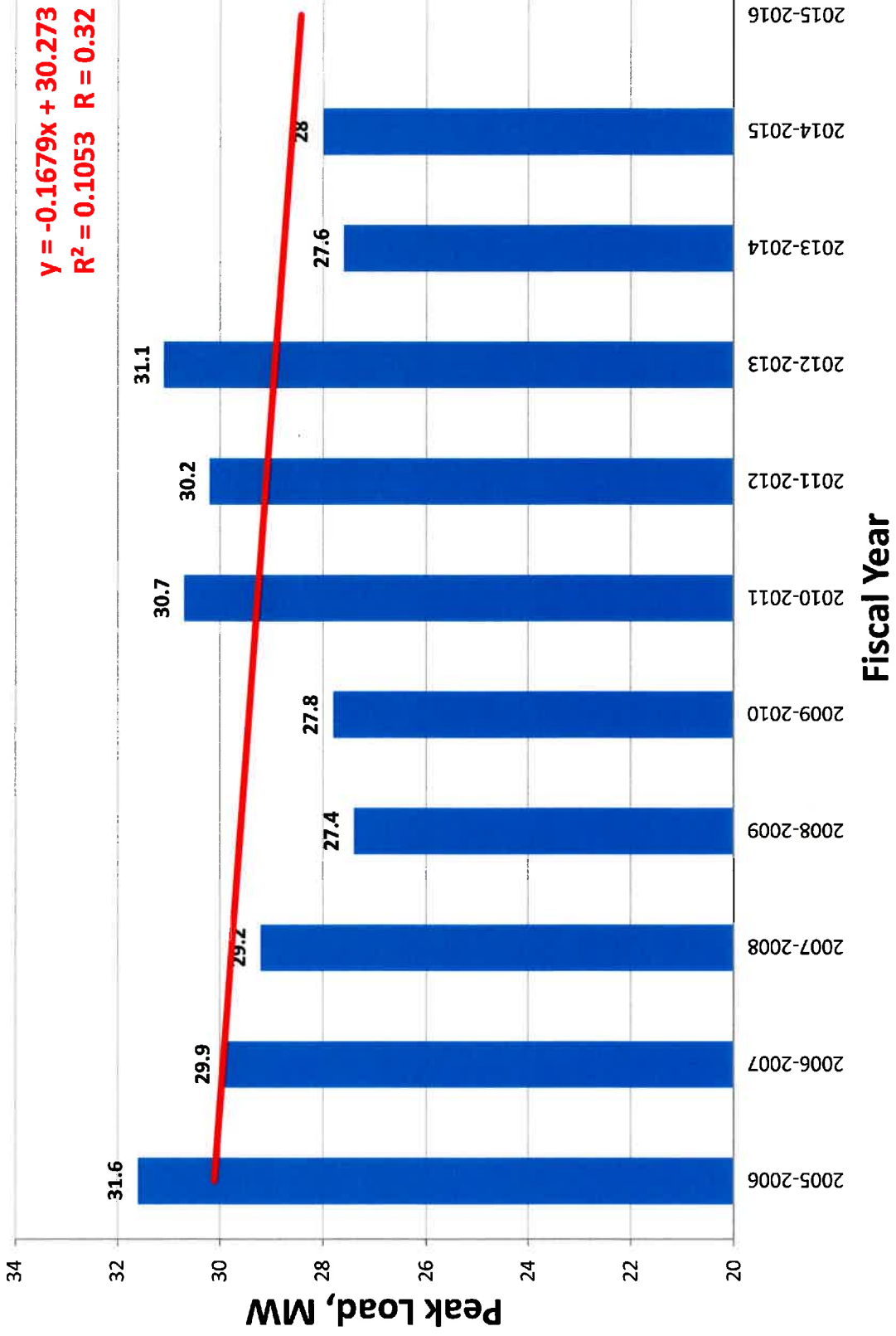
- 1. Monthly distribution of electric sales peaks in July, followed by January and August.**
- 2. Lowest monthly electric sales occurs in May**
- 3. This distribution of monthly electric sales is probably driven by the weather related ambient temperature.**
 - a. High temperature extremes, e.g., in July, increases air conditioning and refrigeration loads.**
 - b. Low temperatures extremes, e.g., in January, increases heating loads.**

Sunlight Drives Load (and Price)



Recent electric load or sales modeling efforts have found that residential loads have a complex relationship with temperature and other weather parameters, as illustrated in the above graph.

