Michigan Public Power Agency

Delivering Value Added Energy Solutions and Services

Petoskey City Council Meeting
March 18, 2019

Discussion Topics

- Update on Public Power and Benefits of Joint Action
- Renewable Supply part of a Decarbonization Plan
  - Energy Efficiency and Conservation
  - Renewable Resource Plan
- Renewable Resource Plan
  - Specifications
  - Portfolio Management
  - Affordability
  - Reliability
- Supply Plan Considerations & Challenges
- Petoskey Fuel Composition – History, transition and future
- Joint Action Economics & Risk Benefits
- Prepare Renewable Resource Strategy & Plan

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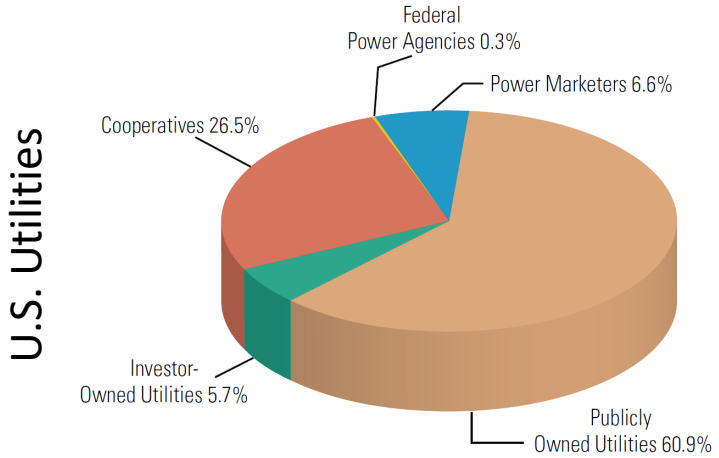
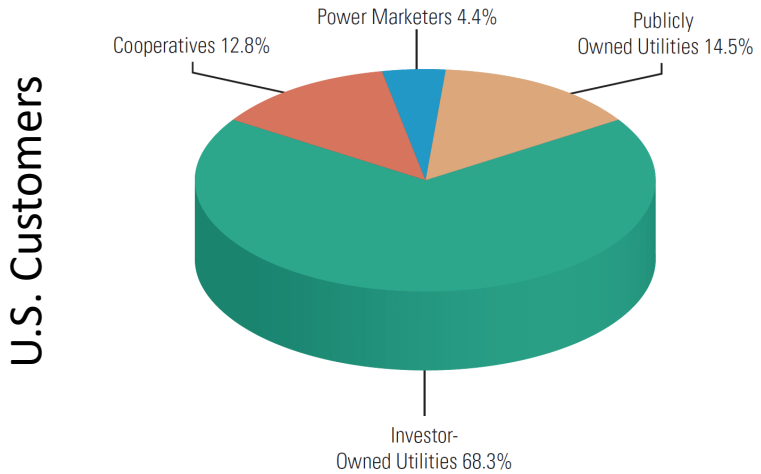
Public Power – United States

- 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 Supply consortiums
- *JAAs pool resources to gain efficiency, share costs, obtain economies of scale and focus expertise*
- ***JAAs like MPPA are an extension of your local utility***





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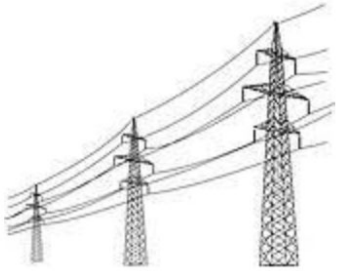
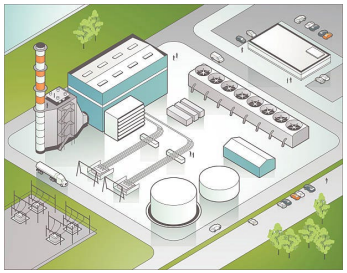
Public Power – Michigan

- 40 Municipal Electric Utilities in the State of Michigan (approx 2 GW or 10% of load)
- Joint Action Agencies (JAA) formed -1970s
  - Enabling Legislation
  - Municipal Utilities formed consortiums to invest in baseload power projects
  - Pooled needs of its members, finance (bond) and own a % central station power (mostly coal)
  - Member participants under JAA obligated through Municipal Resolution
  - Share in Projects to get best economics
- Michigan has 3 JAAs – MPPA (22 members), MSCPA (5 members) and WPPI (6 Members)





