# Solar Development Potential on Contaminated Lands in Maryland

A detailed analysis of hundreds of contaminated sites across Maryland to determine their development potential for solar photovoltaic electricity generation facilities

UTILITY SCALE SOLAR ENERGY COALITION
USSEC
OF MARYLAND

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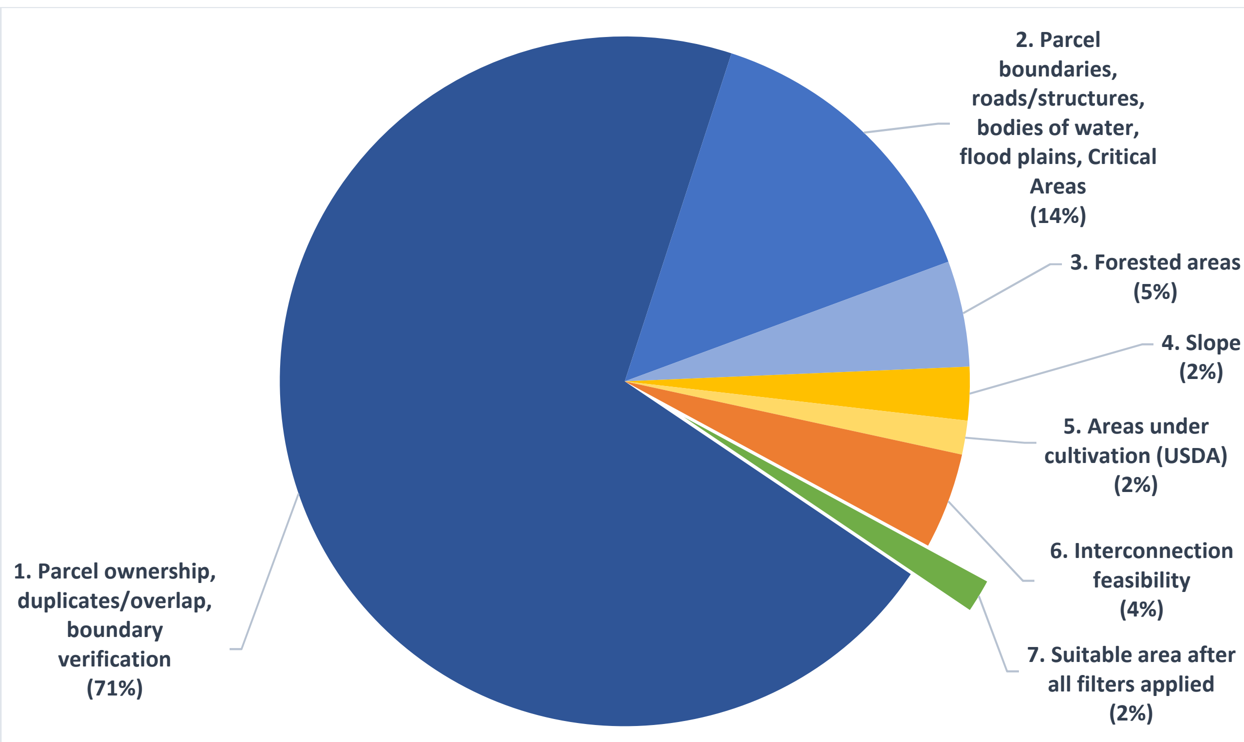
# Executive Summary

The Utility-Scale Solar Energy Coalition of Maryland (USSEC) performed a detailed analysis of current and formerly contaminated sites in Maryland to assess the potential for such sites to host solar farms. The sites considered in the analysis were drawn from the Environmental Protection Agency's (EPA) "RE-Powering America's Land Initiative" and a list of closed solid waste facilities compiled by the Maryland Department of the Environment (MDE).

As described in this report, USSEC applied a variety of filters to hundreds of sites in Maryland and drew upon its members' significant experience bringing renewable energy projects online to estimate the solar potential across these sites. Due to real-world land-use and interconnection constraints as well as the multiple challenges involved in successfully developing, financing, and constructing solar facilities on such sites discussed in this report, the results indicate that the total solar potential across 370 sites for which sufficient data was available for analysis is between 214 and 427 MWac. Importantly, these figures are significantly lower than the 17,100 MW of solar development potential estimated by EPA for the EPA-registered sites alone. Chart 1 below summarizes the results of the filtering process applied by USSEC to all of the sites 10 acres or larger in the two databases.

*Chart 1: Acreage Reductions for Utility-Scale Projects*




This report describes the data, analytical methodology, and implications of USSEC's analysis. USSEC will make its complete analysis—including a list of all reviewed sites, data sources, and site-specific GIS data—available to the public in order to advance the discussion regarding Maryland's renewable energy policies.

