Renewables in Milton

Featuring Tyler Augst and MI REDI

Welcome + MI REDI Introduction

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Michigan Renewable Energy Development Initiative (MI REDI) - Graduate student team from the University of Michigan

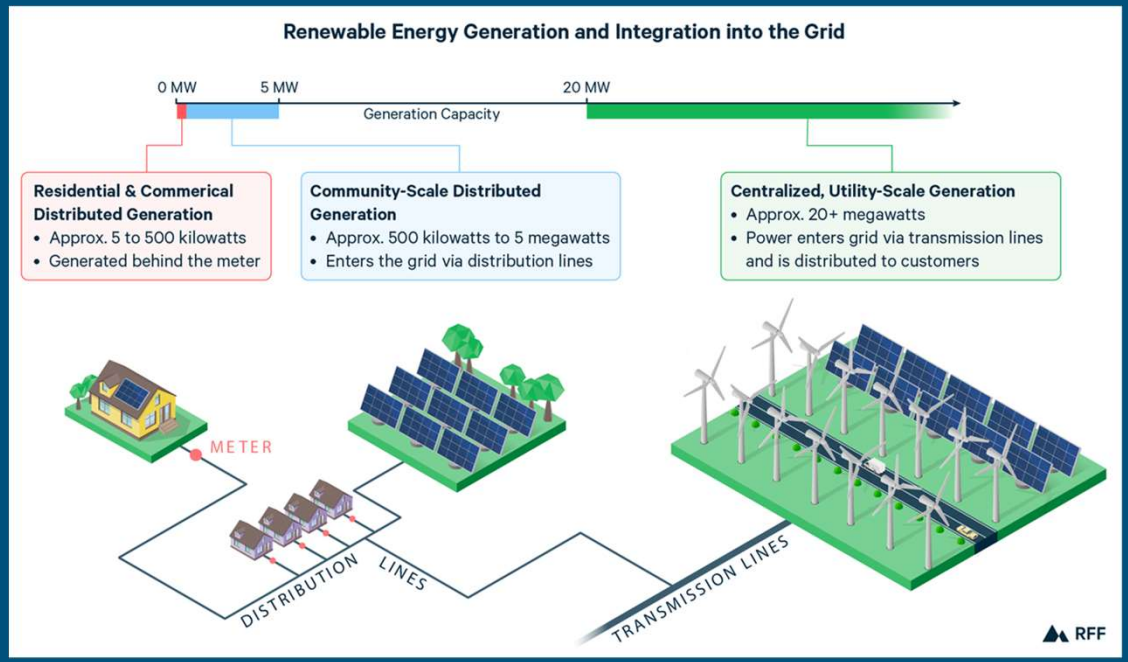
- Creating a program for EGLE to encourage proactive zoning for *utility-scale* renewables
- Student team unaffiliated with the industry
- Goal is to ensure any development is done on the township's terms through zoning
- Any zoning is good, restrictive or permissive

What does utility-scale mean? (MI REDI)

- >25 acres, and **plugs into the grid**
  Average solar farm in MI: 200 acres
  Largest in MI: 1,900 acres

- Not house rooftops or personal systems that use electricity on-site, but fields or large roofs devoted to grid-wide generation

- Electricity goes to I&M who then distributes it—doesn't necessarily reach Milton's local lines



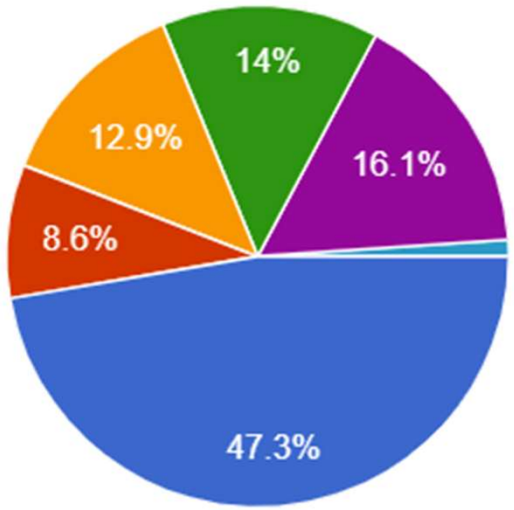
Zoning for Utility-Scale Renewables (MI REDI)