Escanaba Annual Hourly Peak Electric Load Trend, MW



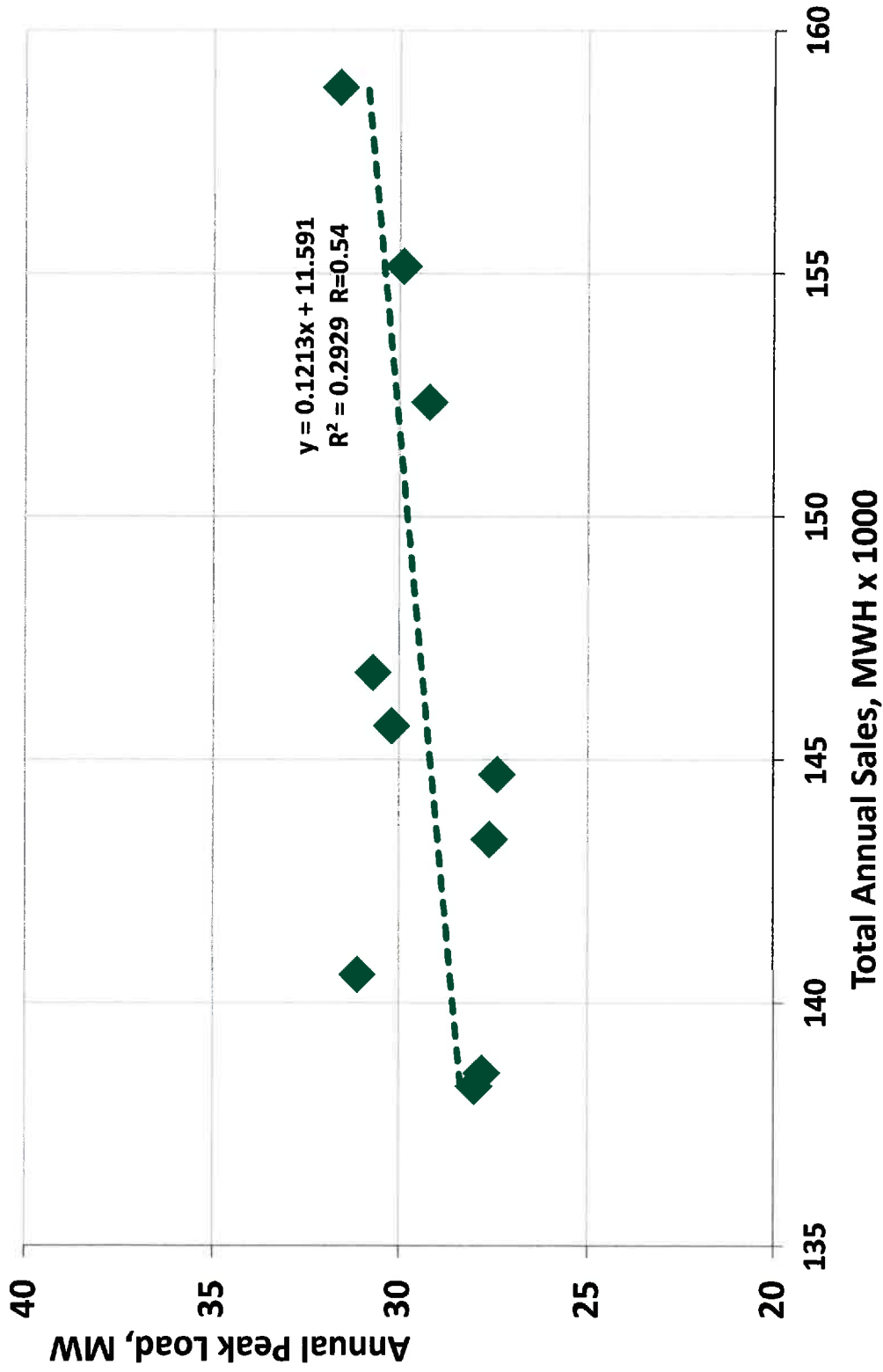
1. While the total annual electric sales is trending lower in the last 10 years, -12.9%, The annual hourly peak loads are quite variable, with minimum to maximum range 4.2MW, and an average of 29.4MW in the last 10 years. The Regression trend line decrease over the last 10 years only explains 32% of the peak load variation (R=0.32).
2. This is a significant long term concern since capacity and transmission costs are based on peak loads. The capacity and transmission costs will be spread over fewer total KWHs of sales.
3. During the last 10 years, the annual peak loads were distributed in the following months:

