Reaching 100% Renewable Energy in Traverse City, MI

Review of Community Benefits Models and Engagement Strategies

August 2018

groundwork
CENTER FOR RESILIENT COMMUNITIES

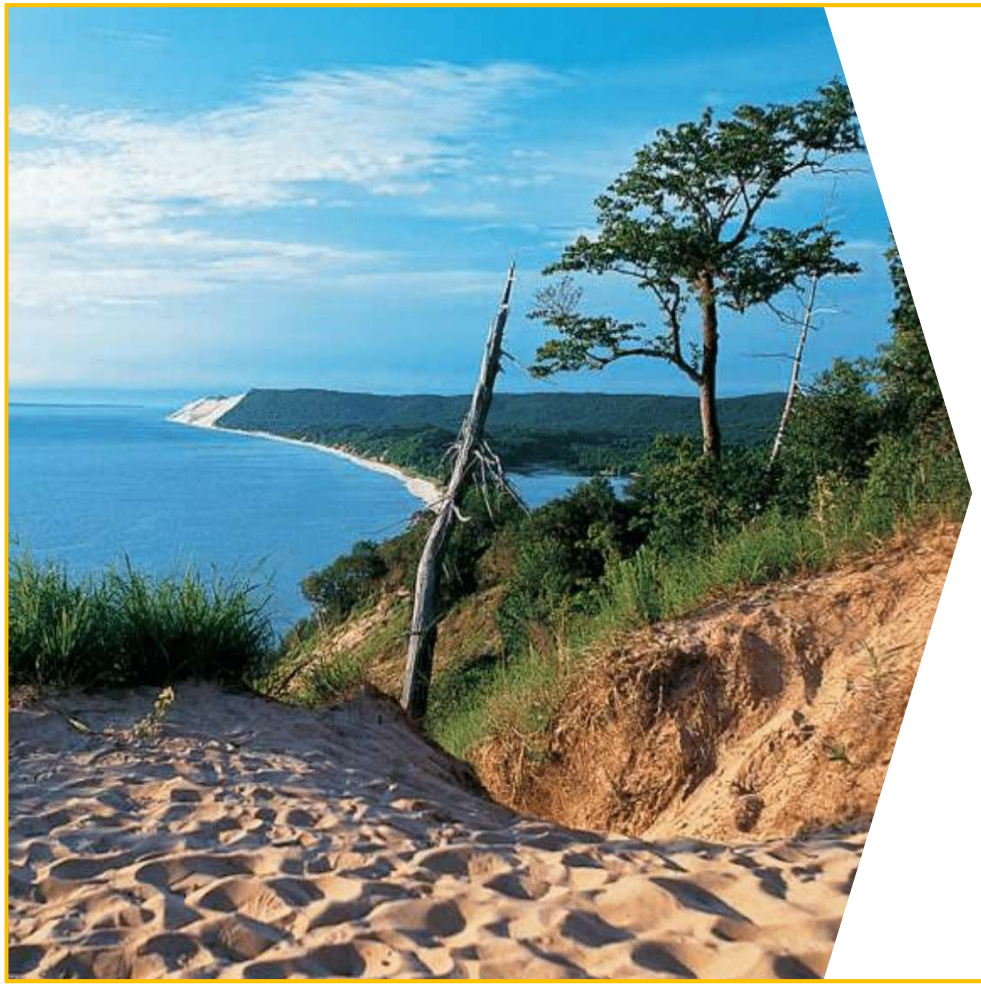
DOW SUSTAINABILITY FELLOWS PROGRAM
UNIVERSITY OF MICHIGAN

Introduction and Background

Reaching 100% Renewable Energy Equitably

- **Project Background:** The Dow Sustainability Fellows team is helping the Groundwork Center identify a business plan and models for community engagement for reaching Traverse City's 100% renewables goal.
- **Energy Development Goals:** The aim of the project is to be community-driven, with benefits inclusive of low and middle-income residents.
- **Log-term Outcomes:** The team hopes to develop a model that can be replicated in other communities in Michigan and beyond.
- **Presentation Content:** The scope of this research includes case studies on two types of renewable energy:
  - **Wind:** International and domestic
  - **Solar:** Domestic, with a focus on community solar, which is defined as a development that accepts capital from and provides output credit and tax benefits to individual and other investors within a local community.

