



Howard County Solar Task Force – Cover Letter

July 24, 2020

On October 7, 2019 the County Council of Howard County, Maryland passed Resolution No. 133-2019 to create a Task Force to study commercial solar facilities on agricultural land preservation parcels. Members of this Task Force include two representatives from the Howard County Agricultural Land Preservation Board, one representative from the Maryland Clean Energy Advisory Council, one representative from the Maryland-DC-Delaware-Virginia Solar Energy Task Force, two representatives from the Howard County Farm Bureau, one representative from the Howard County Soil Conservation District, one representative from Maryland Solar United Neighbors, two representatives from the Environmental Sustainability Board, two representatives from the Howard County Office of Community Sustainability and two representatives from the Howard County Department of Planning and Zoning.

The Task Force met for a total of 14 meetings starting on January 23, 2020 and ending on July 14, 2020. A Public Hearing was held on May 28, 2020 that included testimonies from 16 individuals/organizations along with 12 written testimonies.

In regard to the recommendations being submitted past the July 1, 2020 deadline, the co-chairs of the Task Force determined that in the interest of having a complete and thorough recommendation document to submit, as well as detailed supplemental documentation, an additional meeting was needed. The first available date for the additional meeting that accommodated the majority of the members was July 14, 2020.

The following documents constitute the final submission package:

1. Names of Task Force Members
2. Solar Task Force Recommendations: Responses to the questions originally posed to the Task Force by the Council
3. Solar Task Force Definition Recommendations: The Task Force's recommended updates to the current solar definitions in Howard County's Zoning Regulations
4. Solar Task Force Resource Guide: Additional resources which were discussed by the Task Force but not directly included in the above documentation

Meeting agendas, meeting minutes, and written public testimonies can be found on the Environmental Sustainability Board webpage: <http://www.howardcountymd.gov/Departments/County-Administration/Community-Sustainability/Environmental-Sustainability>.

For questions about the documents, please contact the Task Force Chair, James Zoller, at Jzoller@howardcountymd.gov or Task Force Co-Chair, Dani Phillips, at Dphillips@howardcountymd.gov.

Names of Task Force Members

<i>Agricultural Land Preservation Board</i>
Jamie Brown
Cathy Hudson
<i>Maryland Clean Energy Advisory Council</i>
Kevin Lucas
<i>MD-DC-DE-VA Solar Energy Industries Association</i>
Franny Yuhas
<i>Howard County Farm Bureau</i>
Daniel Jacobs
Keith Ohlinger
Howie Feaga (Alternate)
<i>Howard County Soil Conservation District</i>
John Dove
<i>Maryland Sun (Solar United Neighbors)</i>
Corey Ramsden
<i>Environmental Sustainability Board</i>
Kelly Hensing
Amber Butler
<i>Howard County Office of Community Sustainability</i>
James Zoller (Chair)
Leah Miller (Vice Chair from 1/23-4/21/20)
Dani Phillips (Vice Chair from 4/21-7/14/20)
<i>Howard County Department of Planning and Zoning</i>
Amy Gowan
Mary Kendall
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Howard County Solar Task Force Recommendations

1) Regulations governing the size, location, and siting of commercial solar facilities.

See associated definition recommendations for further information pertaining to definitions, size limitations, locations, and siting of commercial solar facilities. Siting considerations for commercial solar facilities may also be dependent upon additional policy decisions, which were not part of the Task Force's purview. It is not the Task Force's intent to exclude brownfield, mine lands, and landfill sites from commercial solar development. The Task Force supports incentivizing development on such locations in the County.

2) Application procedures and approval processes for commercial solar facilities.