JOINT ACTION

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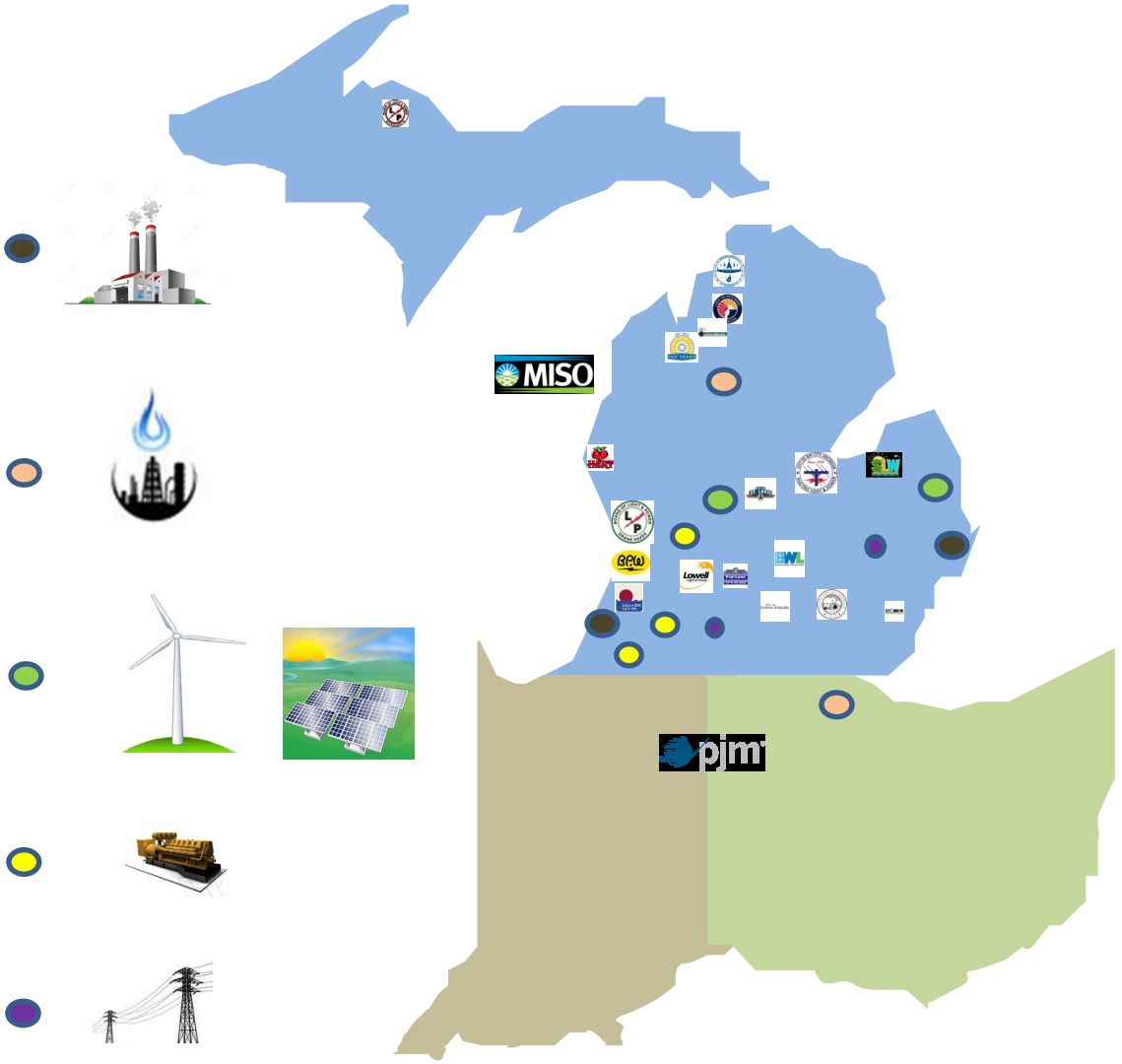
Created 1978, Act 448

- 40 + Years in Operation
- 22 Full Members
- 85% of Municipal electric retail energy sales
- 90 + % of Municipal Owned electric generation

Power Supply Resources

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



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Project Based Agency

Project Based means a Member chooses to participate in Resources or Services that fit its needs

Project Committees

Campbell 3

Fremont Energy Center

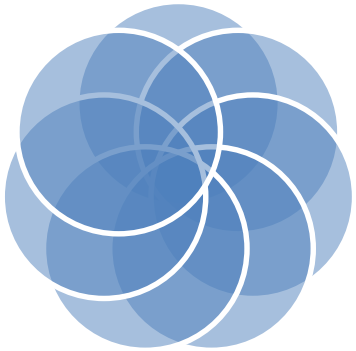
Belle River

Energy Services

Combustion Turbine

Renewables

Transmission



Service Committees

- Base Resources
- Combined-cycle
- NERC Compliance
- Peaking Capacity
- Renewable Resources
- Energy Efficiency
- Renewable Portfolio
- MIREC's
- GADS

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

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Agency Business Model

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Membership Principles

Control – A Member influences direction of the Agency through its representation on the Board

Teamwork – A Member is a Municipal Electric Utility with aligned business interest

Trust – Agency & its Members are a source of stability in an otherwise volatile energy market

Continuity – Agency provide expertise to manage through staffing turnover, experience gaps and succession planning of Member

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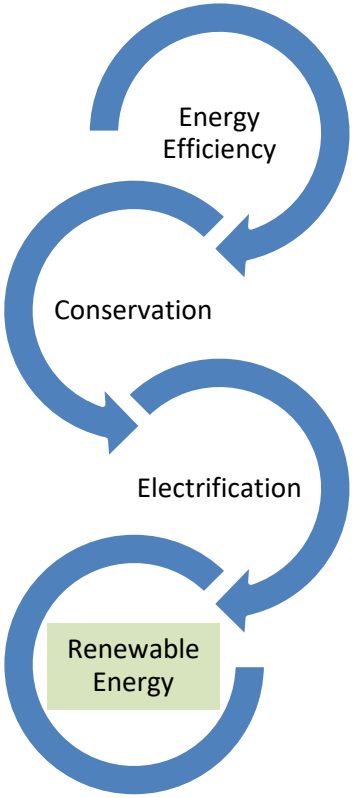
Decarbonization Strategic Plan

Basic Electric Utility Tools



Programs and Infrastructure

Renewable Resource Plan

Example: City of Holland set a Greenhouse gas emissions per capita (CO_2e/capita) in their Community Energy Efficiency and Conversation Strategy

- Ensure economic competitiveness
- Provide reliable and affordable energy
- Protect the environment

Sustainable Return on Investment

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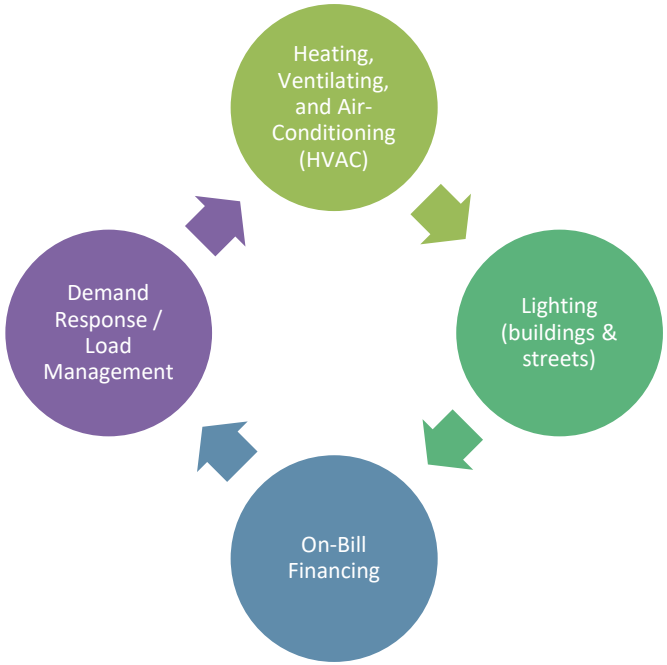
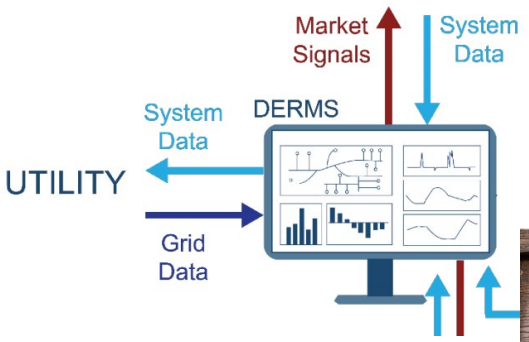
Energy Efficiency & Conservation

