

Escanaba Energy Supply Plan

City Council Town Hall Meeting
January 30, 2008

Presented by Michael A. Furmanski
Electrical Superintendent



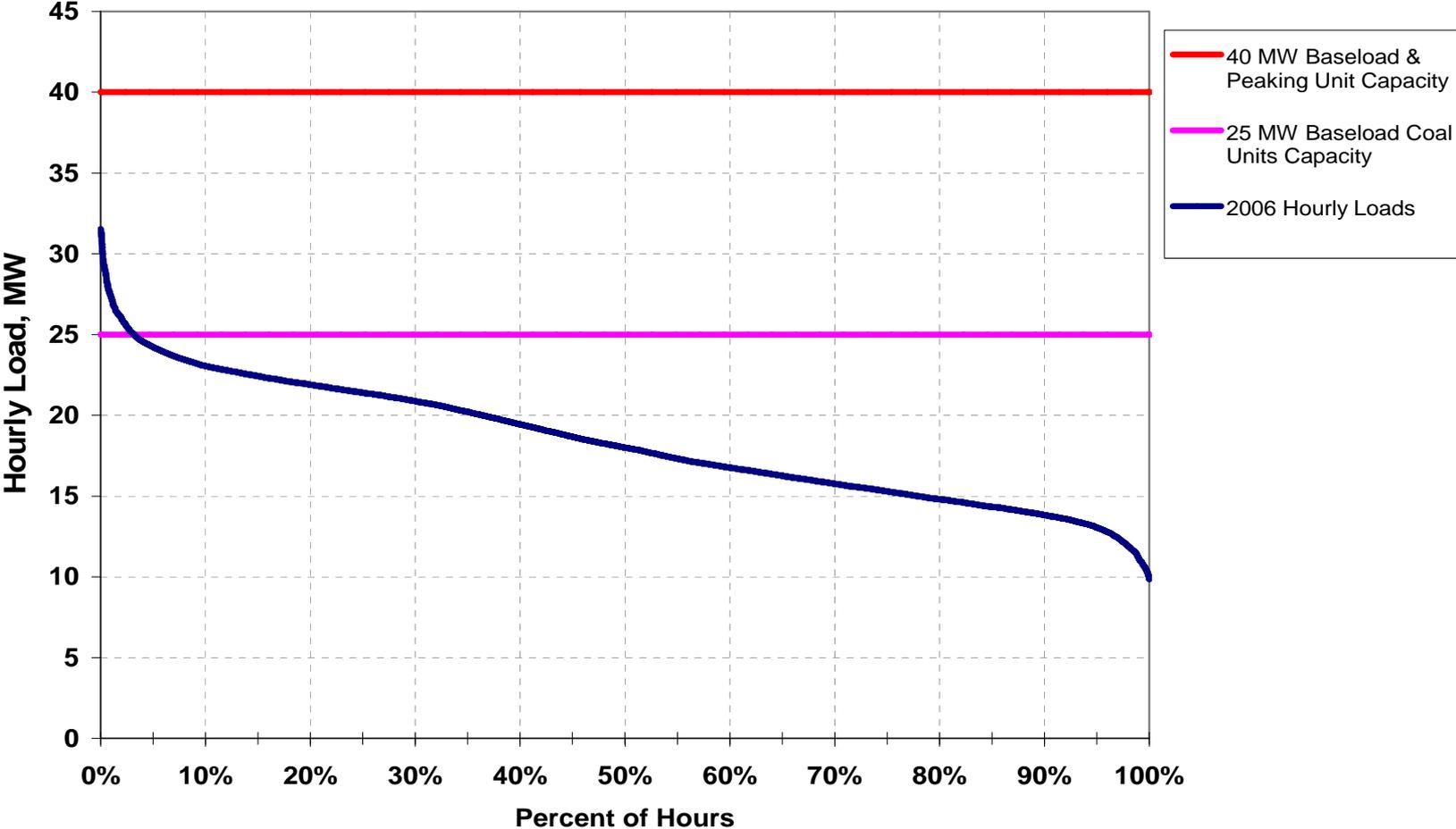
Energy Supply Plan

Why do we need a new energy supply plan?

1. Escanaba is facing high electricity costs associated with high fuel costs.
2. Escanaba is facing costs associated with maintaining an aged facility.
3. Escanaba must plan for future growth.
4. Escanaba needs to provide competitive and reliable electrical energy to its customers.



2006 Escanaba Load Duration Curve



Existing Escanaba Power Plant



Existing Escanaba Power Plant

- Coal units
 - Two identical 12.5 MW units - entered commercial operation in 1958
 - Traveling grate stokers
 - Once-through cooling from Lake Michigan
- Transmission facilities
 - Plant connects to 69 kV Escanaba Substation on west side of site
 - Two 69 kV lines connect to ATC's Delta Substation



Combustion Turbine



Escanaba Combustion Turbine (CT)

- 15 Mw Capacity
- Refurbished GE Frame 5 combustion turbine – installed in 2002
- Fuel oil fired
- Is used by the City of Escanaba as a peaking generator
- Currently offered into Midwest Independent System Operator (MISO) power market (revenue source)
- Has “black start” capability



Existing Escanaba Power Plant Substation



Escanaba Energy Supply Plan History Highlights

2002, The City of Escanaba contracted with Power System Engineering, LLC to perform a load forecast, alternative power supply study, and an economic evaluation of the supply options. The studies demonstrated a need for additional long-term electric generation capacity for Escanaba. The studies also identified coal as the most economic fuel source and indicated the current plant site should be considered as a location for a new plant.



