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EGLE

MI Solar Communities: Utilization of Geothermal and Other Resources

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We are recording this meeting

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MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

CATALYST COMMUNITIES

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Catalyst Communities

Resources to aid communities
with their decarbonization efforts

https://www.michigan.gov/egle/outreach/catalyst-communities

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Michigan Green Communities

Resources for benchmarking and tracking sustainability progress

https://migreencommunities.com/

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Today's Speakers

- John Freeman, Executive Director, GLREA

Michigan Solar Communities Guidebook

Geothermal Energy and Resources to Support Local Communities

December 4, 2023

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GREAT LAKES RENEWABLE ENERGY ASSOCIATION

GLREA

The Great Lakes Renewable Energy Association (GLREA) is a non-profit organization of solar energy advocates who support the expansion and adoption of renewable energy in Michigan.

- GLREA's mission is to educate and enable homeowners, farmers, and businesses to save money and protect our environment by installing a renewable energy system and to establish policies that support the expansion of renewable energy in Michigan.
- Become a member or learn more by visiting GLREA.org

Michigan Solar Communities Guidebook

- A Practical Guide for Local Units of Government and Renewable Energy Advocates
  - **Purpose**: To help Local Units of Government, Organizations and Individuals learn about solar and geothermal energy, and be able to support the deployment of it.
  - **Recognition**:
    - The transition from fossil fuels to renewable energy is underway. There is the need of having a Guidebook so people can learn about it, quickly.
    - Many Local Units of Government are developing 'Sustainability Plans' and renewable energy plays a critical role in the implementation of these plans.
    - GLREA and the State of Michigan want to help Local Units of Government support and deploy renewable energy.

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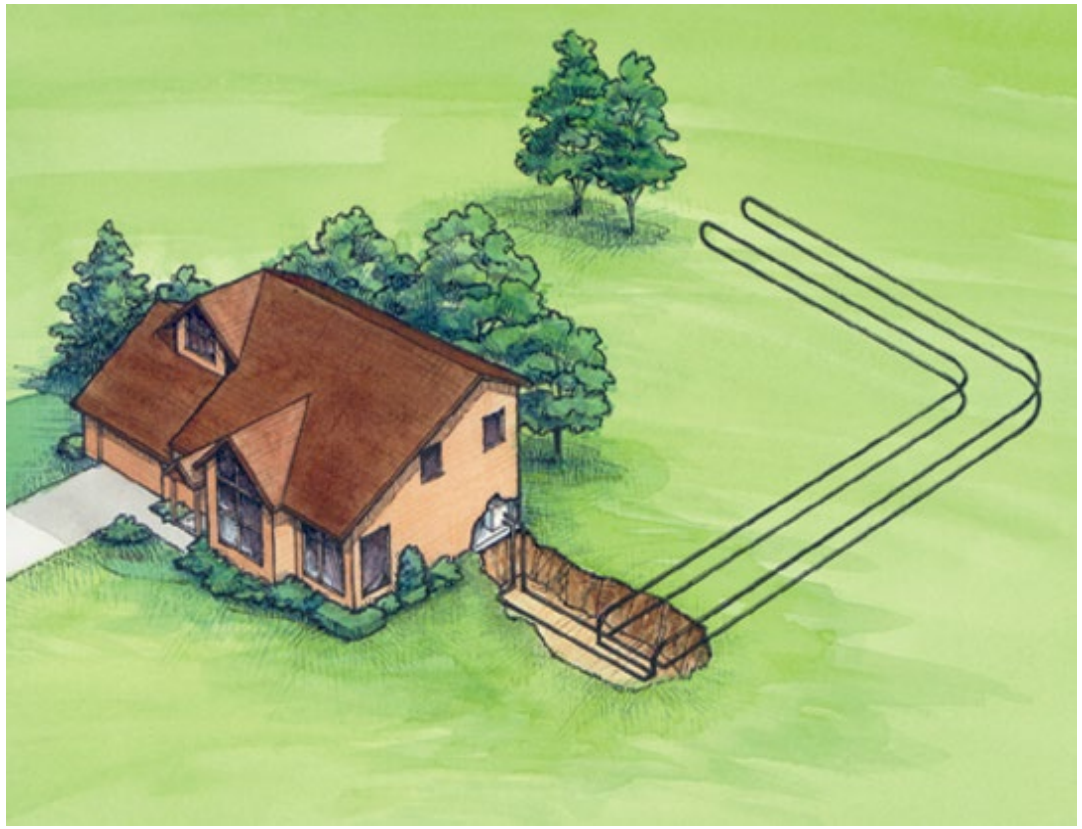
Geothermal Energy

What is Geothermal Energy:

- Is utilizing the heat from the Earth to heat or cool a home or building.
- The temperature of the Earth 30 feet down is relatively consistent between 50 and 59 degrees Fahrenheit.
- Thus soil temps are warmer than air in the winter and cooler than air in the summer.
- During the winter, the Earth serves as a heat source. In summer it serves as a heat sink.