- Large wind or solar projects cannot be sited in a community unless zoning ordinances allow them
- Resident preferences can be factored into zoning with things like:
  - Setbacks, which require that projects be a certain distance from roads or buildings
  - Fences, vegetation, or other barriers to hide solar projects from view
  - Wildlife corridors and environmental siting
- The next town hall meeting in December will be an opportunity to share your input in developing Milton's zoning ordinances for utility-scale renewables
- **Zoning ordinances are a collaborative effort by the township**

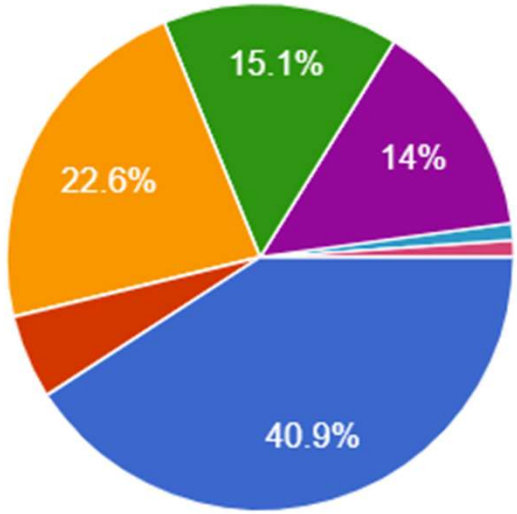
Milton’s Questions

Milton's Survey Summary

What is your initial impression about a large scale wind project in Milton Township?



What is your initial impression about a large scale solar project in Milton Township?