History-continued

2004, based upon the Power System Engineering study, a 60 Mw plant was researched with the assumption that Escanaba would retail its excess capacity.

In 2004, Other U.P. Utilities looked for long-term Power Purchase Agreements. None of the utilities received any offers due to transmission line limitations.



History-continued

2004-2005, Escanaba City Council directs administration to commence the process for evaluating the feasibility of constructing a new power plant.

2006, City of Escanaba receives Environmental Fatal Flaw Analysis stating up to a 250Mw plant could be built.

June, 2006, City of Escanaba retains Gilbert X. Cheves of Construction Consultants of Michigan to act as project consultant on the feasibility of building a new power plant.



History-continued

November, 2006, City of Escanaba partners with Wisconsin Public Power, Inc. (WPPI) on a cost sharing agreement for a base load power plant option assessment. City of Escanaba and WPPI retain Sargent & Lundy, LLC of Chicago, Illinois, to complete a base load power plant option assessment.

April, 2007, City of Escanaba and WPPI received Sargent & Lundy, LLC Base Load Power Plant Option Assessment (draft report).



History-continued

May, 2007, WPPI places project on hold due to construction cost of a new facility, possible new regulatory requirements, and available energy opportunities elsewhere

June, 2007, City of Escanaba solicits long-term power purchase offers from regional suppliers.

July, 2007, City of Escanaba receives three long-term power purchase offers from regional suppliers. The offers are based on transmission system improvements being made by the American Transmission Company (ATC).



History-Continued

Fall 2007, City of Escanaba retains Power Systems Engineering (PSE) to analyze the proposed power purchase agreements against each other, as well as comparing proposals against self generation. As submitted, all proposed power purchase proposals were less expensive than self generation.*

*There are several issues that are being researched that could further qualify or disqualify this statement.

