



Farmland Solar Potential in Washtenaw County

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Executive Summary

Across the globe, communities are turning to renewable energy as a pathway to decarbonization. In Washtenaw County, the Climate Reality Project partnered with the Graham Sustainability Institute to help their community take the next steps through the renewable energy transition.

Out of this partnership, Washtenaw Climate Reality worked together with an interdisciplinary team of University of Michigan students, known as the Dow Sustainability Fellows. Together, the team scoped and executed a comprehensive evaluation of farmland solar potential in Washtenaw County. The project included literature review of environmental, economic, technical, and social components of solar siting; stakeholder engagement with potential host communities; scenario modeling to compare land lease revenue against agricultural output under different cropping choices; and geospatial analysis of land suitability by individual parcel. Following analyses and community engagement, the team compiled the following deliverables: this report, a one-page pamphlet for public distribution and education (Appendix C), and a publicly accessible GIS web-mapping application, which residents can use to understand the solar siting process and participate meaningfully in decision-making.

In order to build trust between county officials, energy developers, and their host communities, each party must have access to complete and transparent information about the decision-making process. This work is intended to empower community members, policymakers, and project partners with information about local siting for solar energy, in particular for utility-scale installations. Should these deliverables facilitate further solar development, positive environmental impacts are anticipated in the form of emissions reductions, economic benefits in the form of diversified agricultural income and growth of the tax base, and quality of life improvements in the form of grid resilience and environmental stewardship values.

This team found that it is reasonable and technically feasible to install enough solar generation to offset fossil fuel generation in Washtenaw County. There are social barriers to success in solar siting, for which solutions include further transparency and community involvement. Depending on the threshold level of land suitability, CO₂ emission reductions for Washtenaw County can be expected to be approximately 64,000 to 143,000 metric kilotons per year.

Beyond the work of this fellowship, this team recommends further community engagement, public education, and ongoing transparency in the siting process. This team also recommends that readers review the recently-passed bill, HB 5120, for state-controlled solar siting, which, due to its timeline, is outside the scope of this research [8].

02 Introduction

- Global climate change is prompting international, national, and local goals to reduce carbon emissions. Washtenaw County is launching a climate planning effort that will look at strategies to become carbon neutral operationally by 2030 and community-wide by 2035 [1,2]. Solar development is a modular form of renewable energy that can be tailored to local land use patterns with capacity range of small-scale residential to utility-scale installations.



Photo from [Sydney Mark](#).

“To assist the county in backing solar development that makes progress towards its decarbonization goals and earns the support of the local community, our Dow Fellows team has performed a geospatial analysis of the intersection between farmland preservation and the clean energy transition in Washtenaw County.”

Solar installations at the utility-scale require large swaths of open land. In 2019, Governor Gretchen Whitmer and the Michigan Department of Agriculture and Rural Development (MDARD) enacted legislation to permit commercial solar development on preserved farmlands [3]. This change to the state’s Farmland and Open Space Preservation Program aimed to integrate farmland preservation with renewable energy development. Landowners continue receiving tax incentives to maintain land as agricultural use and may lease their land for solar installations. This policy is especially relevant to Washtenaw County, where 67.5% of land was zoned Agricultural/Rural Residential in 2020 [4]. Because of this land use compatibility, the county stands to make substantial clean energy progress through farmland solar development.

Energy transitions to renewables have surpassed expectations of forecast models of IEEEE, IEA, EIA, BP, and Shell throughout the last 20 years [5]. The cost of solar power has plunged

since 2009, making this renewable energy source both clean and economical [6]. As Washtenaw County looks to the future, we should look to solar development.

Development can be met with resistance from local residents, regardless of the project’s purpose or degree of proposed changes, due to human predisposition to resist change. Development proposals have to be aligned with community objectives or else risk facing lengthy permitting processes and other economic pitfalls associated with public opposition [7]. Within a strong farming community like Washtenaw County that has a well-established sense of place, the landscape’s potential for renewable energy development is mediated by social acceptance of it. To assist the county in backing solar development that makes progress towards its decarbonization goals and earns the support of the local community, our Dow Fellows team has performed a geospatial analysis of the intersection between farmland preservation

and the clean energy transition in Washtenaw County. This project aims to assess the opportunity for siting utility-scale solar projects on farmland in Washtenaw County and its potential to forward local carbon neutrality progress. It considers the potential impacts of farmland solar across environmental, economic, and social dimensions, and how this approach could scale to state and national levels. This report reviews energy production for a county-wide peak demand of 2000 MW. For the remainder of this report, “farmland solar” and “utility scale solar” will be used to refer to agricultural lands that local farmers lease to the county for non-residential scale solar installations.

It is important to note that recently passed bills in the state of Michigan transition control of solar ordinances to state authority. Project work was conducted under the assumption of preexisting local control [8] due to the timing of the legislation.

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- Project work was completed in stages: literature review, community engagement, and geospatial analysis. The following sections detail the component methods.

Literature Review

Team members conducted an extensive literature review on topics including zoning regulations, renewable energy policy, social attitudes toward large-scale solar installations, and geographic information system (GIS) analysis.

Policy. Federally, the National Climate Task Force has goals of reducing greenhouse gas emissions by 50% of 2005 levels by 2030 and achieving 100% carbon-free electricity by 2035 [9]. In Michigan, Governor Whitmer initiated the MI Healthy Climate Plan through executive orders 2020-182 and 2020-10 [10]. The plan aims to reduce greenhouse gas emissions and reach carbon neutrality by 2050. Locally, Washtenaw County released the Resilient Washtenaw Climate Action Plan in December 2022, which outlines pathways to carbon neutrality by 2035 [2]. Emissions reduction goals at federal, state, and local levels motivate technological innovation and policymaking that better supports the clean energy transition.

Social attitudes. Many local governments have the authority to modify zoning ordinances in ways that can pave the way or block solar development.

“Not in My Backyard” (NIMBY), coined by Walter Rogers in 1980, is the idea that while one may express approval of a specific policy or infrastructural intervention, they disapprove of its implementation in their community [11]. One study found that the visibility of energy infrastructure from roadways is negatively correlated with support of ground-mounted solar array installation [12]. The NIMBY stereotype in mainstream media can make people feel uncomfortable expressing their opinions regarding local development proposals, for fear they may be named a NIMBY.

Another study explored the energy justice implications of renewables projects found that that siting burden has historically and inequitably fallen on marginalized populations, such as power plants being sited close to poor communities [13]. Within an accelerating energy transition, proposed

host communities are often those of the poor and rural demographic as a result of the large spatial requirements for installation and affordability of land [13]. The study found that just distribution of burdens and benefits, as well as transparency, are vital factors for local acceptance of development.

One significant piece of publicly available literature is the “Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments” published by Michigan State University Extension [14]. This comprehensive planning and zoning guide reviews successes and opportunities for solar energy systems and provides guidance related to drafting ordinances on solar zoning that is aligned with community objectives and clean energy goals.

Technical. Many research studies have utilized GIS to evaluate site suitability for large-scale solar installations [15, 16]. Typically, a site suitability analysis incorporates multiple geographic datasets, such as land cover, slope, land use, and solar irradiance and insolation. Social preferences can be added to the model for additional granularity [17, 18]. Together, environmental and social factors propose a least-conflict siting framework for farmland solar development. These frameworks utilize GIS and community engagement to make siting decisions more accessible to nontechnical audiences [19]. By using this approach, participatory decision-making can support energy democracy and community ownership of solar developments.

