



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY



GRAHAM
SUSTAINABILITY INSTITUTE
UNIVERSITY OF MICHIGAN

CLEAN ENERGY & ENERGY MANAGEMENT WEBINAR SERIES

Introduction to Planning & Zoning for Wind and Solar

Have a question?

Use the “Questions” function to pose questions throughout the webinar



The screenshot shows a software window with a menu bar (File, View, Help) and a toolbar on the left. The main content area is divided into two sections:

- Audio:** Features a "Sound Check" link, radio buttons for "Computer audio" (selected) and "Phone call", a "MUTED" indicator with a microphone icon, a dropdown menu for "Transmit (2- Plantronics Savi 7xx)", a volume slider, and another dropdown menu for "Speakers (2- Plantronics Savi 7xx)".
- Questions:** Contains a large text input field, a smaller input field with the placeholder text "[Enter a question for staff]", and a "Send" button.

At the bottom of the window, there is a footer section with the text "Webinar Now", "Webinar ID: 200-167-467", and the "GoToWebinar" logo.

Today's Speakers

- **Hannah Smith** - Master's Student at the University of Michigan School of Urban and Regional Planning
- **Sarah Mills, PhD** - Senior Project Manager at the Graham Sustainability Institute



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INTRO TO P&Z FOR WIND & SOLAR ENERGY

Sarah Mills, PhD

Hannah Smith

Overview

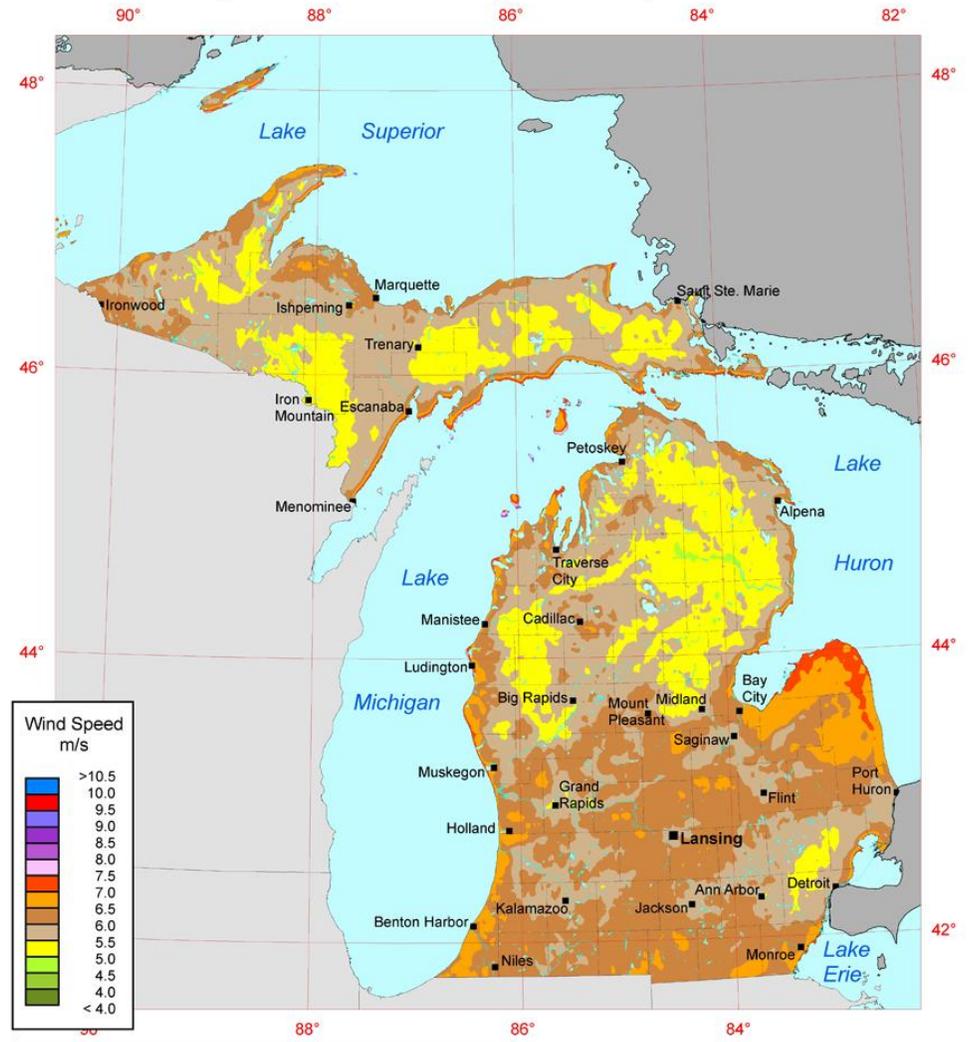
- **Why plan (or re-plan) for renewable energy?**
- **Community impacts of wind & solar**
- **Basic principles in planning/zoning for clean energy**
- **Planning and zoning resources**



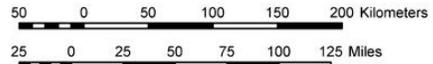
Photos by Gonz DDL and John Cameron on Unsplash, Jukka Niittymaa on Pixabay