Energy efficiency continues to be one of the cleanest and lowest-cost utility system resources (Lazard 2017)



Advanced Metering Infrastructure –

integrated system of smart meters, communication networks, data management systems that enables two-way communication, information processing and decision making



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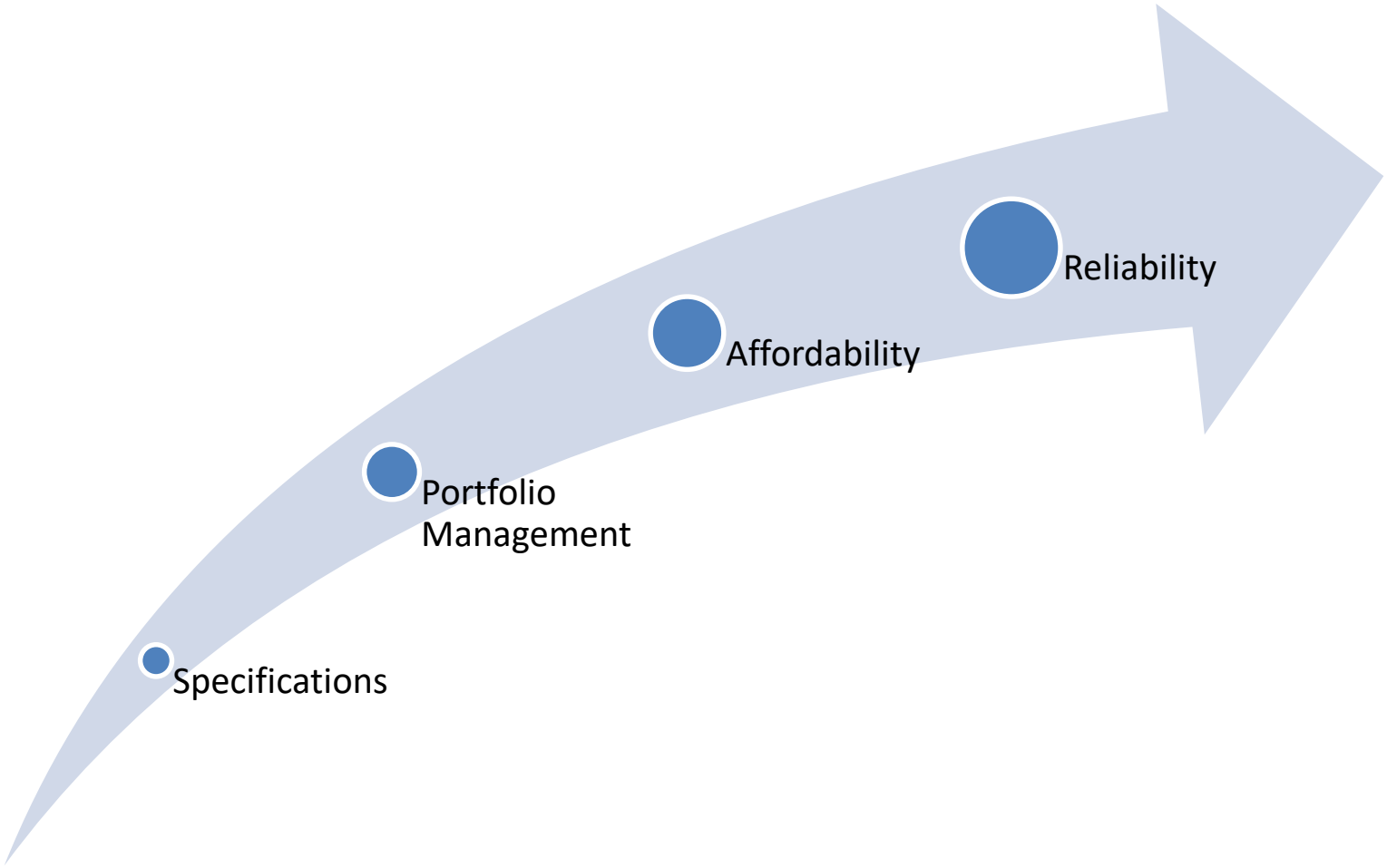
Renewable Resource Plan



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Why are Specifications critical?