The team selected model parameters based on their evaluation of the available GIS-assisted case studies. The team decided on the final geographic parameters as follows:

- *Slope:* simulate physical siting constraints
- *Distance to Substations, Water Bodies, and Transmission Lines:* account for system needs
- *Solar Radiation:* measure generation potential of different sites
- *Land Use and Conservation Lands:* visualize developable area

The team decided to incorporate their findings from community engagement qualitatively in the report rather than compromise data validity by using quantitative representation.



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Environmental Impacts. Given that emissions reduction goals often drive renewable energy development, it would be remiss to not address the environmental impacts of solar installations. Lu et. al studied solar electricity on a spatiotemporal life cycle assessment (LCA), identifying decarbonization pathways for three states, including Michigan [20]. The life cycle carbon footprint was quantified with a weighted average of 0.040 kg CO₂ equivalent per kWh, which was a reduction from the benchmark of 0.056 kg CO₂ equivalent per kWh. Meanwhile, Talledo et. al conducted an LCA and energy pay back time (EPBT) analysis for carbon footprint of photovoltaic (PV) systems and found time averaged footprints to be 1.26*10⁻⁴ tons CO₂ equivalent per MJ and found EPBTs ranging from 3 to 5 years for different systems [21]. Both conservative and liberal calculations find that solar energy generation is a net benefit for carbon emission reductions.

For this study, the team did not evaluate non-carbon impacts, including environmental justice issues related to poverty and health risks in marginalized communities due to metal sourcing, silicon sourcing, and material end of life, although previous studies qualitatively discuss potential negative impacts in sourcing materials for solar installations.

Cost Benefits. Several studies employ cost-benefit analysis when evaluating farmland solar development. Costs include forgone net profit from the agricultural land and yield loss while benefits include diversified agricultural incomes, growth of tax base, clean energy generation, and emissions reductions. The chosen cost-benefit analysis technique depends on a variety of factors. One study included the amenity value of land and the value of biodiversity in their model [22] while another incorporated potential energy storage into anticipated profitability [23].

For this study, we focus primarily on the method used by Luna et. al for their analysis of solar potential in the Philippines’ Tarlac province [24]. The study uses net potential profit, which compares the revenue from energy generation to the opportunity cost of reduced agricultural yield. In the aforementioned study, the net return to farmers assumes agricultural activity is completely replaced by solar farms, even though there are numerous opportunities to co-locate agricultural and energy systems.

Utility-scale solar leases have terms from anywhere between 15 and 50 years (accounting for extensions), with built-in annual rent escalation as a standard practice [25], [26]. Rent increase rates are estimates of future inflation and average between 1.5% to 2.5% annually. Starting rent amounts per acre – both pre-construction and post-construction – vary widely as several factors affect solar farm lease rates:

- Size and location of the land.
- Local zoning regulations.
- Availability of existing infrastructure.
- Length and terms of the lease agreement.
- Generation potential of the land.
- Access to public utilities.

For our model, we used lease rate estimates from two sources, with straight line appreciation \$400 per acre per year to \$2,000 per acre per year [25], [26]. Parcels of land with the minimum amount of power generation (above a threshold

of 1MW for utility-scale solar) are assumed to be leased out at \$400 per acre, with rates increasing with power generated up to \$2000 per acre.

To estimate the opportunity cost of forgone yields, it is true that no financial analyst knows the land better than those who farm it. We can however highlight how analysts are estimating opportunity cost conceptually. Depending on local climatic and economic conditions, certain crops may be a better fit for replacement by or co-location with solar. Our financial calculations explore the profitability of different crops commonly grown in Michigan (Appendix E). Without township-level data, we used the latest county price and production

Factors affecting lease rates

Parcel size and location - Bigger, better locations may lead to more revenue for the landowner.

Local zoning regulations - Zoning regulations might affect solar development and permitting timelines, influencing a developer’s willingness to pay.

Availability of existing infrastructure - New infrastructure is expensive. Thus, proximity to existing infrastructure increases land attractiveness.

Length and terms of the lease - Longer lease durations may reduce revenues if landowners are willing to discount annual rates in exchange for more stable cash flows.

Energy generation potential - More energy means more revenue for the developer.

Access to utilities - Connecting to the grid can be expensive; therefore, access to public utilities can affect lease rates.

Government tax incentives - Local or state government tax incentives can lower the project cost.

data [30], [31]. While this project does not use financial inputs in its land suitability analysis, it is important to identify the range of considerations for farmland solar, and that no singular study will be inclusive of the decision-making environment.

Community support is related to economic benefits and burdens. Uebelhor et. al completed a study

which found that “equity and share of benefits” was a significantly cited term in a robust review of local newspapers throughout the Great Lakes Region. The paper also found that economic benefits from industry and taxes do filter back into communities, but community members do

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not universally anticipate this benefit during the planning process of solar installations [27].

Community Engagement

Town Hall Meetings. The team was eager to integrate the opinions and concerns of potential host communities into their analysis. To this end, team members attended four in-person town hall meetings in jurisdictions within and adjacent to Washtenaw County. Town hall meetings strengthened the team’s understanding of community perspectives of solar development. Notes for all meetings are included in the Appendix.

*Augusta Township Board of Trustees
June 27, 2023.*

Despite no explicit mentions of solar on the agenda, the team observed community distrust of their board members, specifically related to claims of incompetence and a lack of transparency.

*Iosco Township Planning Commission
July 11, 2023.*

The observations from this meeting illustrated a lack of public knowledge regarding solar siting, zoning, installation process and approvals, and individual landowner contract approvals. This meeting took place between the draft completion of a privately contracted viability analysis (commonly referred to as “Mark’s Report” in the meeting notes) and the completion of the master plan revision including zoning ordinances. The preemptive report was not yet released and residents expressed concerns regarding how their community would be

affected or changed by solar.

The team also observed confusion among community members regarding why solar installations are being “pushed” in the first place. One resident indicated that the state “obviously dictated solar” and questioned how state renewable goals trickled down to individual land owners in Iosco Township. Another resident commented that big government was meddling in people’s private lands. This resident is referring to the state mandate that renewable energy goals be pursued by Investor Owned Utilities. The providers may contract developers in rural locations, like Iosco, for these solar installations, but they are subject to zoning ordinances and landowner agreements. In practice, there are financial and logistical motivators to install solar in the township.

The Iosco meeting attendees also voiced concerns that development would interfere with way of life and sense of place, with phrasing like “protect the purpose of the land.” The commission responded that development happens over time and is largely unavoidable. The attendees then expressed concern regarding the lack of regulations in place to oversee discarded solar panels, under the impression that these qualify as hazardous waste.

The team also observed some resistance to novelty and uncertainty. Two commenters voiced public safety concerns, one comparing the unknown technology to asbestos. Another commenter shared their concerns regarding a panel quality report, which was not provided for review. It can be

assumed that the lack of public safety information shared locally regarding solar development is not assuaging these concerns.

*Sylvan Township Planning Commission
July 27, 2023.*

In contrast to the Iosco meeting, Sylvan Township showed an overall positive perception of solar development. The commission brought forward additions to the master plan and draft ordinances that promote solar and other renewable energy sources, with the meeting purpose being to revise the language of these drafts. The new ordinance divided accessory use and principal use solar energy systems and briefly addressed biomass, geothermal, and stationary fuel cells as emerging adapted technology. Multiple residents shared their trials jumping through hoops to install solar, especially regarding aesthetics.

*Lodi Township Planning Commission
August 22, 2023*

Due to low meeting attendance, the planning commission relayed to the team that there was a moratorium on solar energy ordinance changes to be revisited later in the fall. For the remainder of the meeting, the team exchanged informal conversation with commission members regarding agrovoltaic opportunities while remaining careful not to overstate expertise or reveal biases.