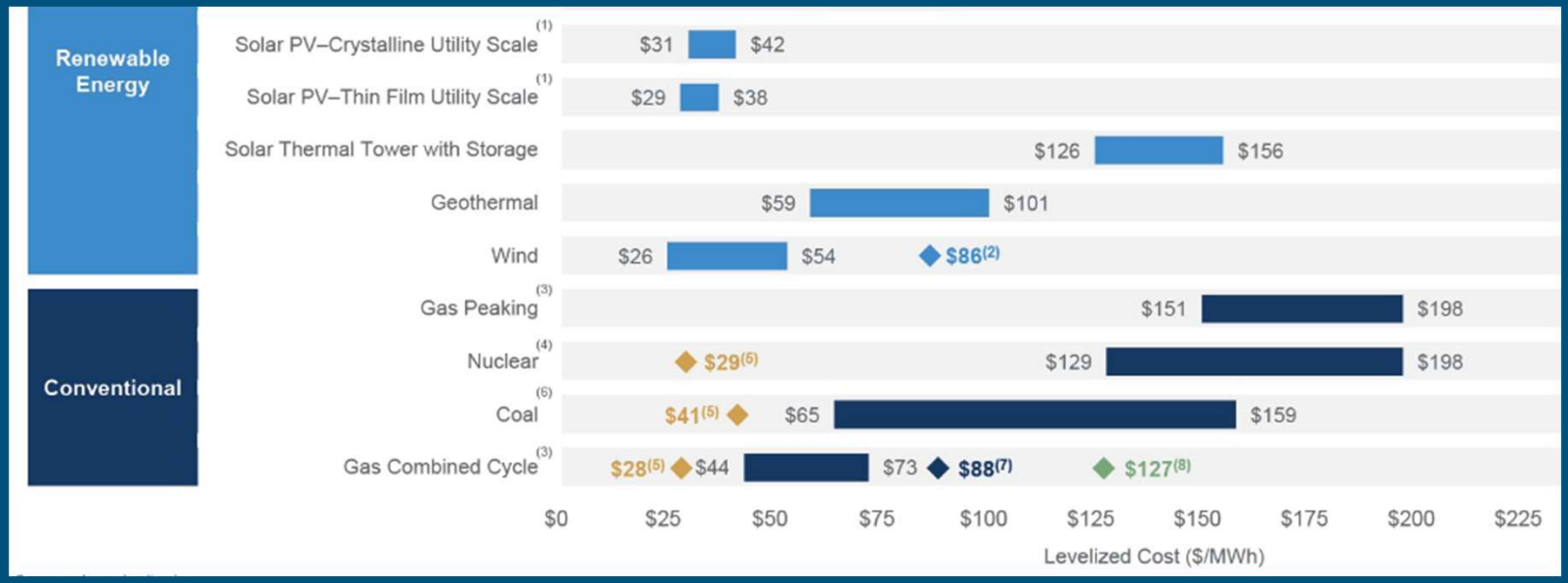


Absolutely does not belong
Maybe does not belong
Maybe belongs
Absolutely does belong
I need more information

Who pays for a utility-scale project?

- The township and its citizens don't pay for the system. A utility/developer fronts the bill in exchange for permission to use private or public land
- A project can lease the land it sits on, or the utility/developer can buy the parcel outright from a landowner
- This way, the developer either pays the township through property taxes or pays the township's landowners, without those entities incurring any cost.
  Developers might also pay "good neighbor agreements" to neighbors in the line of sight. Individual landowners who directly host may receive large payments.

How expensive are renewables?



- Due to federal and state funding, renewables are fully cost competitive with standard generation. **However,** transmission & storage upgrades will cost the utility, which will reach electricity bills

How can the community benefit from a solar or wind project?

- Increased local tax revenues
  - More revenue to fund services within the community
- Landowner payments
  - “Under agreements with private solar developers, farmers can earn rental payments varying from $500 to $2,000 per acre per year.” - Charles Gould, Bioenergy and Agricultural Energy Conservation Educator at MSU Extension
- Land sales
  - If landowner sells property rather than renting
- Good neighbor agreements
  - Financial compensation to landowners near utility-scale renewable projects

Renewable Energy Impacts on Property Values

Note: Little peer-reviewed literature exists on this topic, and there is no firm stance on the impact of renewable energy on property values among experts. However, the research below does provide some insights on this relationship.

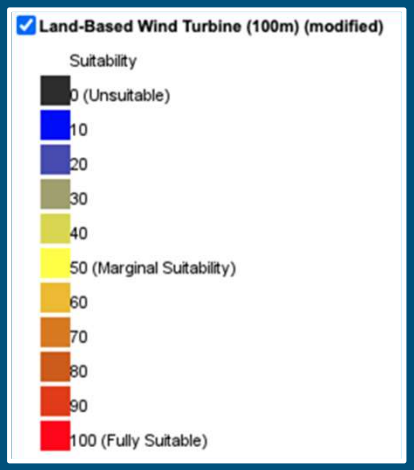
Solar:

- Research found that while a majority of estimates showed no value impact, some cases did see a decrease in property values when solar installations were in close proximity to homes.
- Geospatial analyses show that few homes in a community will be impacted. Proactive zoning and neighbor payments by the developer are the best way to ensure this meets the township's terms.
- Developers can be made to contract a third-party assessment of the nearby area's property values before and after solar in their proposal.