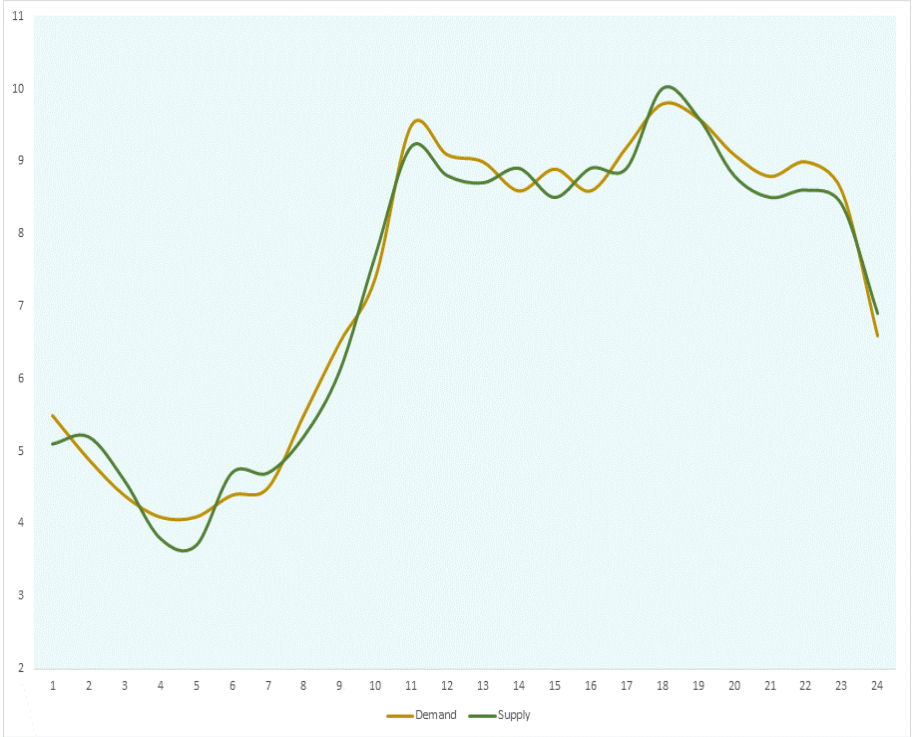
These two entities today can both claim 100% renewable energy

City A

$\sum$ = Annual Energy Use

- 100% Purchase of Renewable Energy Certificates
- Voluntary National Market – no geographic limits
- Banking rules (store Rec's generated in prior years)

City B



- Follow load with supply (minute by minute)
- Require electric storage & advanced controls
- Technically and economically challenging today

Green, Greener, Greenest

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Renewable Resource Plan
Supply Specifications

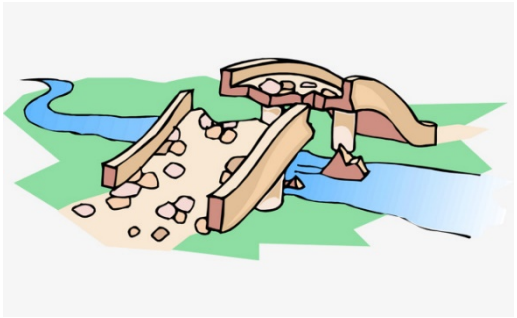
A **specification** refers to the documented requirements of a material, design, product, or service

State Compliance Requirements

- Clean and Renewable Energy and Energy Waste Reduction Act (Act 295 of 2008)
  - Solar, wind, landfill, water, municipal solid waste to energy in Michigan
  - Existing (some exceptions) and new renewable resources qualified
- Act No 342 of 2016
  - Present – 10%
  - 2019-2020 – 12.5%
  - 2021 – 15%
  - 35% goal of combined renewable energy and energy waste reduction ("EWR") is a sum total since 2008

Renewable Specifications

- New or existing (do you want to change grid?)
- Fuel Type (wind, solar, water, biomass)
- Geographic location (local, regional, national)
- Cost / utility Rate impact
- Diversification (contribution of each resource)
- Technology Obsolescence (layering)
- Vintage (banked)



Voluntary Objectives must have Specifications otherwise community goals may not be met

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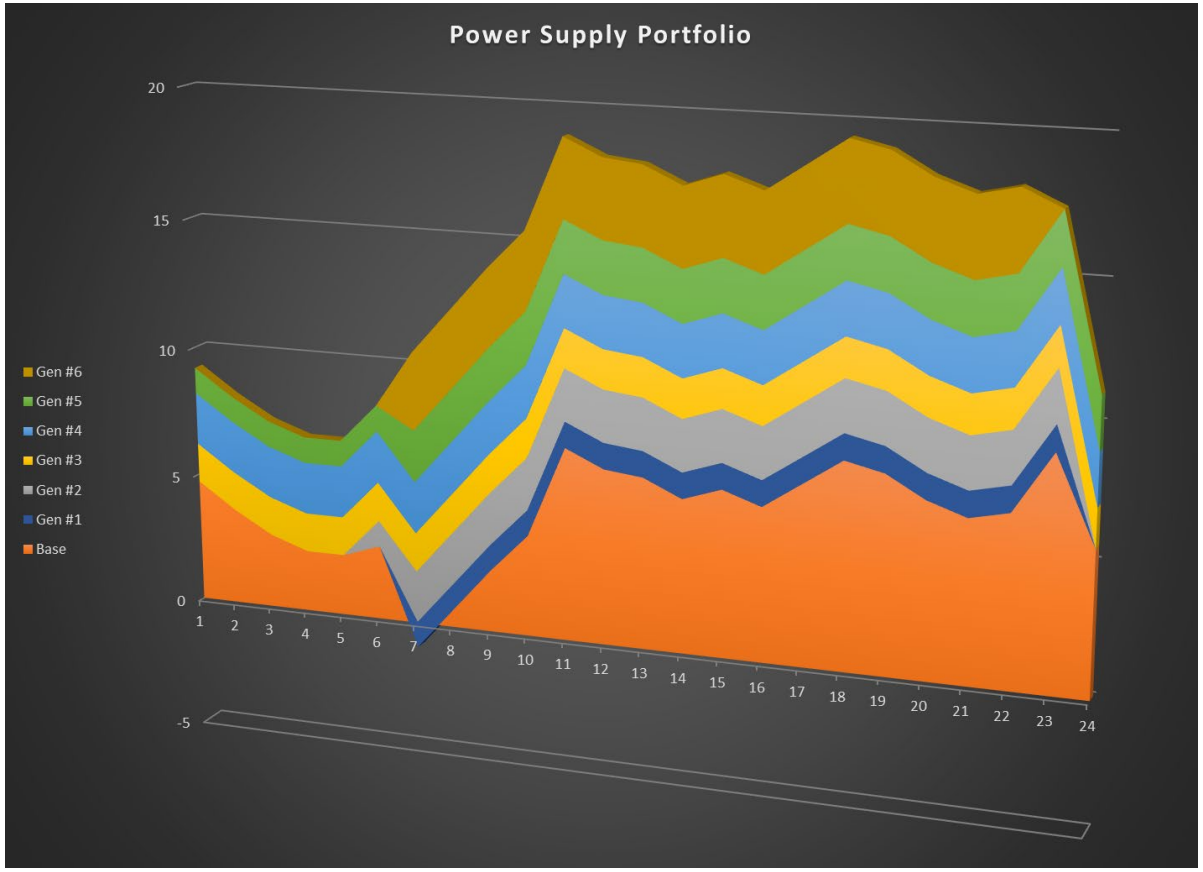
Renewable Resource Plan
Portfolio Management