The Task Force recommends the following modifications to the application procedures for commercial solar projects in order to streamline the process, remove unnecessary steps, and improve the overall process:

- a) Eliminate the requirement for a glare study except when required by state or federal mandate.
 - According to the Howard County Department of Planning and Zoning, none of the proposed solar projects have been turned down due to glare issues. Solar panels are inherently designed to absorb sunlight and not reflect sunlight, therefore eliminating the need for a glare study. This would need to be addressed in Howard County's Zoning regulations, Conditional Use Criteria – Sec. 131.O.N.52.
- b) Add an Agricultural Land Preservation Board (ALPB or 'Board') preliminary conditional use review for Commercial Solar Facilities.
 - Currently, an application for conditional use for commercial solar is submitted to the Agricultural Land Preservation Program to be reviewed by the ALPB. The conditional use application requires a letter from property owner, deed of easement, Soil Conservation and Water Quality Plan, Soil Classification Analysis Map, Soil Classification Analysis table and Proposed Condition Use Plan.
 - The recommendation would be to have a **preliminary review prior to the submission of the Conditional Use Application** (similar to a pre-submission hearing), which would require all of the items listed above less the Conditional Use Plan. The Conditional Use Plan requires extensive engineering for the placement of the commercial solar panels. By requiring this preliminary review, the Board will be able to make suggestions on placement of the solar facility before costly engineering is done by the applicant. This will create a beneficial dialog between the Board, landowner, and solar developer to ensure the best placement for the solar project.

3) The role of the Agricultural Land Preservation Board in the commercial solar facility policy and approval process.

The Task Force recognizes the importance of agricultural land, and its preservation, as well as solar energy as a clean energy source for Howard County. The Task Force believes agricultural land and commercial solar can coexist in a mutually beneficial relationship. It is recommended that the ALPB should continue to provide input to the discretionary permit (CUP) approval process of commercial solar on Agricultural Preservation Land and should have the ability to create their own policy for Commercial Solar on those properties. The ALPB is comprised of farmers, agricultural experts, and leaders in the community that have intimate knowledge of farming in Howard County and can assist in creating a balance between agricultural land and solar energy.

The Task Force recommends the following to assist the Board in reviewing and updating, as necessary, the current Commercial Solar Facility Policy for Howard County Agricultural Preservation Properties:

- The policy must be realistic (not so restrictive that it eliminates most potential projects) and allow for the Commercial Solar Facility to be beneficial to both the farmer/property owner and solar company.
 - Community Solar projects are more likely to be economically feasible when their generating capacity is close to the 2-Megawatt (MW) program maximum size as defined in COMAR.
 - Community solar installations are a good means of supplementing farm income in order to keep farms financially viable by using a portion of their land to obtain year-round and dependable income.
- The policy suggests placement of Solar Facilities to the less desirable farmland of the property as much as possible and takes into consideration the current and future farming practices planned for the property.
 - Where possible, at least two potential placements on the property should be proposed to the ALPB, to allow the board to select the best placement of solar facility to minimize a negative impact on the farming operation.
- The policy recognizes that each property is unique and has different characteristics that dictate the placement and size of a Solar Facility.
- The policy recognizes there are three types of ground-mounted commercial solar facilities with differing requirements.
 - Solar Collector, Accessory Use (is no larger than the maximum system size according to state net metering regulations). This includes Municipality and Non-Profit Commercial Solar using Aggregated Net Metering (as defined in COMAR);
 - Solar Collector, Commercial (is no more than the maximum system size according to state net metering regulations). This includes: Community Solar facilities (as defined in COMAR); and
 - Solar Collector, Utility-Scale (larger than the maximum system size according to state net metering regulations).
- The policy supports the intent of the Agricultural Preservation Easement.
- The Task Force recommends that the ALPB take into account both quantitative and qualitative aspects of the potential solar project. Not only should the data-driven

analyses be reviewed (i.e. soil analysis, business plan, percentage of property), but the Board should have the flexibility to utilize their expertise when making recommendations. This aligns with the Preliminary Review recommendation from Question 2.

4) Conditional use parameters.

The Task Force recommends keeping in place most of the current conditional use parameters for commercial **ground-mount** solar collectors, keeping in mind that the Task Force recommends allowing **rooftop** solar collectors in all zones as an accessory use *without conditional use parameters*.