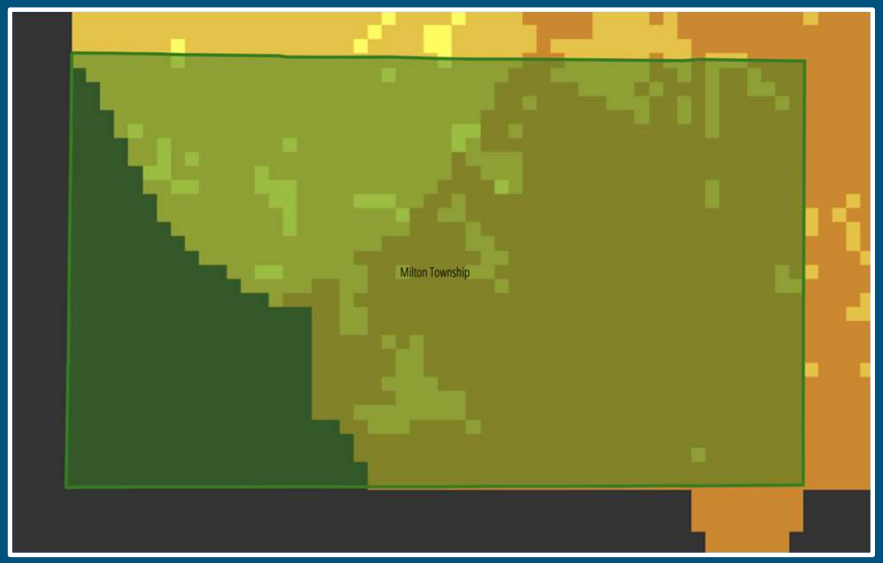
Wind:

- One UK study found a price reduction around 5-6% on average for housing with a visible wind farm within 2km, falling to under 2% between 2-4km, and to near zero between 8-14 km, which is at the limit of likely visibility.
- Another paper looked at 50,000 home sales including 1,198 within 1 mile of a turbine, finding no statistical evidence that home values were affected in the turbine post-construction or post-announcement/pre-construction periods.

Is wind energy viable in Milton?



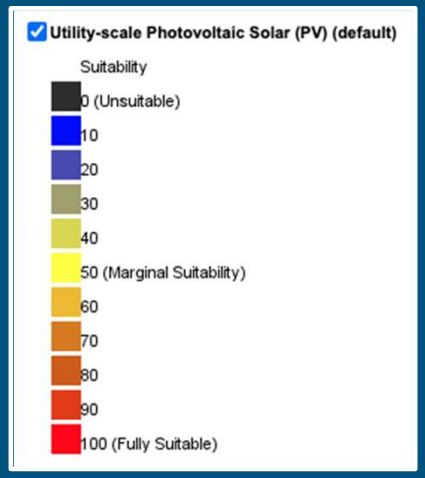
- Model factors includes wind speed, land cover, distance to substation, distance to major roads, habitat, protected land, and population density
- Many areas in Milton are considered suitable for wind turbine development



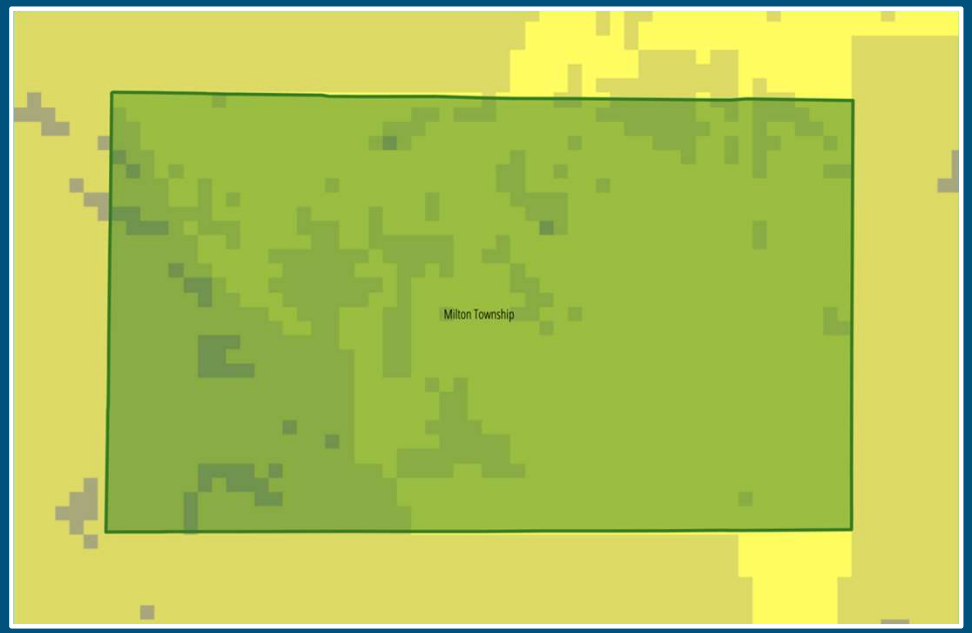
Suitability Analysis for Land-Based Turbines at 100m