Presentation Outline



1. Project Status Update
2. 100% Renewable Cities: Strategies for Reaching 100%

   How are US cities reaching their energy goals?
3. Community Engagement Strategies and Decision-Making

   What are the best practices for engaging communities in the energy project development process?
4. Community Benefit Mechanisms

   How can financial benefits flow into communities from energy projects?
5. Next Steps

Project Status Update

Engagement Definition and Preliminary Research

- Develop letter of engagement
- Conduct preliminary research of the renewable energy space in MI
- Visit Traverse City and meet with Groundwork Center staff and other key stakeholders

We are here

Phase I: February - April

Phase 2: May - August

Secondary Research and Analysis

- Identify successful business models with associated community benefits
- Identify community engagement strategies and decision-making processes for renewable development
- Research federal, state and local policies that may affect renewable development in Michigan and assess their likely impact
- Develop literature review document summarizing findings from research

Primary Research and Analysis

- Identify the most appropriate model(s) with potential for implementation
- Interview developers with interest in investing in a project with a community benefits structure
- Collect data to calculate expected revenues and costs
- Interview project stakeholders,
- Develop stakeholder landscape for greater Traverse City area renewable projects
- Form preliminary hypotheses for a Traverse City-based model for 100% renewable energy implementation

Phase 3: September - November

Phase 4: November - December

Final Deliverables and Presentation

- Build financial model to assess expected revenues and costs from generating an additional 4mw of renewable energy
- Develop business plan for investing in renewables in Traverse City Produce final report (Deadline: November 28)
- Produce and give final presentation to the Graham Institute (Deadline: November 16)
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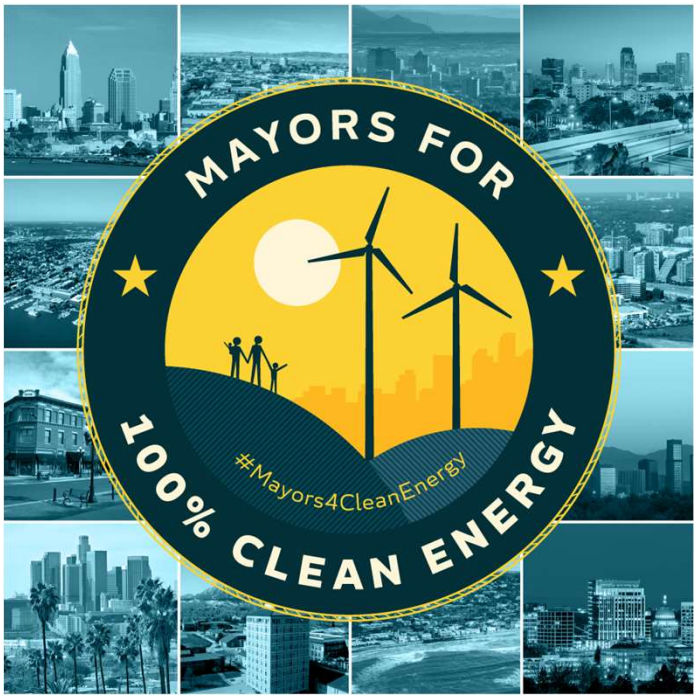
** See Letter of Engagement for full project plan

100% Renewable Cities:
Strategies for Reaching 100%

Sierra Club Mayoral Commitment

Traverse City has a unique opportunity to lead among municipalities committed to using 100% clean energy by creating and implementing a community benefits scheme for future energy development.



- In December 2016, Traverse City, led by Mayor Jim Carruthers, committed to powering all city operations entirely with renewable energy (i.e., wind, solar, geothermal, landfill gas) by 2020.
- City operations include “city buildings, street lights, traffic signals and water treatment facilities and make up 3 to 4 percent of total electricity use in the Traverse City area.
- Traverse City is one of 75 cities with mayoral commitments to 100% clean energy by 2050
- Cities commit to 100% renewable energy in one or more energy-use sector: electricity, buildings, or transportation
- On August 14, 2018, Traverse City Light & Power, the city’s municipal electric utility, voted to generate 40% of its electricity from renewable sources by 2025 and 100% by 2040. Such a commitment represents an even bigger opportunity for Traverse City to lead the energy industry in social sustainability.

Source: “Ready for 100%: 2017 Case Study Report.” *Sierra Club*, 2017, www.sierraclub.org/sites/www.sierraclub.org/files/blog/RF100-Case-Studies-Report-2017.pdf.

Aspen, Colorado

Aspen committed to reaching 100% renewable energy in 2007 and has received media attention for achieving this milestone in 2015.