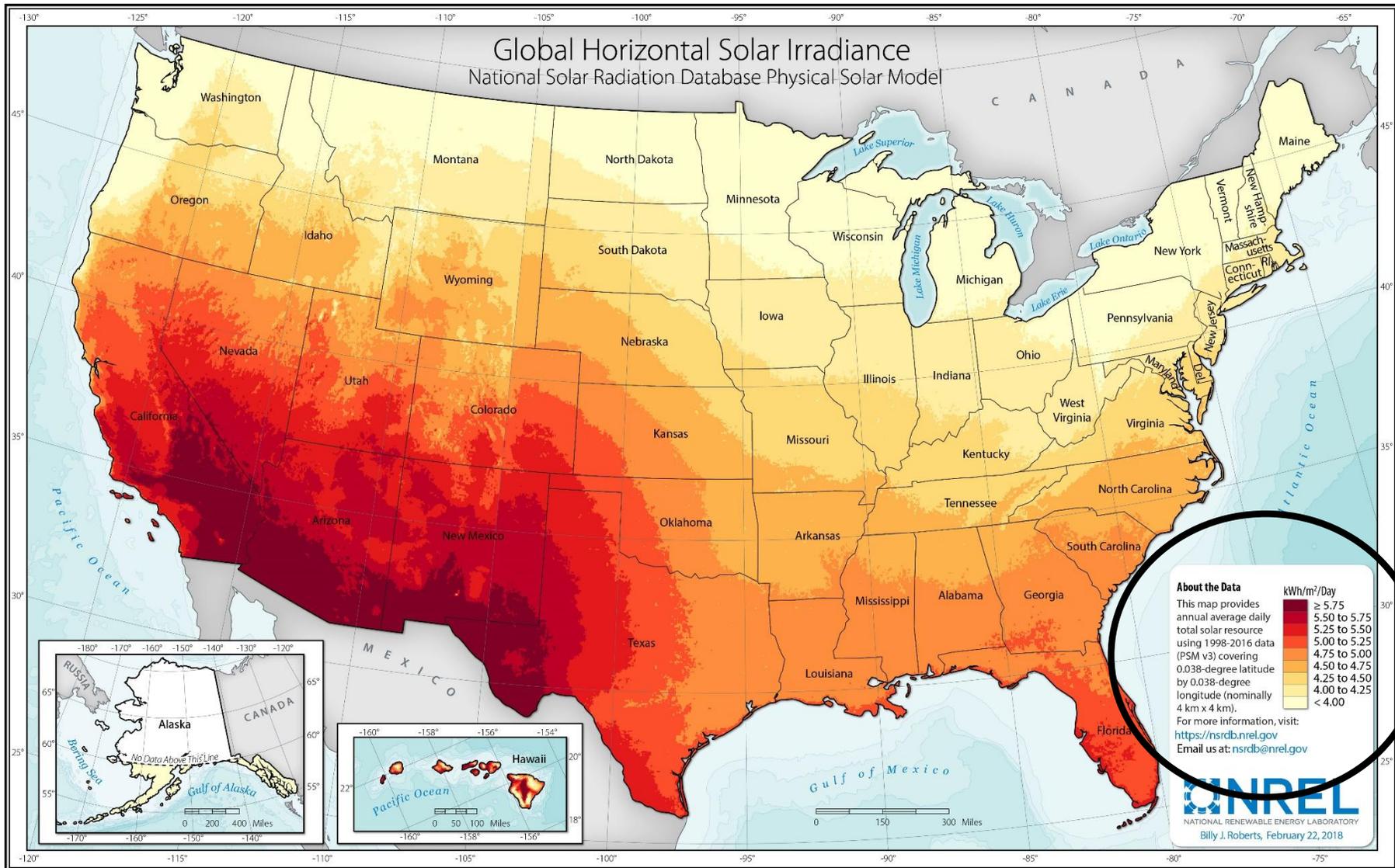
WHY PLAN (OR-REPLAN) FOR RENEWABLE ENERGY?

Michigan - Annual Average Wind Speed at 80 m



Source: Wind resource estimates developed by AWS Truepower, LLC for windNavigator®. Web: <http://www.windnavigator.com> | <http://www.awstruepower.com>. Spatial resolution of wind resource data: 2.5 km. Projection: UTM Zone 16 WGS84.





Existing Utility-scale Solar & Wind 2,290 MW



Source: U.S. Energy Mapping System, March 13, 2021
<https://www.eia.gov/state/maps.php>