Recommended changes to the Conditional Use Parameters:

- Remove the requirement of a glare study [Howard County Zoning Code Section 131.0, 52 (i)]
- As noted in the response to Question 2, add a preliminary meeting (similar to a pre-submission hearing) with the ALPB to discuss locations and the feasibility of the solar installation project **prior to establishing a conditional use plan** [Howard County Zoning Code Section 131.0, 52 (m)(1)]. This recommendation is also discussed in further detail in the Task Force's response to Question 3.
- Add a requirement for one of the agricultural practices/pollinator habitats to be included in the solar project on ag pres land as listed in the response to Question 6. For projects on non-ag pres land, these practices should be encouraged.

5) Circumstances or exceptions when solar facilities may be installed on agricultural preservation easements without a conditional use application.

Solar collectors to produce energy *solely* for the use of a farm in Howard County may be placed on existing roofs of farm buildings and ground-mounted installations **without** a conditional use application, referred to in the definitions matrix as "Solar Collector, Rooftop", "Solar Collector, Accessory Use Ground-Mount", and "Solar Collector, Accessory Use Ground-Mount (aggregated)".

6) Methods and strategies for integrating commercial solar facilities and agricultural practices and pollinator habitat.

On Agricultural Preservation Land, one of the following should be required by applicant to meet the intentions of the ALPB policy:

- Pollinator or native grass habitats;
- Livestock grazing, such as sheep;
- Agrivoltaics (i.e. crop production under or directly adjacent to an installation, edible landscape barriers, tree crops);
- Or other suitable alternative, as proposed by the applicant.

7) Potential incentives for ground mount, carport, parking canopies, and rooftop commercial installations across the County.

Property tax incentives/credits (real property tax) are one of the options that can be implemented by the County, although in the current climate of COVID-19 and budget limitations, these types of

incentives may not be feasible in the near-term. Personal property tax exemptions or incentives may be more feasible and should be evaluated, specifically incentivizing rooftop installations. Other incentives that the Task Force has considered and recommends are a) streamlining the application and permitting processes and b) allowing commercial solar installations in more zones within the County, especially for rooftop installations.

The Task Force recommends County government evaluate the feasibility of County property/land for solar projects. The Task Force recommends the same of Howard County Public Schools, Howard County Libraries, and community colleges within the County.

Further research is recommended into the concept of establishing a Solar Preservation program (funded by a portion of Transfer Taxes).

8) Recommendations for updates to zoning regulations to encourage more high-quality solar projects across the County.

See associated definition recommendations for further information pertaining to definitions and updates to zoning regulations to encourage more high-quality solar projects across the County.

Highlights:

- a. Recommend updating the definitions to have more clarity:
 - i. between different scales for ground-mount (personal use for property vs. commercial & community-scale vs. utility scale)
 - ii. between ground-mount vs rooftop solar
- b. Allow rooftop solar to be installed if more than 50% of the power is used offsite
- c. Expand the zoning district regulations to allow for commercial and accessory use rooftop solar/parking canopies in all zoning districts
- d. Expand the zoning district regulations to allow for ground-mount solar in more zoning districts such as Business Rural (BR), Corridor Activity Center (CEC), Manufacturing (M) or Institution (I). Explore allowing ground-mount solar in all zoning districts (including residential) in the East with consideration for what is the best land use policy in those districts.

Additional Recommendations

Note: These recommendations are not included in prior responses and were not specifically posed as Questions to the Task Force but were considered and discussed by the Task Force.

- The Howard County Landscape Manual should be reviewed and updated, to allow other alternatives in addition to those presented in the response to Question 6.