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Geographic Information Systems

We used ArcGIS for the GIS deliverable of this project [28]. To determine land suitability values (LSV) for parcels throughout Washtenaw County, we collected publicly-available datasets, preprocessed applicable shapefiles and layers, and created a model using those layers as inputs. The resulting product was then reviewed qualitatively for discussion.

Preprocessing. Preprocessing the downloaded shape layers involved highlighting the attributes relevant to our scope of work, including:

- Isolating all parcels in Washtenaw County designated “AGRICULTURE / RURAL RESIDENTIAL”
- Removing conservation lands from consideration
- Selecting only substations, transmission lines, and water bodies within county administrative boundaries

The final layers were used as the inputs to our ModelBuilder script, which is discussed in the following section.

Model: Intermediate Layers. We created a script using ModelBuilder, a built-in visual programming language in ArcGIS, as shown in Figure 1 below. The model uses solar radiation, substation locations, transmission lines, water bodies, and land use categorization as inputs, then returns a weighted sum polygon layer that we used to determine the parcels with the highest potential. To determine the distance from substations, transmission lines, and water bodies, we used the Distance Allocation tool. Each raster input was then reclassified and used as an input into the weighted sum tool.

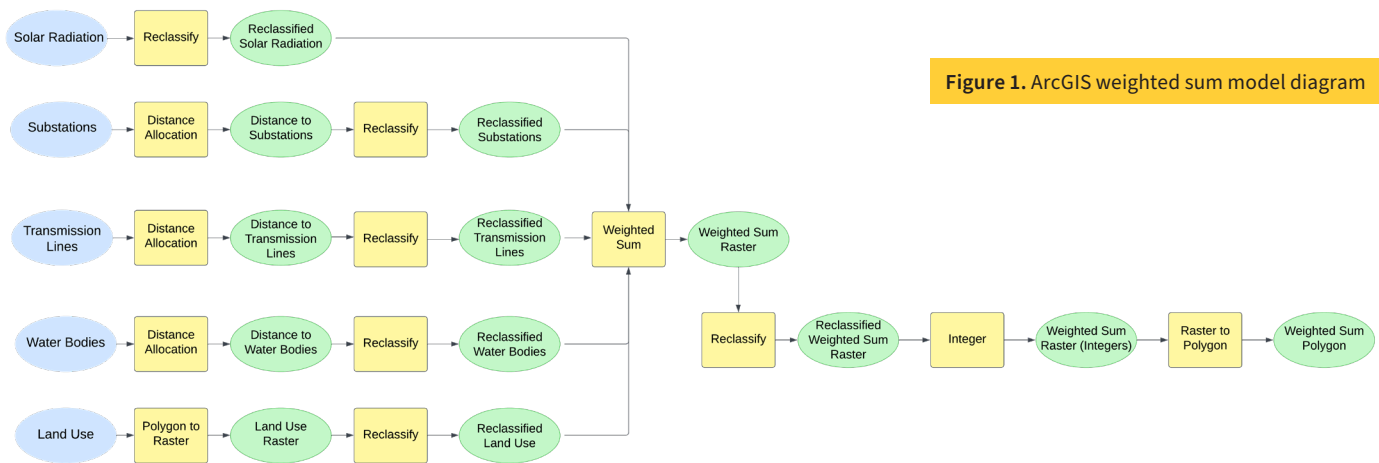


Figure 1. ArcGIS weighted sum model diagram

Table 1. Weighted Sum raster reclassification and weights

Raster	Reclassification	Weight
Distance to Transmission	Geometric	15
Distance to Substations	Geometric	15
Distance to Water Bodies	Geometric	15
Land Use	Unique	20
Solar Radiation	Geometric	35

The Weighted Sum tool generated a Weighted Sum raster, which we then converted to a polygon by reclassifying, converting each cell of the raster to an integer, and using the Raster to Polygon tool to arrive at our Weighted Sum polygon.

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Energy Impact Calculations

Energy impact can be determined through evaluating the land characterized as ideal by Land Suitability Value (LSV). The respective sums of power available to the grid at each threshold of LSV are included in Table 2. Compared to the total power demand of Washtenaw County (provided as 2000 MW by the provided project information), the newly generated solar power was computed as a percent of the total county peak energy demand in Table 2. The energy impact for the client and the county is to provide a rational estimate of capacity for Washtenaw to serve our own energy needs. Note that this does not yet account for energy storage needs, which we determined was out of scope for this project.

In order to compute carbon offsets through potential solar generation in Washtenaw County, we used the Electricity Marginal Factor Estimates for Michigan using 2021 data for the transition from existing generation to solar generation and the National Renewable Solar Database for Michigan in 2021 [29, 30].

We computed power as depicted in the calculations in Appendix E. Based on the power generation of each LSV category in MW, the hourly energy produced was computed for the year in MWh. Marginal factors in units of kg CO2 per MWh were multiplied by the energy in MWh per each hour of the year to produce the resulting kilograms of CO2 avoided per hour of the year. The sum of the CO2 avoided was calculated per LSV category, including undetermined LSV, as shown in Table 2 below. The resulting energy generation below is computed without factoring angle of insolation, to be consistent with how the GIS energy generation figure was computed, which accounts for discrepancies between energy generation per LSV area category.

Table 2. Energy and emission impacts

LSV Category	Power Generation (MWh/year)	CO2 Avoided (metric kilotons)
1 <i>Low Suitability for Solar Development</i>	4,068,784.76	2,566.59
2	27,534,423.35	17,368.74
3 <i>Suitable for Solar Development</i>	25,689,294.29	16,204.83
4	67,007,806.83	42,268.58
5 <i>High Suitability for Solar Development</i>	102,240,607.74	64,493.46

04 Deliverables

- In addition to this report, the deliverables of this project include an interactive web mapping application, geospatial datasets for each model input, and an informational pamphlet for distribution at town hall meetings throughout the county.

Web Mapping Application

The results of our GIS model were adapted into an interactive web map application, which utilizes a combination of widget tools and data visualization to enrich user experience of the geospatial analysis. The web application is available at: <https://umich.maps.arcgis.com/apps/webappviewer/index.html?id=7635ec46056b42e8bf6720dbc68e37ec>.

The web application allows community members and policymakers to digest what exactly determines optimal solar installation locations in their county. Users can filter the data by location, land suitability values, and power generation and summarize the output in ways that are meaningful to their position in the community. A screen capture of the web map is available in Appendix B.

GIS Data

To support further geospatial analysis by Climate Reality and future projects in this space, we compiled our raw datasets (scoped to Washtenaw County) into a geodatabase file that can be distributed and modified as needed.

Informational Pamphlet

The pamphlet is a digestible, single-page document that can be pinned to cork boards at township halls or can be distributed at meetings for combined use by policymakers and community members. Based on findings from town hall meetings, the pamphlet includes information about characteristics of suitable land for solar development, the solar siting and installation process, and policy recommendations to assist in development proliferation. The pamphlet is available in Appendix C.



05 Recommendations



Where do we go from here?

Community education meetings and flow charts should be used to better demonstrate a clear process pathway from the discussion stage to the execution stage of solar installations. Logistics and motivations of renewable energy installations, namely siting factors, should also be clarified by leaders to provide further community understanding and support. Based on community concerns over panel safety, policy holders should consider different methods of education dissemination on panel safety. Life cycle information for panels can provide further transparency and comfort to community members.

In addition to public education, transparency in the planning and policymaking process can build trust between public officials, developers, and the community. All policy action that concerns solar development should be made accessible to the public along with opportunities for engagement.

Some community members voiced concerns around solar development in neighboring

properties. To address this concern, certain solar ordinances in Washtenaw County require a buffer zone between parcels to help shield the solar development from neighboring plots. Visual barriers, buffer zones, or financial compensation to adjacent properties are all potential mechanisms to mitigate concerns of neighbor properties.