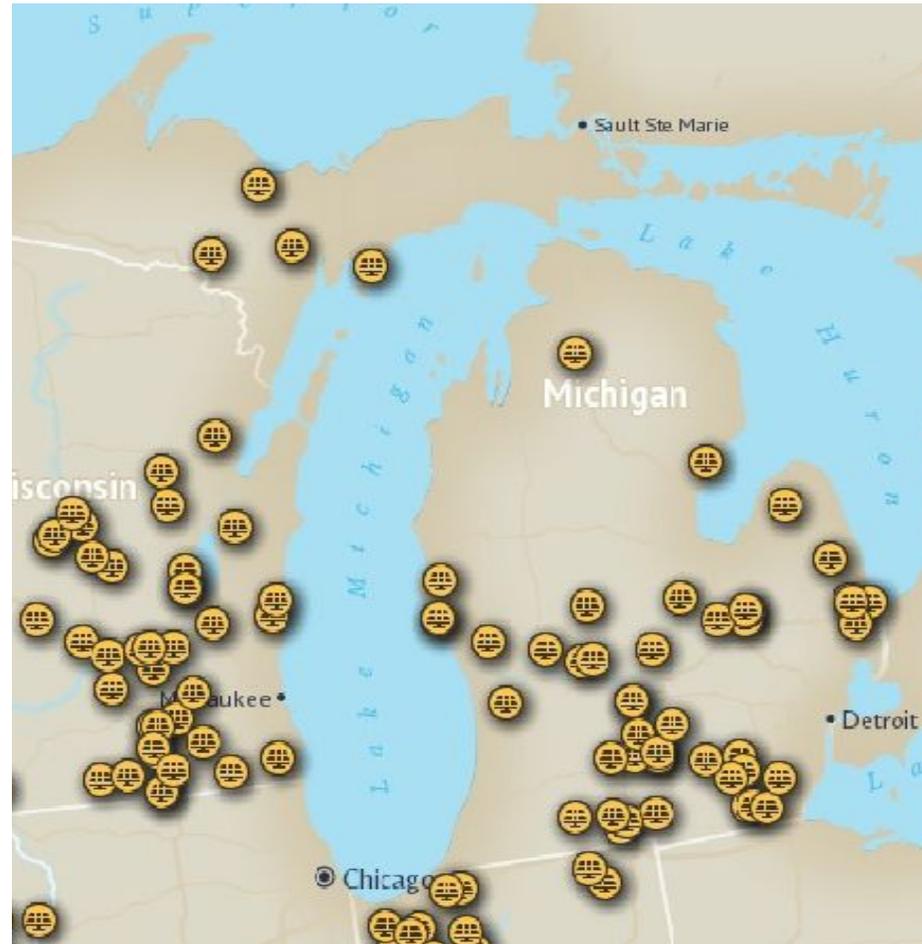
Wind being considered 11 projects, 1,968 MW



