

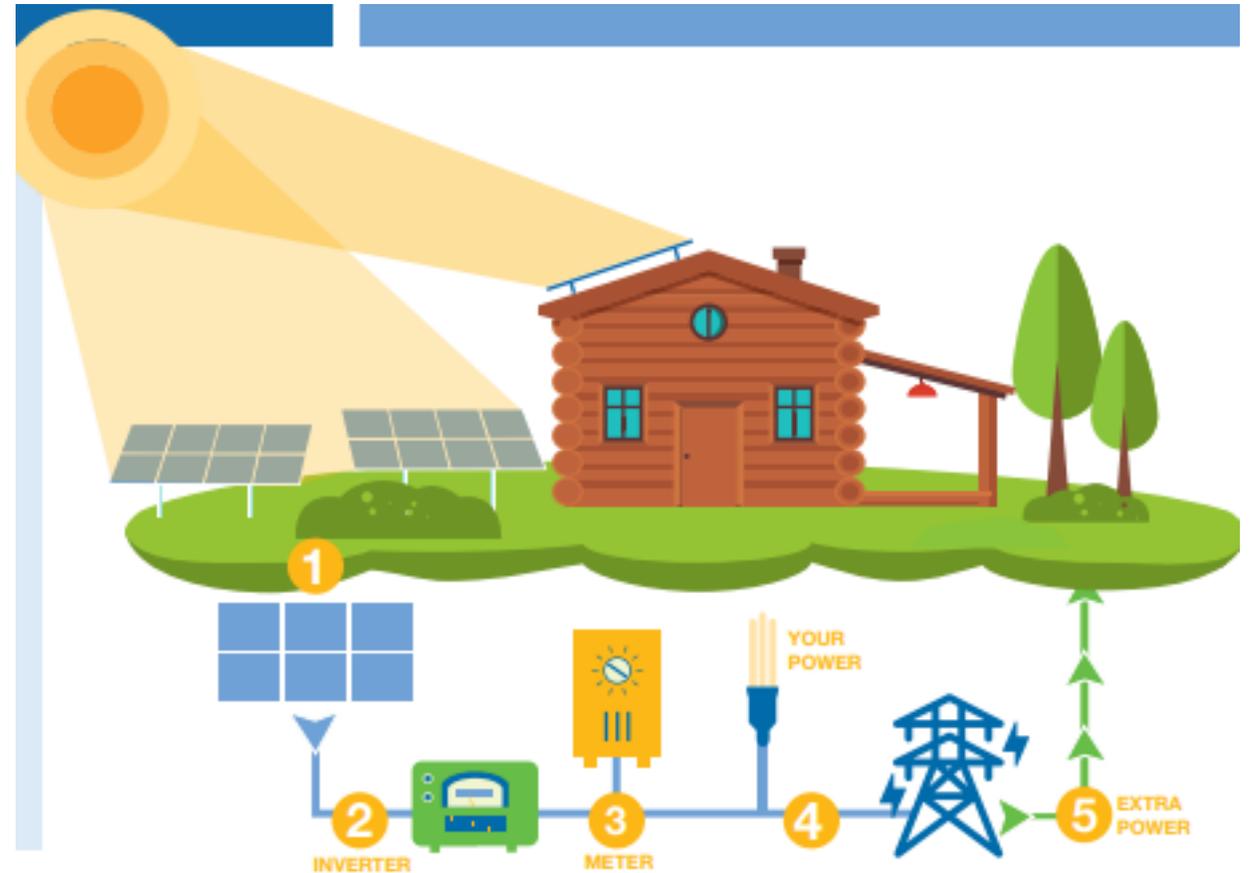
Utility Scale Solar Facilities

Boone County Resource Management



Photovoltaic (PV) Solar Panels

1. Sunlight hits the solar panels, capturing energy creating direct current (DC).
2. Inverters convert direct current (DC) into alternating current (AC) to be used locally or sent to the grid.
3. Meters record the amount of energy being generated.
4. Bi-directional meters record amount of energy a customer purchases and excess power sent to the grid.
5. When solar energy is not enough to meet demand, local power company provides additional power.