Petoskey Energy Profile Annualized over one day



Diversification

- Small volumes - many resources
- Layered in at different costs
- Unique start and end dates
- Geographically disparate
- Different technology
- Owned and contracted

Transition to Renewables must maintain prudent risk management

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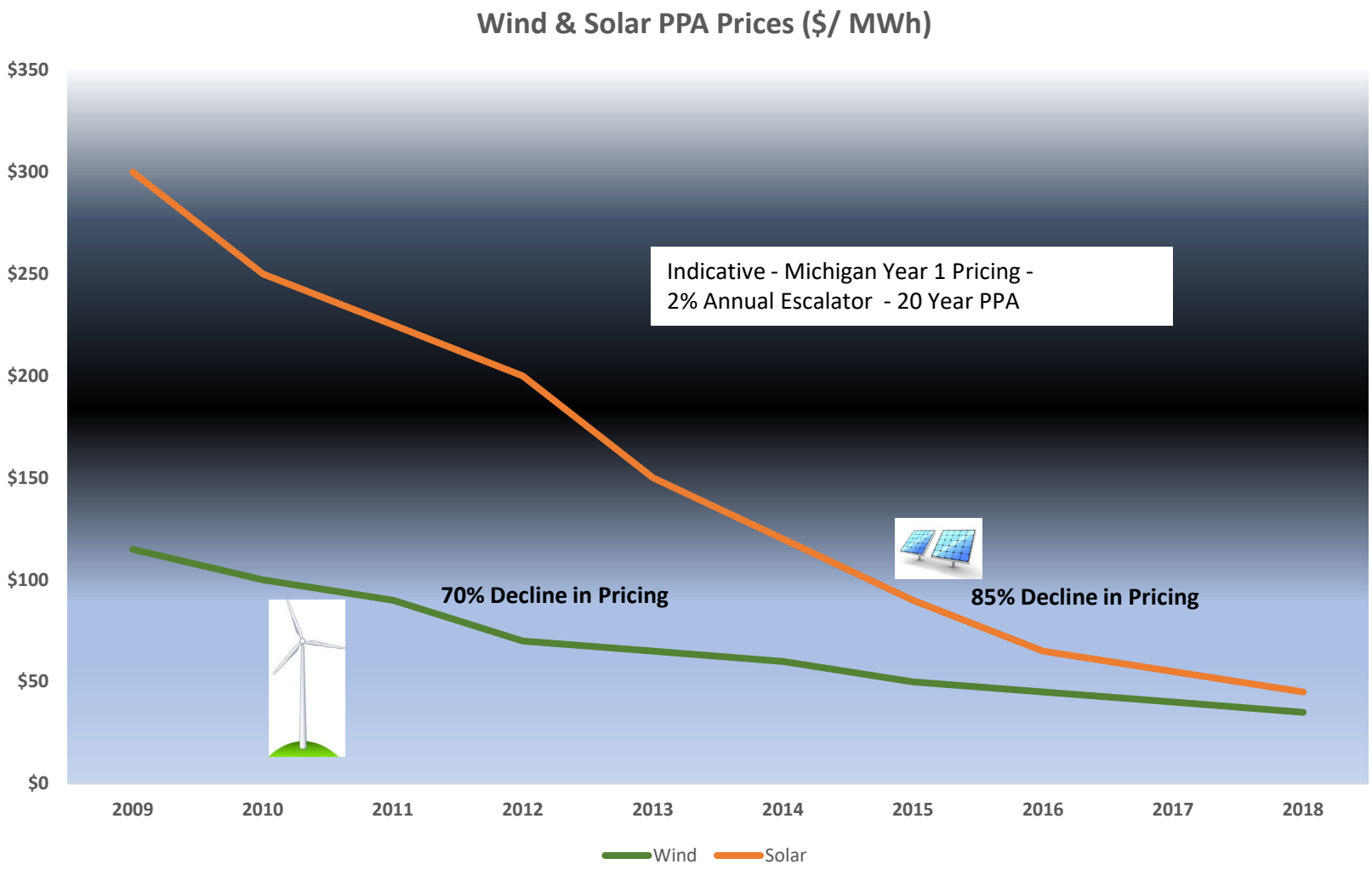
Renewable Resource Plan
Affordability



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Renewable Resource Plan Affordability

- Public Power Advantage (tax exempt)
- Measure - neighbor utilities (IOU's & Coop's)
- Effective Rate Design
- Residential, Commercial and Industrial
- Protect Low Income Customers
- Lower Bills not just rates