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How Does a Geothermal System Work

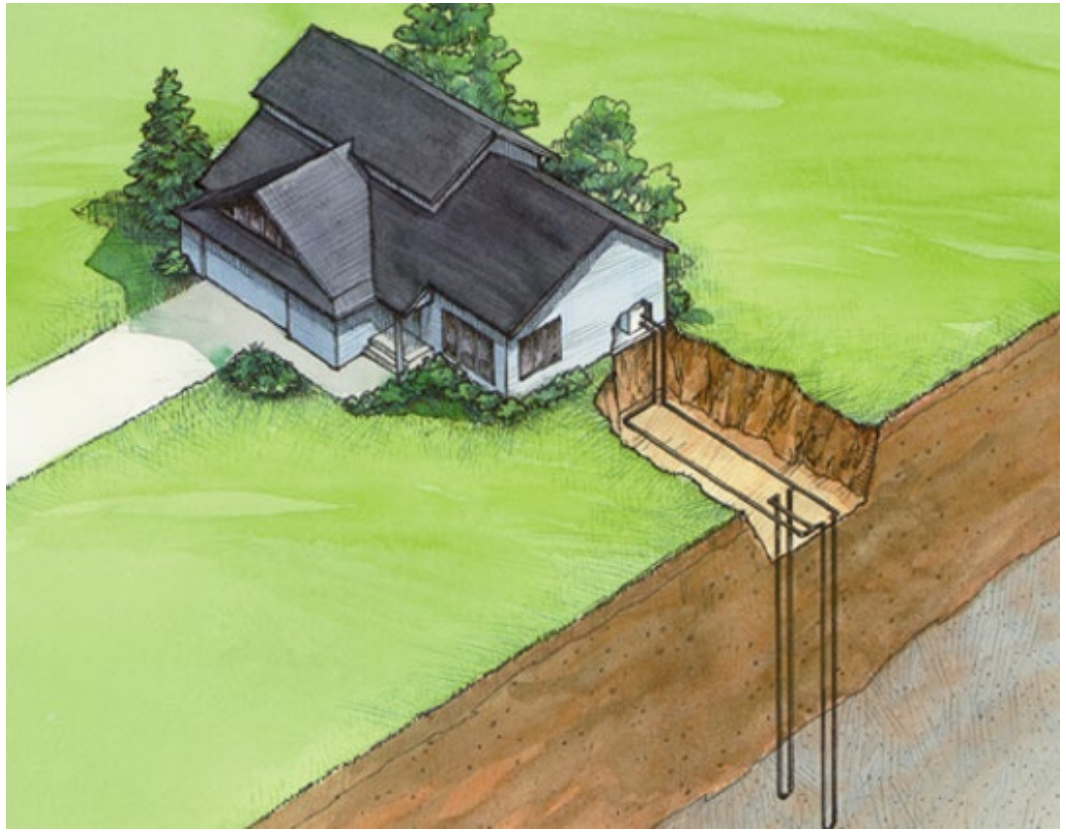
Ground Heat Exchanger: a series of closed loop pipes buried in the ground with fluid, water/antifreeze 5% running thru them to transfer the heat.

- This can be horizontal or vertical loop pipes.

Ground Source Heat Pump: transfers the heat from the pipes to the energy Delivery System.

- During the winter it delivers heat. During the summer, heat pumps works in reverse like an air conditioner.

Delivery System: consists of ductwork for forced air heating or in floor piping for radiant heating.



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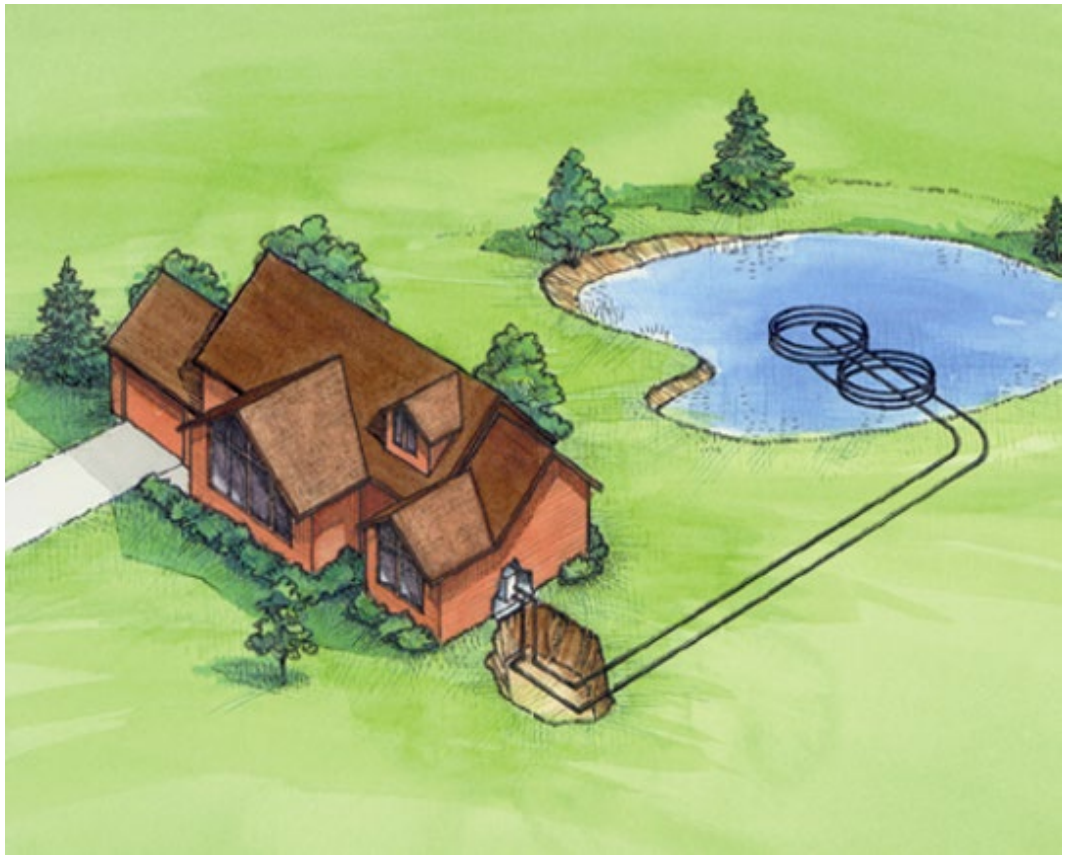
Benefits of Geothermal Energy