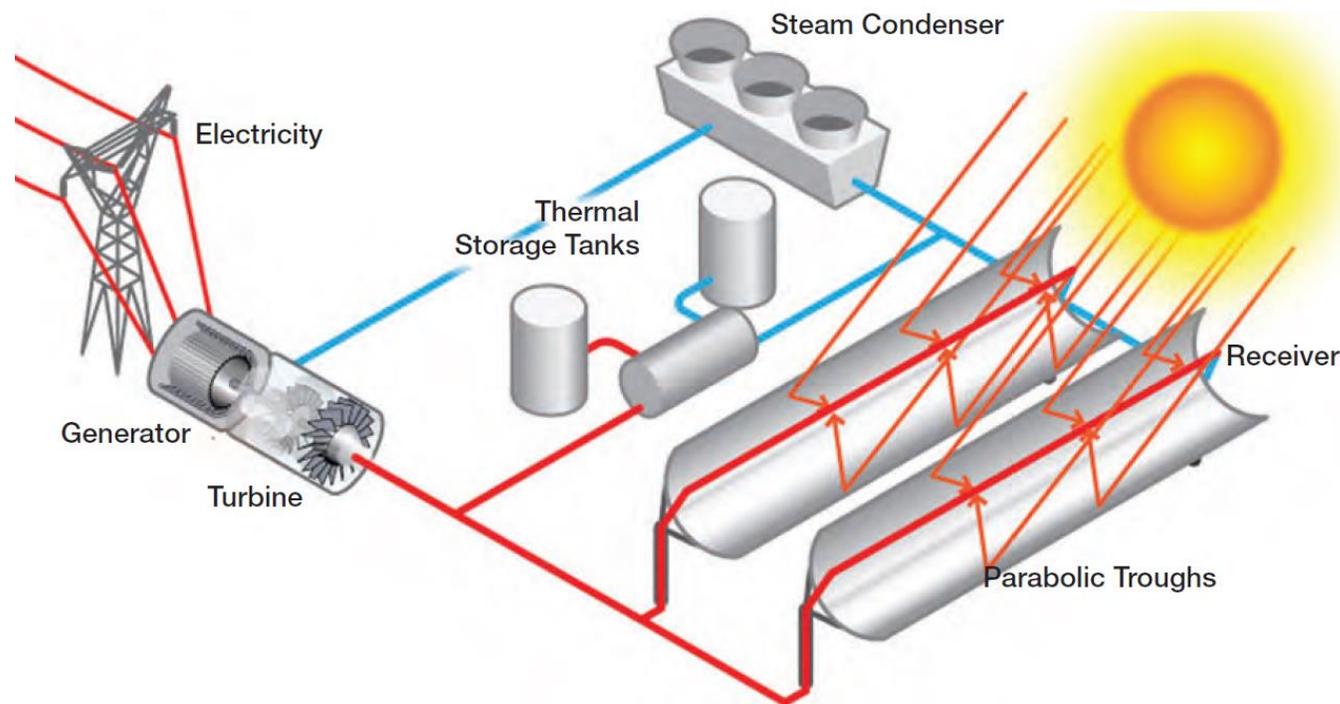


From Tennessee Valley Authority, "How Solar Energy Works". Accessible via <https://edt.tva.gov/manuals/How%20Solar%20Energy%20Works.pdf>

Concentrated Solar Power (CSP)

Concentrated Solar Power (CSP) utilizes a system of mirrors to focus sun's energy to heat water and create steam. Steam is used to spin a turbine and create electricity.

Staff is considering ordinances for photovoltaic (PV) solar panels.