Month	Frequency, %
June	10
July	60
August	20
September	10

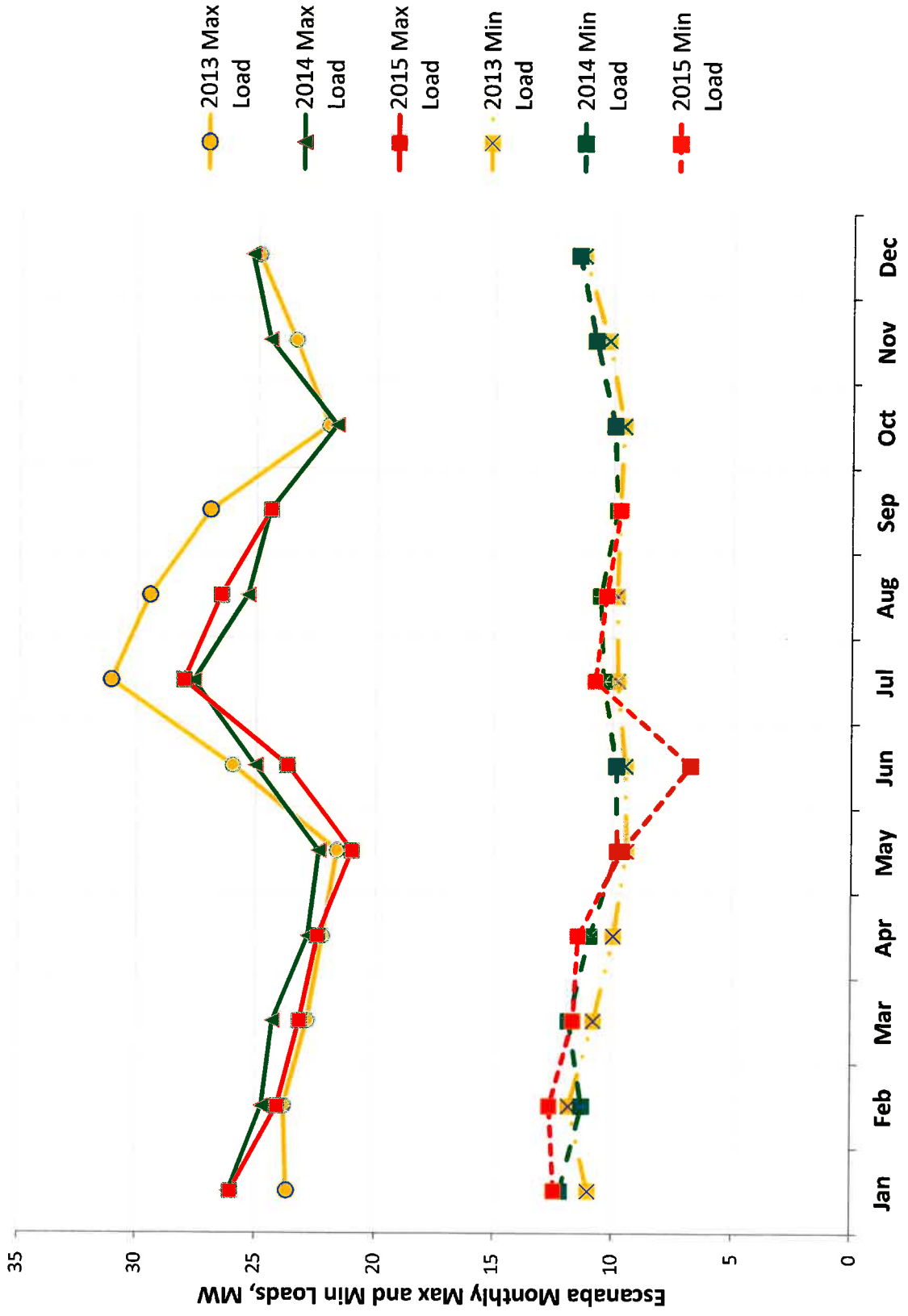
4. Clearly, to control future electric capacity and transmission costs, Escanaba must develop a better quantitative understanding of the factors which determine hourly peak loads and the relative contributions of Residential, Light Commercial and Large Power customer categories to hourly peak loads.