Aspen's energy landscape includes:

- Hydroelectric (46%)
  - Ruedi Dam hydroelectric facility
  - Maroon Creek hydroelectric facility
- Power purchase agreements (54%)
  - Wind (South Dakota + Nebraska)
  - Landfill gas (Iowa)
- Unbundled RECs to ensure 100%
  - negotiated for low escalation rates and/or fixed energy costs to eliminate cost volatility
- Natural gas for home heating

Key Success Contributor

Hydroelectric facilities were built in the 1980s; bonds were fully retired, meaning that energy costs from these sources are extremely low and stable

Sources: "REACHING 100% RENEWABLE ENERGY." National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy15osti/62490.pdf
City of Aspen. https://www.cityofaspen.com/453/Renewable-Energy
"It's Not Easy, But Aspen Moves Toward 100 Percent Renewable Energy." NPR. https://www.npr.org/2017/07/05/535578438/aspen-moves-toward-its-goal-of-supporting-100-percent-renewable-energy

Georgetown, Texas

30 miles north of Austin with a population of 67,140, Georgetown committed to reaching 100% renewable energy in 2015 with a target achievement date of 2018.

Key Success Contributors

Recent state-wide investment in transmission lines across Texas has led to increased renewables investment, and the Georgetown municipal utility has authority to negotiate PPAs

Georgetown's energy landscape includes:

- Power purchase agreements:
  - Wind + Sun energy from Texas
  - Terms: 25-year fixed price
- Investment in solar to eventually generate local electricity

Sources: "Yes, Cities Can Do 100% Renewable Energy — Even In Texas." Clean Technica. https://cleantechnica.com/2018/04/02/yes-cities-can-do-100-renewable-energy-even-in-texas/
"This is what America's eco city of the future looks like." The Guardian. https://www.theguardian.com/environment/2017/oct/16/texas-town-georgetown-energy-green
"Texas City Leads The Way On Renewable Energy." NPR. https://www.npr.org/2017/03/07/519064002/texas-city-leads-the-way-on-renewable-energy

Burlington, Vermont

Burlington's efforts toward 100% renewable energy began in 2012, and the city achieved its goal in 2014.

Burlington's energy landscape includes:

- Mostly local sources
  - Hydropower (20%)
  - Burning wood chips (35%)
  - Wind + Solar (20%)
- During times of high demand, might use a small amount of power that comes from fossil fuels, but it uses RECs to cancel out that usage

Key Success Contributor

Burlington has an advantage in local sources of power, including hydropower acquisitions and local natural assets, such as wood

Sources: Burlington Electric. https://www.burlingtonelectric.com/our-energy
"America's First All-Renewable-Energy City." Politico. https://www.politico.com/magazine/story/2016/11/burlington-what-works-green-energy-214463
"How Burlington, Vermont, Became The First City In The U.S. To Run On 100% Renewable Electricity." Fast Company. https://www.fastcompany.com/3042029/how-burlington-vermont-became-the-first-city-in-the-us-to-run-on-100-renewable-electricity

Traverse City's recent commitments to renewable energy ***poise the city to drive innovation*** *in the US renewable energy sector, which lags far behind in incorporating community engagement and decision-making strategies, as well as community benefits models that serve middle- and low-income communities. A commitment to the local community* ***provides an opportunity for renewable energy to drive positive change for the environment, local resources, and a source of equitable growth for local communities.***

Community Engagement and Decision-Making Strategies:

Methods for Gaining Public Buy-in

Social License to Operate

Social License to Operate is the overarching concept of approval and/or public-buy in from the citizens of a community in which a development is being built.

- Developers or utilities aim to achieve "the approval or broad social acceptance of a project by the local community and other stakeholders"
- Can be achieved through a formal structure, such as a community trust or consultation committee
- Alternatively, can be achieved through a broad strategic campaign to build community support

Source: "Iowa: Cedar Falls Utilities." Environmental and Energy Study Institute. http://www.eesi.org/obf/solar/casestudies

Case Study: Cedar Falls Utilities

Municipally owned utility in Cedar Falls, IA

- Partnered with a private developer to connect a 1.5 MW solar array to its grid
- Engaged customers early in the process, launching a pre-enrollment media campaign
- Introduced customers to solar farm designs, allowed customers to reserve their unit in advance, and ran a show on local-access TV
- Focused on marketing the project through television, online, in-person, and direct mail channels. to excite customers and answer questions about the "Simple Solar" program
- Exclusively focused on education and engagement; there was no effort to engage the community in decision-making prior to or during project launch

Community Consultation and Community Benefits Agreements

Developers across industries leverage community consultation committees to obtain social license to operate, sometimes implementing a Community Benefits Agreement (CBA) for formal partnership.

Case Study: Atlantic Yards

Real estate development in Brooklyn, NY

- Developer purchased land to build Atlantic Yards Arena in Brooklyn, NY
- Developer engaged a number of neighborhood groups to develop a community benefit agreement (CBA) to gain public support
- Benefits outlined in the CBA include jobs development, small business development and contracting, public housing, community amenities, environmental assurances, and educational initiatives
- Support for the development has waned as residents failed to see the immediate outcomes of the benefits agreement

Source: "Atlantic Yards Community Benefits Agreement: A Case Study of Organizing Community Support for Development." Pace Environmental Law Review, September 2009.