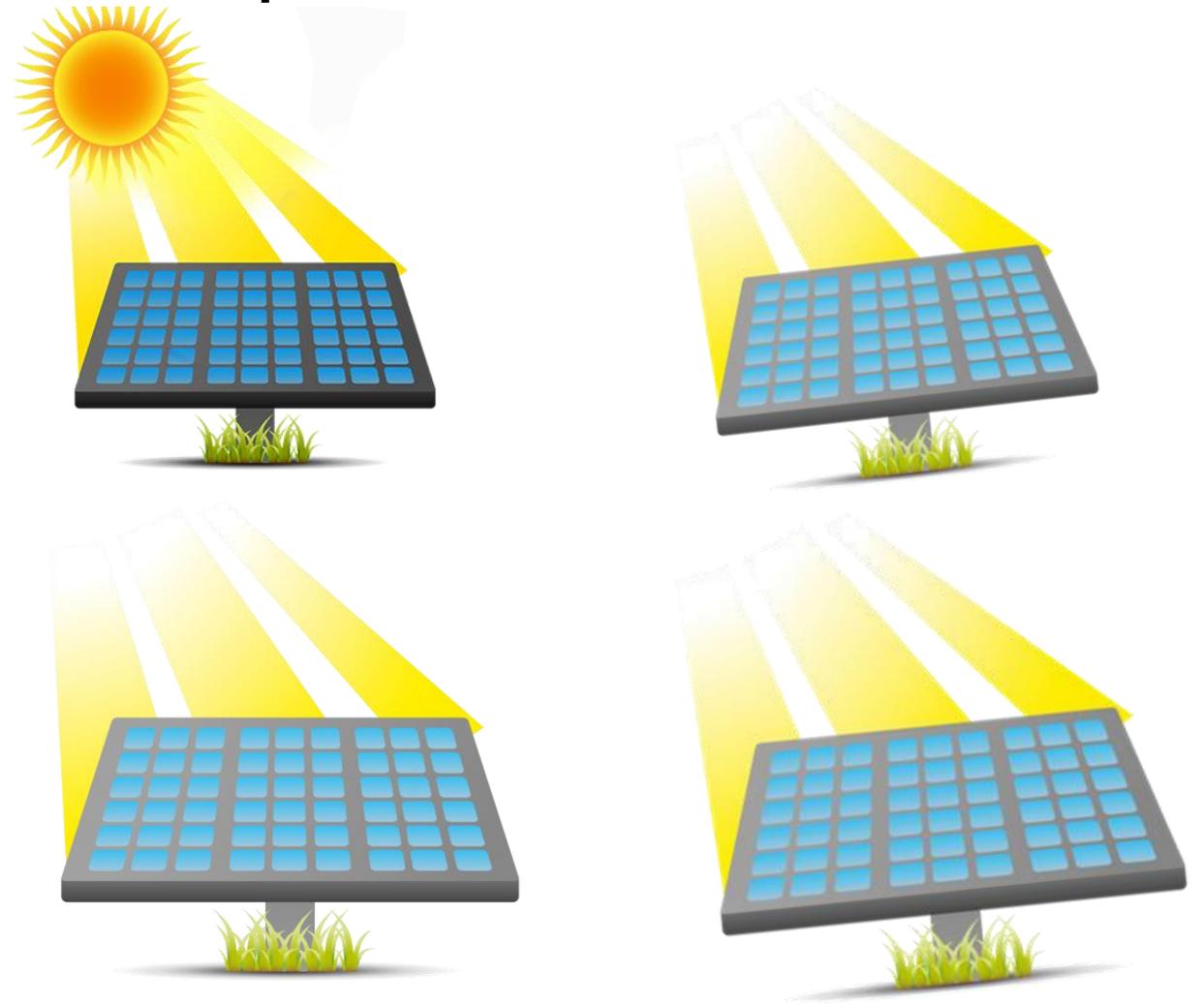


From David Morley, ed. "Planning for Solar Energy" American Planning Association. April 2014; p 12.