Are Annual Peak Load and Total Sales Significantly Correlated?

Up to 54% of the peak load variation may be explained by total annual sales.



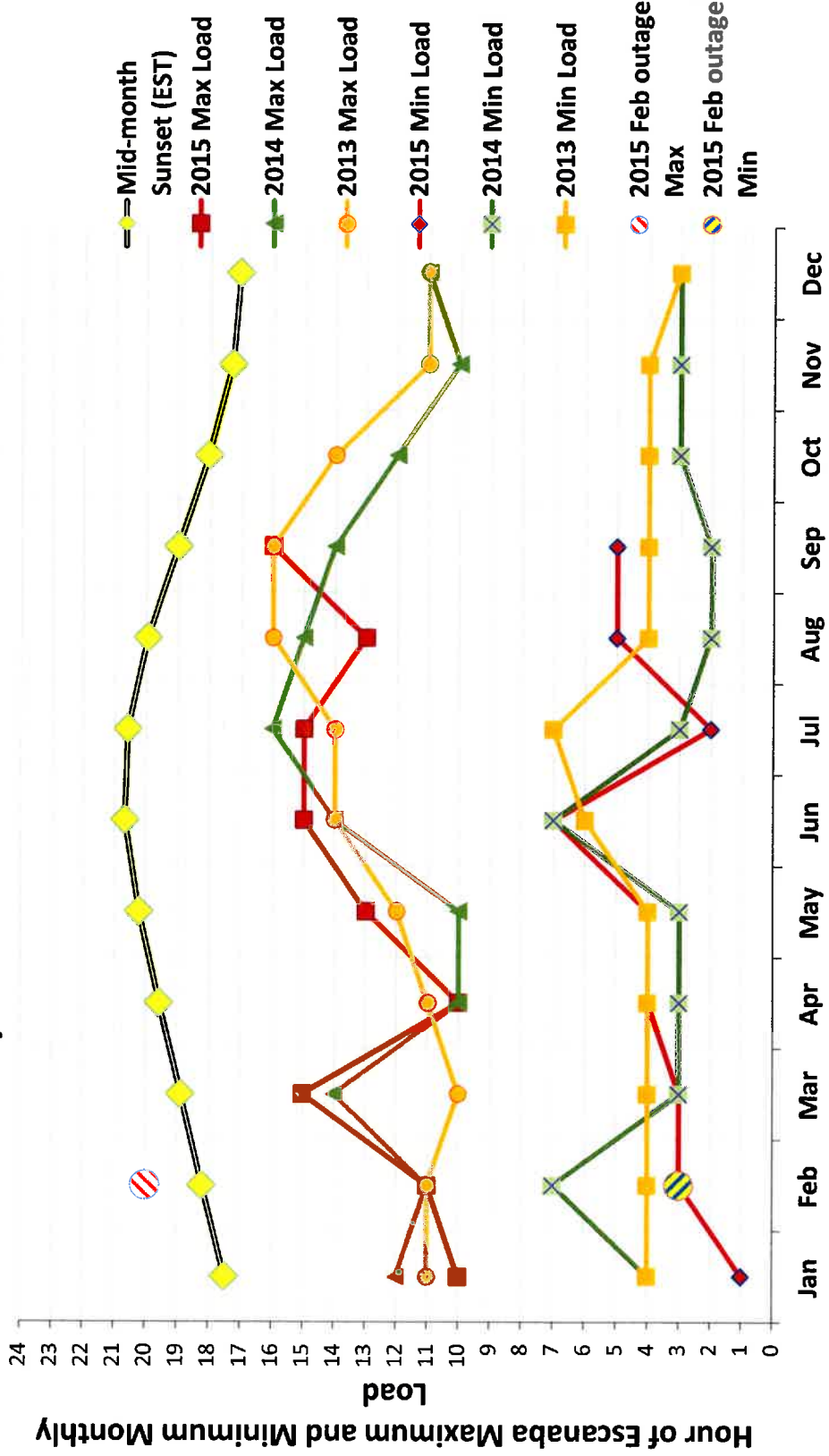
2013-2015 Escanaba Monthly Hourly Max and Min Loads, MW