Source: Energy Zones Mapping Tool (EZMT)

Is solar energy viable in Milton?



- Model factors includes solar potential, land cover, distance to substation, slope, habitat, protected land, and population density
- Most areas in Milton are considered marginally suitable for utility-scale solar development
- Michigan isn't the sunniest place in the world, but solar energy is fully viable in the region



Suitability Analysis for Utility-Scale Photovoltaic Solar

Source: Energy Zones Mapping Tool (EZMT)

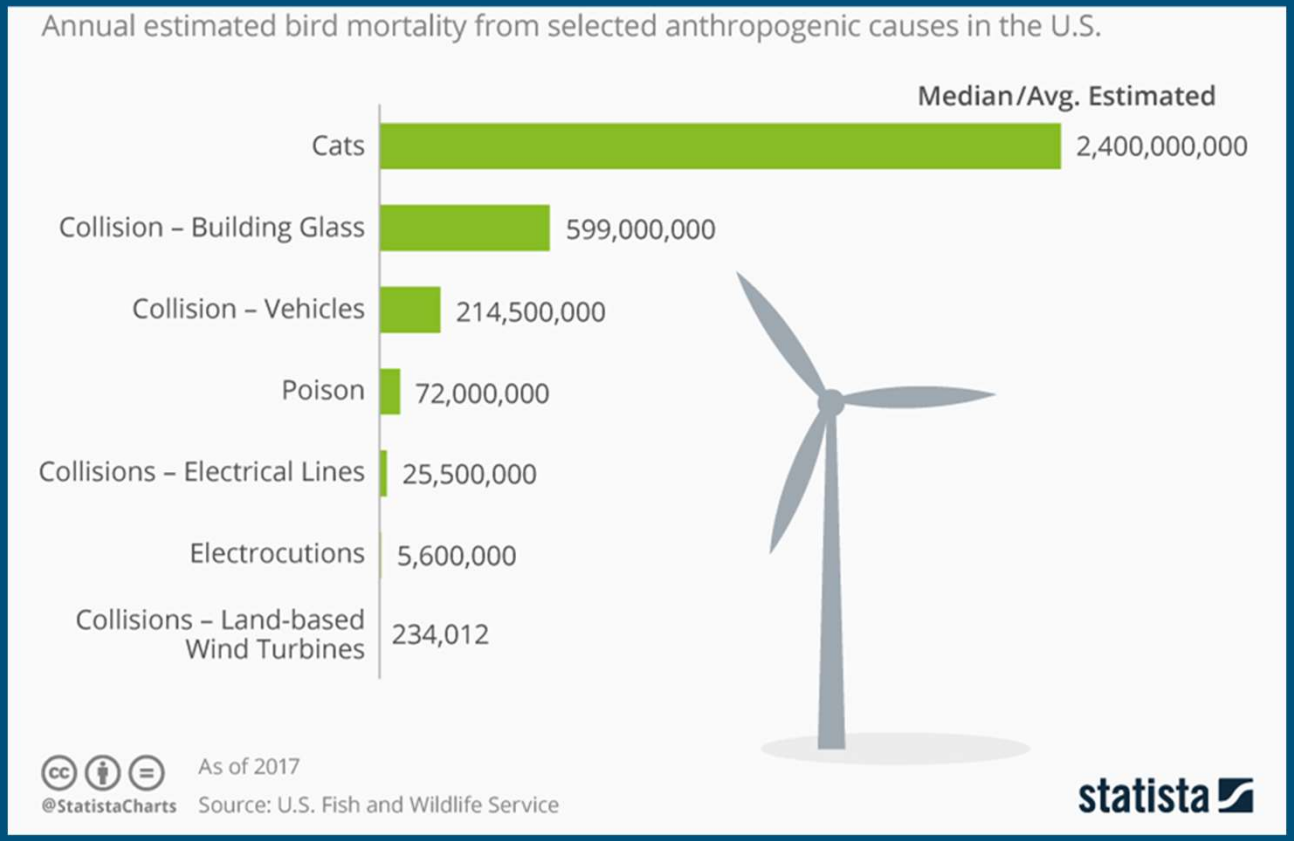
Electrical reliability: Will renewables cause local blackouts?