Land Use Impacts

- Changes in land use
- Location
- Size
- Concentration of uses
- Visual impacts
- Decommissioning
- Environmental impacts
- Economic impacts



Locations to Consider



AREAS NOT
DESIGNATED FOR
FUTURE GROWTH



BROWNFIELDS



CAPPED LANDFILLS



NEAR POWER
TRANSMISSION
LINES

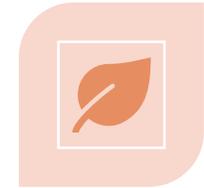
Locations to Avoid



GROWTH AREAS



PRIME FARMLAND



ECOLOGICALLY
SENSITIVE AREAS



HISTORICAL SITES



ADJACENT
RESIDENCES OR
BUSINESSES

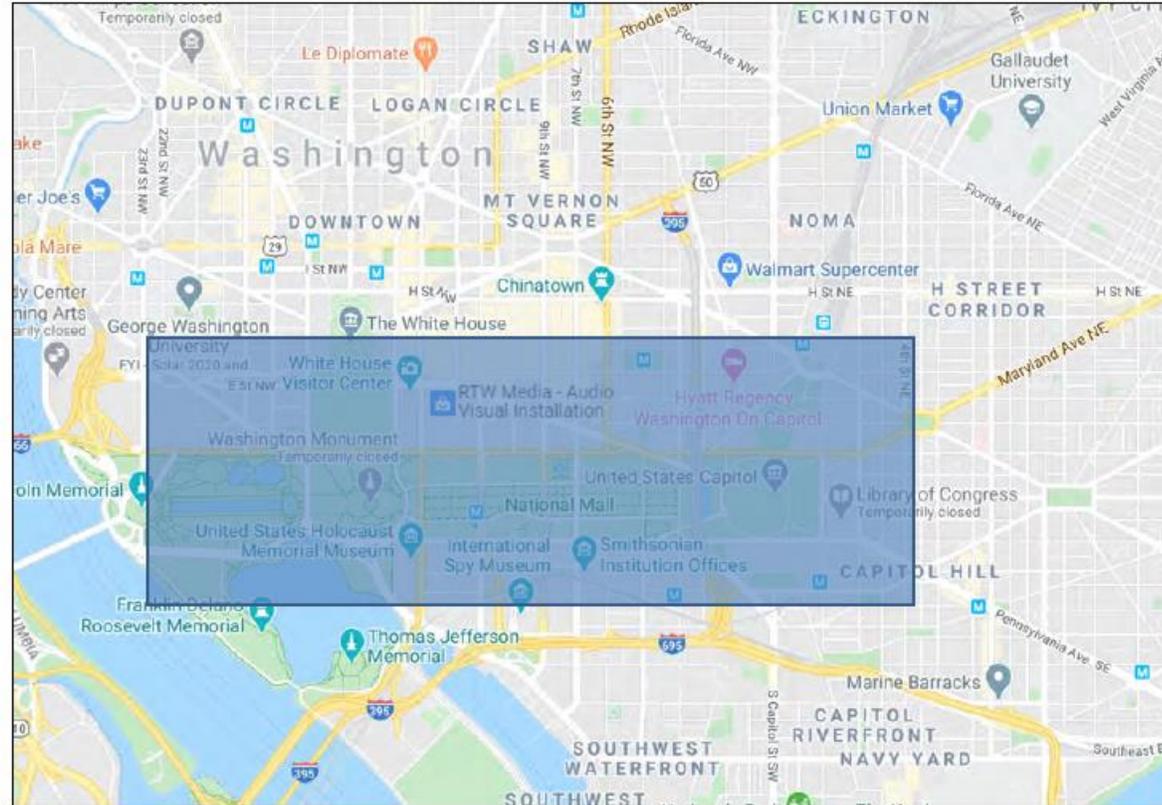
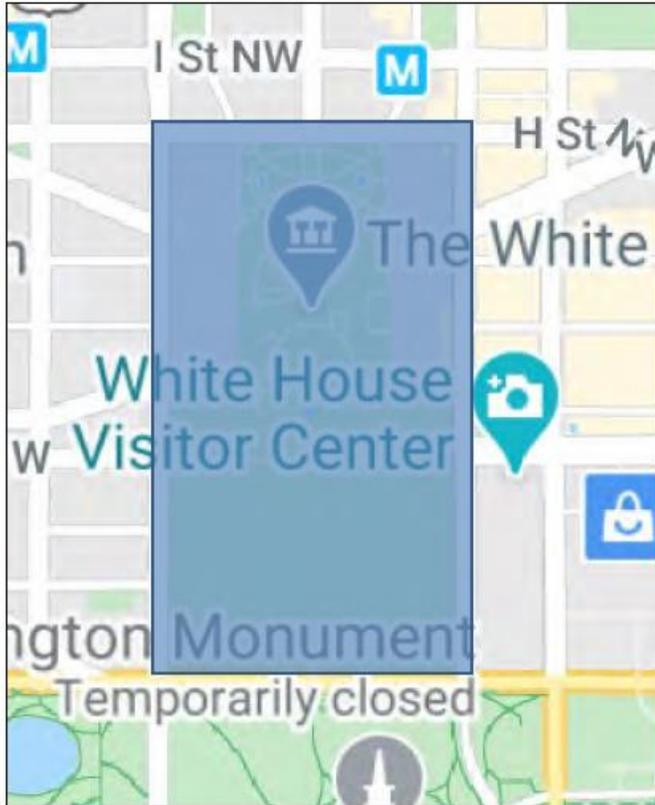
From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Size

