

MEETING NOTICE

STUDY SESSION

Of The

TRAVERSE CITY LIGHT AND POWER BOARD

Will Be Held On

TUESDAY, November 28, 2017

At

5:15 p.m.

In The

COMMISSION CHAMBERS

(2nd floor, Governmental Center)

400 Boardman Avenue

Traverse City Light and Power will provide necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and audio tapes of printed materials being considered at the meeting, to individuals with disabilities at the meeting/hearing upon notice to Traverse City Light and Power. Individuals with disabilities requiring auxiliary aids or services should contact the Light and Power Department by writing or calling the following.

Jennifer St. Amour
Administrative Assistant
1131 Hastings Street
Traverse City, MI 49686
(231) 922-4940 ext. 201

AGENDA

Roll Call

1. Presentation by Spartan Renewable Energy. (p.3)
2. Presentation by Heritage Sustainable Energy, LLC. (p.10)
3. Presentation by Michigan Public Power Agency. (p.14)
4. Discussion of committing utility controlled meters to the Solar Governmental Renewable Power Cost Recovery Rate. (p.33)
5. Public Comment
 - a. Reserved
 1. Groundworks Center for Resilient Communities. (p.38)

b. General

Traverse City Light and Power
1131 Hastings Street
Traverse City, MI 49686
(231) 922-4940

Posting Date: 11-22-17
3:00 p.m



Traverse City Light & Power

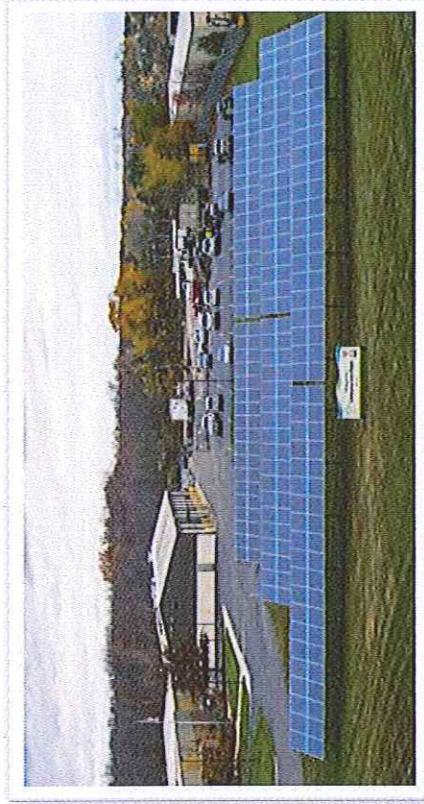
Sam Hogg – Director, Business Origination

November 28, 2017

CONFIDENTIAL INFORMATION

Topics

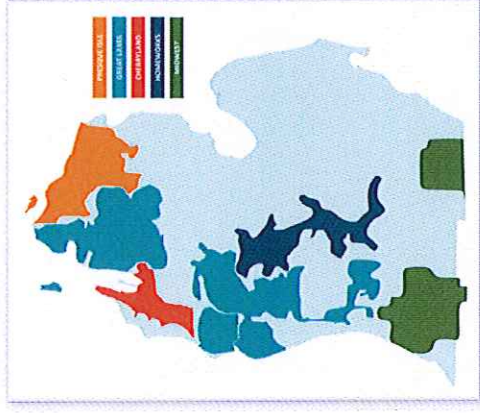
- Who We Are
- Renewable Development Landscape
- Spartan Renewable Energy and TCL&P



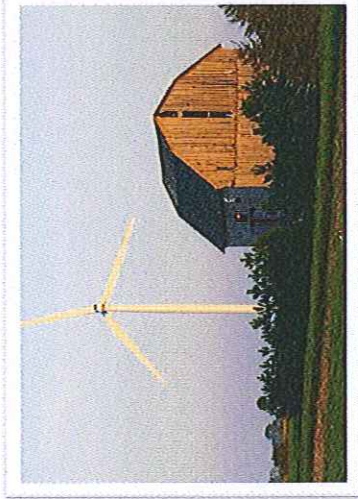
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Who We Are

- Wolverine Power Cooperative
- Spartan Renewable Energy



Wolverine's 2018 portfolio features 200+ MW of renewables and is 56% carbon free



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3



Renewable Development Landscape

Type	Price	Risk	Local
Small Renewables Built or Future	Expensive	Low	Yes
Large Renewables Future	Cheaper	High	Unlikely
Large Renewables Built	Cheapest	None	No

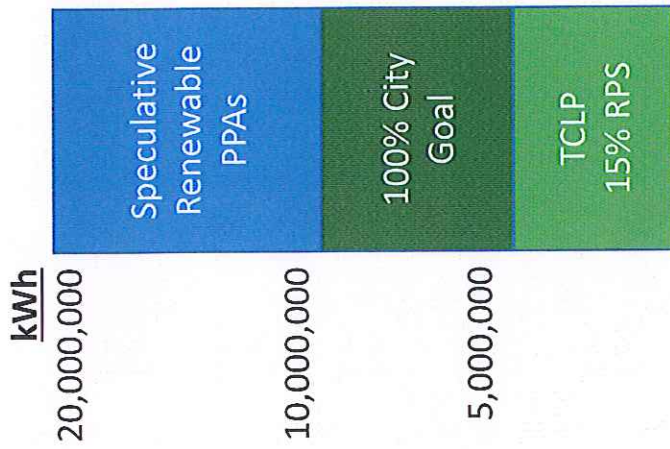
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4



TCL&P Renewable Energy Indicative Pricing

- \$0.0545 kWh for up to 10,000,000 kWhs (annual)
 - 6-month option to expand to 20,000,000 kWhs
- 20-year term
- Includes energy, capacity and RECs
- Available immediately
- First come first served



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5



Benefits in Brief

- Savings of \$2,000,000 over M-72 expansion
- Eliminates “Green Rate” subsidy
- The City of Traverse City would become the sixth city in the United States to become **100% powered** by renewable energy

Traverse City, Michigan

Aspen, Colorado Greensburg, Kansas

Burlington, Vermont Kodiak Island, Alaska Rockport, Missouri

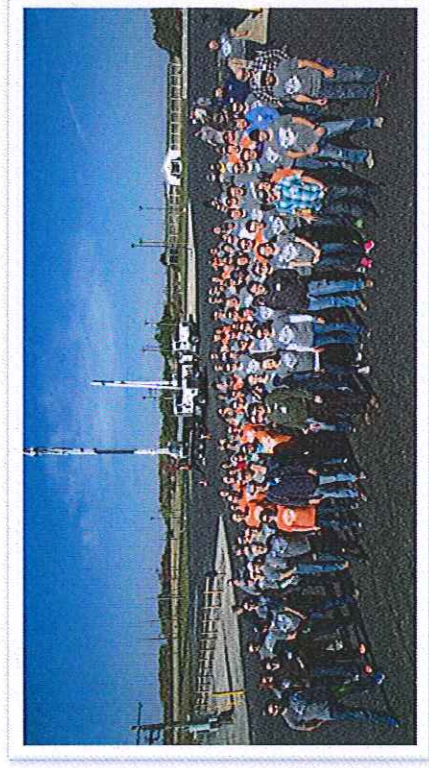
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6



Spartan Renewable Energy and TCL&P

- We are competitive on all three options
- Our strength is in our balanced portfolio approach
- We would love to work with our neighbors at TCL&P



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7





TRAVERSE CITY
LIGHT & POWER

To: Light & Power Board
From: Tim Arends, Executive Director
Date: November 14, 2017
Subject: Heritage Sustainable Energy, LLC

Enclosed for your review are a proposal on wind energy and an expansion notice from Heritage Sustainable Energy, LLC (“Heritage”).

PROPOSAL/CONTRACT

The proposal is for the option to purchase wind energy from Heritage’s existing two Fuhrlander 2.5 MW turbines at Stoney Corners Wind Farm for a total of an additional 5 MW, generating 8,600 MWh per year. The expansion letter provides notice Heritage would like to provide additional solar energy in an amount of 2.25 MW in accordance with the Amended and Restated Power Purchase Agreement (“Agreement”) dated August 16, 2018 to be constructed in the spring of 2018.

In accordance with the Agreement the utility has two options. (1) The utility, within sixty days of the receipt of the expansion notice has the option to elect to purchase all, and not less than all, of the additional solar energy generated at a price of \$99.50/MWh. (2) If the utility does not exercise this option, the utility will purchase the additional solar energy at the LMP Real-Time hourly rate at the Cons.TC Node. not including capacity or renewable energy credits.