Source: MISO Queue, March 13, 2021

<https://api.misoenergy.org/PublicGiQueueMap/index.html>

(Large) Solar being considered 48 projects, 6,708 MW



+ 3,000 MW of
small projects

Source: MISO Queue, March 13, 2021

<https://api.misoenergy.org/PublicGiQueueMap/index.html>

Not all—but lots—will be built

CRAIN'S DETROIT BUSINESS

THIS WEEK NEWS & DATA AWARDS SPECIAL FEATURES VOICES EVENTS CONTENT

September 02, 2020 08:16 AM

DTE files plan to expand solar by 120,000 homes by 2022

420MW by 2022

gtm: Solar Grid Edge Storage Wind More Trending Podcasts Resources

SOLAR

Michigan PURPA Settlement Set to More Than Triple State's Solar Capacity

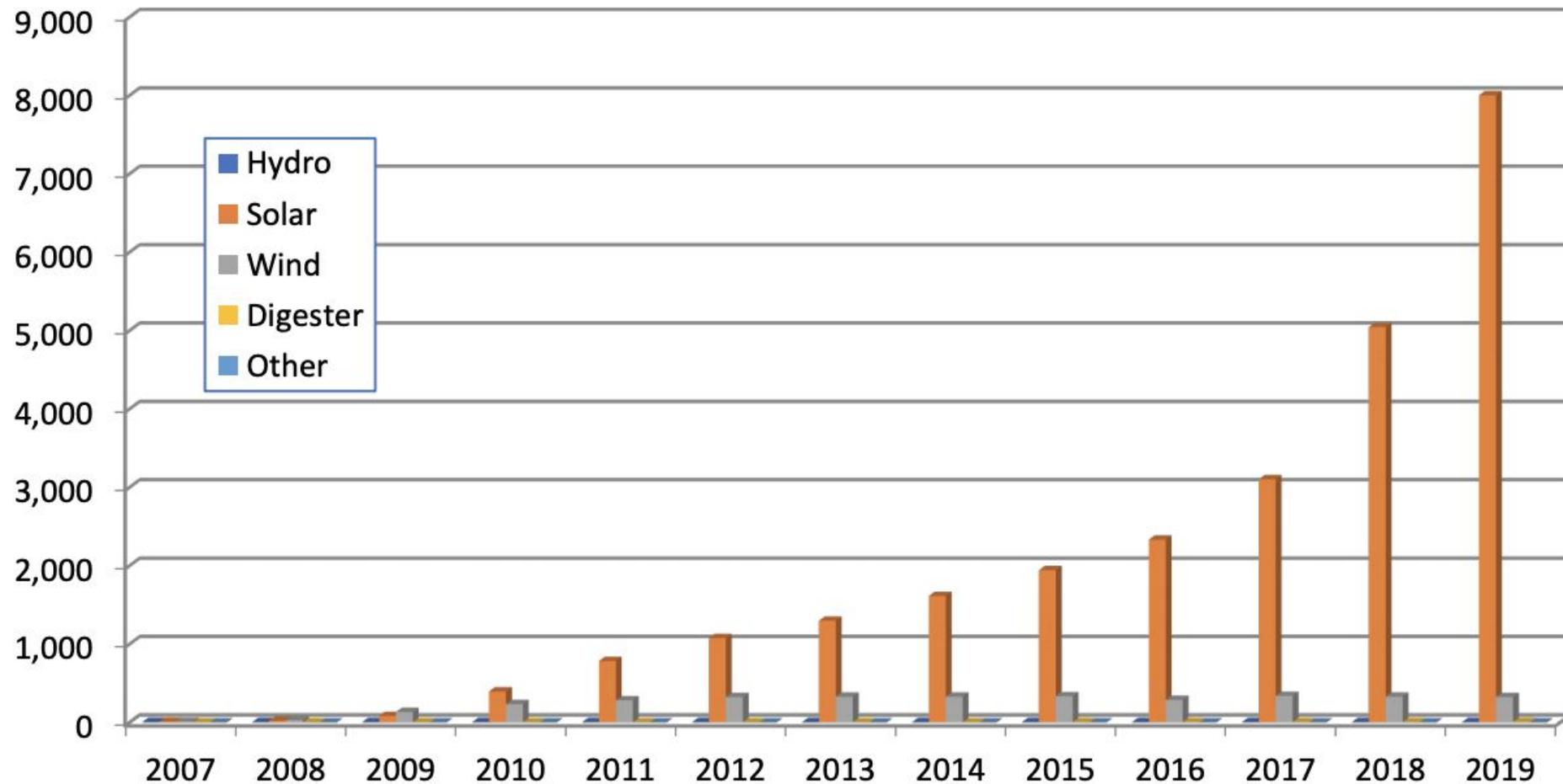
Consumers:
+584 MW by
Sept 2023

Michigan has its first massive solar contract

Consumers Energy has agreed to a deal with Ranger Power to purchase the output of 100 MW of Ranger's planned 149 MW River Fork Solar project, the first deal of its kind known to pv magazine in the state.

SEPTEMBER 9, 2019 **TIM SYLVIA**

Small-scale (net metered) solar also on the rise



Why so much activity?