## Background

Development of in-state, cost-effective solar power has been a Maryland policy priority for more than a decade. In 2004, Maryland enacted a Renewable Portfolio Standard (RPS) requiring the state's electricity suppliers to obtain a minimum share of consumers' electricity from certain renewable energy sources including solar, wind, geothermal, biomass, hydro-electric, and other sources, and the RPS has been revised several times since then. In 2007, a solar-specific requirement, or "solar carve-out", was added to the RPS, and the most recent revision of the RPS, H.B. 1106 which was enacted in 2017, expanded the state's RPS to require 25% of the state's electricity to come from renewable sources by the year 2020 and increased the state's solar carveout to 2.5%. In 2018, Maryland's General Assembly considered legislation (H.B. 1453) that would have doubled the state's RPS to 50% by 2030 and significantly increased the solar carve-out.

As Maryland has continued to push for more in-state solar development, which not only helps clean Maryland's air and water but also brings substantial economic development, jobs, and tax revenues to all corners of the state, the opportunity to site solar farms on current and formerly contaminated sites has been a consistent topic of interest among Maryland's leaders. These sites are distributed throughout the state and have limited alternative use, which has made their potential for solar development a topic of interest for both state and local policy. Re-purposing currently or formerly contaminated sites as renewable energy generation facilities offers the prospect of accomplishing multiple public policy objectives including sustainable land development, preservation of open spaces, use of existing electricity transmission infrastructure, and providing clean power and economic development to local communities.[1] In 2018, the Maryland legislature considered legislation (H.B. 934) that would have altered the state's net metering and community solar programs in order to facilitate the development of large-scale solar on county and municipal landfills and brownfields, driven primarily by Montgomery County's efforts to make such a development economically viable on a county-owned landfill. Maryland residents often express support for state-level policies and/or incentives to facilitate development of renewable energy facilities on contaminated lands, and USSEC supports policies to achieve that goal.

In September 2018, the City of Annapolis announced the opening of an 18 MWdc solar project on the site of a former municipal landfill that will re-purpose the contaminated site for socially productive purposes, provide a long-term stable revenue stream to the city in the form of annual lease payments, and provide clean energy to the local county and municipality.[2] As this project demonstrates, the prospect of generating renewable energy on contaminated lands is an opportunity that deserves further exploration as Maryland endeavors to meet its renewable energy goals. Given that the project took 8 years to reach commercial operation at a cost of more than twice that of a typical utility-scale facility, however, the Annapolis landfill solar project also highlights the challenges associated with realizing such potential.

USSEC performed the analysis described in this report in order for policy-makers, advocates, and industry participants to better understand the scale of this opportunity and its place in the state's renewable energy policy landscape.

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[1] https://www.epa.gov/sites/production/files/2015-04/documents/contaminated_land_resuse_factsheet.pdf

[2] https://baltimore.cbslocal.com/2018/09/11/annapolis-solar-park/

## Sources of Data

The sites considered in the analysis were drawn from two sources: 1) the Environmental Protection Agency's (EPA) "RE-Powering America's Land Initiative," and 2) a list of closed solid waste acceptance facilities published by the Maryland Department of the Environment (MDE).

The EPA database includes over 80,000 landfills, Superfund sites, abandoned mines/mineral processing sites, and sites containing (or potentially containing) hazardous waste materials in the United States compiled from EPA's inventory of sites tracked through state and federal remediation and grant programs. EPA pre-screened the sites for renewable energy potential and lists such potential along with name, size, location, and various site characteristics in its database. The GIS tool ("RE-Powering Mapper") contains downloadable subsets of the database according to renewable energy technology: solar, wind, biomass, and geothermal. For this analysis, USSEC analyzed the subset of sites deemed by EPA as having solar potential, which includes 337 sites in Maryland.[3]

The list published by MDE includes 64 closed solid waste acceptance facilities. The MDE list contains only address and contact information for each site.

The two databases include a total of 401 current and formerly contaminated sites. Twenty-one of the sites were duplicates of other sites in one or the other database. Additionally, the EPA and MDE lists did not include—nor was USSEC able to obtain—sufficient information to analyze 10 of the sites, though it appears that these sites are relatively small in size and thus do not materially impact the analysis or conclusions in this report. As a result, while the two databases (and the table attached in Appendix C) list 401 contaminated sites in Maryland, USSEC's analysis covered the 370 unique sites for which sufficient data/information was available for inclusion in the analysis.