2013-2015 Escanaba Monthly Hourly Max and Min Loads, MW

- 1. The monthly distribution of hourly maximum and minimum in recent years, 2013-2015, shows the annual hourly peak load occurring in July with a peak range of 27.6 to 31.1 MW.**
- 2. The minimum loads are higher during the winter months, December, January and February.**

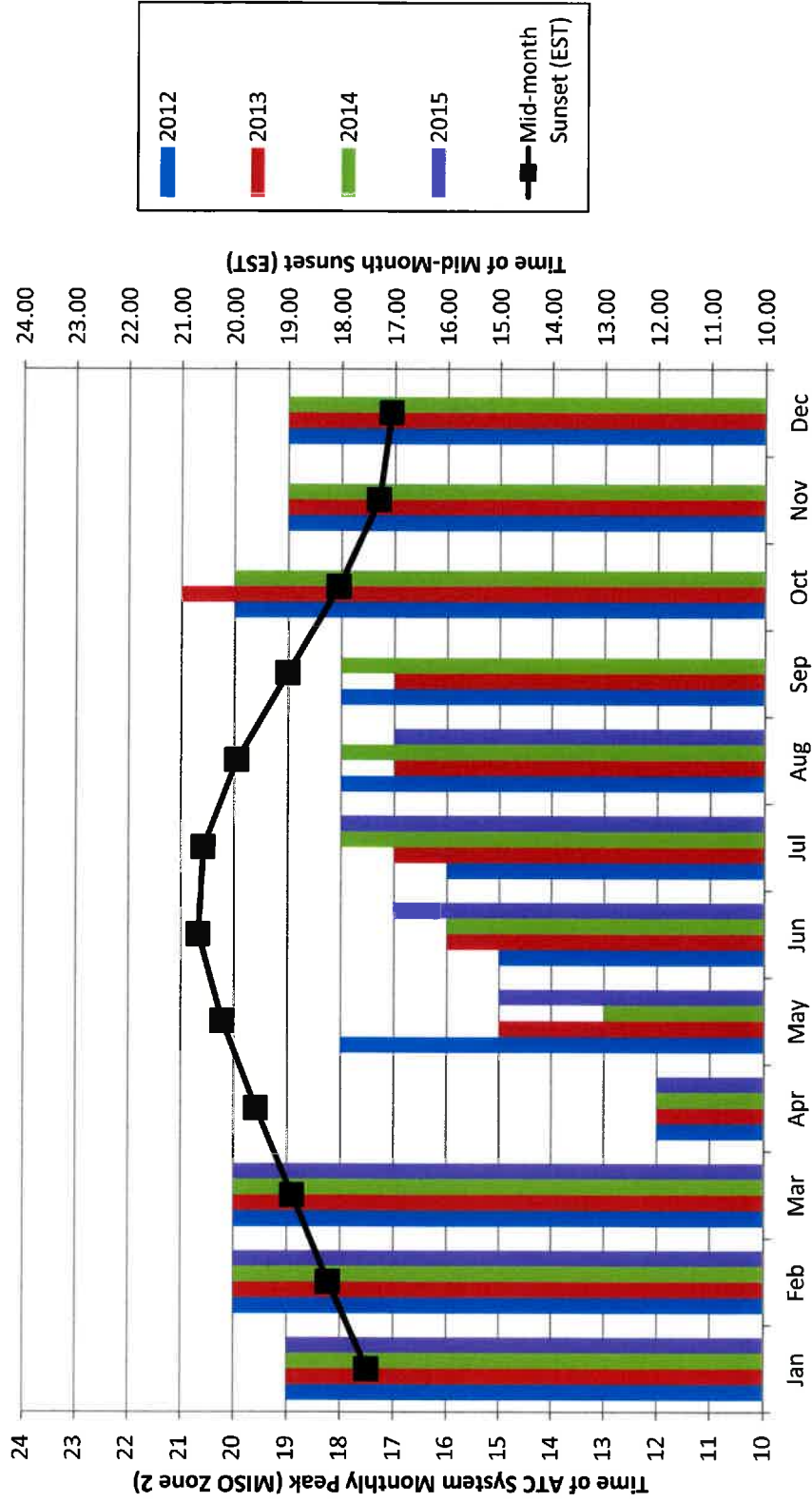
2013-2015 Time of Day (Hour) of Escanaba Monthly Max and Min Loads and Mid-month Sunset