AVOIDED COST OF SOLAR

Staff recalculated the estimated avoided cost of solar as of “today” for the purpose of evaluating the option being proposed for the solar generation array expanding another 2.25 MW. The avoided cost of solar reduced from \$.089 to \$.08. The following is a summary of the causes reflecting the change:

1. The energy price applied was the locational marginal pricing (“LMP”) at the TC Node estimated for twenty years rather than in the prior calculation, the Michigan HUB LMP or market was used for ten years then a 2% inflationary factor was applied.

Michigan Public Power Agency (“MPPA”) supplied the estimated hourly market prices and various tools were used by MPPA to compile these energy prices. Overall this caused an increase in the avoided cost of solar.

FOR THE LIGHT & POWER BOARD MEETING OF NOVEMBER 28, 2017

2. Capacity prices as a result of large plants getting approved for construction to replace the aged coal plants being retired in the near future is increasing the amount of capacity within the MISO region. However, in the long-term market for capacity there are continued plans for coal plants to retire without approved replacement projects at this time. Based on the recent approved plants and the continuation of the trend occurring, the capacity cost in this calculation was reduced from \$6.00 per kw to \$4.00 per kw.
3. MISO has made a ruling within the last few months clarifying whether the transmission tariff should be calculated on gross or net load (the difference between gross and net would be the distributed generation within a utility's system such as the M-72 solar array), and stated a utility is to pay for transmission based on gross load. Staff was unaware of the practice/requirement to report gross load for the transmission tariff.

However, it was practice by some utilities to measure on gross load rather than net load, while others measured it on net rather than gross load. This ruling removes the inconsistent reporting, and any transmission savings from the avoided cost of solar calculation. The utility will be required to report the M-72 solar generation load to MISO to be included in the calculation of the transmission tariffs through MPPA. The only transmission savings would be wear and tear on the transformer substations and extending their lives.

The total annual premium for the City based on all meters participating in the new project is \$21,763 per additional MW or \$48,968 for the total 2.25 MW project. If this project was added it would bring the renewable generation for the City to 42.58%.

ADDITIONAL INFORMATION

Also included within the expansion letter is additional information regarding a proposal for a donation to the Father Fred Foundation with the proceeds to be utilized to help pay electric bills for customers within shut off status and the opportunity of a community solar project.

With direction from the Board, staff can dedicate time to prepare additional analyses on these proposals for a future meeting.



November 2, 2017

Mr. Tim Arends
Traverse City Light & Power
1131 Hastings Street
Traverse City, MI 49686

Dear Mr. Arends:

I am writing to you regarding the Amended and Restated Power Purchase Agreement dated August 16, 2017 by and between TRAVERSE CITY LIGHT & POWER DEPARTMENT ("TCLP"), a Michigan municipal electric utility, ("Buyer") and HERITAGE SUSTAINABLE ENERGY, LLC ("Heritage"), a Michigan limited liability company ("Supplier"), ("the Agreement").

Specifically, pursuant to Section 6.2.2 of the Agreement, Supplier would like to supply Additional Solar Energy in an amount of 2.25 MW to be constructed in the spring of 2018. This letter will therefore serve as the Expansion Notice as set forth in the Agreement.

Also, as we discussed in our recent telephone conversation, Heritage will be making the following donation: we will donate a 2% royalty interest in the project to the Father Fred Foundation with the proceeds therefrom to be utilized to help pay electric bills for TCLP customers who are in need of such help. The 2% royalty would be for the entire 20 year term of the purchase contract with TCLP. TCLP would simply pay the Father Fred Foundation 2% of the value of the electricity generated from the 2.25 MW array and Heritage would receive 98%. Heritage prides itself on being a good corporate citizen of Traverse City, and on behalf of itself and its employees, is happy to be able to help in this regard.

Finally, again per our conversation, we will be reserving space for an additional 250 kW of solar panels. This space could be utilized for community solar on terms and conditions to be negotiated between TCLP, Heritage and the community. My understanding is that there is interest in the community for such a project, and we would be gratified to be part of making that happen.

Please let me know at your earliest convenience whether TCLP will be exercising its option to purchase the Additional Solar Energy.

Sincerely,

Martin G. Lagina

President and CEO, Heritage Sustainable Energy, LLC



November 13, 2017

Mr. Tim Arends
Traverse City Light & Power
1131 Hastings Street
Traverse City, MI 49686

RE: Additional Renewable Energy


Dear Mr. Arends:

I am writing on behalf of Heritage Sustainable Energy ("Heritage") to propose the following:

Heritage and Traverse City Light and Power Department ("TCLP") would enter into a new power purchase agreement covering all production from Heritage's existing two Fuhrlander 2.5 MW turbines at Stoney Corners wind farm. These two turbines produce approximately 8,600 MWh per year. Heritage would supply this energy for \$55/MWh beginning January 1, 2018. The \$55/MWh would also include the REC beginning on January 1, 2019. If TCLP also exercises its option on the 2.25 MW of Additional Solar proposed at "Renewable Energy Corners" (M72), TCLP would be purchasing approximately 8,600 MWh of wind generated electricity and about 3,900 MWh of solar per year. This would be about 12,500 MWh per year of 100% renewable energy, which would allow the City of Traverse City to more than meet its goal of 100% renewable energy by January 1, 2019. The weighted average cost of this 100% renewable energy would be about \$70/MWh (7 cents/kW-hour!)

If this proposal is generally acceptable to TCLP let me know at your earliest convenience and we can work out the details.

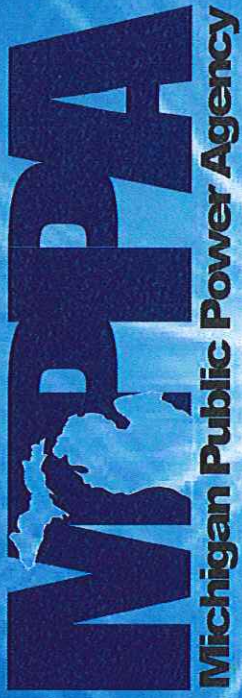
Sincerely,



Martin G. Lagina

President and CEO, Heritage Sustainable Energy, LLC

121 East Front Street, Suite 200, Traverse City, Michigan 49684
Telephone: 231-935-3659 Facsimile: 231-421-8838
www.heritagewindenergy.com



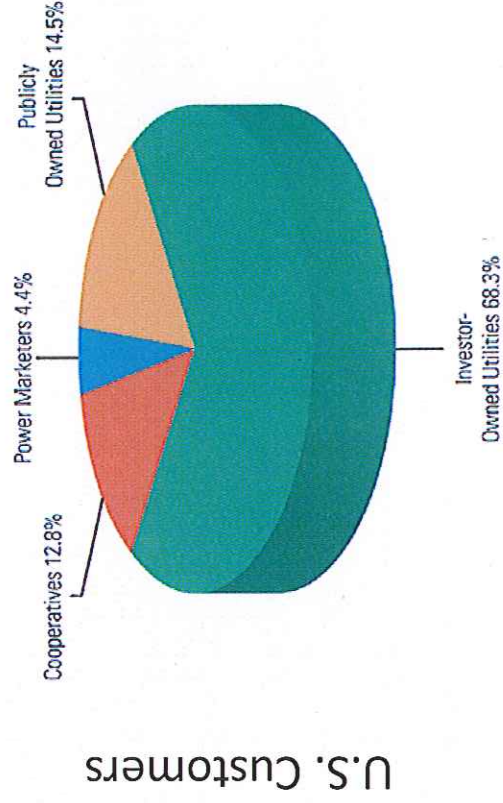
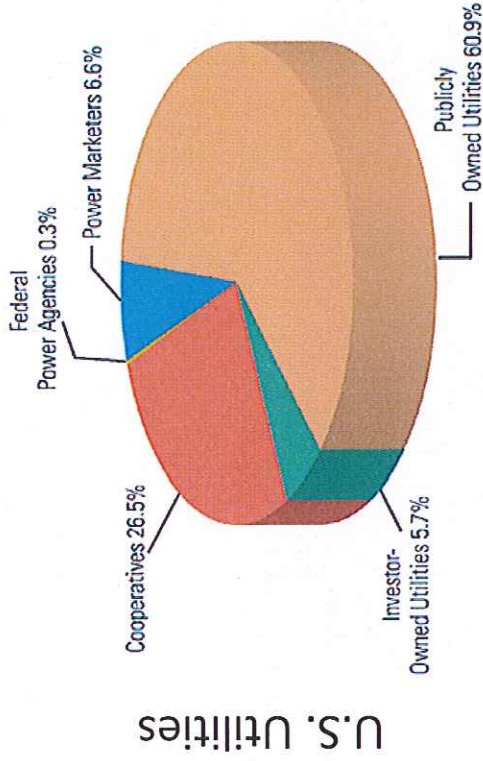
Michigan Public Power Agency