Solar Task Force Definition Recommendations

Type of System	Definition	Principal Use By Right	Accessory Use	Conditional Use	Zoning Districts	Allowable on Ag Pres Land
Solar Collector, Rooftop	A solar collector or commercial solar collector and all supporting electrical and structural components that is attached to the rooftop of an existing structure or integrated into the building envelope, where the solar panels themselves act as a building material or structural element. Examples include rooftop net-metering, rooftop aggregated net-metering, and commercial rooftop including community solar.		X		All	Yes
Solar Collector, Accessory Use Ground-Mount	A solar collector and all supporting electrical and structural components that is mounted onto the ground or is a canopy and is used for the purpose of generating electrical power to be consumed primarily by the principal use. Examples include ground-mounted net-metering.		X		All	Yes
Solar Collector, Accessory Use Ground-Mount (aggregated)	A solar collector and all supporting electrical and structural components that is mounted onto the ground or is a canopy and is used for the purpose of generating electrical power to be consumed primarily by the principal use. A ground mounted accessory solar collector may be located on a different lot than the principal use, including systems eligible for net meter aggregation by state net metering regulations. Examples include ground-mounted aggregated net-metering.		X		All	Yes
Solar Collector, Commercial Ground-Mount	A commercial solar collector and all supporting electrical and structural components that is mounted onto the ground or is a canopy and is no more than the maximum system size according to state net metering regulations. Examples include community solar (virtual net metering) and small-scale power purchase agreements (PPAs) located off-site from customer.			X	RC/RR plus consideration of others (policy decision)	Yes, with conditional use criteria
Solar Collector, Utility-Scale Ground-Mount	A commercial solar collector and all supporting electrical and structural components that is mounted onto the ground or is a canopy and is more than the maximum system size according to			X	RC/RR plus consideration of	No

state net metering regulations. Examples include large-scale merchant facilities tied to the grid and large-scale PPAs located off-site from customer.

others (policy decision)

Commercial Solar Collector

A solar collector connected directly to the electrical distribution or transmission system separately from any other electrical service on the property on which it is hosted and whose generated electrical power is not primarily consumed by the principal use. **Note:** This is purely a definition to assist with clarifying the other definitions.

For Reference:

Principal Use

The main use of a lot or the structure used for the main function of a lot, as opposed to an accessory use or structure. Structures which are attached to the principal structure, either directly or by a breezeway not to exceed 15 feet in length, shall be considered part of the principal structure.

Accessory Use

A use or structure which is customarily incidental to the principal use or structure, serving no other use or structure, and which is subordinate in area, intensity and purpose to the principal use or structure. An accessory use or accessory structure shall be located on the same lot or parcel as the principal use or structure, except where it is otherwise allowed in these Zoning Regulations.



Howard County Solar Task Force Additional Resources

The following sections are background information and references the Howard County Solar Task Force considered on key topic areas when making recommendations.

Agricultural Preservation Easements

<https://www.howardcountymd.gov/Departments/Planning-and-Zoning/Conservation-and-Preservation/Agriculture>

<https://livegreenhoward.com/food-ag/ag-preservation-easements/>

<https://mda.maryland.gov/malpf/pages/default.aspx>

Tax Implications

See associated document – Howard County Department of Planning and Zoning “Commercial Solar Facilities Policy-REVISED”

Ground-Mount Project Scales and Land Use Averages

- Ground-mount commercial solar facilities typically use ~5 to 10 acres per Megawatt (MW)
- Community solar projects (as defined in COMAR) have a maximum size of 2 MW
- The maximum size project for a facility that is directly offsetting energy loads of one (“net metering”) or more (“aggregated net metering”) electric meters owned by the same entity is 2 MW
- Only projects above 2 MW need Public Service Commission approval through the Certificate of Public Convenience and Necessity (CPCN) process

Interconnection Line Capacity Considerations for Project Siting

The density of commercial solar installations is inherently limited by the electricity grid and its capacity to handle electrical power introduced into the grid from distributed locations. Once a project is approved for a particular location on a distribution circuit, the number of other projects that can be added to that line is limited by the capacity of the line.

Here’s an example of the impacts of this fact, provided by Stefano Ratti of Chaberton Energy to the Solar Task Force: “A typical 13 kV distribution line (which is the most common type) generally maxes out at 3 MW (equivalent to 12-18 acres). What it means is that, once you have injected ~3 MW on a distribution line (often referred to as “circuit”), no more solar energy (or any other type of energy for that matter) can be injected on that line. The line has a thermal limit that cannot be exceeded (too much energy would “fry” the line).” “Each line is several miles long, which means that, once a project has “occupied” a line (such project being anyway <12-18 acres), no other solar development can occur for miles around it (or until the next circuit). There are a few bigger (34 kV) lines, which can take generally up to 10 MW (equivalent to 40-60 acres), but those are far and few in between in the agricultural area (in BG&E territory, I know there are two on Rt 144, one on Rt 32, one on Folly Quarter Rd., and I would guess perhaps a couple of others).”