The time of day for the monthly peaks is quite repeatable for 2013-2015:

1. All the monthly hourly peaks occurred between 10AM and 4 PM EST
2. Summertime peaks occur between 1PM and 4PM EST
3. Wintertime peaks, November to February, occur between 10 AM and Noon.
4. All the monthly peaks occur at a time when local solar generation could reduce the peak loads.
5. The one exception to these repeatable time patterns happened during the February, 2015 substation outage.

Time (EST) of ATC System Monthly Peak MISO Zone 2



Time (EST) of ATC System Monthly Peak MISO Zone 2

The ATC transmission costs for Escanaba are based on the monthly Escanaba load at the time of the MISO Zone 2 system wide peak. In other words, Escanaba's relative contribution to the overall Zone 2 transmission loads.

Transmission costs are currently approximately 10% of the total electric costs in Escanaba.

Looking at 2012 through August 2015 data:

- 1. Monthly peaks are always on weekdays**
- 2. The time of monthly peaks is repeatable within 2 hours, year to year, except for May 2012.**
- 3. For January to March and October to December,**
 - a. Monthly peaks occur between 7 and 9 PM EST.**
 - b. Monthly peaks occur after sunset**
- 4. April to September, a six month period, the peaks occur before sunset so that local solar generation could reduce city loads at the ATC peaks.**