*Delivering Value Added Energy Solutions and
Services to its Members*

Traverse City Light & Power
November 28, 2017

Public Power – United States

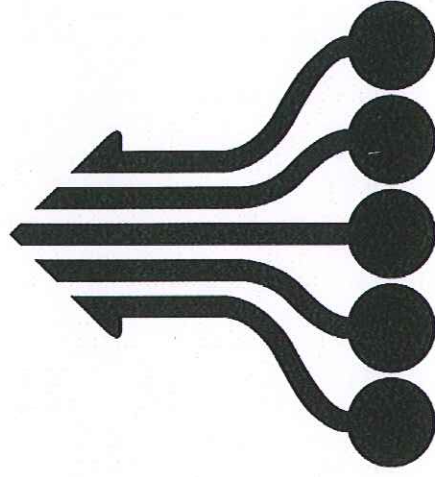
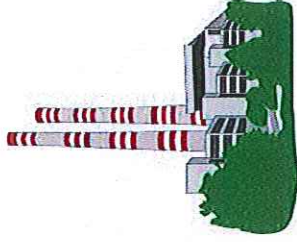
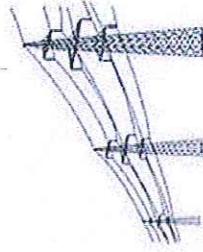
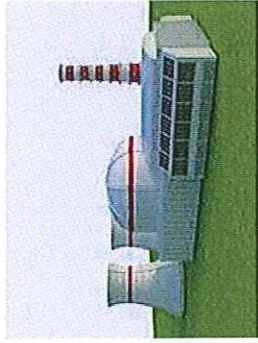
- Approximately 2,000 Public Power Entities in the United States
- Represent roughly 60% of Electric Utilities and 15% of the customers in United States
- Vast majority of Public Power Entities are Members of roughly 80 Joint Action Agencies (JAAs) or Power Authorities
- *JAAs pool resources to gain efficiency, share costs, obtain economies of scale and focus expertise in managing the complexities of the electricity business*
- ***These entities like MPPA are an extension of your local utility***



Public Power – Michigan

What is Joint Action?

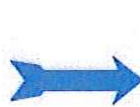
- 40 Municipal Electric Utilities in the State of Michigan (approx 2 GW or 10%)
- Joint Action Agencies formed in the 1970s
- Impetus was rapid electric cost increases in the 60s & 70s led to focus on coal and nuclear power construction
 - Municipal Utilities formed consortiums to invest / own baseload power projects
 - JAA pools needs of its members, finances (bond) and owns a % of large central station power (mostly coal)
 - Member participants under JAA obligated through Municipal Resolution
- Michigan has 2 JAAs – MPPA (22 members), MSCPA (5 members) and a Wisconsin JAA WPPI (6 Members in UP)



JOINT ACTION

Joint Action Principles

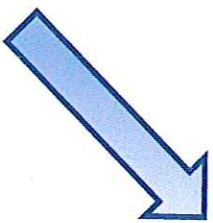
Trust, Mutual Understanding and Shared Values



Scale



Collective Efficiency



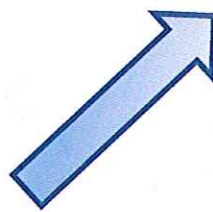
Asset Investment

- Power Supply Resources
- Power Delivery Resources



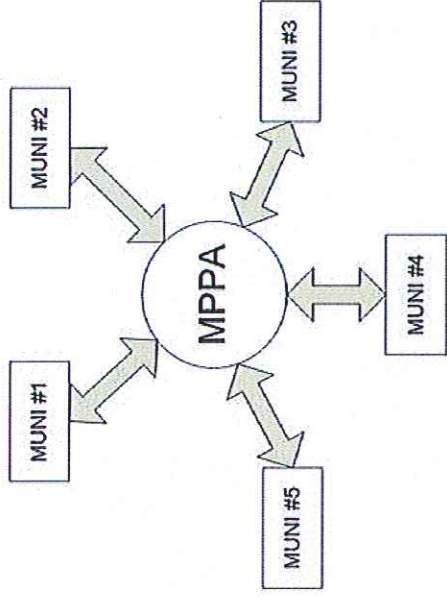
Human Capital

- Industry Expertise
- Focus



Systems

- Information Processing
- Resource Management
- Financing

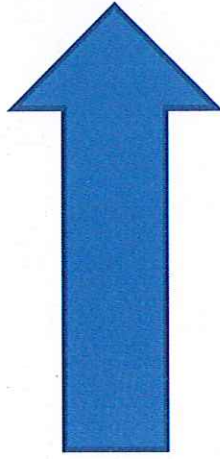


Value Platform

Economic Principles translate to Value

Economic Principles

- Economies of Scale
- Resource Diversity
- Resource Sharing
- Centralized Financing Platform
- Specialization



Value

- More Efficient Resources
- Economic Portfolio Building
- Lower Reserve Margins
- Reduced Risk & Costs
- Expertise & Knowledge

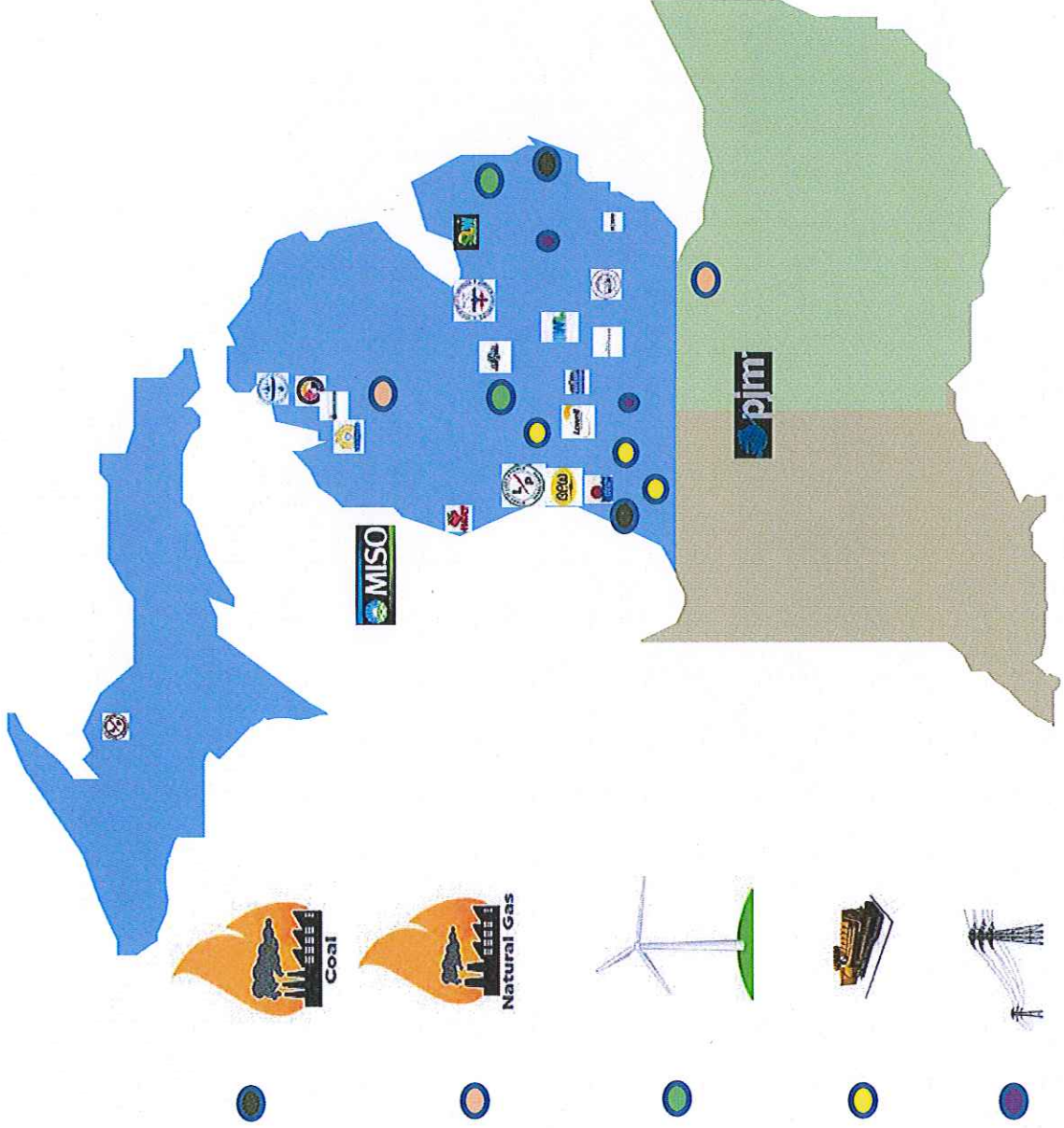
Michigan Public Power Agency

Created 1978, Act 448 of 1976

- 22 Municipal Members
- 55% of Municipal Electric Utilities in Michigan
- 85% of Municipal Utility retail energy sales
- 90 + % of Municipal Owned electric generation