This fellowship team hopes that the deliverables of this project, including the interactive GIS tool and the pamphlet attached as Appendix C, can help educate policymakers and community members in achieving the above listed recommendations.

Photos from [Sydney Mark](#).

06 Impact

The deliverables of this project will be used by Climate Reality Project to educate policymakers and community members on renewable energy siting.

■ GIS

The GIS tool will be maintained and updated by the University. Climate Reality’s access to information can help shape townships’ master plans and zoning ordinances for equitable, efficient, and environmental energy planning. Specifically, the United Nations Sustainable Development Goals served through this work are: (#7) Clean and Affordable Energy, (#8) Decent Work and Economic Growth, (#9) Industry, Innovation, and Infrastructure, (#11) Sustainable Cities and Communities, and (#13) Climate Action.

■ Energy

Depending on the extent to which solar is developed in Washtenaw, power generation can be estimated between 102,240,607 MWh/year to 226,540,914 MWh/year. The avoided CO₂ emissions due to local solar energy deployment can be expected to be between 64,493 metric kilotons and 126,857 metric kilotons.

■ Environment

The environmental impact of this reduction is reduced climate change and reduced ambient air emissions.

■ Financial

According to our financial analysis, the average land parcel (approx. 25 acres) in Washtenaw county, , excluding those where generation estimate is below 1MW, would receive approximately \$14,000 in solar land lease rent annually. Across counties, Lyndon and Saline townships are estimated to average more than \$20,000 in lease rent per land parcel. It is observed that in 2021, corn was produced at a profit of approximately \$200 per acre in Michigan [31] while blueberries were produced at a corresponding loss figure of approximately \$8,000 per acre [32]. While blueberry farmers might be more amenable to leasing land for solar, the same makes sense for corn farmers only when the land parcel can support energy generation closer to 5MW (net profit more than \$5,000 annually).

■ Social

The social impact and community benefit of this project is policymaker and community education on solar installation siting processes. Through transparent and thorough education about solar power, equitable distribution of benefits and burdens of energy infrastructure, and engaged planning of policy, we can promote efficient and equitable renewable energy in Washtenaw County.



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APPENDIX A

■ Townhall Meeting Notes

The following notes summarize comments made during public meetings. They are not perfectly transcribed, nor do they capture tone or intent of comments. The notes were taken live during the meetings and are not legal representations of the speakers present, only a best-attempt transcription/summary. Responses below public comments are loosely transcribed from the meeting leader.

August Township Board of Trustees Meeting - June 27, 2023

See Meeting Minutes

Augusta Township Meeting Minutes were not annotated specifically, due to conversation not focusing on solar development

Iosco Township Planning Commission Meeting - July 11, 2023

See Meeting Minutes

Public Comment Notes:

Public Comment 1: “Clarifying question - should we have hesitation to have a solar overlay in the district or is this just eliminating areas where it can go?”

Response to PC1: “Before anyone commits to anything, the goal is to see what ‘Mark’s report’ says”

Public Comment 2 (From Conway): “Here, we are 7 months into moratorium and nothing is set in stone. 9-10 months before final draft for solar plan at best based on report. The big thing is making sure Mark is 100% confident that he can defend this report if it goes to litigation.”

Response to PC2: “We will review it together”

Public Comment 3: “Thank you for pushing timely response from the planner. Also we need to worry about budgeting for workshops – attorneys can be expensive”

Response to PC3: “We don’t have budgeting issues. Our attorneys [John and Mike] are very good”

Public Comment 4: “State has dictated solar. Is there any legitimate minimum vs maximum? Just because we

have land, do we need to? Is going smaller scale an option?”

Response to PC4: “It is state mandating energy companies, not the towns. The town isn’t being forced to do solar. This isn’t big government telling us to go solar”

Public Comment 5: “There are 3 house bills searching to get rid of local control. Governor says she won’t sign them because she wants local control”

Response to PC5: “Okay”

Public Comment 6: “What about wind and other renewables in ordinance? What about a package?”

Response to PC6: “We are including them separately”

Public Comment 6 response: “battery storage too?”

Response to PC6: “Yes, it will be”

Public Comment 7: “Based on words said here, there seems to be a vibe that if they want it, they should be allowed to have it.”

Response to PC7: “It is an ordinance issue, not a land issue. Development is going to happen”

Disordered comment 1: “I feel bad for those of you that live closer because you’ll probably have it”

Disordered comment 2: “PA116 opened it up”

Disordered comment 3: “Zoning issue, not property rights issue”

Disordered comment 4: “same make an model panel - one passes, the other one doesn’t”

Disordered comment 5: “It’s a new thing, so was asbestos”

Disordered comment 6: “Phone lines leaching lead, these new PUC coatings can leach lead, I don’t trust these wires of these

panels”

Disordered comment 7: “I’d rather it be nice clean farmland”

Public Comment 8: “We should be extremely careful about what industrial uses we allow”

Response to PC8: “we will be careful, that’s why we’re looking at zoning and planning”

Public Comment 9: “Organic Solar cells are being developed, why can’t we wait?”

Response to PC9: “I know it’s different, but development is going to happen and we can get on board or not. Truth is, in 100 years, none of us will be here and this place will look really different....”

Public Comment 10: “Listening to your people is never going overboard”

Response to PC10: “Thank you.”

Sylvan Township Planning Commission Meeting - July 27, 2023

Meeting minutes were not available on Sylvan Township directory of public records

Public Comment Notes:

Public Comment 1: “Going through previous proposed one [solar energy system ordinance draft] line by line and no changes were made, it’s making it too hard to do SES. Why are we trying to control color fo things people can put on property? Why do we care so much about aesthetics instead of anything that can harm people? And about that survey - I couldn’t find the link to the survey that was in the property taxes. Questions should also have more context in the survey. People want to compare to what it is now”

Public Comment 2: “I agree about the survey, how did that

survey role out? I got draft documents but never got the notification for the meeting. It looks like only a couple people attended and it happened quickly and quietly.”

Public Comment 3: “I agree about the questionnaire. I’m glad it was pulled back. It should be done right. I am dismayed that it is harder for residents to install self-susained solar on their on property. I hope this gets to public hearing in better form than it is now.”

Public Comment 4: “I agree that residents shouldn’t have so many hoops to jump through. Resident solar should be separate in zoning”

Response to PC1 and PC2 and PC3: “Thank you for the comments on the survey.”

Response to all: “Thank you for the feedback on the residential solar. We actually do have different SES detailed in the ordinance draft.”

Counter-response from one of public commenters: “But the differentiation is by percent of lot, not acreage. Some of us have large plots that are not residential and now we’re being told our developments can’t support our homes. I want to know if I’m even approved on what I already have”

Lodi Township Planning Commission Meeting - August 22, 2023

See Meeting Minutes

Public Comment Notes are not available because solar topics were on moratorium. Discussion between team members Nivedita Biswal and Kira Edwards with the commission members were of casual nature and not recorded as public commentary.

Augusta Charter Township
8021 Talladay Road
Whittaker, MI 48190

Board of Trustees Regular Meeting Minutes

June 27, 2023, 7:00 p.m.