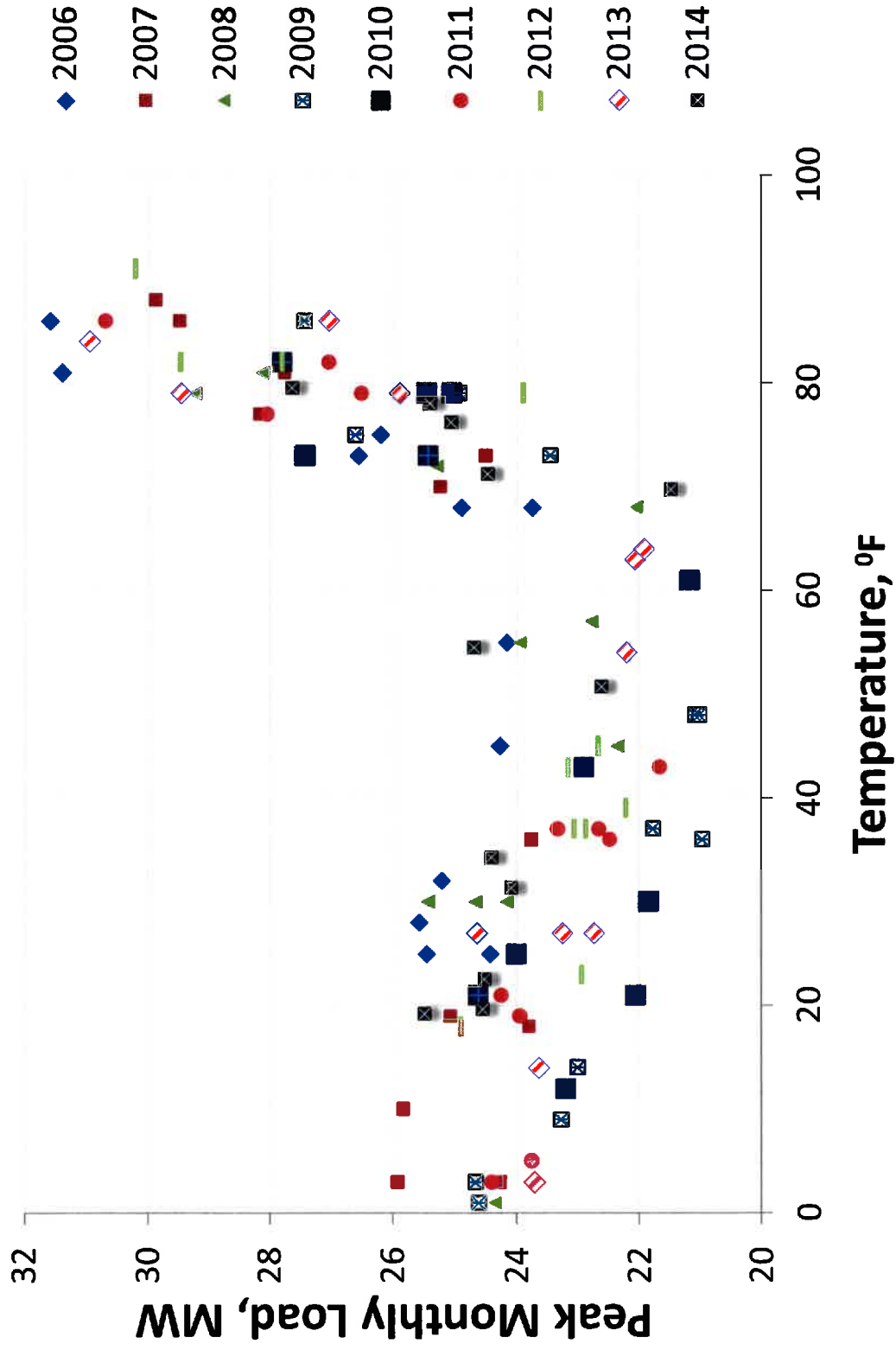
5. The time of day for the Escanaba monthly peak loads are quite different from the ATC System MISO Zone 2 peak loads as summarized below:

	Time of day for Escanaba Monthly Peak Loads	Time of day for ATC System MISO Zone 2 Monthly Peak Loads
June-September	1 – 4 PM	3 – 6 PM
November – February	10AM - 12 Noon	7 – 8 PM

6. The difference in monthly peak times between Escanaba and the ATC System MISO Zone 2, should clearly work to Escanaba’s advantage in lowering Transmission charges from ATC. Escanaba’s and ATC System peaks are NOT coincident.

7. A move by the Michigan Legislature to place the UP in the same MISO Zone as the Lower Peninsula would likely increase Escanaba’s Transmission charges because there would be no time zone difference.