Health and Safety Impacts

Sound/Noise

According to a [State of Massachusetts report](#), “Ground-mounted solar PV array inverters and transformers make a humming noise during daytime, when the array generates electricity. At 50 to 150 feet from the boundary of the arrays, any sound from the inverters is inaudible.” The report further notes “Most typically, the source of noise associated with ground-mounted solar PV comes from inverters and transformers. There also may be some minimal noise from switching gear associated with power substations. The crackling or hissing sound caused by high-voltage transmission lines (the “Corona Effect”) is not a concern in the case of solar PV, which uses lower voltage lines.”

For specific Howard County and State of Maryland noise regulations see: http://howardcounty-md.elaws.us/code/coor_title8_subtitle9_sec8.900 and <http://mdrules.elaws.us/comar/26.02.03.02>

The table below represents the maximum allowable noise levels specified in State regulations.

Zoning Designation			
	<i>Industrial</i>	<i>Commercial</i>	<i>Residential</i>
<i>Day</i>	75	67	65
<i>Night</i>	75	62	55

Day: 7am - 10pm

Night: 10pm - 7am

Electric and Magnetic Fields (EMF)

Concerns of electromagnetic radiation are sometimes voiced in opposition to solar array facilities. While all electronic equipment has electric and magnetic fields associated with their operation, there is no indication that solar facilities present any significant concern. According to a [State of Massachusetts report](#): “Electric and magnetic fields are a normal part of life in the modern world. PV arrays generate EMF in the same extremely low frequency (ELF) range as electrical appliances and wiring found in most homes and buildings. The average daily background exposure to magnetic fields is estimated to be around one mG (milligauss – the unit used to measure magnetic field strength), but can vary considerably depending on a person’s exposure to EMF from household electrical devices and wiring. The lowest exposure level that has been potentially associated with a health effect is three mG. Measurements at three commercial PV arrays in Massachusetts demonstrated that their contributions to off-site EMF exposures were low (less than 0.5 mG at the site boundary), which is consistent with the drop off of EMF strength based on distance from the source.”

As reference, EMFs are measured in milliGauss (mG). The [Environmental Protection Agency](#) recommends that you limit your exposure to **0.5 mG to 2.5 mG**. When you are three feet away from a microwave, you are exposed to up to 25 mG. More information can be found here: <https://www.safespaceprotection.com/emf-health-risks/emf-health-effects/emfs-in-the-home/>

Environmental/Pollution Impacts

Chemicals Leaching into the Soil

A concern that is often raised about ground-mounted solar installations is that some chemical toxins can leach into the soil underneath the panels. Most panels consist of a rigid aluminum frame silicon, tempered glass, an inert substrate under the silicon and a series of thin metal connectors between the silicon cells. Small amounts of lead may be used in electrical connections but increasingly those connections are made by silver compounds which are superior conductors of electricity. Some models which are much less commonly used, especially in non-utility scale projects, could use hazardous materials such as cadmium telluride (CdTe), copper indium diselenide (CIS), and gallium arsenide (GaAs). However, as is noted by a report from the [State of Massachusetts](#), all “solar panels materials, including the chemicals noted above, are contained in a solid matrix, insoluble and non-volatile at ambient conditions, and enclosed. Therefore, releases to the ground from leaching, to the air from volatilization during use, or from panel breakage, are not a concern.” The report also notes that “Release of any toxic materials from solid state inverters is also unlikely provided appropriate electrical and installation requirements are followed.”