Power Supply Resources

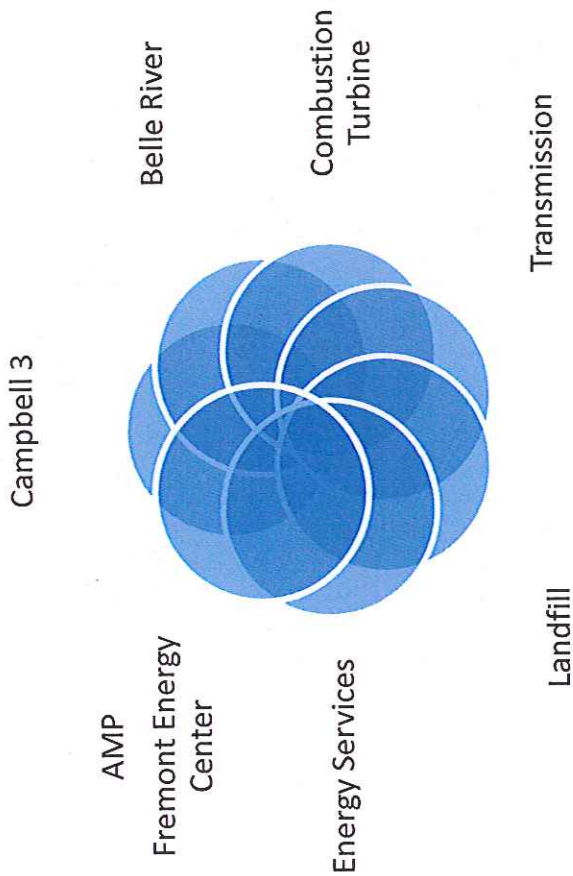
- Coal
- Natural Gas
- Wind
- Solar
- Landfill Gas
- Hydro
- Transmission



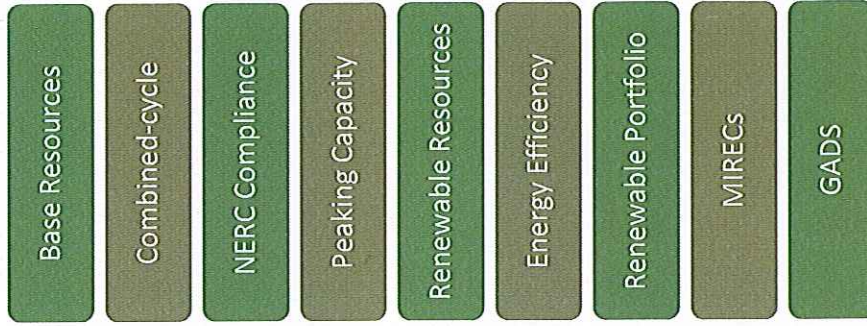
Project Based Agency

Project Based Agency means each Member chooses the Resources or Services it wants to participate in.

Project Committees

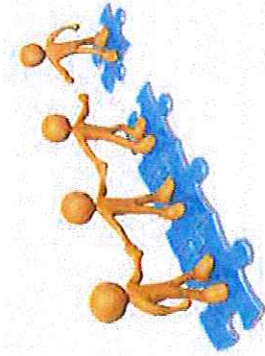


Service Committees



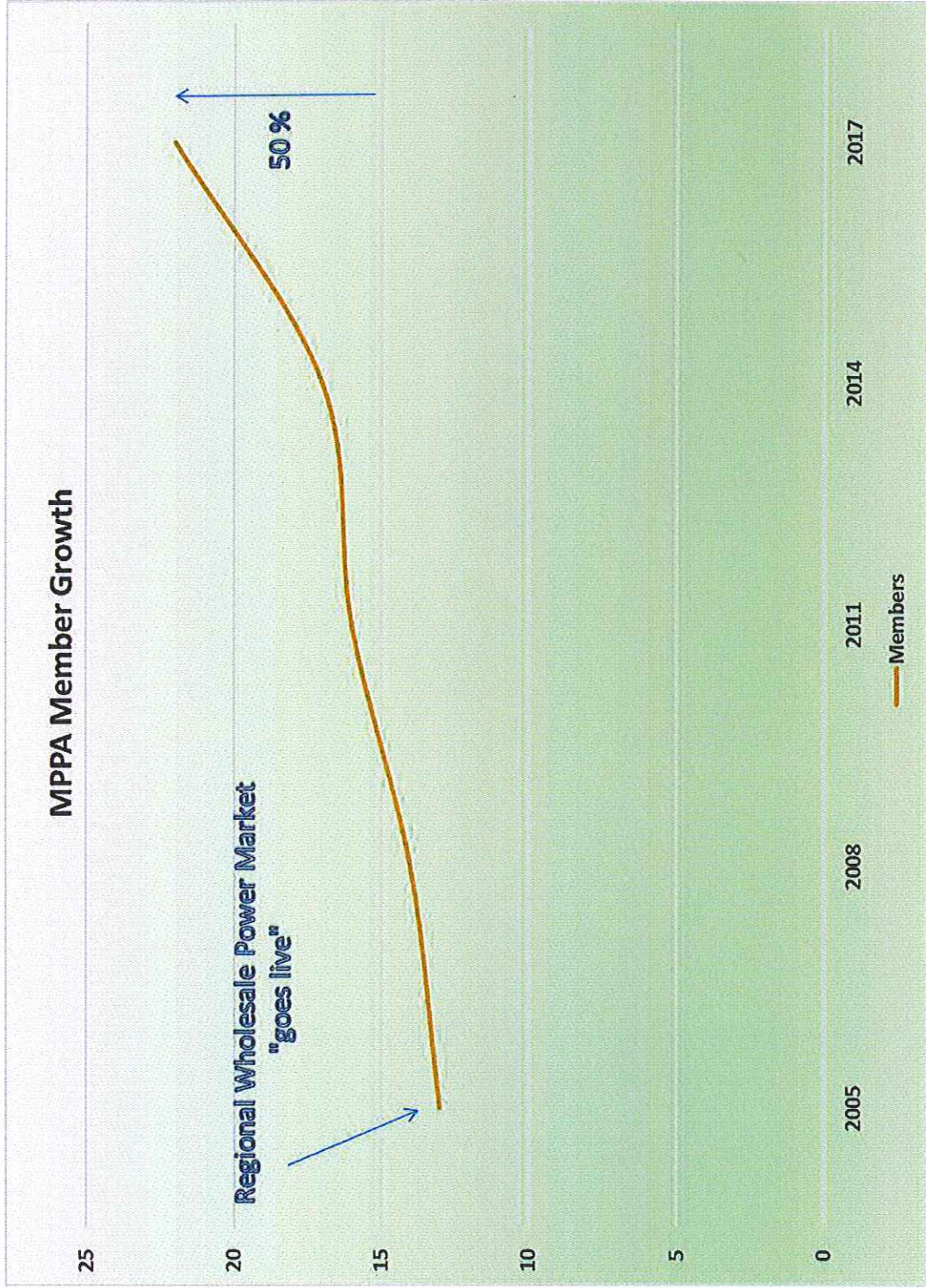
Members have the benefits of independence while leveraging expertise, resource sharing and economies of scale.