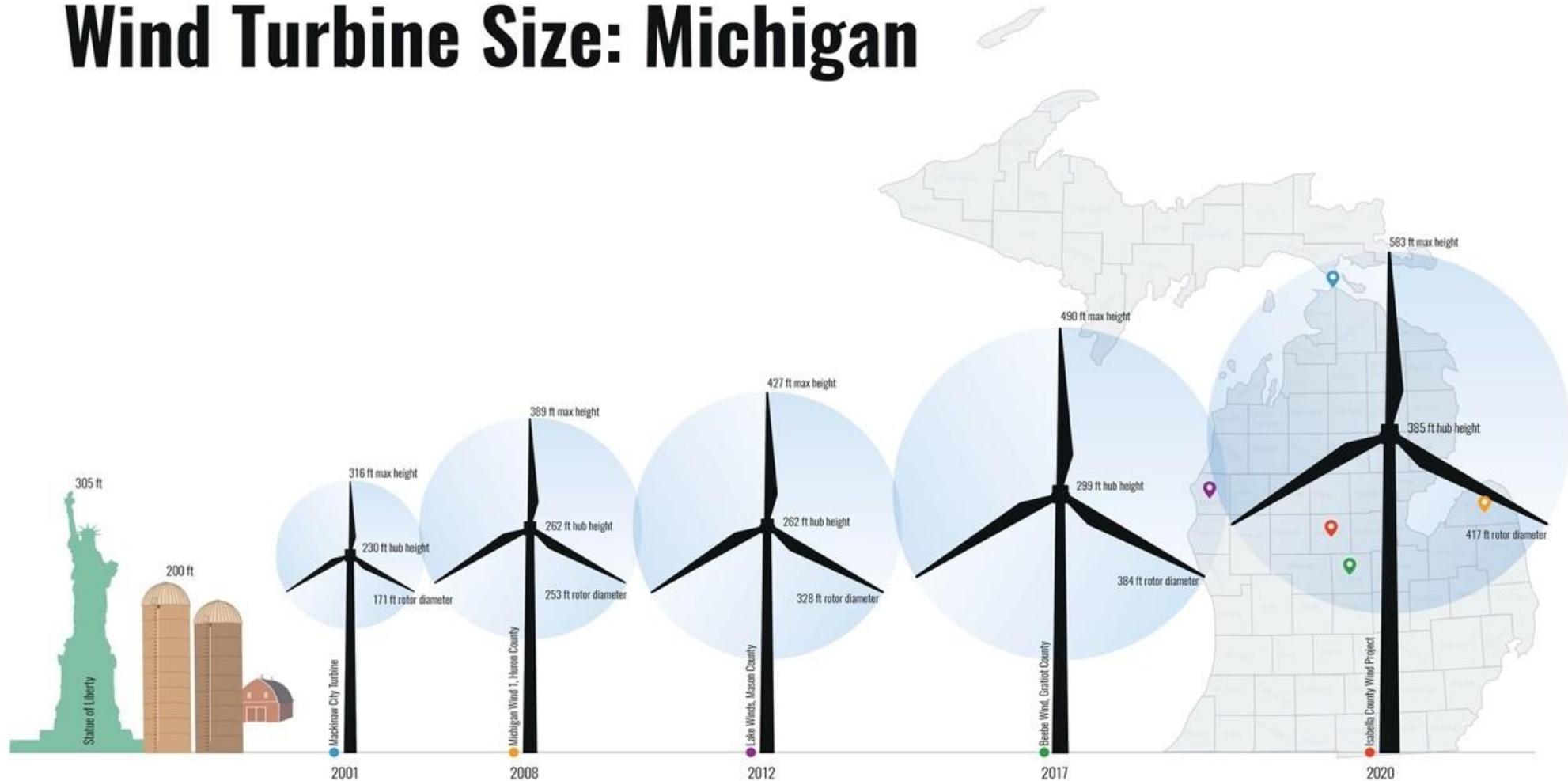


Demand from
consumers, cities,
corporations

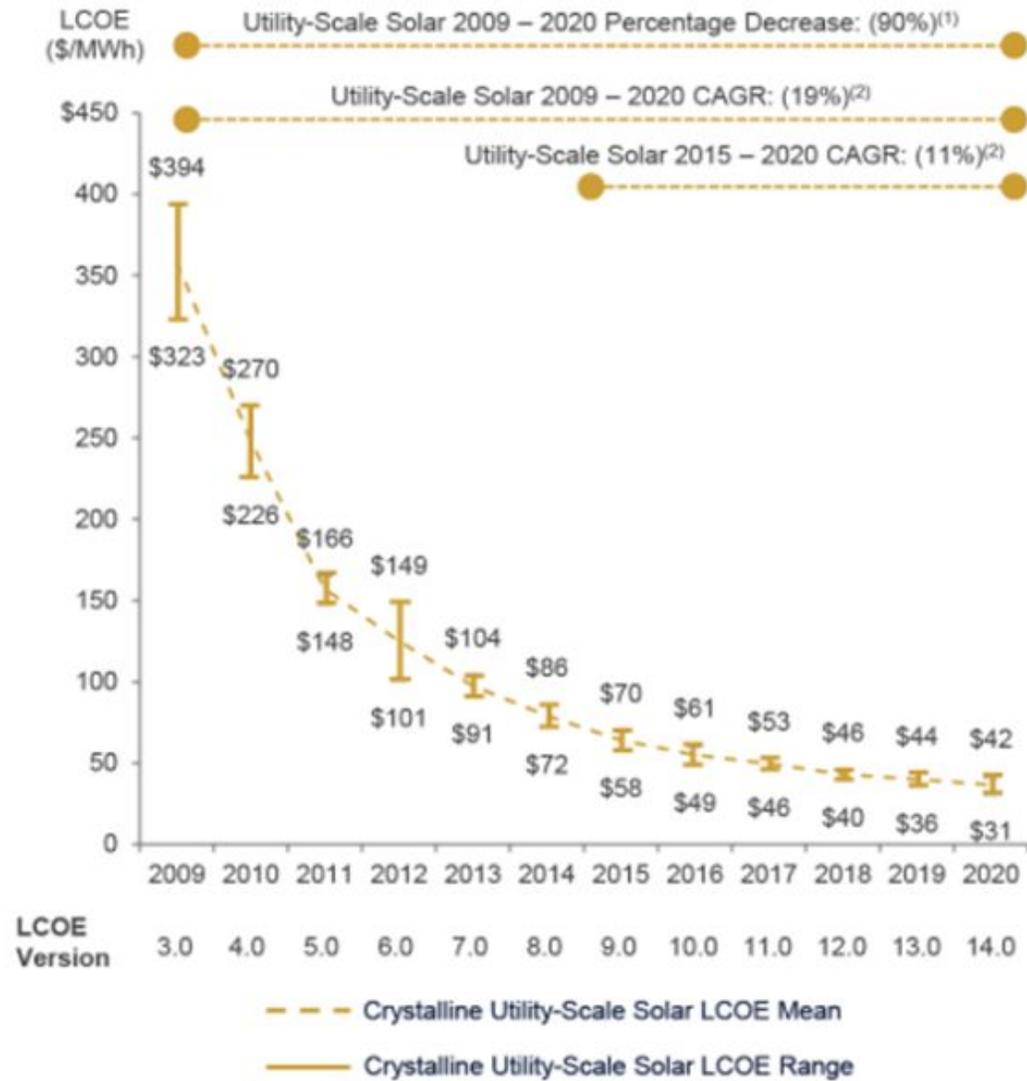
Technology (wind),
cost reductions (solar)
making renewables
possible statewide

Wind Turbine Heights over Time

Wind Turbine Size: Michigan



Unsubsidized Solar PV LCOE



Source: <https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2020/>

Why Plan Now?



Photo:
<https://www.uppermichiganssource.com/content/news/Friends-of-the-Huron-Mountain-s-not-in-favor-of-wind-turbine-project-in-LAnse-489183491.html>

All communities will be
approached within 10 years

- **Set clear expectations for property owners and potential developers**
 - When zoning is silent, ambiguity
- **Best before proposal is on the table**
 - Time
 - Fewer conflicts of interest
 - Strategize