Run-off/Impervious Surfaces

The State of MD has very strict rules regarding stormwater management to prevent/mitigate runoff. The Maryland Department of the Environment (MDE) Stormwater Design Guidance – Solar Panel Installations can be found [here](#). This guidance addresses installations Average Slope $\leq 5\%$, Average Slope $\geq 5\%$ but $\leq 10\%$. Detail for all situations including those areas with slopes greater than 10% can be found in the “2000 Maryland Stormwater Design Manual.”

Glare and Glare Studies

According to a [State of Massachusetts report](#), “solar panels are designed to absorb solar energy and convert it into electricity. Most are designed with anti-reflective glass front surfaces to capture and retain as much of the solar spectrum as possible. Solar module glass has less reflectivity than water or window glass. Typical panels are designed to reflect only about 2 percent of incoming sunlight. Reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight.”

Fixed-tilt systems are typically oriented south with an upward tilt of 20-30 degrees. Any sunlight that is not absorbed by the panels will bounce off at the same angle that it hit the panel. For most hours, this means the reflections will be directed up into the sky and away from any people or buildings near the ground.

Tracking systems are designed to follow the sun through the day. For these systems, the panels are typically oriented on north-south trackers and turn to match the elevation of the sun (that is, when the sun is overhead, the panels are pointing straight up, and when the sun is halfway up, the panels are pointed at a 45 degree angle with respect to the horizon). Any reflected light will be directed back to the same elevation as the sun.

Current State of Grazing as a Co-Location Benefit

Grazing under and around commercial solar installations is still a relatively new but growing part of the solar industry. As an indication of the growth of this practice in the industry, the [American Solar Grazing Association](#) was established recently and supports the expansion of this agricultural co-location benefit to solar. Grazing service providers are compensated to keep the vegetation on the solar array site at a manageable height to avoid shading the panels and to keep vegetation intact to avoid erosion and run off. Some key facts about this practice:

- Service providers can be either the land host or a 3rd party contracted by the solar facility owner.
- The most common animal used is sheep which do not eat wiring or climb on equipment unlike goats which are not a good option for solar grazing services.
- Panel height is not an issue as sheep are able to make their way in and out of relatively low and tight spaces.

Current State of Native & Pollinator-Friendly Habitat as Co-Location Benefits

Native grasses and pollinator friendly habitats are increasingly being included in ground-mounted commercial solar facilities. The state of [Maryland and other states](#) in the region have adopted scorecards to allow commercial solar facilities to qualify and stay certified with a state designation. The addition of these plantings provides a number of co-location benefits on commercial solar installation sites. Among them:

- Long-term cost savings for the facility owner in operations and maintenance due to a reduced need for mowing and landscaping service.
- Pollinator habitat provides opportunities for apiaries to be sited close by and utilized by either the land host or a 3rd party an additional income source.
- Well-established plantings can reduce erosion and water runoff from the site.

Resource: <https://fresh-energy.org/beeslovesolar/>

Additional Resource: <https://dnr.maryland.gov/pprp/Pages/pollinator.aspx>

Current State of Agrivoltaics as a Co-Location Benefit

The practice of co-locating crops under and around solar arrays is still uncommon but interest and supporting research is growing with small-scale projects taking place in a number of areas across the country and worldwide. The NC Clean Energy Technology Center at the NC State University published a recent whitepaper entitled "[Balancing Agricultural Productivity with Ground-Based Solar Photovoltaic \(PV\) Development](#)." This paper discusses some of the considerations that agricultural land owners should take into account when investigating whether PV development is appropriate for their land, and covers the following topics:

- Understanding the Context of Solar Development and Agriculture
 - Developing Renewable Energy
 - Landowner Land Use Choice
 - Solar Facility Construction
 - Duration of Solar Use
- Weighing the Impact of PV Development on Agriculture
 - Solar PV Land Use
 - Impact on Agricultural Productivity

Other Resources Utilized by Task Force

Governor's Task Force on Renewable Energy Development and Siting Interim Report:

<https://governor.maryland.gov/energy-task-force/>

Maryland Farm Bureau Policy

Maryland Agricultural Land Preservation Foundation Policy

Howard County Agricultural Preservation Board Solar Policy Guidelines