Community Consultation Committee

- Formal forum for discussion between the community, developers, and other stakeholders
- Often include representatives of the community, involved landowners, neighboring landowners, local community organizations, local government, and developers
- Used to provide information about proposal, community concerns, desired community benefits

Community Benefit Agreement

- Formal contract negotiated by developers and local neighborhood groups

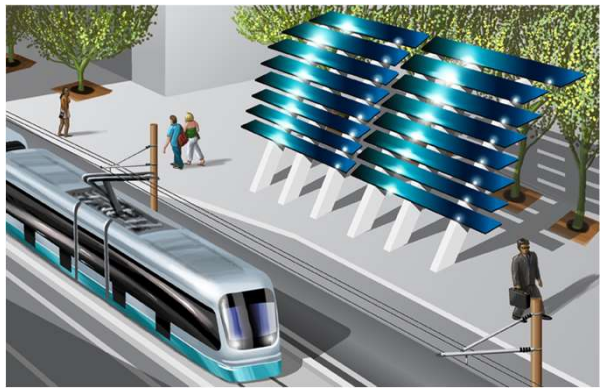
Community Trust

A community trust is a financing mechanism driven by donors that engages the public in identifying local priorities to fund.

Case Study: Solar Commons
Solar development in Tucson, AZ

- Local donors gifted solar panels that were installed on the roof of Dunbar School
- Income stream from the electricity sold goes to a Solar Commons escrow account held in trust by a Federal Credit Union
- The savings on Dunbar school's electric bill produced by this project are funding the school's insurance, technical repairs, and low-income housing weatherization and energy assistance programs

- A non-profit "trust" organization is created to collect and disperse money raised through renewable energy generation
- The energy source is funded by local donors, or other interested parties
- Legalities of creating a trust and installing energy sources on public land can be extremely complex to navigate



Source: "Who We Are." *Solar Commons*, 2018, www.solarcommons.org/.

Community Benefit Mechanisms:
Development Structures to Fund Local Priorities

I. Payments to Communities
II. Payments to Landowners
III. Community Ownership
IV. Local Examples

Community Enhancement Fund

A developer establishes a fund for community initiatives, financed either through a donation or via profits from the development.

Overview:

- Generally administered by a community trust organization, local government agency, or funds awarded on an ad hoc basis through a grants process
- Dollars fund community programs such as transportation, education, etc. within an established radius of the project

Preconditions for Success:

- Well-informed working group to represent the needs of the community
- Plan for achieving long-term outcomes
- Clarity and transparency on the size of the financial benefit

Gaminglay WInd Turbines, UK

- Generates 10% of local energy needs
- Dedicates 10% of revenue to local Community Fund that reinvests into local energy projects
- Owned by residents, operated by a private firm
- Investment options:
  - Fixed interest loan at 6%
  - Equity investment with projected rates of return at 7-12%

Source:" Strategic options for delivering ownership and benefit sharing models for wind farms in NSW." Ernst and Young, September 2014.

Discounted Electricity

Municipal utilities collaborate with developers to provide discounted electricity to customers who contribute space or capital for financing an energy development.

Overview:

- Customers either own or invest in renewable sources
- Customers receive discounts on their electricity that those sources generate
- Some developers also provide advice to community members on energy efficiency, which can help reduce their energy bills

Coyote Ridge, CO

- Solar farm partnership between Colorado Energy Office, Poudre Valley Electric Association, and non-profit GRID Alternatives
- Dedicates 35% of output to low-income residents

Cedar Falls, IA

- Solar farm financed and built by a private developer: RER Energy Group
- Solar farm connected to grid by municipal-owned utility
- Private developer leveraged Federal Investment Tax Credit
- Customers buy 20-year lease on a 170-watt unit for $270 and receive a $1.30 credit for each unit generated

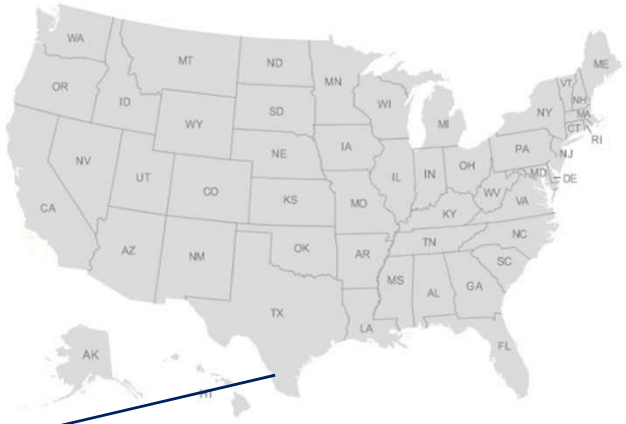
Sources: "Iowa: Cedar Falls Utilities." Environmental and Energy Study Institute. http://www.eesi.org/obf/solar/casestudies
Young, Craig. "Poudre Valley Electric Co-Op Named as Finalist for Award." *Loveland Reporter-Herald*, 21 May 2018, www.reporterherald.com/news/larimer-county/ci_31891201/poudre-valley-electric-co-op-named-finalist-award.