1. Augusta Township's Board of Trustee's Meeting held at Lincoln Golden Ages Senior Center, 8970 Whittaker Road, Ypsilanti MI 48197, was called to order by Shelby at 7:00 p.m.
2. Pledge of Allegiance.
3. Roll Call: Present: Adams, Burek, Fuqua-Frey, Hall, Ortiz, and Shelby. Absent: Gonczy.
4. Motion by Shelby, 2nd by Adams to approve the agenda with the following changes. Remove Item C. add Laura Kreps and Spring Cleanup. Motion passed unanimously.
5. Public comment opened at 7:02 p.m. public comment closed at 7:10 p.m.
6. Motion by Adams, 2nd by Hall to approve the Draft Board of Trustees Meeting Minutes from May 23, 2023 as amended. Roll Call: Aye; Adams, Burek, Hall, Shelby, Fuqua-Frey, Ortiz. Nay; none. Absent; Gonczy. Motion passed.
7. Motion by Shelby, 2nd by Ortiz to approve the Fire Department Report as submitted. Motion passed unanimously.
8. Motion by Adams, 2nd by Shelby to approve Resolution 23-15 Resolution to Adjust the April 27, 2021, Water and Cost Recovery Schedule Adopted Per Resolution 21-12. Roll Call:

Aye; Adams, Burek, Hall, Ortiz, Shelby. Nay; Fuqua-Frey. Absent; Gonczy. Motion passed.

9. Motion by Adams, 2nd by Fuqua-Frey, to approve Resolution 23-14 Resolution to Appropriate \$5500 to Lincoln Golden Ages Senior Center. Roll Call: Aye; Adams, Burek, Fuqua-Frey, Hall, Ortiz and Shelby. Nay; none. Absent; Gonczy. Motion passed.
10. Motion by Adams, 2nd by Hall to approve paying Augusta Township's Ordinance Officer hourly rate of \$25.00 an hour. Roll Call: Aye; Adams, Burek, Fuqua-Frey, Hall, Ortiz, Shelby. Nay; none. Absent; Gonczy. Motion passed.
11. Motion by Adams, 2nd by Shelby to approve Cloudpermit Code Enforcement Software Service Agreement costing \$2500 for three years and a \$500 implementation fee. Roll Call: Aye; Adams, Burek, Fuqua-Frey, Hall, Ortiz and Shelby. Nay; none. Absent; Gonczy. Motion passed.
12. Motion by Shelby, 2nd by Fuqua-Frey to spend up to \$700 for the July 22, 2023, Augusta Township Spring Clean Up event. Roll Call: Aye; Adams, Burek, Fuqua-Frey, Hall, Ortiz, and Shelby. Nay; none. Absent; Gonczy. Motion passed.
13. Motion by Shelby, 2nd by Adams to approve the Supervisors Report. Motion passed unanimously.
14. Motion by Adams, 2nd by Shelby to approve warrants 26352-26434. Roll Call; Aye; Adams, Burek, Hall, Ortiz, Shelby. Nay; Fuqua-Frey. Absent; Gonczy. Motion passed.
15. Motion by Shelby, 2nd by Adams, to approve the Clerk's Report as given. Motion passed unanimously.
16. Motion by Shelby, 2nd by Adams, to approve the Treasurer's Report as given. Motion passed unanimously.

17. Motion by Shelby, 2nd by Hall, to approve the Township Hall Committee Report. Motion passed unanimously.
18. Motion by Shelby 2nd by Adams to approve the Planning Commission Report as given. Motion passed unanimously.
19. Public Comment Opened at 8:07 p.m. Closed at 8:13 p.m.
20. Motion by Shelby, 2nd by Hall to adjourn. Motion Passed unanimously.
21. The Board of Trustees Meeting adjourned at 8:16 p.m.

Respectfully submitted:




Brian Shelby, Supervisor



Date



Kimberly Gonczy, Clerk



Date

**Iosco Township Planning Commission Minutes
July 11, 2023**

Meeting was called to order at 7:40pm by Chairperson T. Higgins.

Members present Tammy Higgins Chairperson, Anne Allen Zoning Administrator, Patty Dunn Secretary, Sheri Van Wyck and Mary Wood Recording Secretary. Dan Alderson absent.

Agenda was read. S. VanWyck motioned to approve. P. Dunn 2nd. All Ayes. Approved.

June 13, 2023 meeting minutes were read. P. Dunn motioned to approve. S. VanWyck 2nd. All Ayes. Approved.

First Call to Public. No requests to be heard from the public.

Public Hearings – Not Applicable at this time.

Unfinished Business - Section 13.19 Solar Energy Systems. M. Eidelson responded to T. Higgins e-mail about solar energy systems. Items like wet lands, closeness to residential areas and forest areas etc will be discussed in the workshops. Future workshops are scheduled for July 27, 2023 and August 10th and 24th 2023. Attendees will be T. Higgins PC Chair, D. Alderson, M. Eidelson President Landplan, Inc. J. Harris Iosco Township attorney and M. Homier attorney. These meetings are not open to the public.

Section 13.10 Commercial Kennel. T. Higgins e-mail M. Eidelson and Deputy Delatorre of Livingston County animal control requesting advice and suggestions on Commercial Kennels. M. Eidelson has not responded as of this meeting date. Waiting for more information on this issue.

Section 20.12 Personal Dogs – nothing further at this time.

New Business - none

Future Meetings/Agendas – Next meeting date August 8, 2023 @7:00pm.

Township Board Report – The Township Board report was heard.

Zoning Administrator Report – 18 permits have been issued so far this year. Seven (7) are for new dwellings. One (1) waiver was issued. No other issues to report.

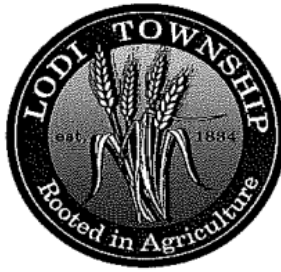
Zoning Board of Appeal – None

Second call to the public. Public was heard.

T. Higgins motioned meeting be adjourned at 8:30pm.

Respectfully Submitted

Mary A. Wood
Recording Secretary



Lodi Township Planning Commission Special Meeting Minutes

August 22, 2023 7:00 PM

**Lodi Township Hall
3755 Pleasant Lake Road
Ann Arbor, MI 48103**

1) Call to Order and Pledge of Allegiance

The meeting was called to order by Vice Chair Stevenson at 7:01 PM. The Pledge of Allegiance was then recited.

2) Roll Call of the Commission

Present: Rogers, Stevenson, Sweetland, Swenson, Vestergaard and Warner.

Absent: Strader.

Others Present: Township Planners Hannah Smith, Supervisor Jan Godek, Mark Eby, Paul Steigerwald, Alex Matelsle, Skyler Hofbauer, Anne Shelton, Richard Happle, Xavier Edwards, Gabriela Eykich, Dennis Marr, Joseph Molnar, Vicki Marsh, Steve Marsh, Mary Orczykowski, Amber Palmer, Kira Edwards, Nivedita Biswal, Julie Holst, Eric Holst, Leslie Blackburn, and several other citizens.

3) Announcements

Vice Chair Stevenson introduced himself and noted that since Chair Strader is absent, he would be running the meeting.

4) Approval of Agenda

Smith requested that a discussion of an amendment to Section 40.05 regarding caretaker living quarters be added as an item to New Business.

Moved by Vestergaard, seconded by Warner, to approve the agenda as amended.

The motion passed unanimously by voice vote.

5) Public Hearing

A. Public Hearing to receive comments on an amendment to the Lodi Township Zoning Ordinance regarding Principal Dwelling Units.

Moved by Warner, seconded by Vestergaard, to open the public hearing.

The motion passed unanimously by voice vote.

Smith explained that the proposed changes are aimed at focusing wording and providing additional clarification of the purpose of this section. She believes that the specific intent of the section is not being changed. She reviewed a section draft with the proposed changes highlighted and noted that the following definitions are proposed for change: Caretaker Living Quarters, Accessory Dwelling, and Single Family Dwelling. There were several other wording changes.

There were no public comments

Moved by Warner, seconded by Sweetland, to close the public hearing.