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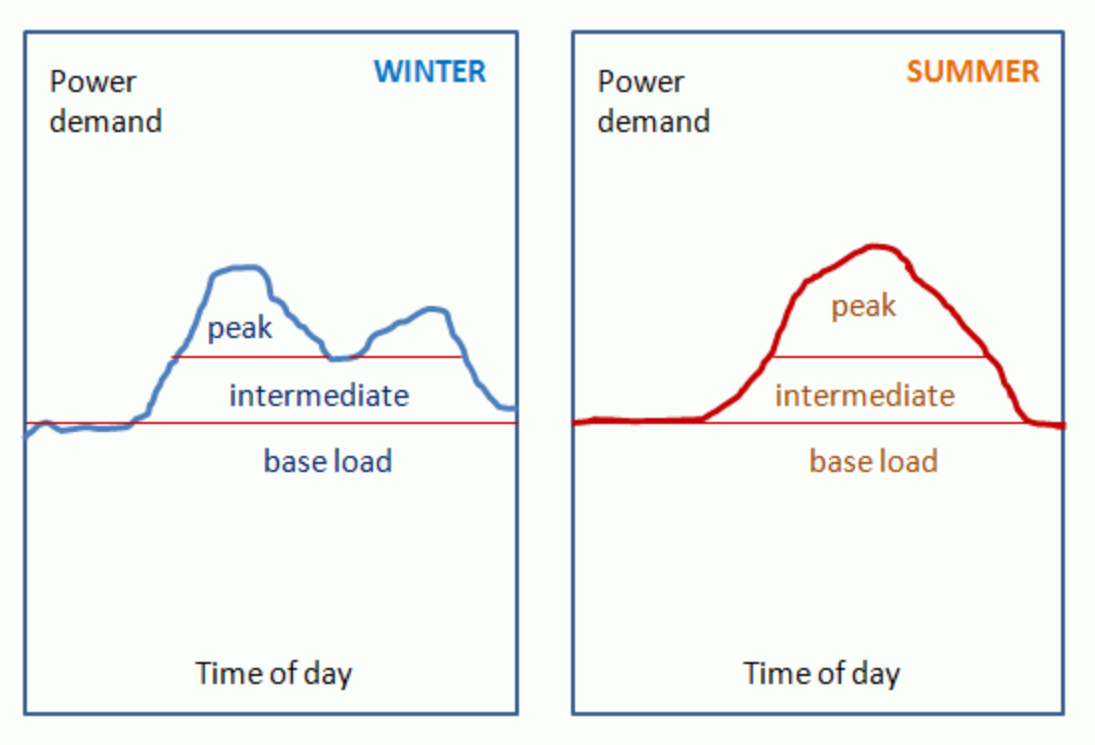
Renewable Resource Plan
Capacity vs. Energy



- Federal standards require enough power supply to meet expected annual peak plus reserves
- Reserves equal additional power supply (above peak) that must be carried to guard uncertainty
- State of Michigan requires those standards be demonstrated 4.5 years in the future
- Renewable Energy is measured against energy consumption not against Capacity

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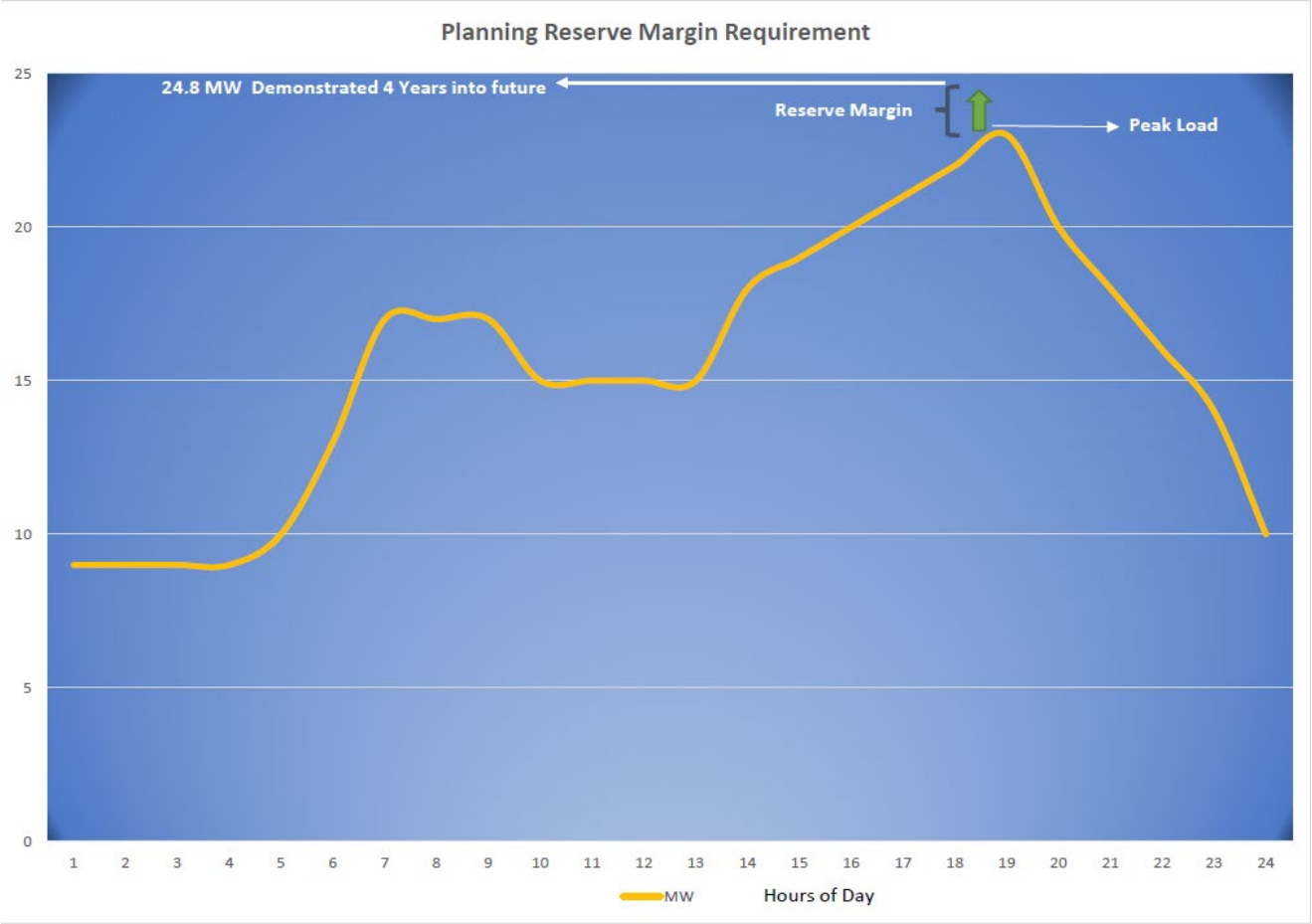
Renewable Resource Plan
Reliability Planning

Public Power Utilities must demonstrate they have electric generating capacity owned or contracted to meet peak load plus reserves 4.5 years in advance



24.8 MW

Capacity Demonstration Filing Due

Feb 2019

June 19 – May 20 | June 20 – May 21 | June 21 – May 22 | June 22 – May 23

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Renewable Resource Plan
Capacity and Energy Performance Considerations