Local Employment and Procurement

Developers 1) provide opportunities for employment via the development, 2) commit to using local employment and procurement for the development, or 3) offer electricity discounts in exchange for labor.

Overview:

- Developers provide employment opportunities for community members for construction and operation of renewable sources
- A 50 MW development can create 48 local jobs during construction and 7 ongoing roles for operation



Bruni, TX

- Partnership between NextEra Energy Resources, an energy developer, and AT&T to deliver 820MW from new wind projects in TX and OK
- The project is estimated to create 1000 construction jobs
- AT&T contributed $50,000 to Texas State Technical College for financial assistance to students earning wind energy degrees or certificates; the scholarship is open exclusively to students from TX counties with AT&T-backed wind farms; NextEra has agreed to interview graduates of the program for future wind technician positions and internships
- NextEra Energy supported a wind energy technician program for Webb County Consolidated Independent Schools, including contributing a wind turbine gear box to help students with hands-on training

Source: "AT&T Expands Its Renewable Energy Program with NextEra Energy Resources." Cision PR Newswire. https://www.prnewswire.com/news-releases/att-expands-its-renewable-energy-program-with-nextera-energy-resources-300667038.html

Landowner Lease Payments and Proximity Rent

These schemes offer a traditional form of payment (leases) and build on this foundation by paying rent to those in proximity to the development.

Landowner Lease Payments

- Landowners lease their land to developers in exchange for payment to host renewable sources
- Can lead to disapproval among neighbors and the broader community

Proximity Rent

- Rent paid to landowners within a certain distance from a renewable source
- Low administrative costs
- Model scales well
- Requires complex GIS modeling
- Does not contribute to wider community fund

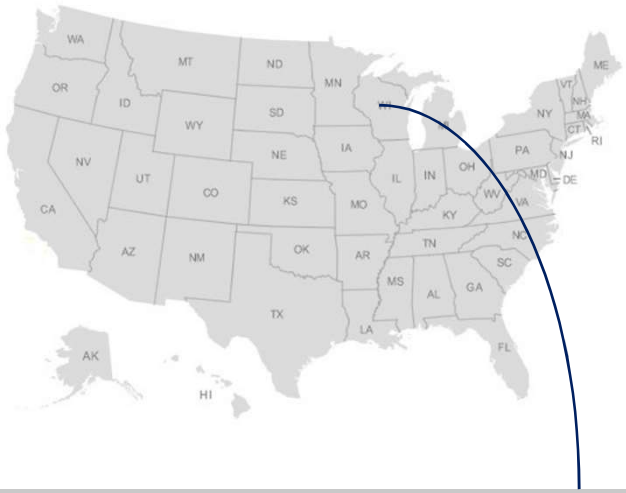
Source:" Strategic options for delivering ownership and benefit sharing models for wind farms in NSW." Ernst and Young, September 2014.

Individual or Organization Co-Ownership

Individual community members or community organizations act as investors or join a cooperative to fund a development.

Overview:

- Typically operated by large commercial wind developers
- Individuals buy shares in the project and are paid an annual dividend
- Investment opportunity opened up to to landowners within proximity to the development or the broader community
- Some structures allow a community organization to invest



Lake Region Electric Cooperative (Minnesota)

- Developed a 60 panel 25 kW solar array entirely developed, owned, and operated by the co-op.
- As a pre-existing co-op, they were able to develop and build the project using internal resources, rather than relying on a developer. To invest, co-op members pay a 1-time, 20-year lease payment of $1,400 for a full panel or $700 for a half panel.
- Full panel leases are also available in installments of $40/month for 35 months; these payments are made on monthly utility bills. Lessees receive $5.75 monthly bill credit for a full panel (20 year payback period).
- Many co-op members who purchased a panel are retirees with a second home in the area; for these members, winter solar credits can be carried forward into the spring or summer months of residency.

Source: "Minnesota: Lake Region Electric Cooperative." Environmental and Energy Study Institute. http://www.eesi.org/obf/solar/casestudies

Community Wholly Owned

Individual community members or community organizations act as investors or join a cooperative to fund a development.