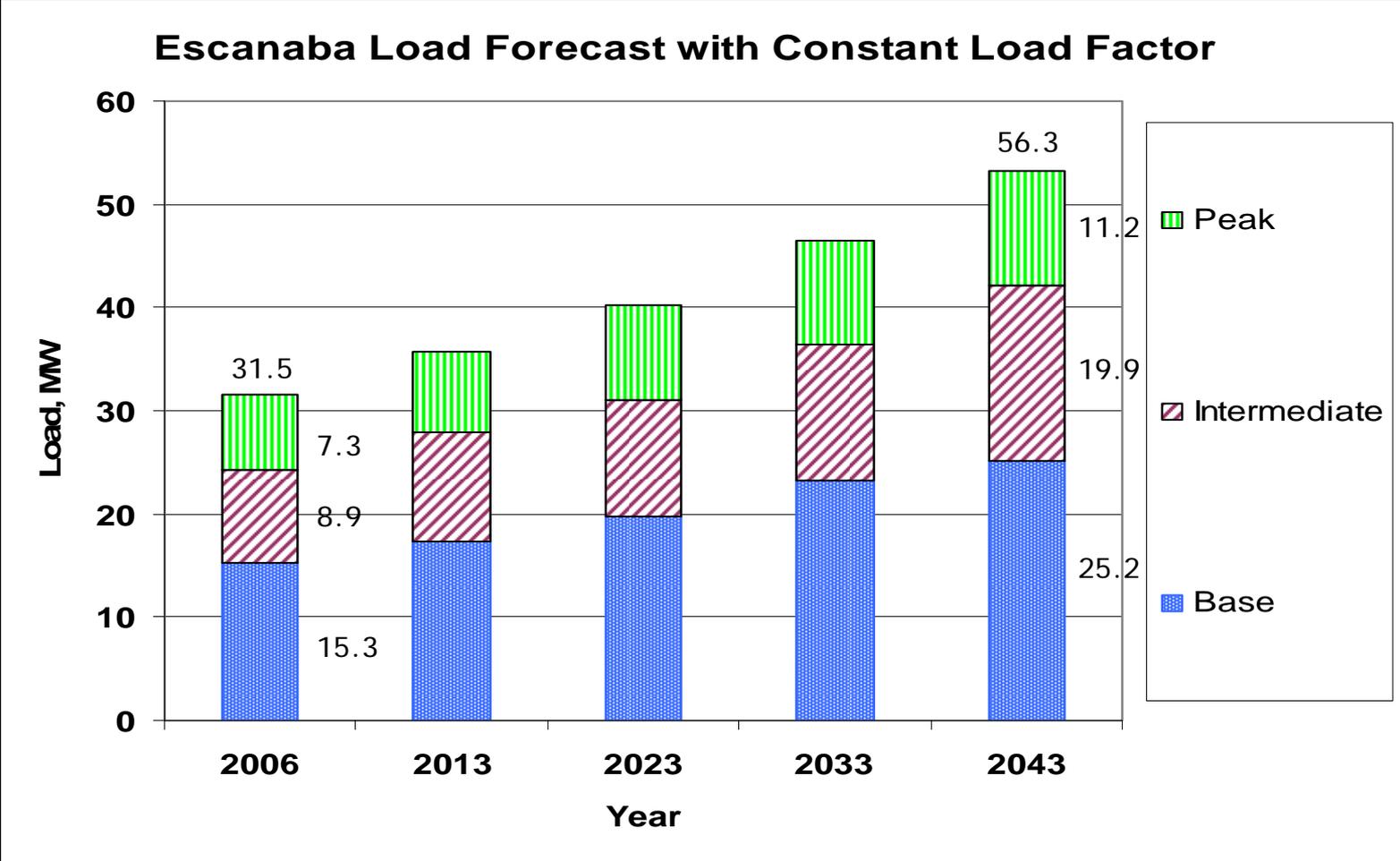


Escanaba Generation Forecast

Escanaba Present Load and, Future Load Forecasts

		PSE Forecast with Declining Load Factor		Forecast Maintaining 2006 Load Factor			
Load, MW by Type	2006	2013	2023	2013	2023	2033	2043
Peak ³	7.3	9.2	11.2	7.6	8.0	8.6	9.3
Intermediate ^{2,3}	8.9	11.9	14.4	11.1	13.3	16.2	19.5
Base ¹	15.3	17.1	18.8	17.1	18.9	21.6	24.5
Minimum	10.0	11.1	12.4	11.1	12.4	14.3	16.4
Maximum	31.5	38.2	44.4	35.8	40.2	46.4	53.3
Mean	18.4	20.9	23.4	20.9	23.4	27.0	31.0
Load Factor	0.582	0.546	0.528	0.582	0.582	0.582	0.582

Escanaba Generation Forecast



Escanaba Generation Forecast - Future Needs

Based upon the PSE forecast, the City Comprehensive Future Land Use Map, and necessary improvements in the load factor trend for base load and intermediate load show that a reasonable baseload power supply goal for new development through year 2043 in the City of Escanaba would be:

35 to 40 Mw



OPTIONS

- Continue as is – do nothing.
- Build a new power generation facility (not feasible due to cost at this time. This option would require a private partner.)
- Discontinue plant operations – enter into a 100% wholesale purchase agreement for energy and capacity supply
- Improve Plant efficiency (currently under study)
- Retrofit the existing plant to utilize biomass fuels to generate “green” power to be sold, while at the same time purchasing 100% of our electrical needs through a power purchase agreement (currently under study)
- Augment the Escanaba Power portfolio which could include a gasification process (currently under study) and/or a Combined Heat and Power scenario (currently under study) (value added process and technology)
- Exploration of wind



Continue as is – do nothing

BENEFITS:

Reliable power from a local source

Continuation of existing plant jobs

Plant maintenance and upgrade contracts are typically awarded to local businesses

Local control



Continue as is – do nothing

DISADVANTAGES:

We are limited to a 25 Mw base load capacity

Escanaba electrical customers may not realize competitive energy pricing as compared to our regional competition



Build a new Power Generation Facility

New base load power plants are very expensive. Without private investment the City of Escanaba cannot, on its own, afford this option. Sargent & Lundy estimated total construction costs as shown:

60MwCFB

\$293M

150MwCFB

\$514M

300MwCFB

\$785M



Discontinue plant operations – enter into a 100% wholesale purchase agreement for energy and capacity supply

BENEFITS:

Capacity is not capped at 25 Mw

Customers could realize cost savings through competitive pricing based on market conditions



Discontinue plant operations – enter into a 100% wholesale purchase agreement for energy and capacity supply

DISADVANTAGES:

Due to contractual requirements under our present operating agreement, a long-term power purchase agreement could not be implemented without a three year notice to the plant operator.

It may take private industry 3+ years to construct needed transmission capabilities to bring power into Escanaba (example: ATC Northern Umbrella Plan).

Reliability of power is based upon the integrity and capability of the electrical grid system.

A loss of local jobs (plant operations) and loss of contracts to local vendors could be realized.

Razing of existing plant to include environmental abatements would be required. Sargent & Lundy estimated demolition costs at \$13M.

Future of combustion turbine unknown.