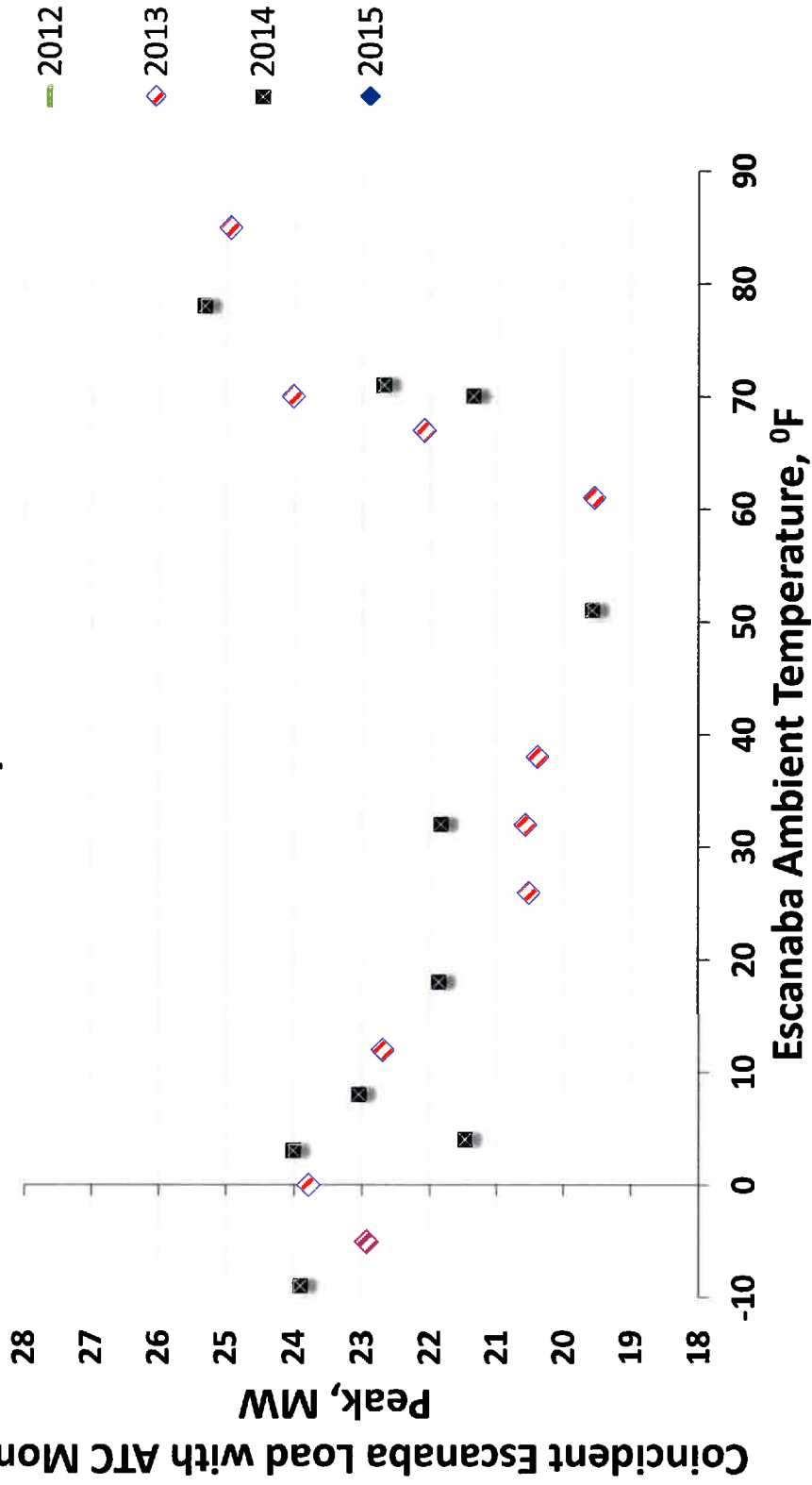
Escanaba Peak Monthly Load, MW and Temperature, °F



Escanaba Peak Monthly Load, MW and Temperature, °F

- 1. Ambient temperature clearly has a major impact on Escanaba's Monthly Peak Loads.**
- 2. Since we do not have control over ambient temperature, it is very important we determine what other variables influence the scatter in peak loads (e.g., + or - 2 MW) above and below the temperature impact trend lines.**

**Coincident Escanaba Load at the time of ATC Monthly Peak, MW
 versus Escanaba Ambient Temperature, °F, at the Time of ATC
 Monthly Peak**



ATT #2

This specific request is for the EAC and Council to support an internal staff and volunteer feasibility study of the Community Solar Garden concept, with the following specific deliverables at the completion of the study in 5 months:

- **Research restrictions on using Renewable Energy Fees**
- **Estimate cost and capacity of the proposed facility based on utility scale contractor/developer contacts and proposals.**
- **Propose site or sites for Community Solar Garden project(s)**
- **Preliminary economic analysis and payback period for investment in the Community Solar Garden capacity by:**
 - Escanaba residents**
 - Escanaba businesses**
 - Escanaba Municipal Government**
- **Quantify benefits to Escanaba Electric Department: Reduced energy, capacity (Variable Energy Resource for MISO?) & transmission costs**
- **Develop a new net metering policy for Escanaba**
- **Survey residents and business community interest in the concept**
- **Clarify Federal Production Tax Credit (30% on installed cost if operational by 12/31/2016) for residents and businesses.**
- **Define impact of any new Michigan energy legislation on concept and economics.**
- **Propose contract language and terms for purchase of Community Solar Garden capacity by a resident or business.**