Photo by RawFilm of Unsplash

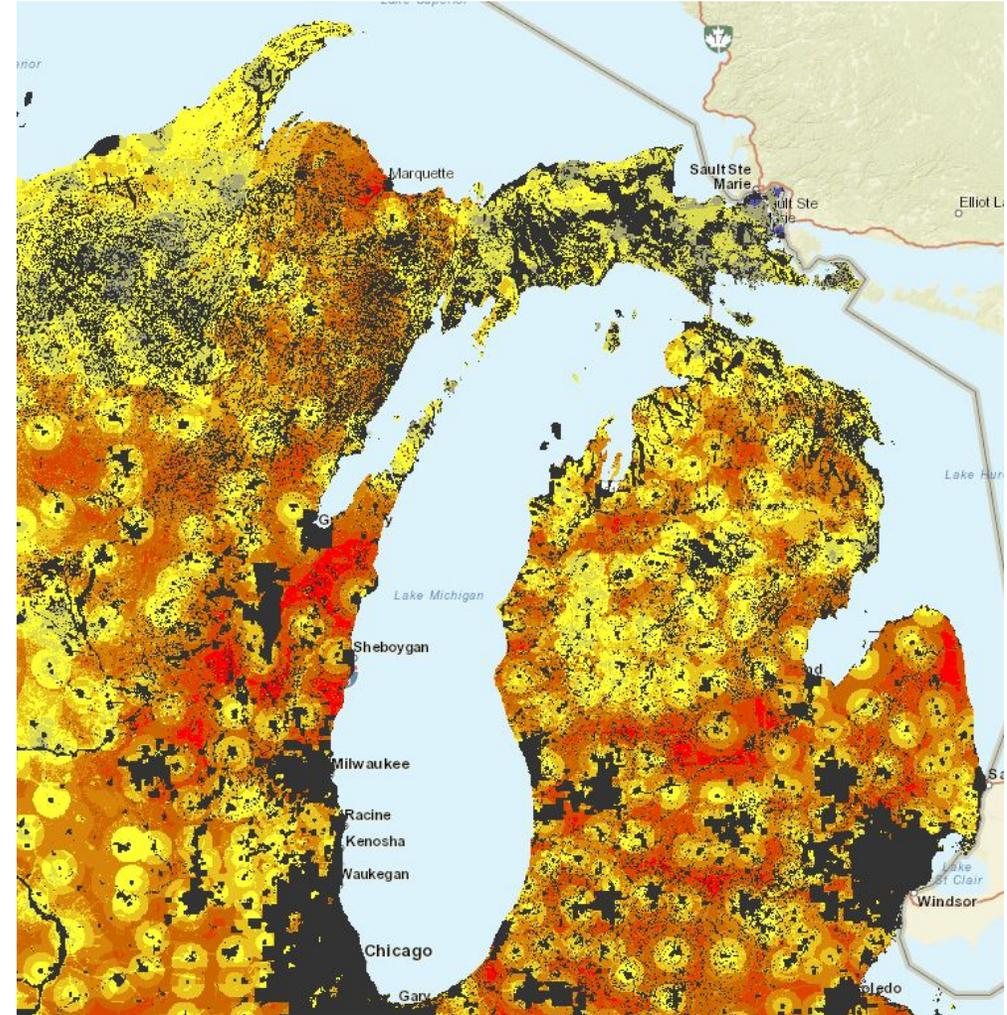
WHAT YOU NEED TO KNOW ABOUT WIND ENERGY

Different scales



Where is utility-scale wind development possible?

- Good wind resource (though relatively easy)
- Looking for access to transmission
- Avoid endangered species
- Away from urban areas
 - Not enough open land
 - Wind disruption



<https://ezmt.anl.gov/mapping/viewer>

Wind Energy

Local Benefits

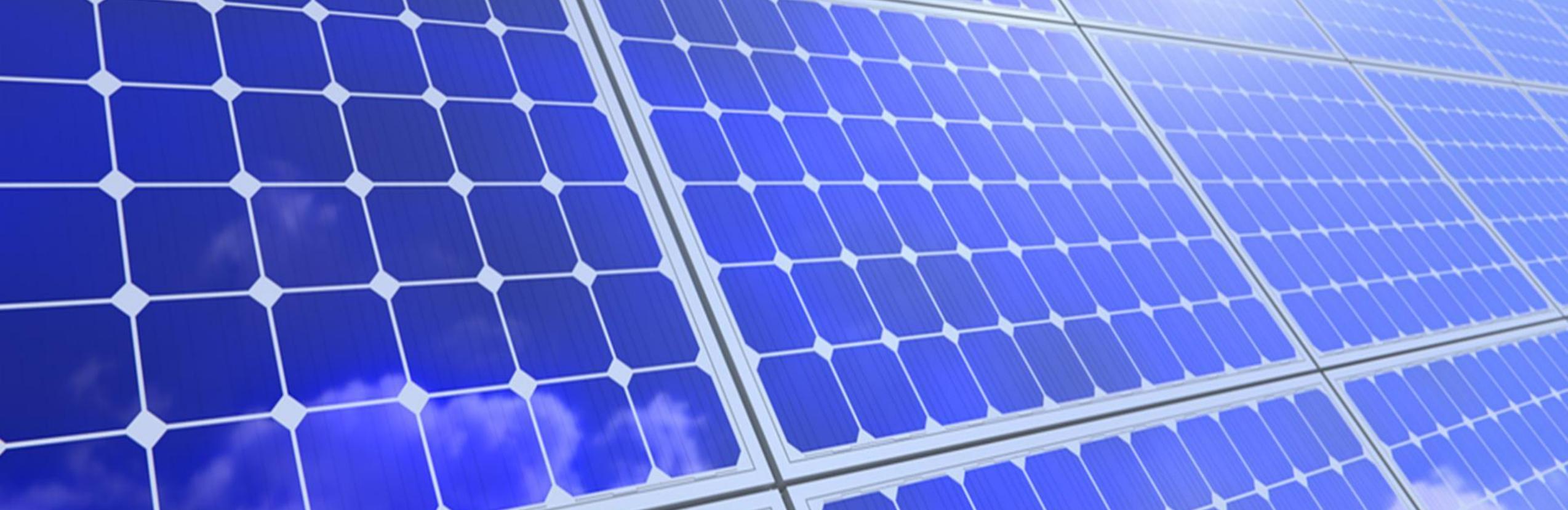
- Landowner payments
 - Farm reinvestment
 - Farm succession
 - Not JUST farmers
- Tax payments, developer donations
 - \$2M+ value / turbine
- Jobs (caveat)