2 MW / 20 ac

500 MW / 5,000 ac



From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83



Environmental Impacts

- Wildlife disruptions
- Soil quality/erosion
- Construction/decommissioning



Photo on left from American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.

Photo on right from Darren Coffey, "PAS Memo; Planning for Utility-Scale Solar Energy Facilities". American Planning Association. September/October 2019; p.

7.



Environmental Impacts



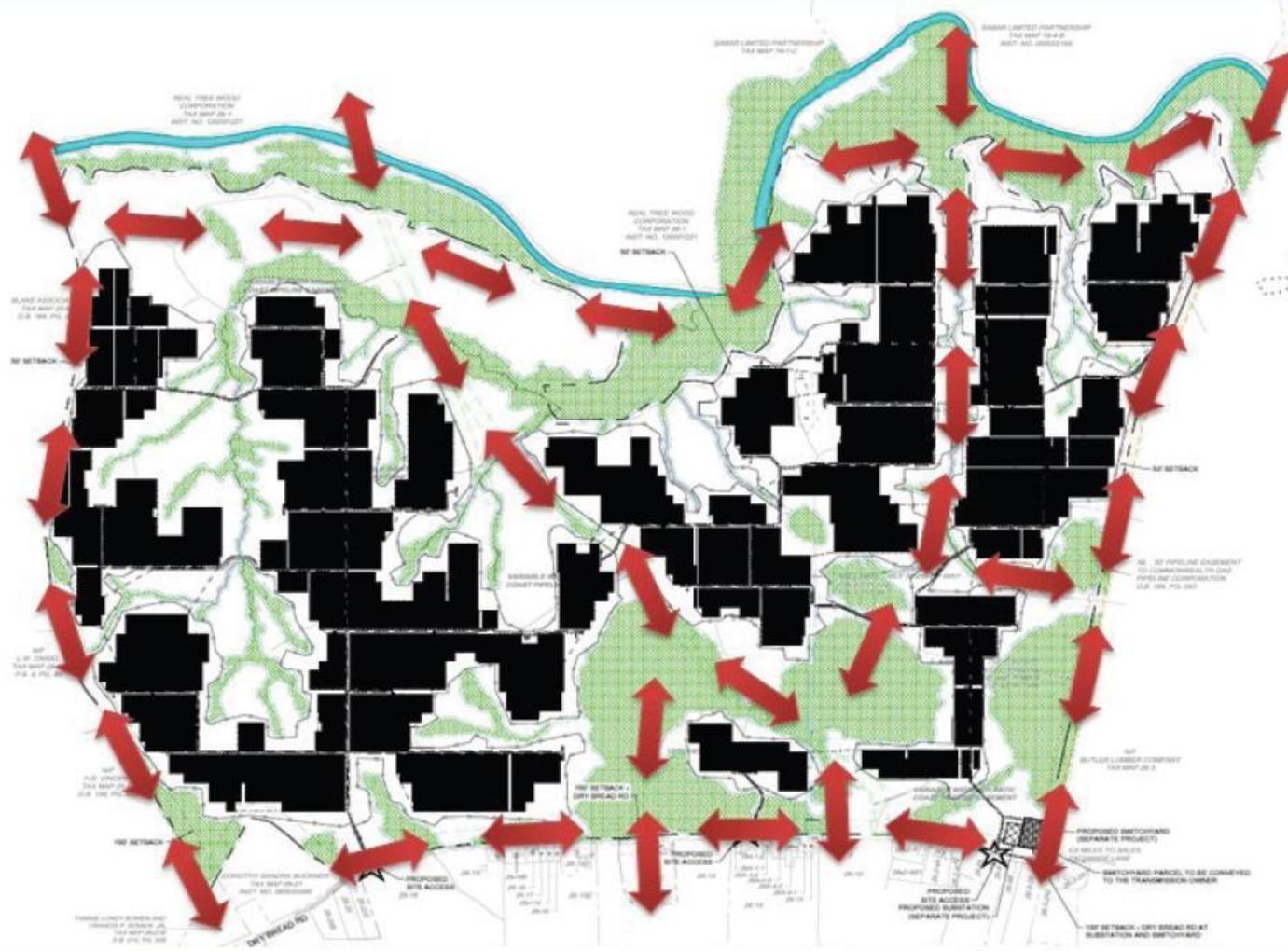
First and second photos (from left to right) from Rob Davis. "Fresh Energy." SolSmart Webinar. October 15th, 2019. Available from <https://drive.google.com/file/d/1b0UyDpp06L7VEIZRgFKNew5RQfFT8-IS/view>.