Required size (MW) of Resource Type to meet Michigan Energy and Demand

Energy and Capacity per MW - Annualized			Annual Michigan Energy Consumption (MWh)	Annual Peak Reliability Requirement (MW)
Power Resource Type	Energy % of Year	Capacity Rating per MW	95,000,000	22,500
			MW	**MW**
Solar	**20%**	**50%**	54,224	45,000
Wind	**35%**	**15%**	30,985	150,000
Nuclear	**90%**	**90%**	12,050	25,000
Steam Coal - (large)	**60%**	**90%**	18,075	25,000
Baseload (Natural Gas)	**75%**	**92%**	14,460	24,457
Peaking (Natural Gas)	**10%**	**90%**	108,447	25,131

Land Use implications signifcant - Solar and Wind geographic footprint large per MW

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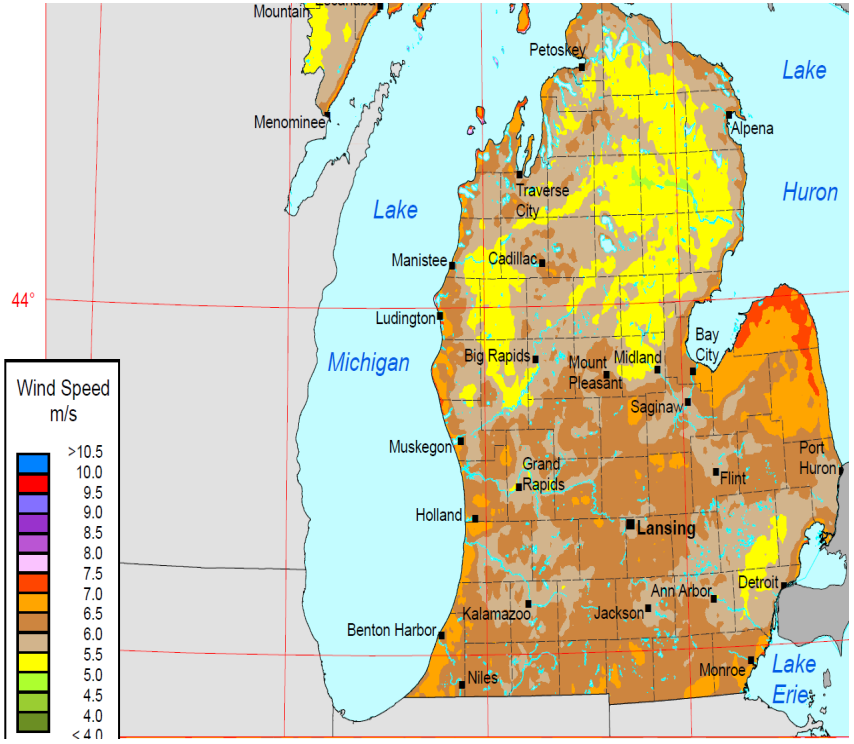
Renewable Resource Plan
Wind Power Challenges

- 10 Michigan Counties (where wind resource is best in lower Michigan) have taken up restrictive wind ordinances
- A group of 5 Counties recently proposed Senate Bill 46 to increase taxes on wind projects
- Transmission Line (known as Thumb Loop) energized in 2015 approximately 30% subscribed and stalled
- National opposition group – well funded
- Ability to develop along west side of State (along lake) complex due to value of property



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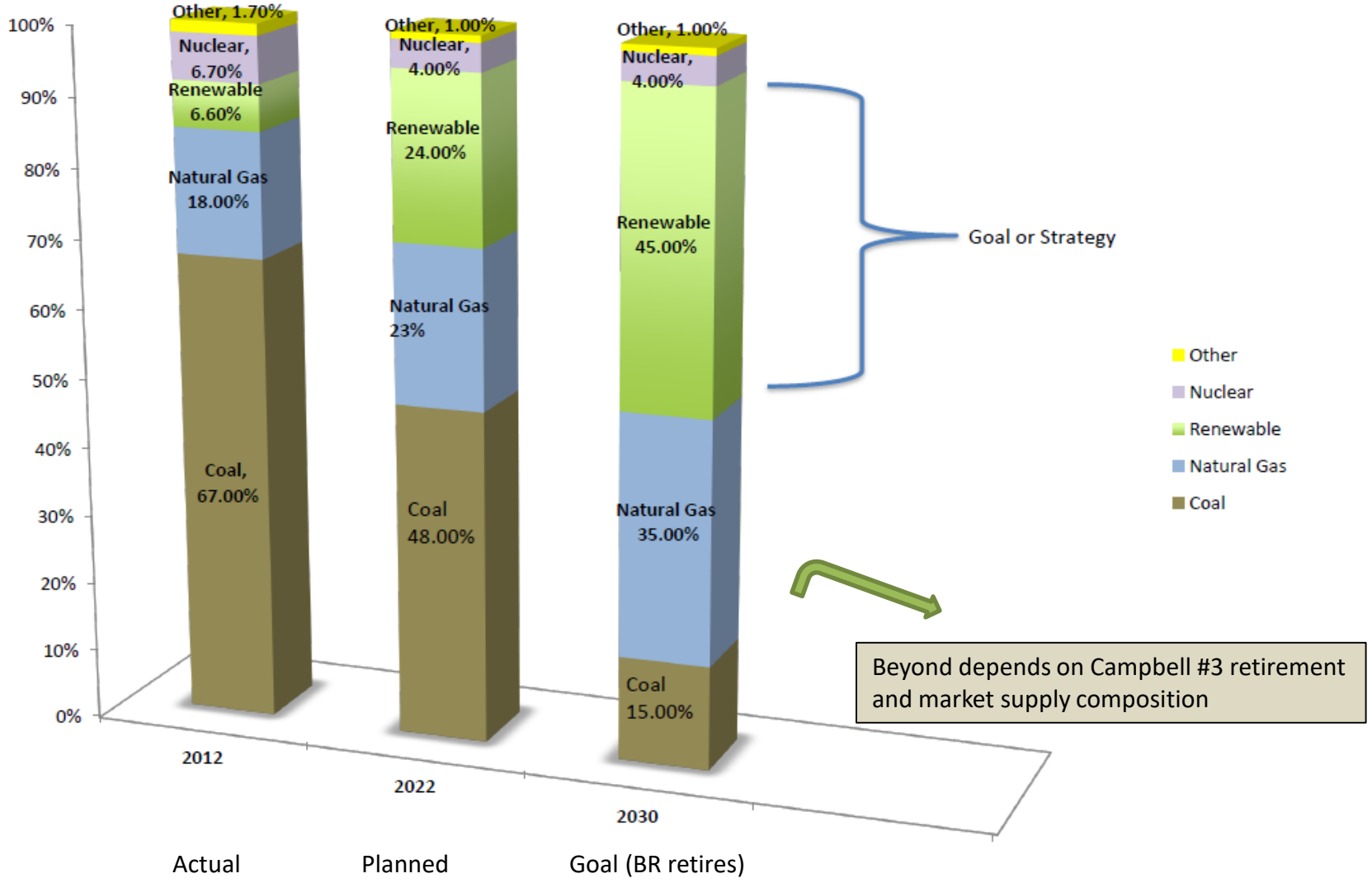
Petoskey Power Supply
Fuel Composition