Local Concerns

- Noise / health
- Wildlife
- Visual Impacts
 - Outright
 - On property values
- “Not why I moved here”

Bottom Line on Wind

- Wind = economic development
- If goal is to sustain agriculture, wind can fit
- If goal is for substantial residential development or growth of tourism, wind may not be right



WHAT YOU NEED TO KNOW ABOUT SOLAR ENERGY

Solar comes in all sizes



<https://news.energysage.com/how-many-solar-panels-do-i-need/>

1MW = 5-7 acres
Avg. project in MISO queue = 600-800 acres



Photo: <https://inovateus.com/portfolio-items/lapeer-michigan-solar/>

Where is utility-scale solar possible?

- **Substation access key**
- **How close? Depends on project size**
 - Projects <50 acres typically adjacent to substation or on updated distribution system
 - Larger projects within a couple of miles
- **Prefer cleared, flat land**
 - Farmland
 - Brownfields
 - Parking lots

Utility-scale Solar Energy

Local Benefits

- Landowner payments
 - Opportunity for brownfields!
- Tax payments (?)
- Jobs (caveat)
- Water quality, pollinator potential
- Most viable urban climate action option

Local Concerns

- Wildlife (?)
- Glare
- Visual Impacts
 - “Not why I moved here”
- Wise use of land
 - Farmland (if not dual-use)
 - Urban land where development interest

Bottom Line on Urban Solar

- **Opportunity to demonstrate local climate action**
- **Where lots of land, little development pressure**
 - Revenue opportunity (leases and taxes)
- **Where considerable development pressure**
 - Perhaps limit greenfield solar, development of not-too-dirty brownfields

Bottom Line on Rural (Ag) Solar

- Solar = economic development
- Where land is of marginal quality, no-brainer
- Where ag-based economy with prime soils
 - Be consistent: What else do you allow in ag-district?
 - Solar as short- or long-term land use?
 - Short term: minimize soil movement/compaction & vegetative screening, require decommissioning
 - Long term: require screening & stormwater management, no decommissioning



Photos by Jukka Niittymaa on Pixabay; Gonz DDL and John Cameron on Unsplash

CORE PRINCIPLES FOR PLANNING AND ZONING FOR CLEAN ENERGY

Step 1: Plan first!

- **How does renewable energy fit with your long-term plan?**
 - For local economic development
 - For land use
 - For local climate action
- **What sort of renewable energy, at what scale, and in which part of community?**
 - On-site use renewables, typically uncontroversial
 - More thought to utility-scale

Step 2: Make zoning match your plan

- **Specifics matter for ability to realize plan**
- **Unlikely to satisfy everyone**
 - Averaging satisfies no one
- **Doesn't have to be all or nothing**
- **Beware of zoning out**
 - But making really hard is ok

When all else fails, or to arbitrate disputes: Be consistent

- What else do you allow in districts, on prime ag land?
- What else do you require screening for, set noise limits for?
- What else do you require decommissioning bonds, performance bonds of?