Last photo (from left to right) from Brian Ross. "Case Study; Stearns County". *Planning*; March 2020. Available from <https://www.planning.org/planning/2020/mar/are-you-solar-ready/>



Conceptual Site Plan

Wildlife Corridors



From Darren Coffey, "PAS Memo; Planning for Utility-Scale Solar Energy Facilities". American Planning Association. September/October 2019; p. 6.

Visual Impacts

Post-construction



6 years later



From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Decommissioning

- Life cycle of large-scale solar projects **between 30 to 40 years.**



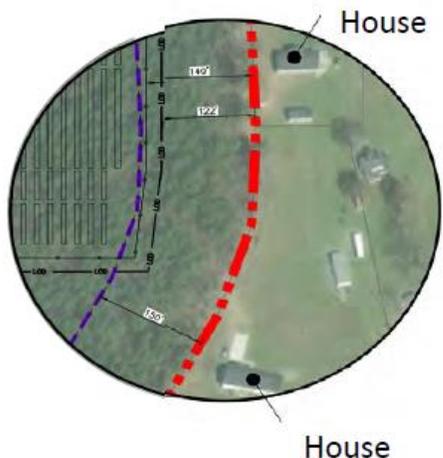
From Cara Libby, "Large Scale PV Plant Decommissioning and End-of-Life Management". SolSmart Webinar. October 15th, 2019.
Available from <https://drive.google.com/file/d/1b0UyDpp06L7VEIZRgFKNEw5RQfFT8-IS/view>



Potential Public Concerns

Property Owner

- Supporting clean energy goals
- Selling or leasing land (\$)
- Individual property rights



Neighbor

- Visual impacts
- Toxins and radiation
- Noise and glare
- Taxes and electric bill increasing
- Property value decreasing
- Wells going dry
- Construction traffic
- Tree removal

From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Zoning Ordinance – Example Intent Statement

“To establish requirements for construction and operation and to provide standards for placement, design, construction, and removal of solar facilities. It also addresses public safety and minimizes impacts.”

From American Planning Association webinar, “Planning for Utility Scale Solar Energy Facilities.” 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Zoning Ordinance – Example Applicability Statement

“Solar facilities ordinances applies to all solar facilities constructed after the effective date of the article and includes any physical modification to any existing solar facilities that materially alter the type, configuration, or size of such facilities or other equipment.”