The motion passed unanimously by voice vote.

The Commission then discussed the changes and decided to send the proposed changes to the Township Board of Trustees.

Motion by Vestergaard, second by Sweetland to recommend approval of the proposed changes to the Lodi Township Board of Trustees.

Yes: Rogers, Stevenson, Sweetland, Swenson, Vestergaard, Warner

No: None

Absent: Strader

The motion passed unanimously.

6) **Public Comment**

None.

7) **Approve of Minutes**

A. Regular meeting minutes of the July 25, 2023 Planning Commission meeting.

Moved by Swenson, seconded by Rogers, to approve the minutes of the July 25, 2023, Lodi Township Planning Commission meeting.

The motion passed unanimously by voice vote.

8) **Old Business**

A. Cooper Leaf Crossing-Minor Site Plan

Smith reviewed the efforts to find the original PUD approval and restrictions, and at this point neither the Township or the property owner are able to provide that documentation. Smith said that the applicant is most concerned about completing the proposed K-9 enclosure quickly, and is willing to go through a major site plan review, including the change to the parking lot, to update the PUD to conform with current and future uses, as agreed upon by both parties, if the minor site plan for the enclosure is approved.

Smith provided the Commission with two options. First, halt all work on the property and require that the PUD be updated as part of a major site plan review. The second option would be to approach the K-9 enclosure as a minor site plan review, and if the Commission is satisfied with the documentation present, approve that, with the requirement that a complete review of the PUD be conducted as part of a major site plan review. Smith recommended that that happen within six to nine months if this option were to be selected.

Steve Marsh, representing Cooper Leaf Crossing and The Creature Conservancy, spoke about the original PUD and his recollections of the process. He also stated that the Board of Directors of the Creature Conservancy has voted to participate in a major site plan review and to develop a list of species that the Conservancy will not house at this site. Marsh said that he is happy to participate in a major site plan review, but said that the time limit was a concern because he does not have control over how long it takes the Township to review plans. Warner asked for a clarification on the purpose of the amendment to the PUD, and Smith indicated that it should include information about all the types of activities that are being conducted on the property such as kid's camps. Stevenson asked about the fence setback and Marsh indicated that he would be willing to make one of the fences a privacy fence. Stevenson also asked what other species could be moved into this enclosure once the wolf hybrid is gone. Marsh said that it is being constructed for K-9s and that they could put dingoes, coyotes, or arctic foxes. A member of the audience clarified that there are three fences involved in the project. First, there is a property line fence to keep people off the property. Then, there is an eight foot high fence with rails on the top, middle and bottom, and vertical rebar sunk into the ground every 4 inches. Inside of that is another enclosure to house the animals at night or during storms. Marsh also responded to a question from Stevenson about using goats to maintain the vegetation in the 3-foot service isle.

Findings of Fact

Cooper Leaf Crossing is a business that has operated in Lodi Township for over 15 years.

Cooper Leaf Crossing was approved by Lodi Township as a Planned Unit Development (PUD), but the records of the exact approvals and restrictions are currently not available.

On May 23, 2023, Cooper Leaf Crossing submitted an application for site plan review for a K-9 enclosure on their property.

The location of the enclosure was chosen because other portions of the property that are large enough have water drainage problems that prohibit building this structure on them.

The structure is being built to house a wolf-dog hybrid and his mate, and it will greatly decrease the probability of animal escape, and increase the safety of the neighborhood.

The Township Planning Consultant believes that a minor site plan review is an appropriate option for approval of the current site plan review application.

The enclosure has double escape proof entrances and the design has been approved by the USDA Inspector responsible for inspection of such facilities.

The enclosure meets the requirement set forth in the Michigan Wolf-Dog Cross Act.

As part of this minor site plan approval process, Cooper Leaf Crossing has agreed to work with the Township Planner to amend the PUD as part of a major site plan review within the next nine months.

Motion by Swenson, seconded by Warner, to determine that the K-9 enclosure is a minor site plan review, and that the information submitted to the Commission is adequate to substantiate approval of the structure, with the clear understanding that this approval is limited to only the K-9 enclosure and the modification to allow the eight-foot fence. Additionally, within the next 9 months, the applicant will work with Planner Smith to submit

a modification to the PUD that reflects the current and future uses of the property as agreed to by both parties.

Yes: Rogers, Stevenson, Sweetland, Swenson, Vestergaard, Warner

No: None

Absent: Strader

The motion passed unanimously.

B. Short Term Rentals

Smith stated that she had nothing new for this subject. Warner did ask a question about whether the township could somehow restrict bonfires and fireworks at short-term rentals. There was a general discussion about this that also included septic system requirements and other aspects of short term rentals. No action was taken.

C. Solar/Wind

Smith mentioned that the Township Board has established a six-month moratorium on solar and wind installations. Two graduate students from the University of Michigan, Kira Edwards and Nivedita Biswal, participated in the discussion based on their research and experience.

9) New Business

A. Section 40.05 Amendment

Smith reported that she has reviewed this section with Township Attorney O'Jack and he would like to add language that requires 30 hours of work per week maintaining the parcel by a person that is living there as a caretaker. Commission members discussed the appropriate number of hours to comply with the intent of the ordinance. Smith also shared that the Commission might want to allow a caretaker's family to also live on the property. The current language seems to limit the occupancy to the caretake only.

Moved by Warner, seconded by Sweetland, to set a public hearing to receive public comment on the proposed amendment of Section 40.05 of the Lodi Township Zoning Ordinances for September 26, 2023, at 7:30 PM.

The motion passed unanimously by voice vote.

10) Public Comment

A. None.

11) Reports

A. Board of Trustees

Swenson reported that he was unable to attend the Board of Trustees meeting in August due to being out of town.

B. Commissioners

Nothing.

C. Planning Consultant

Nothing

D. Engineering Consultant

Nothing.

12) Other Business

None.

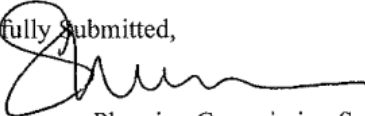
13) Adjournment

Motion by Rogers, seconded by Vestergaard, to adjourn at 8:53 PM.

The motion passed unanimously by voice vote.

The next regular meeting is scheduled for September 26, 2023, at 7:00 PM.

Respectfully Submitted,


Craig Swenson, Planning Commission Secretary

ESTABLISHED 1835



SYLVAN TOWNSHIP

18027 Old US 12
Chelsea, Michigan 48118-9673
(734) 475-8890
Fax: (734) 475-8905

Sylvan Township Planning Commission

DRAFT AGENDA

July 27, 2023

7:00pm

- Call to Order – M. VanBuren, Chair
- Pledge of Allegiance
- Roll call of members: Tom Bareis, Clifford Camp, Courtney Heller, Leah Herrick, Sandie Schulze, Mike VanBuren, Steve Eiseman
- Accept agenda
- Approval of Minutes for the June 22, 2023 regular meeting.
- Public Comment –
- Unfinished Business –
 1. Review of draft Solar/Renewable Energy Ordinance- discussion
- New Business –
 1. Public Hearing on the Administrative Review Ordinance – postponed from June 22, 2023
 - Open Public hearing
 - Close Public hearing
 - Discussion
 - Action/motion
- Comments/ concerns of the Planning Commission members
- Adjournment