Improve Plant efficiency (currently under study)

BENEFITS:

Improving the efficiency of the plant will lower costs of generation by optimizing the manner in which fuel is burned which in turn will reduce emission levels (i.e. will utilize less coal while maintaining the same output)

Reliability of power from a local source

Continuation of existing plant jobs

Plant maintenance and upgrade contracts are typically awarded to local businesses

Maintain local control



Improve Plant efficiency (currently under study)

DISADVANTAGES:

We are limited to a 25 Mw base load capacity

Escanaba electrical customers may not realize competitive energy pricing as compared to our regional competition

Cost of upgrades could impact competitive pricing of power



Retrofit the existing plant to utilize biomass fuels to generate “green” power to be sold, while at the same time purchasing 100% of our electrical needs through a power purchase agreement (currently under study)

BENEFITS:

A “green” power plant would be located within the City limits of Escanaba

A potential for “green” tax credits could be realized

Plant operation jobs would be needed to operate the facility

Fuel sources such as biomass and other opportunity fuels could be utilized at the existing facility which could be purchased locally

Very few modifications would need to be made to the combustion turbine to continue operating



Retrofit the existing plant to utilize biomass fuels to generate “green” power to be sold, while at the same time purchasing 100% of our electrical needs through a power purchase agreement (currently under study)

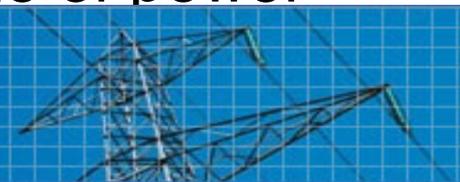
DISADVANTAGES:

Existing plant would be taken out of service for plant conversion

Cost of plant conversion would have to be factored into the production price of electricity

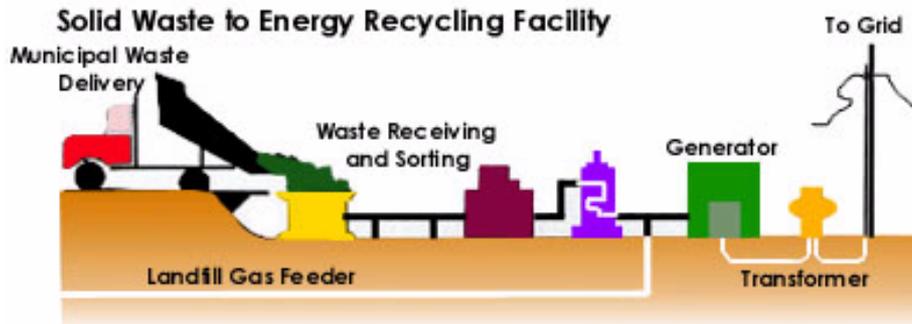
Availability of biomass in the region could become very competitive

Would require a private partner for sale of power



Augment the Escanaba Power portfolio (currently under study)

The gasification process is currently under study and consideration by the City Administration. Gasification of fuels such as solid waste is being researched.



Continued. . .

Co-generation opportunities may also exist utilizing the existing plant. This concept is currently under study by the Administration.