From American Planning Association webinar, “Planning for Utility Scale Solar Energy Facilities.” 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Zoning Ordinance – Example Definitions

Small-scale

- <15 kW and <1 acre or on existing structure

Medium-scale

- <999 kW to reduce onsite consumption

Utility-scale

- >1 MW electricity to provide electricity to a utility provider

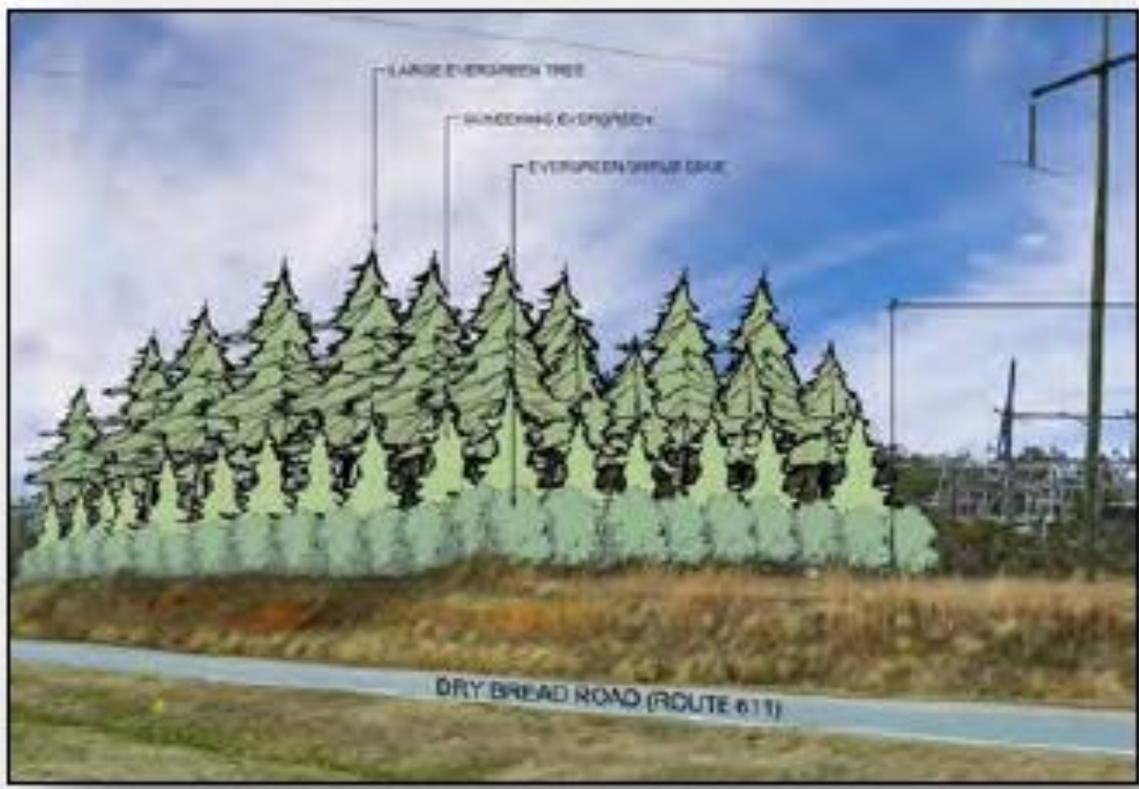
From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.

Zoning Ordinance –Potential Development Considerations

- Area
- Distance to other solar facilities
- Setbacks
- Height
- Buffer/screen
- Fence
- Wildlife corridors
- Native vegetation
- Minimize lighting nuisance



This...



Not this...



From American Planning Association webinar, "Planning for Utility Scale Solar Energy Facilities." 8/21/2020. Accessible via https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.



Knowledge Base:

APA Webinar. "Planning for Utility-Scale Solar Energy Facilities." August 21st, 2020.
<https://www.youtube.com/watch?v=Awi68oQK0Mo>.

https://ohioplanning.org/aws/APAOH/asset_manager/get_file/488074?ver=83.

Darren Coffey. "PAS Memo; Planning for Utility-Scale Solar Energy Facilities." *Planning Advisory Service*; September/October 2019. https://planning-org-uploaded-media.s3.amazonaws.com/publication/download_pdf/PASMEMO-2019-09-10.pdf.