REMINDER: Next regular meeting August 24, 2023

Supervisor
Kathleen Kennedy

Clerk
Amanda Nimke

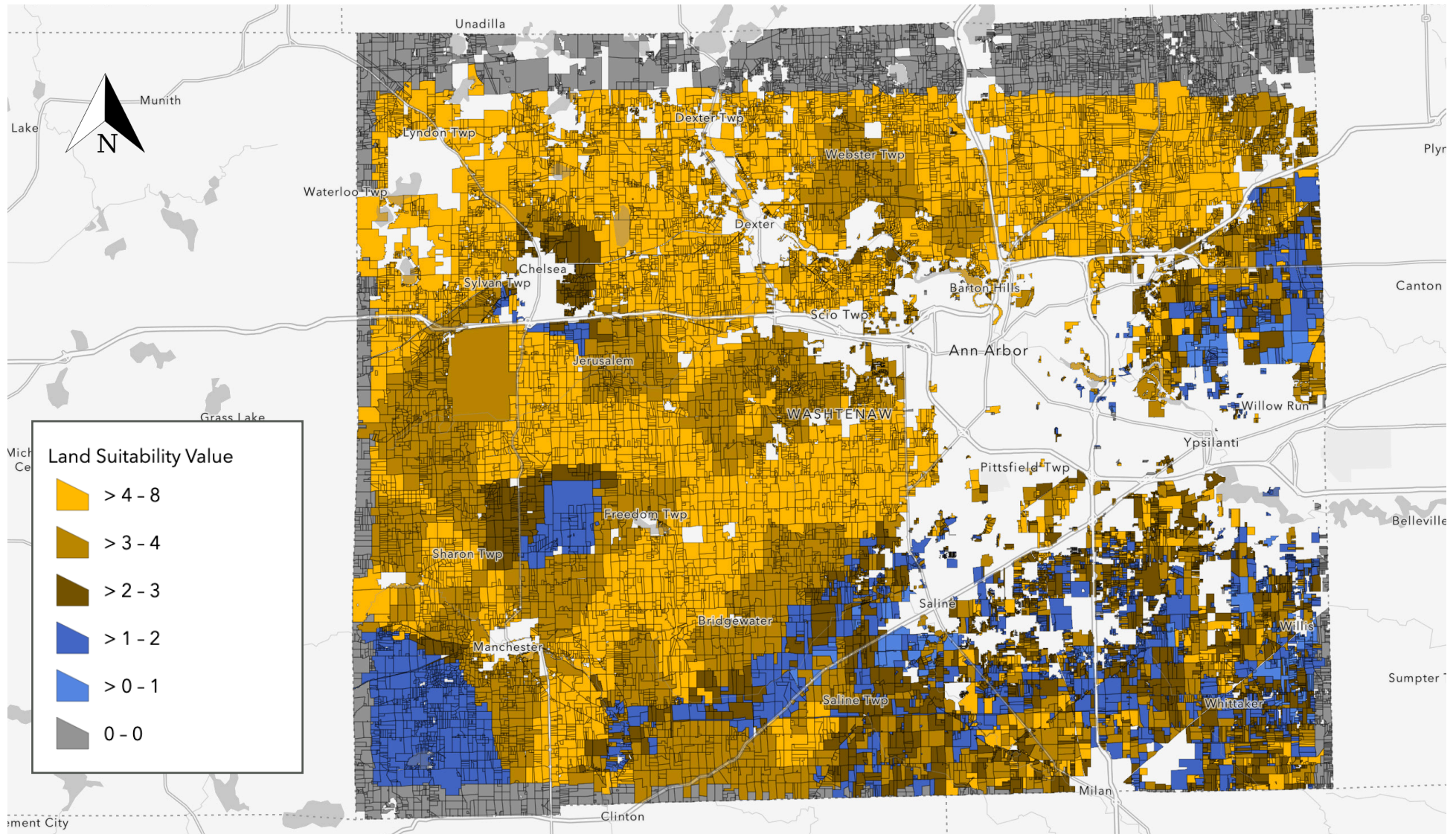
Treasurer
Rodney Branham

Trustee
Kurt Koseck

Trustee
Sandie Schulze

APPENDIX B

■ Washtenaw County Farmland Solar Potential

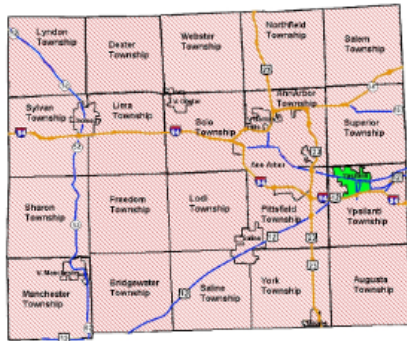


APPENDIX C ■ Siting Pamphlet

Solar Installation Siting

What's the deal with Large Solar Projects in Washtenaw County?

A quick review of solar installation development
Prepared by: University of Michigan Graham Sustainability Institute DOW Fellows



The transition to clean power has arrived in Washtenaw County. The County has completed a [Climate Action Plan](#) that aims for carbon neutrality for the entire county population by 2035. Michigan's Healthy Climate Plan is motivating renewable energy projects statewide. Solar installation companies are looking for large areas of land that:

- Have zoning that enables utility-scale projects
- Are flat and mostly open
- Are close to existing grid infrastructure

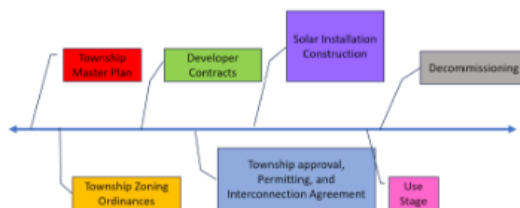
What can local governments and landowners do to make this transition equitable and fair for everyone? What are some key points of understanding?

Policy Makers

- Educational community meetings on solar process and risks/benefits are strongly encouraged to increase transparency and community trust
- Township master plans set the community standard for solar siting, whether to promote or to limit installations
- Zoning ordinances should consider the aesthetic preferences of neighbors through setback requirements and other site controls
- Prior to 2019, PA-116 contracted land could not be used for solar energy systems, but since 2019, landowners can put their contracts on hold to pursue solar developments
- Planning and policy should be considered for the deconstruction, removal, and land restoration of solar energy developments

Residents and Landowners

- Renewable energy goals are set for Utilities.
- Process of Solar Siting: Utility providers seek out solar development opportunities through contractors. Contractors seek out profitable parcels for installations. The choice to enter a contract with a developer falls on the landowner.
- Community township meetings are an excellent space to voice concerns regarding solar panels
- Solar installations can benefit landowners financially through lease programs and through IRA tax credits



For More Information:



<https://www.csr.msu.edu/resources/planning-zoning-for-solar-energy-systems-a-guide-for-michigan-local-governments>



<https://www.forbes.com/sites/energyinnovation/2022/08/23/inflation-reduction-act-benefits-clean-energy-tax-credits-could-double-deployment/?sh=358396366727>

APPENDIX D

■ Acronym List

DTE - Detroit Edison

EPBT - Energy Pay Back Time

GHG - Greenhouse Gas

GIS - Geographic Information System

kW - Kilowatt

kWh - kilowatt hour

LCA - life cycle assessment

LSV - Land Suitability Value

**MDARD - Michigan Department of
Agriculture and Rural Development**

MW - Megawatt

NIMBY - Not in My Backyard

PV - photovoltaic

W - Watt

APPENDIX E

Calculations

Solar Generation Capacity

For energy calculation at each parcel, power generated from the parcel was calculated as:

$$P_{gen}(MW) = P_{solar} \left(\frac{MW}{m^2} \right) * A_{parcel}(m^2) * \eta_{panel} * \eta_{inverter\ and\ transformer} * GCR$$

Where Psolar is the power from solar radiation per unit area, Aparcel is the area of the respective parcel, ηpanel is the panel efficiency, *ηinverter and transformer is the combined efficiency of the inverter and transformer, and GCR is a ratio of how much land area is actually covered by solar panels [33, 34, 35].