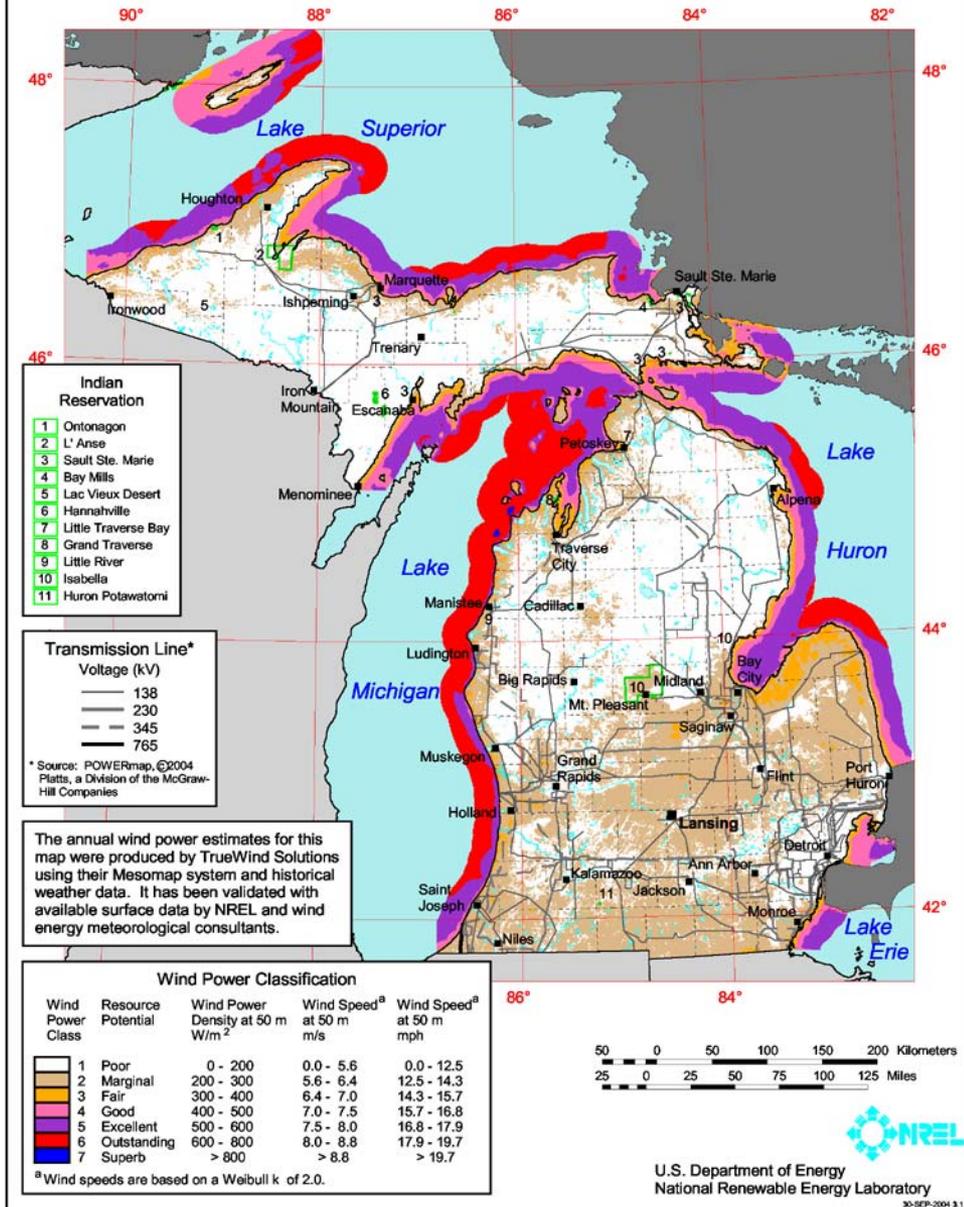


Exploration of Wind

Typically within the City limits of Escanaba, wind reliability is rated poor to marginal.

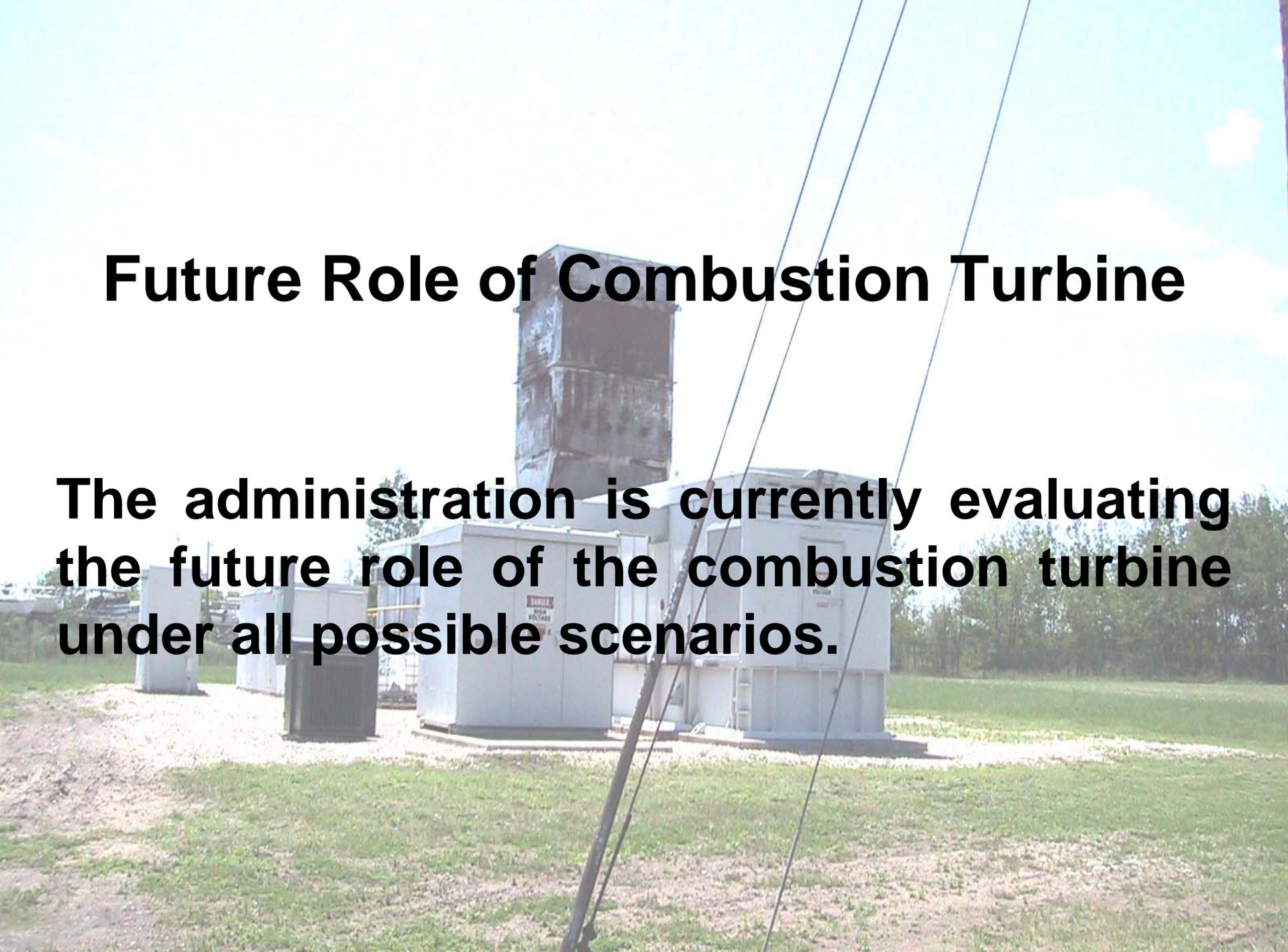


Michigan - 50 m Wind Power



Future Role of Combustion Turbine

The administration is currently evaluating the future role of the combustion turbine under all possible scenarios.