Overview:

- Communities develop wholly-owned energy projects
- This model overcomes difficulties of community organization co-ownership
- Finding a financial institution willing to provide debt finance to a local organization can be difficult
- Some communities have pursued a co-op structure for sole ownership, similar to the co-ownership model

Fintry, Scotland

- Falck Renewables Designs provided Fintry Development Trust (FDT) with loan with 15-year repayment period
- FDT purchased share of the revenue stream
- Income minus the loan payment goes to the trust
- Income funds community projects such as free insulation, free energy consultation, subsidizing energy efficient heating systems, local EV car-share fleet

Hepburn Wind Farm, Central Victoria, Australia

- Community-owned wind farm with 2 wind turbines and 2000 co-op members
- Raised $10 million in capital
- Benefits community through dividends and funds made up of profits from the turbines

Source:" Strategic options for delivering ownership and benefit sharing models for wind farms in NSW." Ernst and Young, September 2014.

Michigan Models

Several projects with community benefits components have been implemented across Michigan.

Geronimo Wind Energy

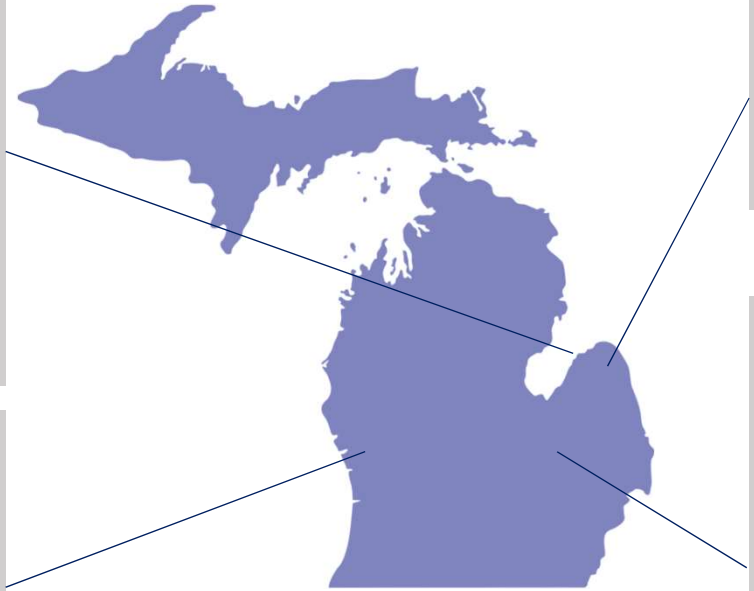
Community enhancement fund

- Established a community foundation in Pigeon, MI
- Functions through a 501(c)(3) organization and guarantees annual payments for a 20 year period during development operation

Consumers Energy Solar Gardens

Discounted electricity

- Customers subscribe to SolarBlocks at solar plants across Michigan; they pay a fee on monthly energy bill and receive a credit for the solar energy produced



DTE Renewables

Community enhancement fund

- Contributed $3M to schools and township priorities in Huron County

Cypress Creek Renewables

Local employment

- Established a Solar Program Fund at Mott Community College with a $20,000 grant from Cypress Creek Renewables
- Aiming to strengthen the U.S. energy workforce through workforce development

Sources: "Community Impacts." Geronimo Energy, www.geronimoenergy.com/local-impact/community-impact/.
"MCC Partners with Cypress Creek Renewables to Advance Solar Job Training." Mott Bear Icon, 23 Apr. 2018, www.mcc.edu/newsroom/20180423CypressCreekGrant.shtml.
"Solar Gardens Project Locations." Our Energy Mix | Consumers Energy, www.consumersenergy.com/residential/renewable-energy/solar-gardens/locations.