Core purpose & value



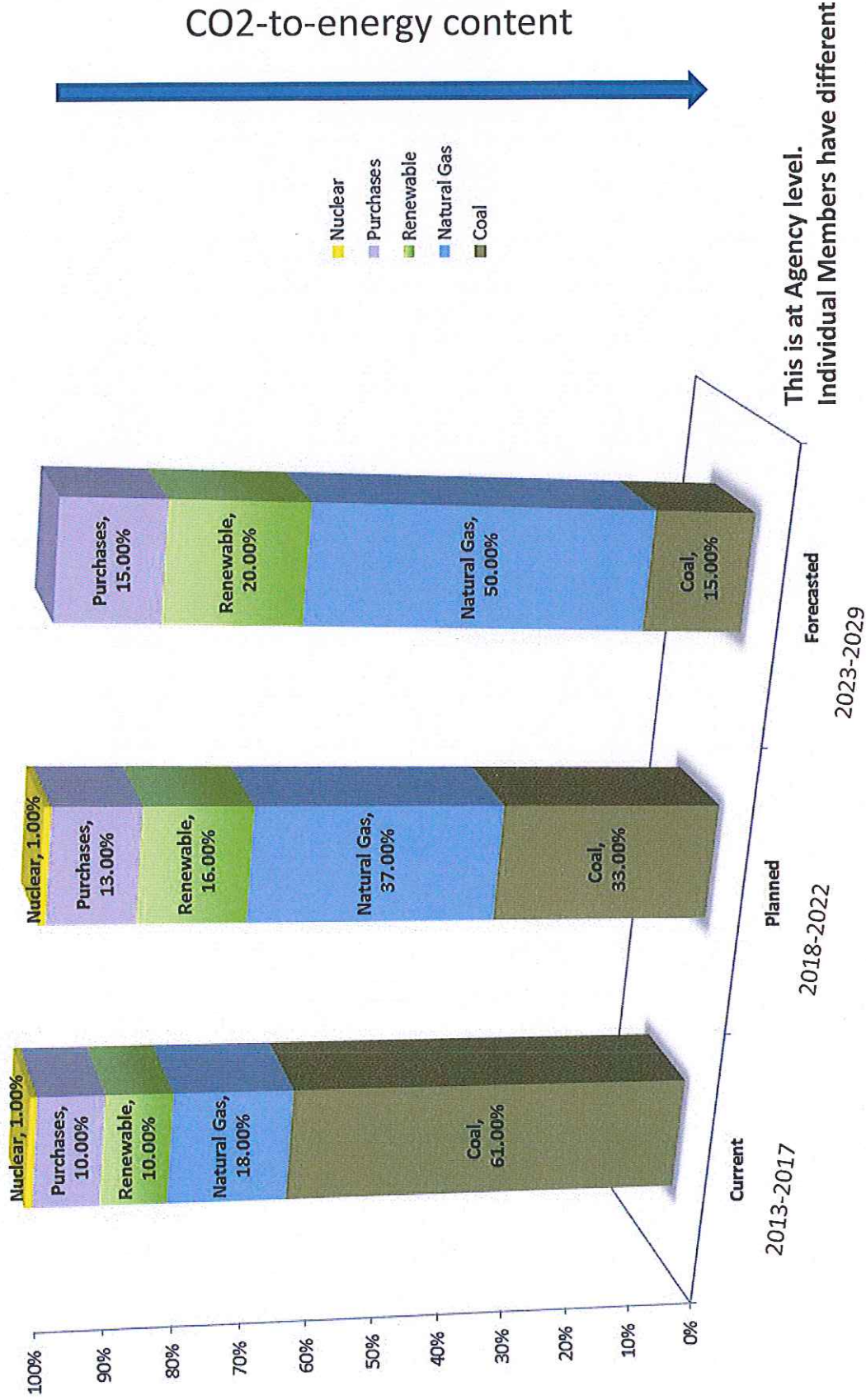
- A Member is an owner that supports the direction and governance of the Agency through its representation on the Board (**trust**)
- Each Member is a Municipal Electric Utility with aligned business interest (**teamwork**)
- The Agency provides each Member's utility board and or city council with a continuous staffing support infrastructure to help manage through employee turnover, experience gaps & succession planning (**continuity**)
- The Agency (40 years old) and its Members (100 years old) are a source of stability compared to the volatile business operations of energy developers & marketers (**durability**)

Strategic Member Growth



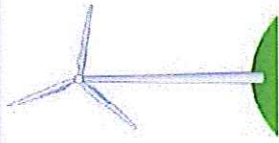
Future of Joint Action

MPPA Power Supply Transformation



Future of Joint Action Power Supply Action Plan

Long-Term Structured Transactions

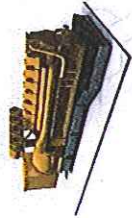


250 MW since 2013



Long-Term Capacity
-2030

Expanding DER Competency



50 + BTMG units pooled
LMR Capacity Resources
Revenue Model Expansion

- Energy
- Ancillary Services
- Load

Member Power Supply Investments



Cogeneration
Transmission Reliability
Local Supply Reliability
Optimal Configuration
Integrate for Economics
Pooling
Network & Financial Model