How are other communities in the U.P. addressing their power needs?

City of Manistique – There is no city involvement in that the Edison Soo Electric Company services this area.

Communities of Ishpeming, Houghton, Rapid River and Iron River – There is no community involvement in that the Upper Peninsula Power Company services these areas.

Communities of Bark River, Iron Mountain and Kingsford – There is no community involvement in that Wisconsin Electric services these areas.

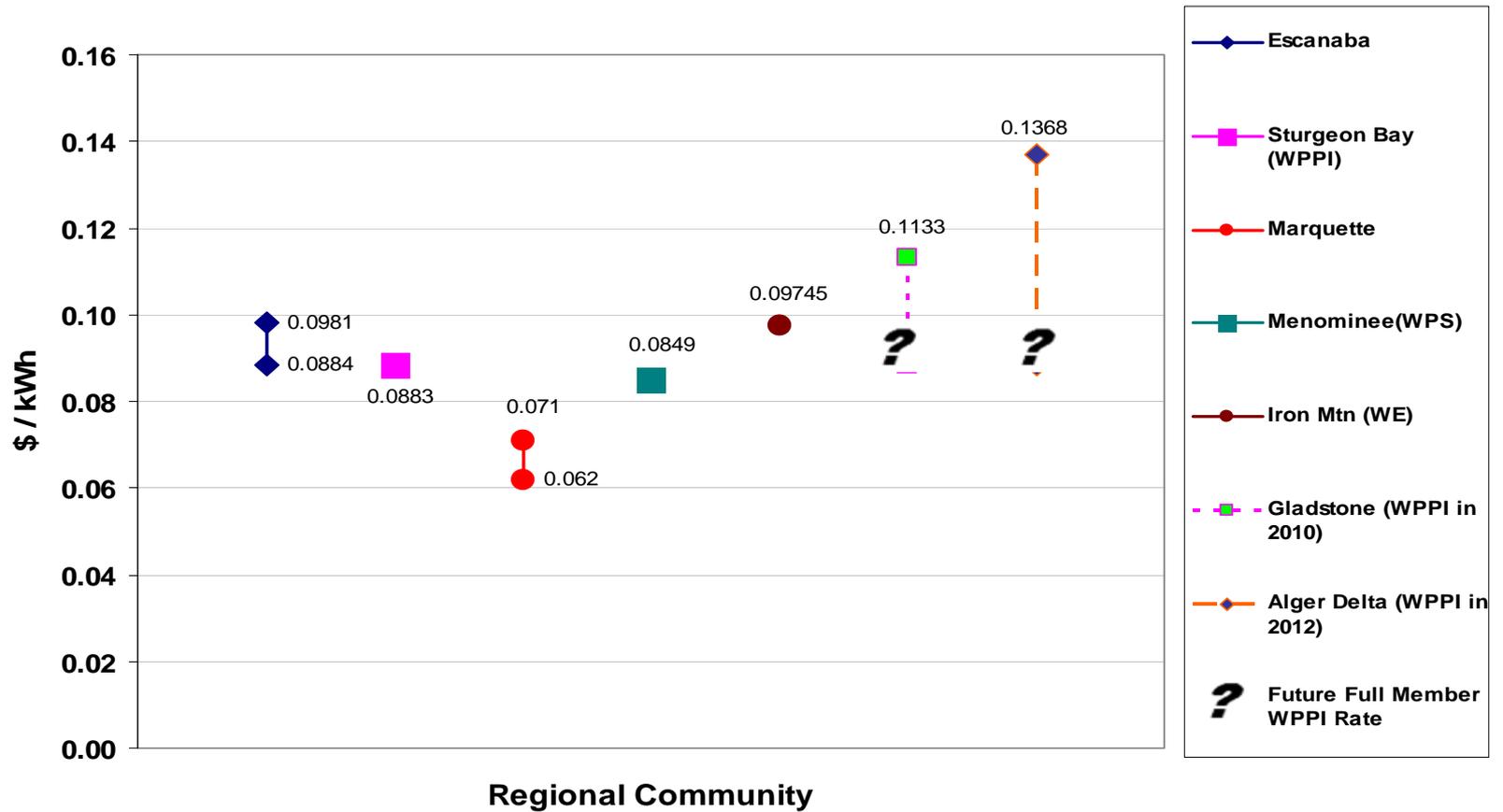
City of Menominee – There is no city involvement in that Wisconsin Public Service services this area.

City of Marquette – The City of Marquette retains ownership of the generating facility, but the facility is operated by the Marquette Board of Light and Power (self-generation/distribution).

Communities of L'Anse, Baraga, Norway, Negaunee, Gladstone and the Alger-Delta Coop – These communities are load serving entities who receive their power from Wisconsin Public Power Inc. (WPPI) on a member equivalent basis.