- Renewables **do** introduce some unreliability into the grid. This is balanced with energy storage like batteries, or keeping other plants ready to generate more.
- Reliability issues **are not** localized. Since a utility-scale plant plugs into the greater grid, (usually not even touching Milton's local power lines), any unreliability is diluted across I&M's network
- In short, Milton would not experience a higher rate of blackouts than any other township due to hosting wind or solar
- **However,** achieving full grid-wide stability will require other infrastructure to be built in the future

How do renewables impact wildlife?

- Potential Impacts from Wind & Solar:
  - Fatalities resulting from collisions with turbine blades or towers
  - Declines in the availability, quality, or connectivity of habitat caused by energy infrastructure
- Minimizing impacts on wildlife habitat
  - Conducting preliminary landscape assessment and siting practices
  - Audible or visual signals on wind turbines can help prevent collisions
  - Painting one of the three blades on a wind turbine black has been shown to reduce avian deaths by 72%
- Unwise siting of wind turbines and solar panels may disrupt migration corridors for deer
  - Impact can be minimized by siting projects further from corridors

Leading causes of bird fatalities in the U.S.



- Reducing carbon emissions is key to protecting birds and other wildlife. Despite this, renewable technologies still have some impacts on wildlife
- Estimated utility-scale **solar** bird deaths: Between 37,800 and 138,600 birds across the U.S. annually (due to collisions)
- Large installations must be properly sited to avoid disrupting vital habitat, and to minimize collision with panels, turbines, and other energy infrastructure

Do large solar farms permanently alter land?

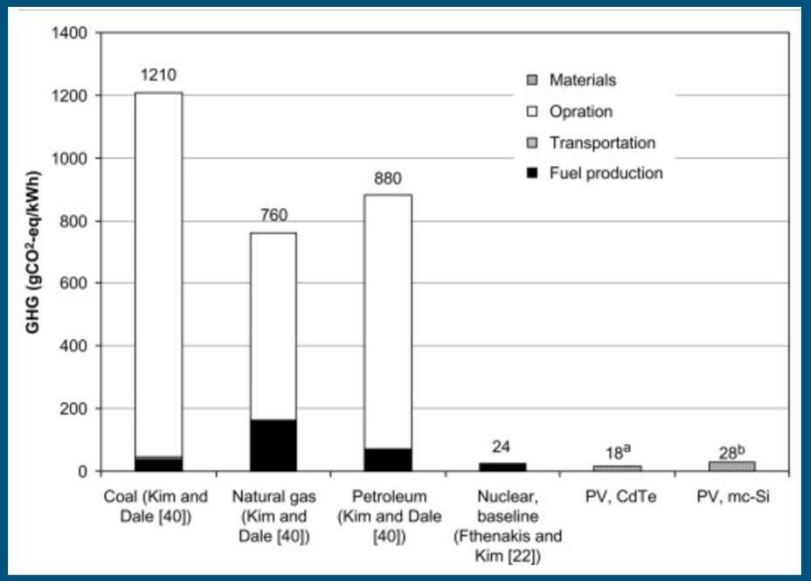
- Panels last 20-25 years, then are replaced or decommissioned
    - Decommissioning involves removing panels and recycling or disposing of them
- Studies have shown that solar farms do not permanently change soil composition, but **erosion** can happen if gravel, turf grass, or other impervious materials are put under panels
    - These impacts can be minimized by planting native vegetation, which decreases soil compaction and provides **pollinator habitat and grazing space**