Future Agency Investment



Solar



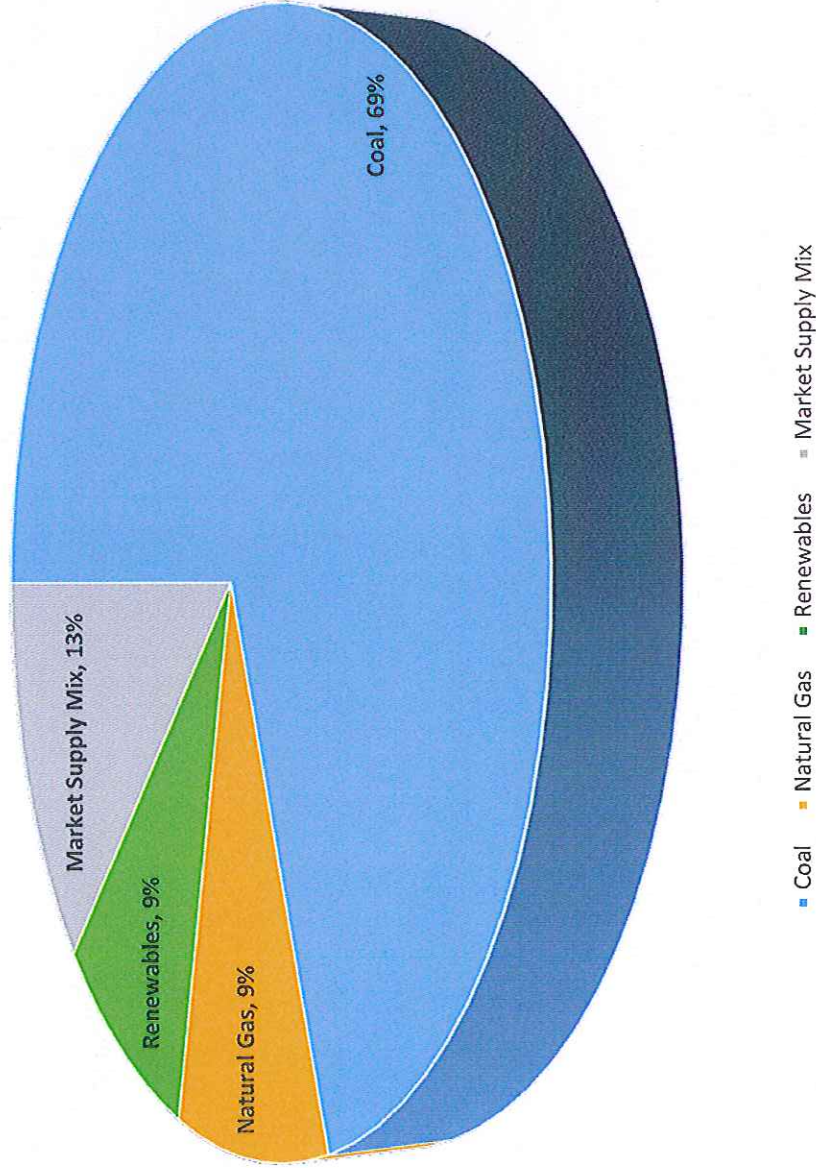
CCGT

Peaking Smart Gen

Potential Additional Wind

Traverse City Light & Power Historic Supply Portfolio Composition

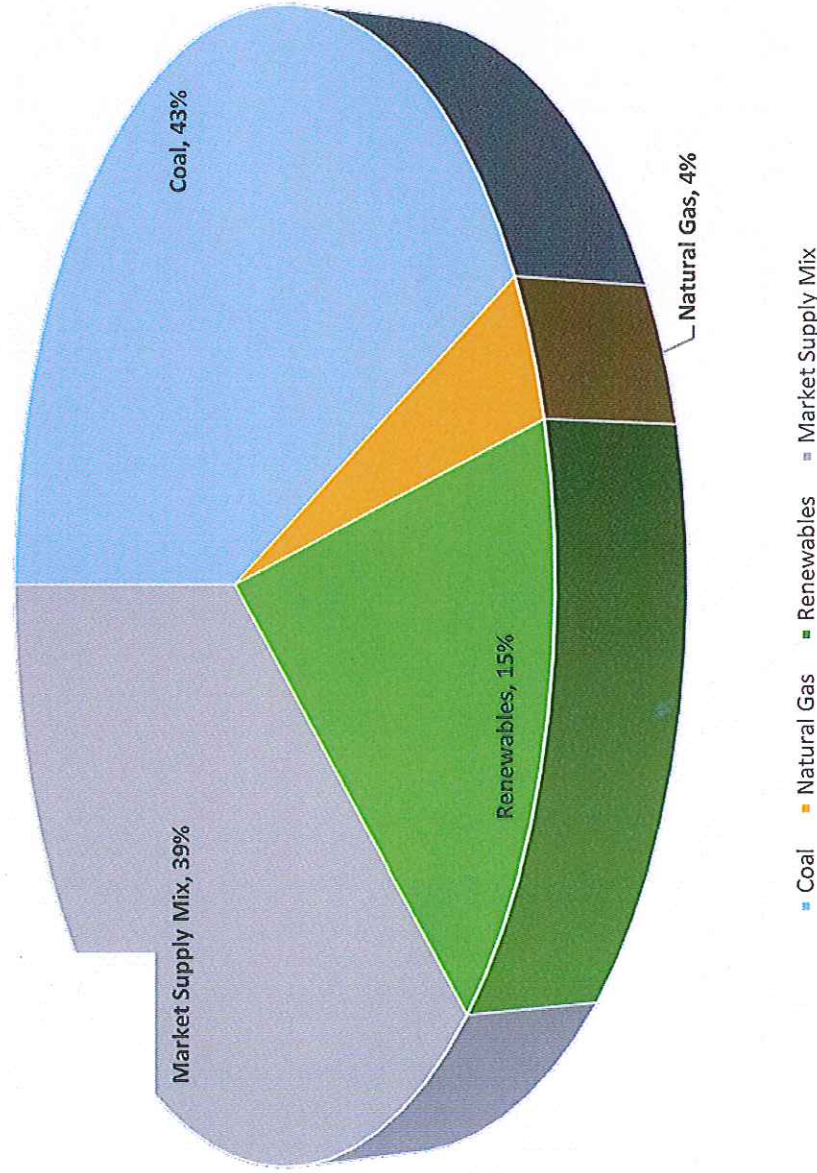
2012 Resource Mix



Impact of Action Plan Planned Energy Supply Portfolio Composition

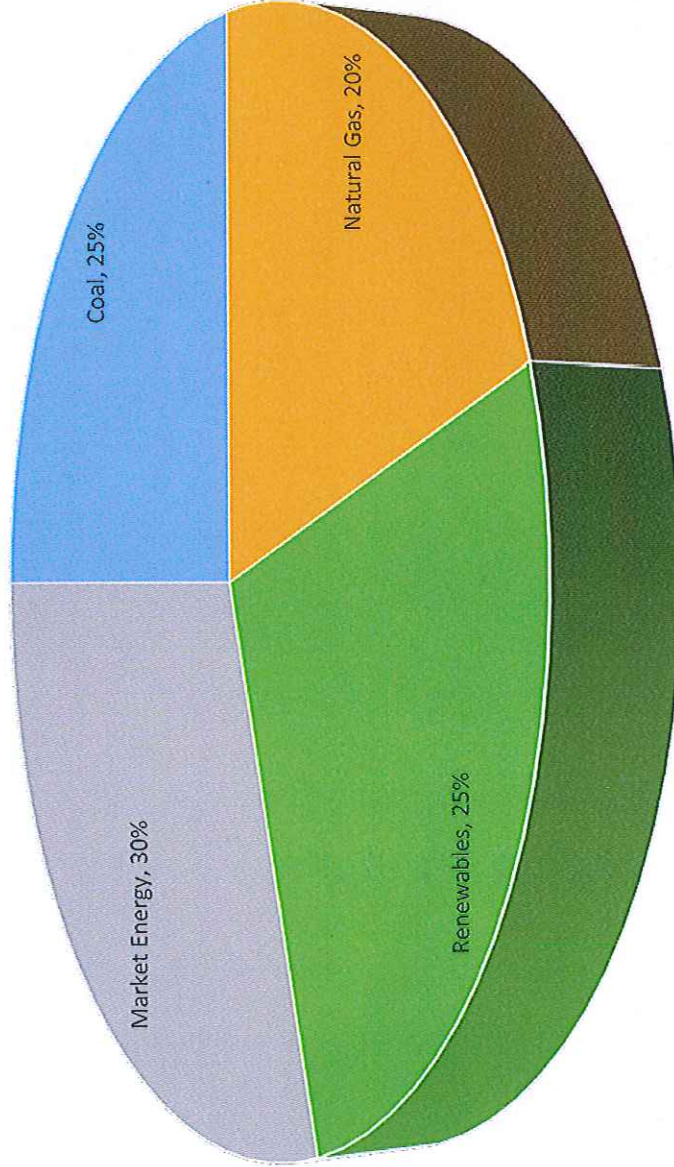
Market supply will consist of MISO Fuel Mix
Current 2017
 - 41% Natural Gas
 - 35% Coal
 - 13% Renewables
 - 8% Nuclear
 - Other

2020 Resource Mix



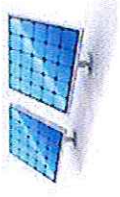
Impact of Action Plan Forecasted Energy Supply Portfolio Composition

Mid to late 2020's Resource Mix

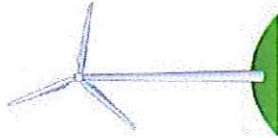


- Coal
- Natural Gas
- Renewables
- Market Energy

Renewable Energy Portfolio Strategy



- There is an abundance of options to purchase or contract with existing renewable energy projects (with no development risk)
- The Agency's preference however is to invest, develop or contract in (a.) "new" renewable energy production that is (b.) strategic to MPPA Members
 - **New** means the renewable resource is additional to the electric grid (adds carbon neutral energy)
 - **Strategic** means the renewable resource creates incremental value to MPPA members (diversification, complement operational capability, lever assets (transmission / distribution rights) and or generate tax revenue / jobs in or around our communities)
- The renewable energy supply plan pivots around these two core objectives. We then apply evaluation criteria such as (a.) Cost, (b.) Contract / Credit Risk, (c.) Development Risk, (d.) Experience, etc. to assess and recommend a plan of action
- Cost is a significant consideration. Our goal is to add projects that are neutral to or a reduction in Member retail rates. At this time this can only happen with Utility Scale Projects

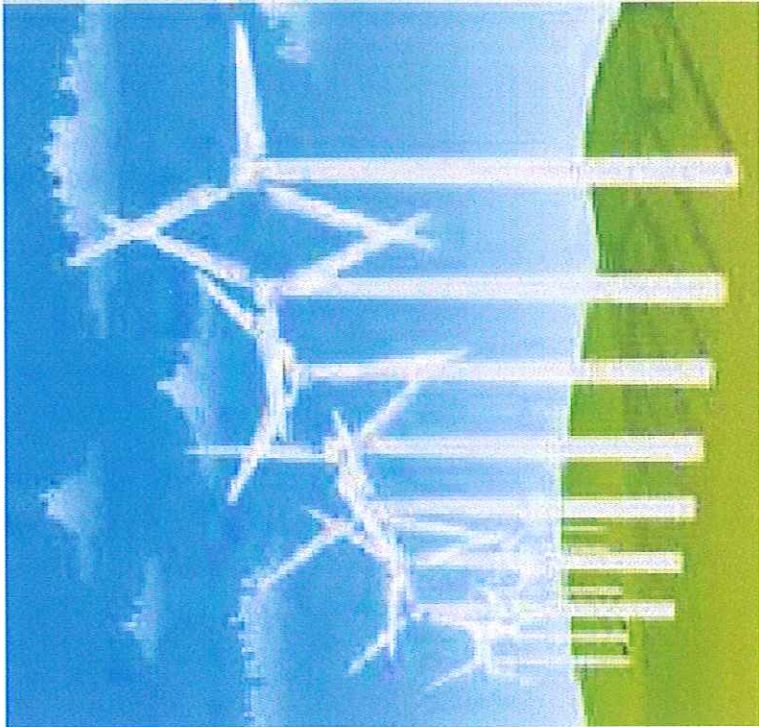


Renewable Strategy in Action

- MPPA is working with the largest wind developer in the United States to bring online one of the most competitive wind energy supply projects in the State of Michigan (2019)
- Options to execute additional wind energy supply in the State with well developed projects in diverse locations
- Evaluating 10 proposed Utility Scale Solar projects in quantity that is 10 times TCL&P load
- The aggregate quantity of proposed Solar is 4 to 5 times what our Members need today showing the overwhelming interest from developers and the finance community
- Almost all the solar projects are at price levels that if executed will reduce projected Member power supply portfolio costs
- Several of the projects are considered “strategic” to MPPA in their ability to reduce risk or add value beyond the energy supply that TCL&P would participate in