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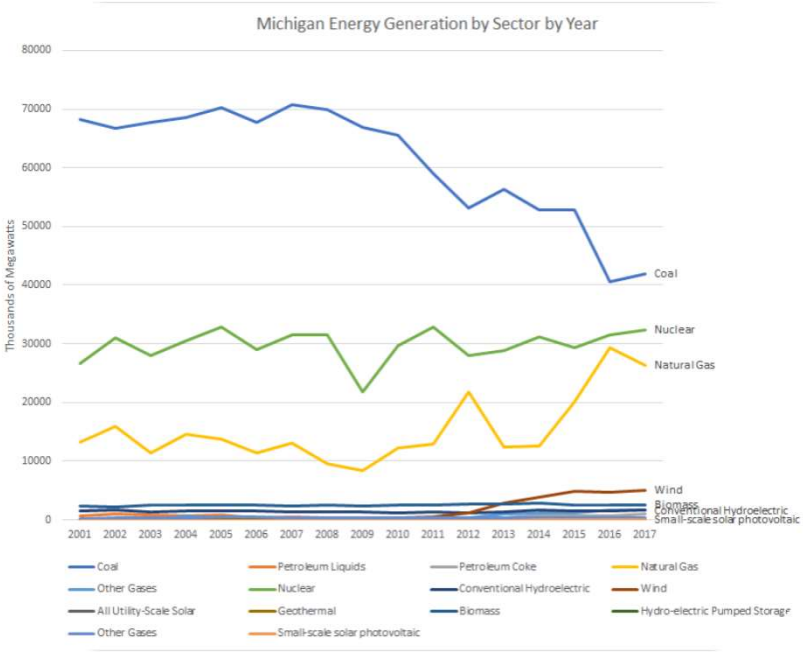
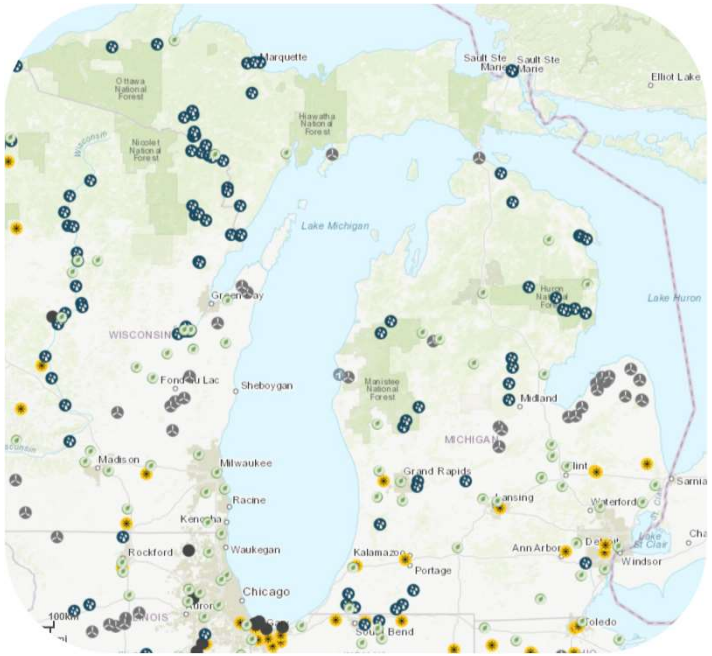
Appendix

Michigan Renewable Energy Landscape





Though coal's share of energy production declined rapidly in 2008, it continues to serve as Michigan's top source of energy. Nuclear and natural gas continue to serve as important sources of electricity, with natural gas filling the gap created by the fall in coal energy. Wind energy has steadily increased since 2011, surpassing biomass as the strongest renewable in the market. Photovoltaic solar energy has also taken off since 2015.

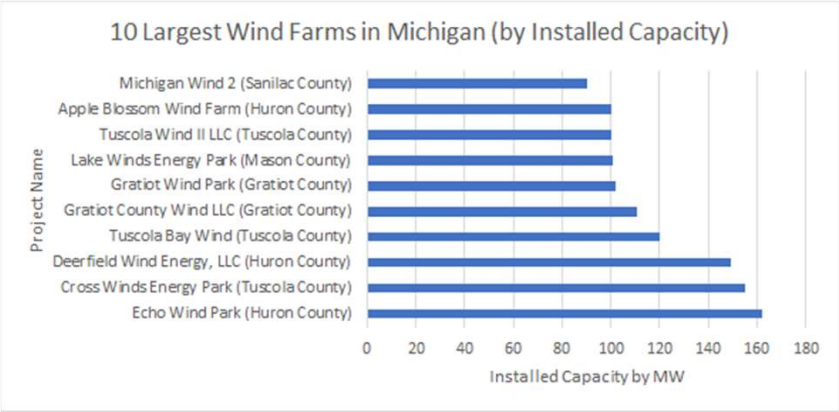
The largest concentration of wind facilities are located on the tip of the "thumb". Another cluster is located in the central part of the state, southwest of Midland. Biomass generators proliferate across the state though concentrate in populous areas. Hydroelectric facilities are particularly notable in the Upper Peninsula.