Reliability: since geothermal energy comes from a constant energy source, it eliminates the spikes of solar, wind or price of propane. Heat pump lasts 20 years or more and pipes 25-50 years. Gas and oil furnace last around 15 years.

Safe and Environmentally Conscious: ground source heat pump are safer, cause no open flames and no risk of gas leaks or explosions. Since Heat pump more efficient and no carbon fuel involved, t/f smaller carbon footprint.

Efficiency: geothermal energy and heat pumps more efficient than traditional heating and cooling systems, provide quiet zero emission heating and cooling with high reliability and long system life.



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Challenges to Geothermal Energy

Economics: geothermal has a high upfront cost but will lead to energy savings over the life of the system.

- Price of system will vary depending on size of system and needs of home or business.
- 30% Federal Investment Tax Credit is available. And other tax incentives.
- Utilities do offer rebate programs to encourage the purchase of them.
- *Community Geothermal*, where a series of homes all connected to larger piping system, can bring down the cost.

Drilling Concerns: because drilling is used to install the pipes, care must be taken to do the drilling properly.

- Need land for horizontal pipes, so may be a challenge for smaller lots in cities, but can do vertical loops on smaller lot e.g. underneath a drive way in Ann Arbor.

Michigan State Capital: large system built. 224 loops were drilled , 500 feet underneath the surface. Cost $70 million, but saving $300,000 a year on heating and cooling.

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Solar and Energy Efficiency

Energy Efficiency (EE): using less energy to perform the same task or produce the same result.

- EE homes use less energy to heat or cool or run appliances.
- EE manufacturing use less energy to produce goods.
- EE is an easy and cost effective way to reduce energy costs, reduce carbon pollution and fight Climate Change.

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Energy Efficiency - Support

Efforts to support EE:

- **State of Michigan** supports local community initiatives.
- **Utilities** support energy efficiency efforts.
- **2030 Districts** support efforts of reducing energy, water and transportation emissions.
- **Michigan Saves:** provides lower costing financing for energy efficient projects.
- **Property Assessed Clean Energy Program (PACE)** is another financial tool for business to finance energy efficiency upgrades. Since loan is attached to the property, risk is reduced and interest rate is t/f lower.
- **Federal Inflation Reduction Act** provides tax incentives to make upgrades.

Resources to Support Local Communities

- **SolSmart and SolarAPP+**
- **Rural Energy for America Program**: US Dept of Ag provides grant funding up to 40% cost of system and guaranteed loan funding to farmers & small business for solar and EE improvements. Most be rural districts with 50,000 people or less.
- **National Community Solar Partnership:** sponsored by Dept of Energy and Office of Solar Energy Technologies, provides information and guidance on community solar. (But we need to establish Community Solar law in MI).
- **Justice 40 Initiative:** requires that 40% of overall benefits of many fed programs flow to disadvantaged communities.
- **Local Solar Zoning and Planning Guidance:** A guidebook called *Planning and Zoning for Solar Energy Systems: A guide for Michigan Local Governments* developed by Prof Sarah Mills U of M and MSU to help local government. www.Extension.msu.edu/solarzoning

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Appendices

- Glossary of Terms – I
- Renewable Energy Policy Framework – II
- Supporting MI Business – III
- Community Solar Resources – IV
- Carbon Trading – MI Renewable Energy Certificate System (RECs) – V

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Questions?

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QUESTIONS?

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Upcoming Webinars

- December 13, 11-12 PM
  Michigan Green Communities New Sustainability Plan Resource Kit Tutorial and Program Updates

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