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Joint Action – Renewable Supply

All Full Members participated to share resources, reduce risk and get best economics

- Executed 350 MW of Power Purchase Agreements since 2008 – representing approx. 18% of total Agency energy needs
- Additionally some Members have their own projects
- Contracted instead of owned because of Federal Tax Credits (can't be monetized by Muni's)
- That will change with PTC / ITC phase out (2022)
- New Wind is a big challenge – Muni's, Coop's and IOU's all experienced project failure
- Executed 100 MW of Solar and looking to double that to counteract wind challenges

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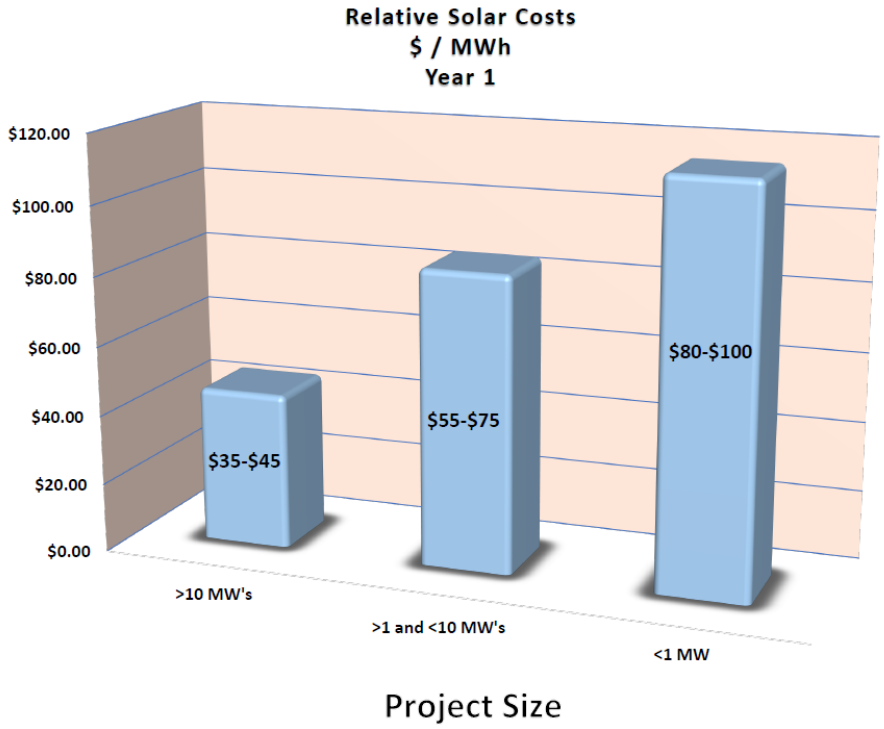
Joint Action – Renewable Supply

Economics and Next Steps

Economies of Scale



- Agency refining organizational design to focus on Strategic Power Supply (x > 6 years)
- Staff proposed establishing Advanced Renewable Energy Project for Members that want to accelerate transition to renewables. Ensure Members are:
  - Minimizing cost through economies of scale
  - Diversify supply participation across resources and projects (portfolio management)
  - Layer in supply over time to participate in technology advancement
  - Budget for Affordability for all customers
  - Consider / plan for reliability

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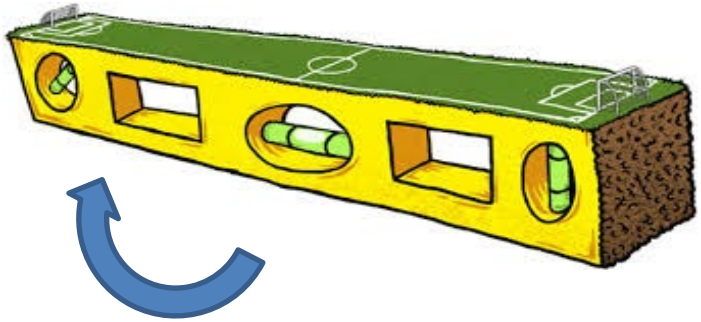
What is the path forward ?

Market forces leveling the playing field for public power

Distributed Energy Resources

Leverage local people & infrastructure without sacrificing economics



Natural Gas

Easily accessible, competitively priced for small users

Renewable Energy

Thru Joint Action – equivalent economics to IOU's

Competitive regional markets

Open access to all market participants, visibility of prices

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Petoskey Strategy
Renewable Resource Plan

- Petoskey establish objectives of decarbonization strategy
- How does Renewable Energy fit into plan?
- Establish tight Renewable Energy specifications so supply requirements are clear to ensure community objectives are met
- Work with Agency on Renewable Resource Plan
  - Current portfolio
  - % Targets and Time Horizon
  - Specifications
  - Portfolio Management
  - Affordability
  - Reliability

- Realize power supply transformation has challenges – technology will eventually provide solutions but time horizon must be realistic

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