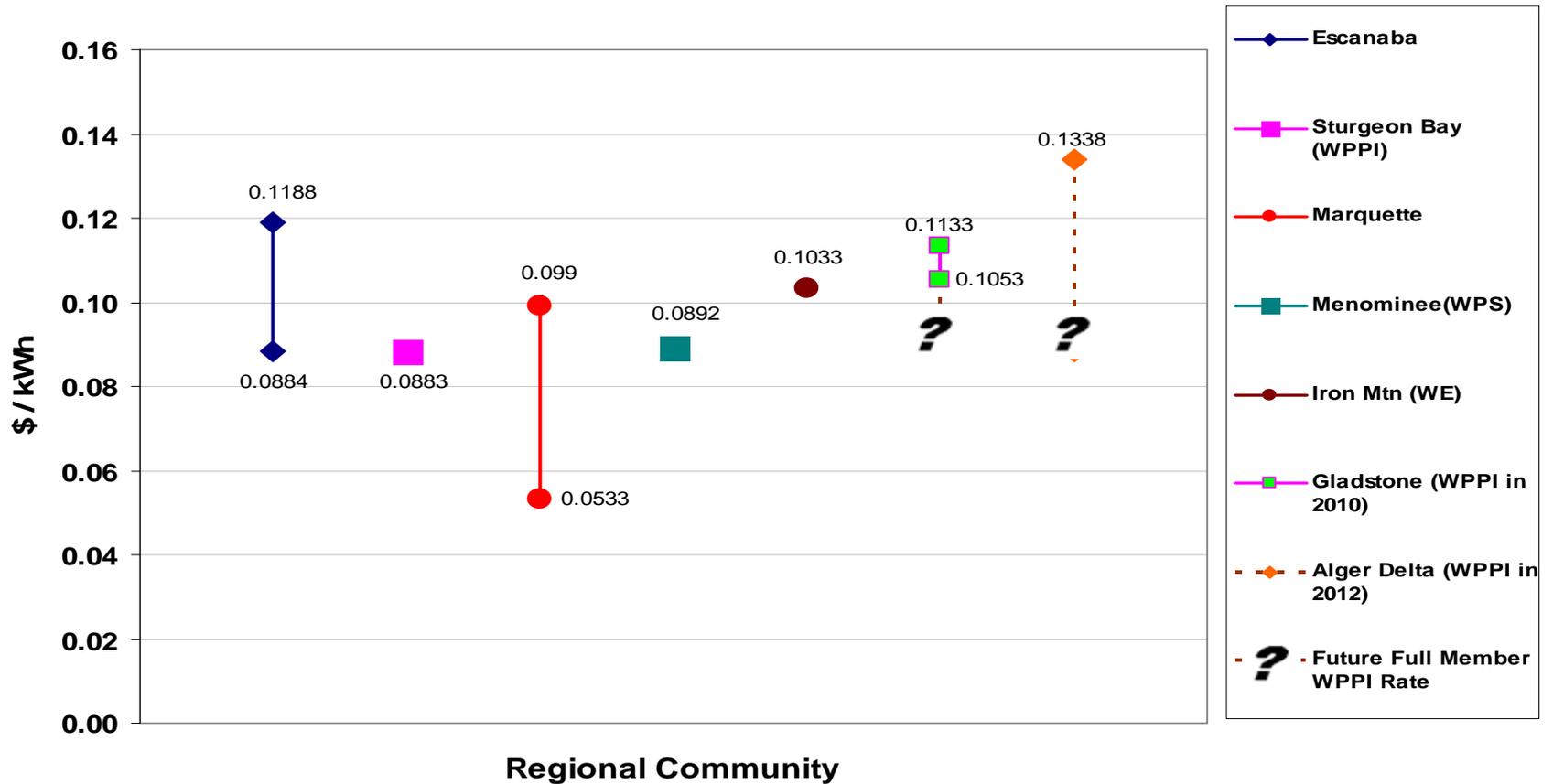
Regional Residential Power Costs

2008 Regional Electric Energy Charge Cost Comparison For Residential Customers



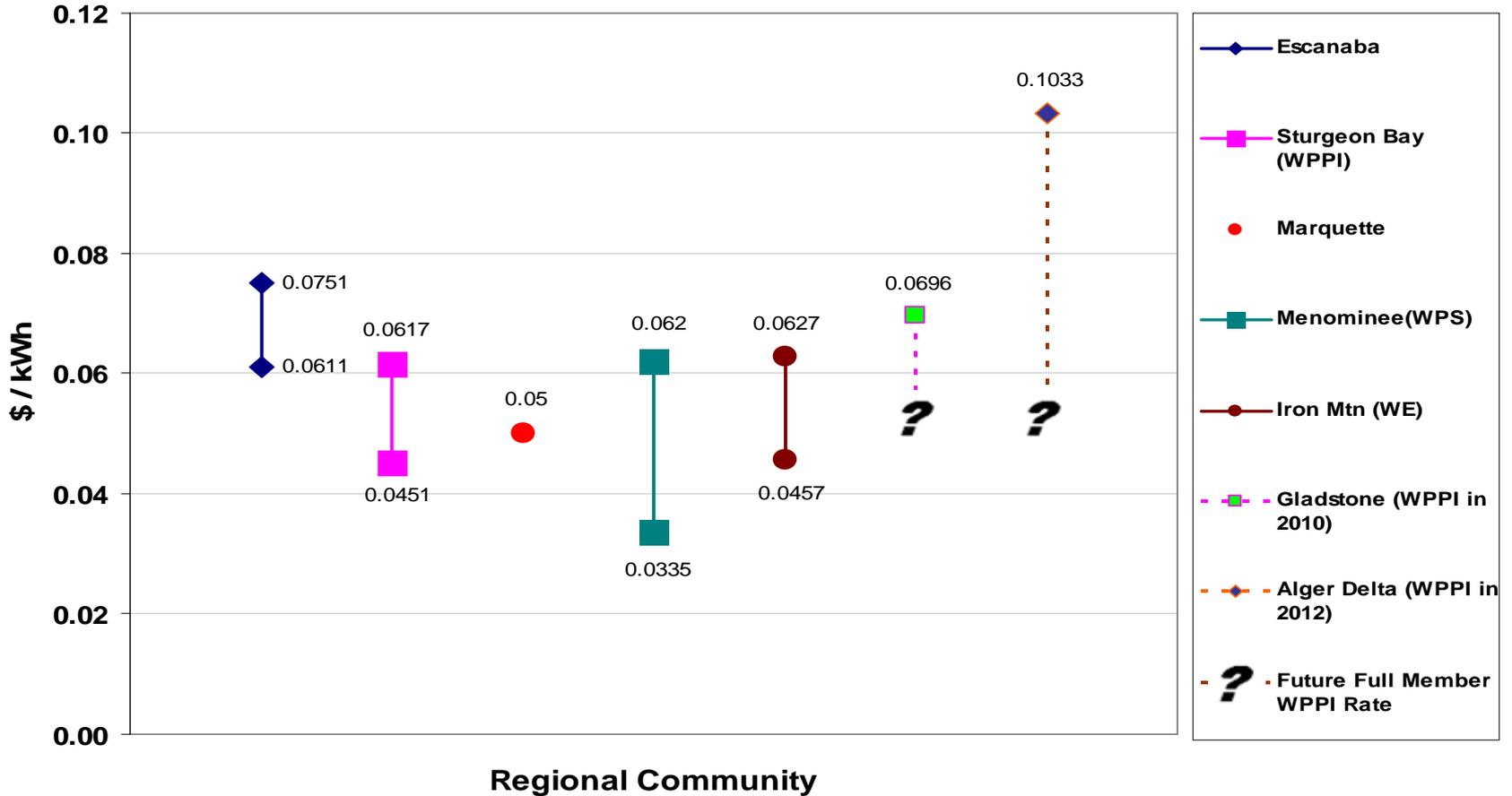
Regional Light Commercial Power Costs

2008 Regional Electric Energy Charge Cost Comparison
For
Light Commercial Customers



Regional Large Power Costs

2008 Regional Electric Energy Charge Cost Comparison For Large Power Customers



Sample Power Charges

These represent **approximate** charges and should be viewed as a snapshot in time. Variations could exist depending on actual usage patterns

	Marquette	Manistique	Sturgeon Bay	Escanaba	Menominee	Kingsford	Gladstone	Ishpeming	Alger-Delta
Residential 500 kWh/mo	\$40.50	\$46.57	\$50.15	\$50.88	\$51.43	\$58.32	\$61.65	\$73.97	\$80.38
Commercial 4000 kWh/mo	\$321.60	\$404.76	\$368.20	\$378.97	\$379.00	\$428.04	\$427.20	\$592.56	\$549.08
Large Power 200,000 kWh/mo	\$13,009.50	\$18,046.70	\$14,158.05	\$15,627.49	\$15,329.12	\$17,025.12	\$15,812.00	\$18,507.50	\$25,191.40

Current Actions

The City of Escanaba is currently in talks with two companies that have expressed an interest in providing wholesale power to the community and working with Escanaba in developing a long-term use of the existing power plant. Options include:

1. Economical power purchase
2. Renewable energy sales
3. Industrial and co-generation opportunities



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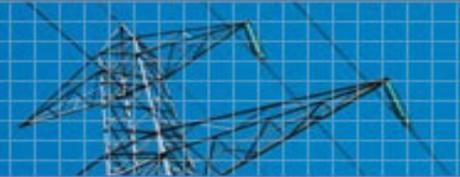
Administration is investigating the feasibility of completing plant modifications which would improve efficiencies through reduced emission levels.

Administration is launching energy awareness programs which are designed to help customers save money by incorporating energy saving equipment and devices into their homes and businesses (It is cheaper to conserve a Mw than to build a Mw)



What's Next?

April 2008 – Modified/expanded proposals from the two regional power suppliers will be presented to the Electrical Advisory Committee and community. Additionally, other options under consideration will be presented.



Additional Information

Please visit the City of Escanaba Energy
Website at:

www.escanabaenergy.com

or

www.escanaba.org