Utility Scale Renewable Economics

WIND



X < 50 MW

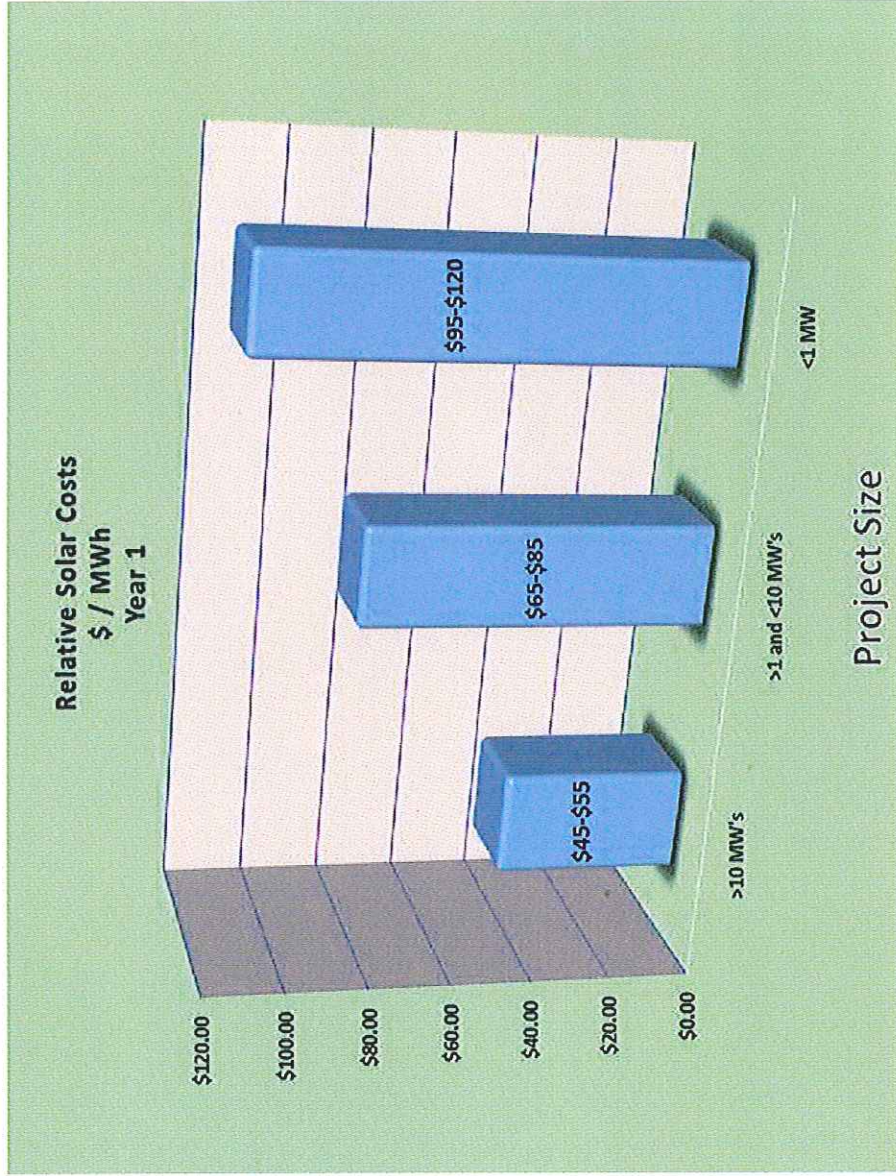
-33% X < 100 MW

-55%

X < 150 MW

Cost Difference

SOLAR



Utility Scale results in cost savings to TCL&P customers of 50% or more

What is the path forward ?

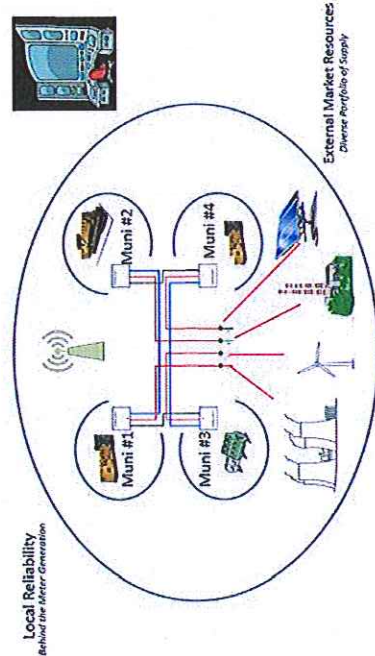
Future energy supply considerations

Drivers

- Listen to our communities and their customers
- Renewable energy is a risk management tool
- Support & complement local control & community based strategy
- Optimize legacy power supply portfolios

Action Plan

- Leverage *economies of scale* to obtain greatest efficiency & cost benefits
- Execute financeable PPA's or directly invest for quantifiable impact to grid
- Pursue resources / projects with multiple value streams "strategic"
- Retain diverse supply of conventional power supply resources to ensure reliability "bridge" to future
- Analyze & educate the balance between cost and reliability
- Monitor new technology applications (distributed resources & storage)



Future of Joint Action positioned for the challenge ahead



- The Joint Action Agency business model is the long-term strategy Traverse City selected to access reliable, clean and competitive power supply for its customers
- The Agency works for Traverse City and other Michigan public power utilities
- The Agency creates a platform of size so Traverse City can participate in a portfolio of utility scale power supply resources taking % pieces of many renewable energy projects
- Each project is developed at a scale that has significant cost advantages over smaller local projects resulting in lower customer utility rates
- The Agency has a well defined business plan that Traverse City and other Board Members approve that focus on new and strategic projects that create additional value



TRAVERSE CITY
LIGHT & POWER

To: Light & Power Board
From: Karla Myers-Beman, Controller
Date: November 21, 2017
Subject: Solar Governmental Renewable Power Cost Recovery Rate

Attached with this memo is the City of Traverse City's Resolution to Increase Renewable Energy and Sustainability for the City of Traverse City. Staff has committed bringing before the Traverse City Light & Power Board (TCL&P) as well as the Downtown Development Authority board the option to subscribe to the Solar Governmental Renewable Power Cost Recovery Rate ("SPCR").

Based on the original estimate of the SPCR, the cost to the utility was an additional \$800 (\$.00229 per kWh the City and related entities consume). With the current estimate of the avoided cost of solar with the changes mentioned in the previous memo, the cost to the utility increases to \$1,100 (\$.00331 per kWh the City and related entities consume), and if the utility elected to move forward with exercising the option for an additional 2.25MW the cost would be \$1,700 (\$.00452 per kWh the city and related entities consume).

Staff is looking for direction from the Board if they would like to subscribe to the SPCR and have this item placed on the next meeting agenda.



**CITY OF TRAVERSE CITY RESOLUTION
TO INCREASE RENEWABLE ENERGY AND
SUSTAINABILITY FOR THE CITY OF TRAVERSE CITY**

- Because, addressing energy use and climate change with renewable energy goals provides an opportunity for the City of Traverse City to move toward energy self-reliance and greater community resiliency; provide environmentally healthy and cheaper-to-operate buildings; encourage new economic development and local jobs; and support local renewable energy production; and
- Because, the City of Traverse City and its municipal utility, Traverse City Light & Power, have a history of leading on renewable energy, installing the first utility-scale wind turbine in the state in 1996, and developing the first community solar garden in the state in 2013; and
- Because, the City of Traverse City passed a 2011 Climate Action Plan with a goal to reduce greenhouse gas emissions by 25% by 2012 with suggested measures including: green electricity purchase for Government Center and many energy efficiency measures within the City of Traverse City; and created a Green Team to implement this Plan but is no longer active; and
- Because, the City of Traverse City's Master Plan includes objectives to "Recognize our responsibility for Climate Change and take rectifying action" and "create an energy plan that balances our demand for electricity with a supply of energy sources that have the lowest possible net-use of fossil-based carbon fuels.
- Because, at least 17 cities in the United States have set 100% renewable energy goals to date for the electricity use for municipal operations, including Grand Rapids, Michigan, and some of these cities have already met their 100% target; and
- Because, research by Stanford University and other sources demonstrate that in addition to climate benefits, shifting to 100% renewable energy creates jobs, boosts economic growth, keeps energy rates lower over time, and reduces pollution – which improves public health, saves lives, and reduces health care costs; and
- Because, surveys of Traverse City residents and businesses, including those completed by the Grand Vision Energy Network and Traverse City Light & Power (TCLP), have consistently found that the majority of respondents support more clean, renewable energy and more locally-generated energy, even if it means it would increase electric rates; and
- Because, Michigan Public Service Commission's 2016 annual renewable energy report found that the combined cost of renewable energy and energy efficiency is less than any new generation, including new natural gas combined cycle plants, and