Hourly Energy Produced:

$$Energy(MWh) = Power(MW) * 1\ hour\ (for\ each\ of\ the\ 8760\ hours\ in\ the\ year)$$

CO2 Avoidance:

$$CO_{2\ avoided}(kg) = Energy(MWh) * Marginal\ Factor \left(\frac{kg}{MWh} \right) \ (for\ each\ hour)$$

$$CO_{2\ avoided}(metric\ kiloton) = \sum_{n=1}^{n=8760\ hr} (CO_{2\ avoided})_n(kg) * \frac{1\ metric\ kiloton}{10^6\ kg}$$

	A	B	C	D	E	F	G	H
1	LSV	Area (square miles)	Area (square meters)	Power Generation (MWh)	CO2 avoided (kg)	CO2 avoided (metric kilotons)		
2	1	8.85718	22940096.2	4,068,784.76	2,566,592,776.14	2,566.59		
3	2	59.93862	155241025.8	27,534,423.35	17,368,736,900.91	17,368.74		
4	3	55.92203	144838057.7	25,689,294.29	16,204,827,972.93	16,204.83		
5	4	145.8667	377794753	67,007,806.83	42,268,579,672.08	42,268.58		
6	5	222.56362	576439775.8	102,240,607.74	64,493,459,467.29	64,493.46		
7	6	0	0	0	0	0		
8	7	0	0	0	0	0		
9	8	0	0	0	0	0		
10	Undetermined LSV (null)	72.06894	186658554.6	33,106,813.34	20,883,805,092.41	20,883.81		
11								
12								

	A	B	C	D	E	F	G	H	I
1		Month	Day	Hour	P_gen_M\	P_gen_M\	Marginal_	CO2_avoided_kg	
2	1	1	1	20	0	0	697.9237	0	
3	2	1	1	21	0	0	634.8974	0	
4	3	1	1	22	0	0	589.4109	0	
5	4	1	1	23	0	0	521.9139	0	
6	5	1	1	0	0	0	727.6094	0	
7	6	1	1	1	0	0	773.9498	0	

Financial

FD	ID	NAME	LABEL	Shape_Ar_2	Power Generation in Summer (MW)	Power Generation Winter (MW)	Lease Revenue	Wheat Revenue	Wheat Cost	Net Profit for 100%	Soybean Revenue	Soybean
1	1	Salem	Salem Township	3,74,812	882	113	76,25,81,27.00	88,94,82,87.00	76,25,81,27.00	10,26,94,190.00	21,18,92,718	88,942
2	2	Salem	Salem Township	2,74,910	590	104	51,16,12,12.00	58,87,85,84.00	51,16,12,12.00	10,26,94,190.00	21,18,92,718	88,942
3	3	Salem	Salem Township	1,54,142	470	60	11,27,70,88.00	68,38,88,87.00	48,23,17,22.00	8,67,07,888.00	11,27,70,88	47,064
4	4	Salem	Salem Township	33,922	127	20	5,93,81,88.00	51,26,82,87.00	51,26,82,87.00	2,88,81,888.00	5,93,81,88	12,700
5	5	Salem	Salem Township	4,32,811	5,701	225	41,46,88,88.00	5,72,08,87.00	4,32,81,22.00	81,26,94,190.00	5,72,08,88	5,72,088
6	6	Salem	Salem Township	66,845	188	29	4,52,17,18.00	14,68,88,87.00	14,68,88,87.00	10,26,94,190.00	4,52,17,18	18,848
7	7	Salem	Salem Township	4,92,811	6,814	235	46,16,88,88.00	6,78,08,87.00	46,16,88,87.00	71,26,94,190.00	6,78,08,88	6,78,088
8	8	Salem	Salem Township	4,82,812	5,809	232	46,16,88,88.00	5,80,08,87.00	46,16,88,87.00	71,26,94,190.00	4,82,812	5,8092
9	9	Salem	Salem Township	4,24,910	862	118	21,48,88,88.00	8,88,88,87.00	21,48,88,87.00	10,26,94,190.00	4,24,910	8622
10	10	Salem	Salem Township	2,87,778	887	114	21,48,88,88.00	8,88,88,87.00	21,48,88,87.00	10,26,94,190.00	2,87,778	8872
11	11	Salem	Salem Township	4,82,812	5,809	232	46,16,88,88.00	5,80,08,87.00	46,16,88,87.00	71,26,94,190.00	4,82,812	5,8092
12	12	Salem	Salem Township	4,82,812	5,809	232	46,16,88,88.00	5,80,08,87.00	46,16,88,87.00	71,26,94,190.00	4,82,812	5,8092
13	13	Salem	Salem Township	10,13,111	4,108	127	88,16,88,88.00	4,08,88,87.00	88,16,88,87.00	4,08,88,888.00	10,13,111	4,1082
14	14	Salem	Salem Township	10,13,111	4,108	127	88,16,88,88.00	4,08,88,87.00	88,16,88,87.00	4,08,88,888.00	10,13,111	4,1082
15	15	Salem	Salem Township	3,52,811	1,108	78	4,48,88,88.00	1,08,88,87.00	4,48,88,87.00	1,08,88,888.00	3,52,811	1,1082
16	16	Salem	Salem Township	1,51,100	1,114	78	14,58,88,88.00	88,88,87.00	14,58,88,87.00	1,08,88,888.00	1,51,100	1,1142
17	17	Salem	Salem Township	3,74,812	8,819	315	46,16,88,88.00	6,78,08,87.00	46,16,88,87.00	71,26,94,190.00	3,74,812	8,8192
18	18	Salem	Salem Township	1,82,812	1,112	67	12,17,88,88.00	11,87,88,87.00	12,17,88,87.00	1,08,88,888.00	1,82,812	1,1122
19	19	Salem	Salem Township	2,28,741	827	119	22,17,88,88.00	8,88,88,87.00	22,17,88,87.00	1,08,88,888.00	2,28,741	8272
20	20	Salem	Salem Township	89,818	389	47	8,88,88,88.00	38,88,88,87.00	8,88,88,87.00	8,88,88,888.00	89,818	3892
21	21	Salem	Charlevoix	8,818	827	47	8,88,88,88.00	38,88,88,87.00	8,88,88,87.00	8,88,88,888.00	8,818	3892
22	22	Salem	Salem Township	89,818	389	47	8,88,88,88.00	38,88,88,87.00	8,88,88,87.00	8,88,88,888.00	89,818	3892
23	23	Salem	Salem Township	4,82,812	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	4,82,812	1,8872
24	24	Salem	Salem Township	1,07,881	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,07,881	1,8872
25	25	Salem	Salem Township	1,07,881	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,07,881	1,8872
26	26	Salem	Salem Township	1,07,881	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,07,881	1,8872
27	27	Salem	Salem Township	92,812	375	68	8,88,88,88.00	38,88,88,87.00	8,88,88,87.00	8,88,88,888.00	92,812	3752
28	28	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
29	29	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
30	30	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
31	31	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
32	32	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
33	33	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
34	34	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
35	35	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
36	36	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
37	37	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
38	38	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
39	39	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
40	40	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
41	41	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
42	42	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
43	43	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
44	44	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
45	45	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
46	46	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
47	47	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
48	48	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
49	49	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
50	50	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
51	51	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
52	52	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
53	53	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00	46,16,88,87.00	1,08,88,888.00	1,24,819	1,8872
54	54	Salem	Salem Township	1,24,819	1,887	128	46,16,88,88.00	1,87,88,87.00				

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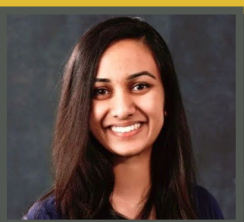
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