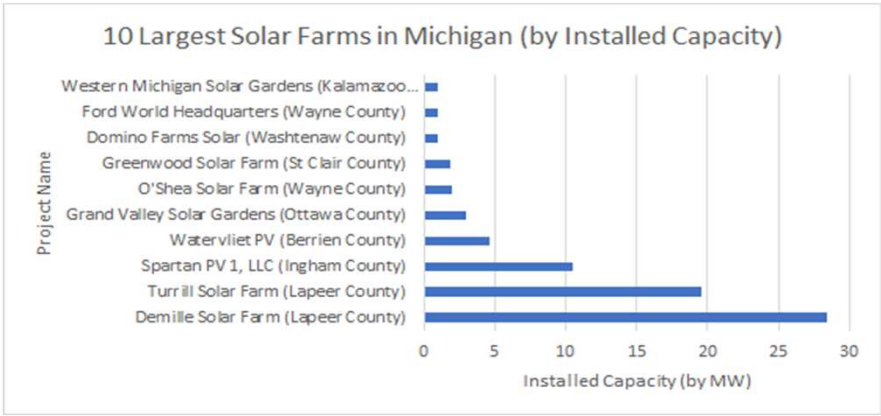
Source: EIA Data, accessed July 2018

Relative Sizes of Renewable Energy Generation Facilities in Michigan

***Wind**: Wind energy facilities have much larger capacity than solar at this point, rivalled only by biomass facilities. However, facilities are concentrated in a few specific places, namely on the northern edge of the thumb and in Gratiot County, between Midland and Lansing. Average capacity is around 110 MW.*

***Solar**: Solar energy facilities are much smaller than wind and biomass. For example, the capacity of the largest solar farm is five times smaller than the largest wind farm. However, solar farms have a wider geographical spread than wind in Michigan, concentrating near the largest cities including Flint, Lansing, Grand Rapids, and Detroit. Also, solar currently benefits from the most market zeal to increase its share in the energy portfolio.*



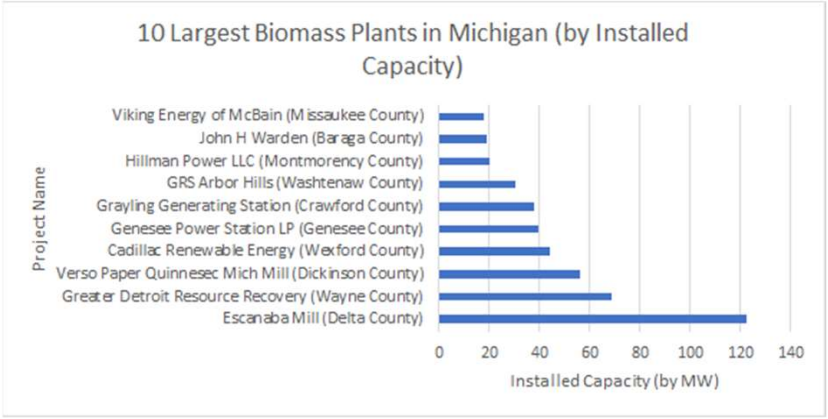


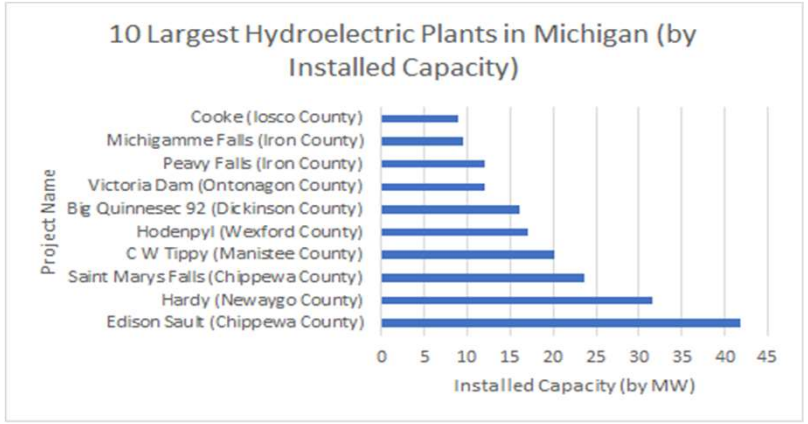
Source: EIA Data, accessed July 2018

Relative Sizes of Renewable Energy Generation Facilities in Michigan, cont'd

***Biomass**: The largest biomass facility capacity rivals that of the largest wind facilities, but their average capacity is much smaller, around 30 MW. Facilities concentrate in agricultural areas surrounding major cities in Michigan. Although biomass energy represents a small portion of total energy in Michigan with few plans to grow its share, biomass is an important part of Michigan's energy portfolio.*

***Hydroelectric**: Hydroelectric facilities' capacities are slightly larger than current solar facilities' capacities. They proliferate across the state, but are particularly notable in the Upper Peninsula, where the grid experiences unique transmission challenges. Hydroelectric is the most common and local source of renewable energy in the UP.*





Source: EIA Data, accessed July 2018