**City of Traverse City Resolution to Increase Renewable
Energy and Sustainability for the City of Traverse City**

Page 2 of 2

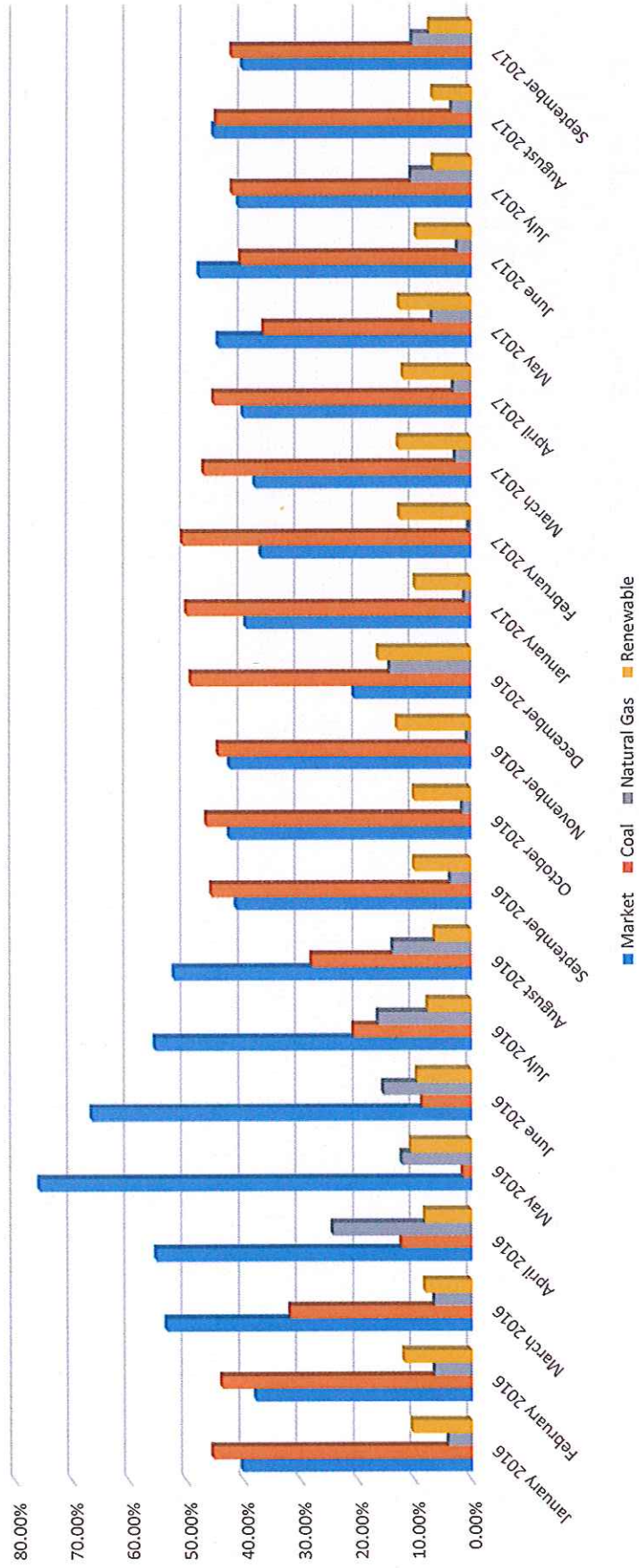
that the cost of renewable energy contracts continues to show a downward pricing trend; and

- Because, the Michigan Public Power Agency presented to Traverse City Light & Power Board in June 2016 and said that wind and solar power are the best sources of new energy generation now and into the foreseeable future, recommended that the City and TCLP purchase more renewable energy; and
- Resolved, that the City of Traverse City does hereby commit to meet 100% of the electricity demand for City operations as reflected by the yearly total of all municipal electric meters, with clean, renewable energy sources (defined as wind, solar, geothermal, and/or landfill gas) by 2020; and be it further
- Resolved, that the City of Traverse City set a goal to reduce its greenhouse gas emissions by pursuing renewable energy and energy efficiency and/or other sustainability projects annually, with the goal of initiating at least two such projects per year from now until 2027; and be it further
- Resolved, that the City of Traverse City will create an advisory "Green Team" within 60 days comprised of 6 to 10 people designated by the City Manager including a representative from the City Planning Commission, a representative from Traverse City Light & Power, a representative from Grand Traverse County, and community members, and charged with: 1) updating the 2011 Traverse City Climate Action Plan to include a 100% renewable energy goal, new GHG reduction goals, and recommended measures to achieve these goals; 2) recommending to the City Commission two renewable energy, energy efficiency and/or other sustainability projects to be implemented each year; 3) meeting regularly to implement these objectives and reporting progress annually to the City Commission; and 4) developing a plan for Traverse City to become carbon neutral before midcentury; and be it further
- Resolved, that with the creation of the Traverse City "Green Team" the City of Traverse City Commission directs the City Manager to assign City staff to promote and further develop clean and renewable energy opportunities in conjunction with the "Green Team."

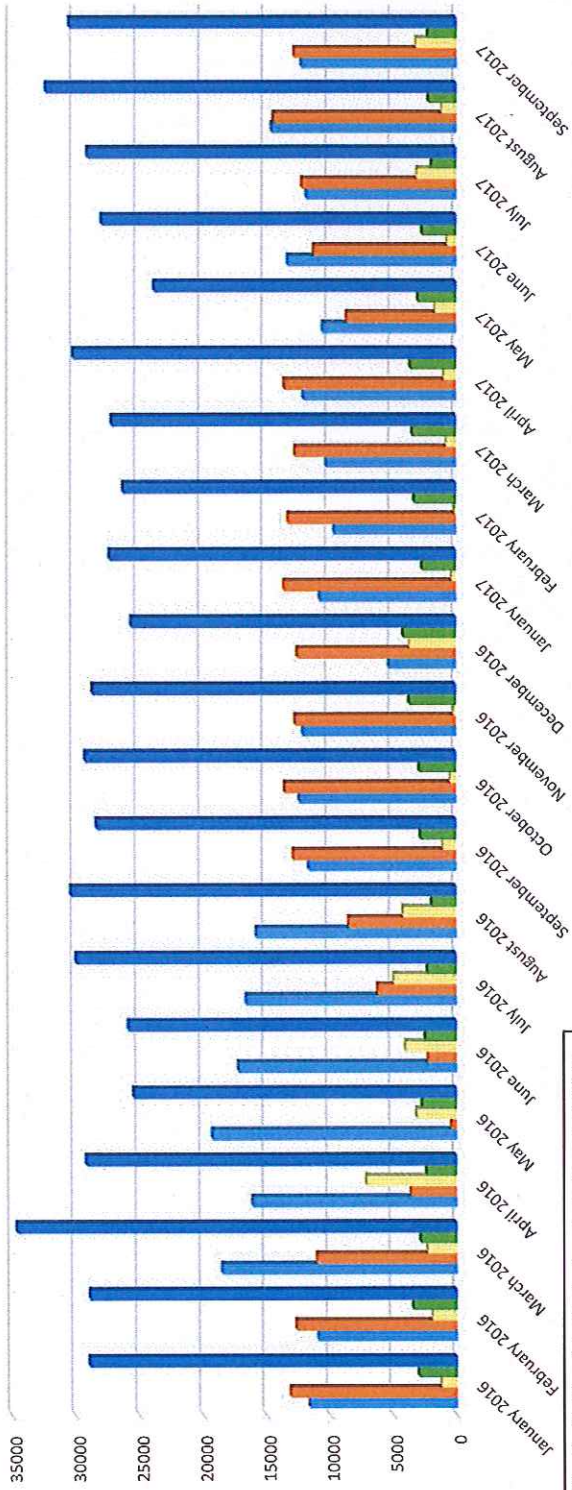
I hereby certify that the above Resolution was adopted by the Traverse City, City Commission at its Regular Meeting held on December 19, 2016, in the Commission Chambers of the Governmental Center, 400 Boardman Avenue, Traverse City, Michigan.

Benjamin C. Marentette, MMC, City Clerk

Traverse City Light and Power Generation Portfolio January 2016 through September 2017



Traverse City Light and Power Generation Portfolio January 2016 through September 2017 in MWH's



Note: Campbell (coal plant) had outages during the period 3/5/2016 to 6/20/2016 and Belle River (coal plant) had outages during the period 2/19/2016 to 5/23/2016.



Request
"Public Comment – Reserved"

Traverse City Light & Power Board of Directors
Department of the City of Traverse City
Regular Meeting

Please Print or Type

I, Dan Worth, representing Groundwork Center for Resilient Communities, pursuant to Light & Power Board Rule 11 (see below), request to be placed under the "Public Comment – Reserved" on the Agenda of the Regular Meeting scheduled for Tuesday, November 28.

I understand that up to 15 minutes is allowed for my presentation.

I wish to address the Board regarding the following matter:

The potential for aggregated local generation in and around Traverse City and the 10 County area of NW MI.

Dan Worth

Signature

148 E. Front Street, Suite #301
Address

November 21, 2017

Date

617-610-7399
Daytime Phone

City/Township

Light and Power Ratepayer: City Taxpayer:

Regular meetings are held the 2nd Tuesday of each month at 5:15 pm.
Please return to the Executive Director no later than Tuesday, 5:00 pm, the week prior to your requested date.

Thank you,
Jennifer St. Amour
Administrative Assistant