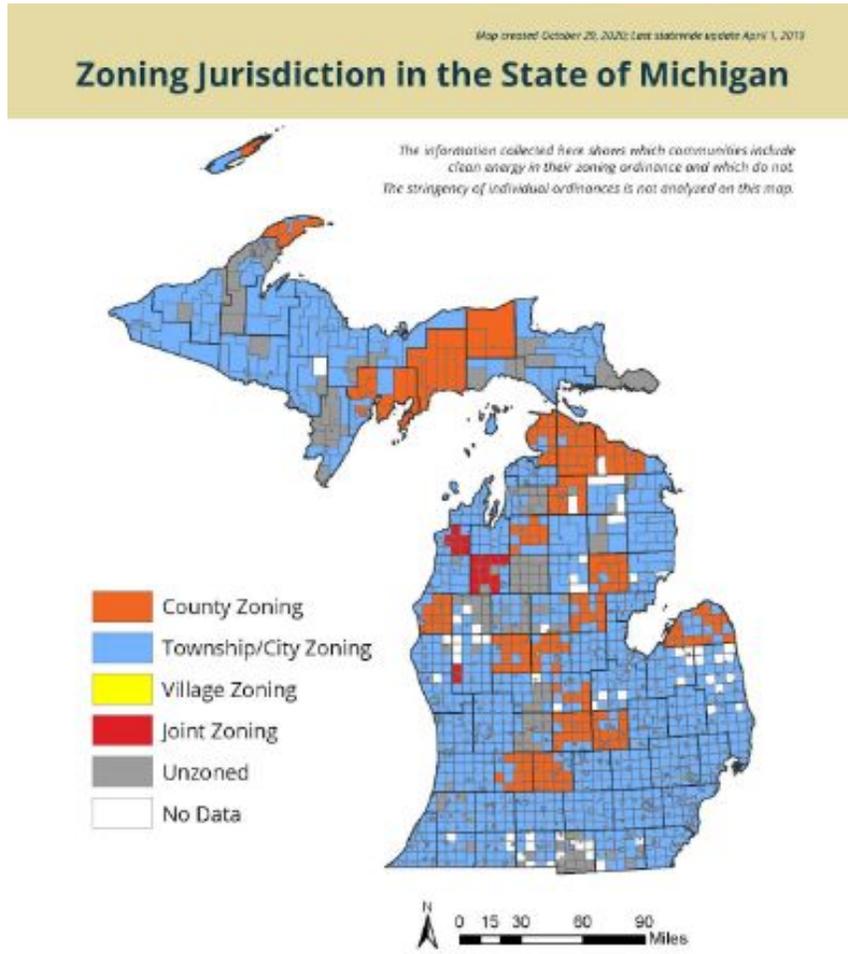
Planning and Zoning Resources

- Curated repository of templates, guidance
 - <http://graham.umich.edu/climate-energy/energy-futures>
- Case Studies, FAQs
- March-April 2020 issue of Planning & Zoning News
- Updated (Oct 2020) zoning guidance on wind from MSU, coming guidance on solar



The screenshot shows the Michigan Office of Climate and Energy website. At the top, it says "Michigan.gov" and "Department of Environment, Great Lakes, and Energy". The main heading is "Office of Climate and Energy". Below this, there are navigation tabs for "ABOUT", "CLIMATE", and "ENERGY". A secondary navigation bar includes "CLIMATE AND ENERGY / ENERGY / COMMUNITIES". A large blue banner contains the text: "Energy Services assists, educates, and encourages Michigan communities to advance conservation and efficient use of energy resources so they may provide for a healthier environment and achieve greater energy security for future generations." Below this banner is a section titled "COMMUNITY ENERGY MANAGEMENT". It includes a paragraph: "Energy management is the process of tracking the energy you use, finding opportunities to reduce the amount of energy needed, taking action on those opportunities, pursuing renewable energy sources and continuously monitoring your energy. Through active energy management, you can take control of your electric bill." and a "LEARN MORE ABOUT COMMUNITY ENERGY MANAGEMENT" button. The next section is "COMMUNITY IMPACTS OF RENEWABLE ENERGY", which is divided into two columns. The left column is "COMMUNITY SOLAR" with a paragraph: "Community solar is a solar energy system that generates renewable energy and is shared by multiple subscribers in a community. Learn more to find out about solar power in your community." and a "LEARN MORE" button. The right column is "CLEAN ENERGY IN MICHIGAN SERIES" with a paragraph: "The Clean Energy in Michigan Series provides case studies and fact sheets answering common questions about clean energy projects in Michigan." and a "LEARN MORE" button. The final section is "PLANNING & ZONING GUIDANCE", which is divided into three columns. The first is "SOLAR RESOURCES" with a solar panel icon and a paragraph: "Guidance on incorporating renewable energy in to community plans and ordinances for solar energy." and a "LEARN MORE" button. The second is "ZONING FOR RENEWABLE ENERGY DATABASE" with a map of Michigan icon and a paragraph: "In a unique project, EGLE and University of Michigan's Graham Sustainability Institute have developed the Michigan Zoning Database, a searchable source of information of municipal ordinances." and a "LEARN MORE" button. The third is "WIND RESOURCES" with a wind turbine icon and a paragraph: "Guidance on incorporating renewable energy in to community plans and ordinances for wind energy." and a "LEARN MORE" button.

Michigan Zoning Database (Thanks to EGLE)



- Database of most zoning ordinances in the state; which have wind/solar content
- Available at <https://www.michigan.gov/energy/>

Consider whether peer communities do or do not have energy projects

EGLE grants

- Community Energy Management Incentive Program
- Grants for updating plans & ordinances for renewable energy
 - Up to \$15,000
- Apply at www.Michigan.gov/energy

OFFICIAL WEBSITE OF MICHIGAN.GOV

Department of Environment, Great Lakes, and Energy
Office of Climate and Energy

CLIMATE AND ENERGY / ENERGY / BUSINESSES

Community Energy Management Incentive Program

Energy Services will offer financial incentives to communities, public education K-12 schools and postsecondary institutions, and other entities for energy related implementation projects, recommended from energy audits and assessments that can be completed between February 1, 2021 and July 31, 2021. The maximum rebate award is \$15,000 per applicant.

Awards will be given on a first come first serve basis at the discretion of Energy Services to work with local governments, public education K-12 schools and postsecondary institutions, and other entities on energy management, energy efficiency and renewable energy projects such as, but not limited to: benchmarking, ASHRAE Level I or II audits, energy efficiency upgrades, renewable energy projects, training, workshops, updating plans/ordinances to include energy, etc.

https://www.michigan.gov/climateandenergy/0,4580,7-364-85453_85455_85523-475266--,00.html

Questions?

- **Reach out to us**
 - Answer questions
 - Give presentation
 - Connect you to MSU-Extension, other communities
- **Wind-, solar-specific webinars**

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CLEAN ENERGY & ENERGY MANAGEMENT WEBINAR SERIES

Upcoming Webinars & Trainings

April 13 Zoning for Utility-Scale Wind Energy

April 27 Zoning for Utility-Scale Solar Energy

Stay Up-to-Date and Find Recordings

www.Michigan.gov/Energy > Energy tab > Communities