Materials, Recycling, and Lifecycle Costs

The lifecycle greenhouse gas emissions (GHG) for photovoltaics from four leading studies are 28, 17, 55 and 35 g CO2-eq/kWh, plus another ~5 g from associated equipment.[1]

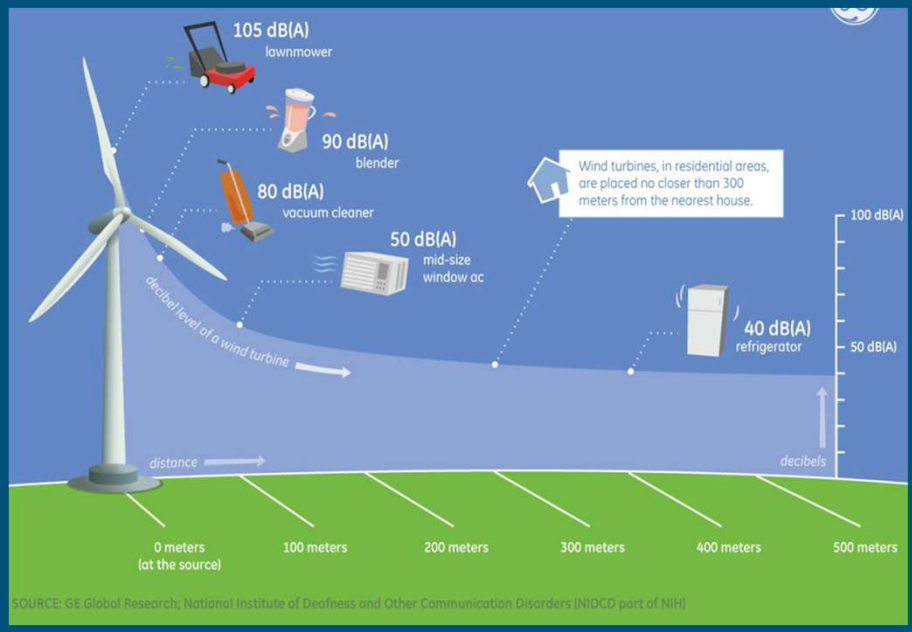
For reference, the average for electricity across all generating types (natural gas, coal, nuclear, renewables) is 475 g CO2-eq/kWh.[2]

CO_2 doesn't account for other damages like land use, mining and waste disposal, including for storage like batteries. These are valid concerns that require better answers. This is a major focus of federal and academic research. However, comparison to coal or natural gas is relevant for concerns like ground & air pollution.



Noise concerns

- **Solar**: Inverters emit a low humming noise (<45 decibels) and can only be heard while in use during the day. (A fridge is ~40 decibels)
- **Wind**: At 1,000 feet from a wind turbine, the noise level is 45-50dB. Humming noises from wind turbines are a characteristic of old turbine models; noise from new turbines comes primarily from the mechanical “whooshing”
- EPA guidelines say wind turbines should not exceed 55dB



Open Q&A Session

Future outreach

- MI REDI and Milton Township will be conducting another Town Hall in December to describe specific zoning pieces and gather direct opinions, which will be used to draft a zoning ordinance for future implementation. (The date for this will be on the forthcoming mailer)

- Thank you for your time and consideration!