## Methodology

USSEC performed a two-stage analysis to determine the total solar potential across the sites. First, USSEC evaluated the sites for suitability to host utility-scale projects.[4] In the second stage, USSEC estimated suitability to host small-scale, ground-mounted projects.[5]

### Methodology for Estimating Development Potential for Utility-Scale Solar Projects on Contaminated Sites

To assess suitability for utility-scale solar project development, USSEC individually screened all sites in the two databases that were listed as 10 acres or larger. USSEC first scrubbed the data for errors, including duplicate site listings and erroneous parcel acreage information. As part of

[3] EPA Re-Powering Screening Dataset "Solar PV/CSP" available at https://www.epa.gov/re-powering/re-powering-mapper.
[4] For the purpose of this analysis, "utility-scale projects" are those with nameplate capacities of 20 MWac or larger and interconnected at voltages of 69kV or higher.
[5] For the purpose of this analysis, "small and medium-scale projects" are those with nameplate capacities less than 20 MWac and are interconnected at voltages less than 69kV (distribution or medium voltage-levels).

this initial step, USSEC identified current site ownership for each site of 10 acres or larger. Due to well-known challenges involved in third-party development of solar energy facilities on land owned by the U.S. Department of Defense (DOD), USSEC eliminated DOD sites from consideration. USSEC then mapped each site and applied a series of screens and filters to the remaining acreage reflecting various land-use constraints and physical features unsuitable for solar development. This detailed screening process resulted in exclusion of the following areas from each site as applicable, which include industry-standard buffers as described below:

- 50 ft. buffers from parcel boundaries;
- 50 ft. buffers around roads, permanent (and relatively new) structures, and currently used parking lots;
- 100 ft. buffers around perennial streams and bodies of water.[6]
- 100-year flood plains;[7]
- Critical Areas;[8]
- 50 ft. buffers around forested areas;[9] and
- Areas with slopes greater than 10%.

Application of these geospatial screens and exclusion of the areas described above allowed USSEC to generate polygons representing the areas suitable to host solar projects at each of the sites 10 acres or larger. USSEC recorded the acreage of each of these "Suitable Area Net of all Filters" in the table found in Appendix C. GIS files showing the suitable area polygons for each site are available upon request.

USSEC then calculated the estimated solar development potential for the resulting suitable areas by dividing the acreage by 6 based on 6 acres of suitable land required per MWac of nameplate capacity (net of various assumed set-backs).[10] These figures are recorded in the column titled "Solar Capacity Potential before Transmission Filters" in the table in Appendix C.

USSEC also screened for transmission interconnection feasibility for utility-scale projects by evaluating the suitability of the nearest substations and transmission lines to each site. Table 1 below shows the criteria used for the interconnection feasibility screen, which include consideration of transmission line and substation rating (i.e. voltage) compatibility and distance to the nearest potential point of interconnection (POI). For example, as shown in Table 1 and consistent with industry standards, USSEC assumed that it would be commercially infeasible for a facility of less than 50 MW in nameplate capacity to interconnect to a 138 kV substation due to the cost of upgrades associated with such a voltage interconnection. USSEC made similar assumptions across various project size minimums and transmission voltages. Due to the generally lower cost of interconnecting to existing substations versus building new substations on existing transmission line segments, USSEC used a lower minimum project nameplate capacity

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[6] National Hydrology Dataset published by the United States Geological Survey available here: https://nhd.usgs.gov/index.html
[7] Federal Emergency Management Agency floodplain data available here: https://geodata.md.gov/imap/rest/directories/arcgisoutput/HYDR_StatewideEffectiveFEMAFloodplain_MDE.zip
[8] All land and water areas within 1000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands and the lands under them. Critical Area data published by the State of Maryland available here: https://data.maryland.gov/Energy-and-Environment/MD-iMAP-Maryland-Critical-Areas-Critical-Areas/fcjm-rgbb/data
[9] 2010 land use/land cover data published by the State of Maryland available here: https://data.maryland.gov/Planning/MD-iMAP-Maryland-Land-Use-Land-Cover-Land-Use-Land/u7py-8ei8/data
[10] Properly sited solar facilities typically require about 10 acres of land per MWac of nameplate capacity to allow for sufficient set-backs from near-by vegetation and structures (to prevent shading), residences, parcel boundaries, stormwater drainage areas, and other features. This figure translates to approximately 6 acres/MWac net of typical set-backs.

threshold to gauge viability of interconnection to a substation vs. a transmission line. As discussed later in this report, it should be noted that this analysis does not include a site-specific assessment of injection capacity and the costs associated with upgrading the local grid to accommodate injection of additional power. The results of the interconnection feasibility screen are recorded in the table in Appendix C in the column titled "Net Solar PV Potential based on Interconnection Voltage and Distance Requirements".

*Table 2: Minimum Project Nameplate Capacity and Maximum POI Distance for Various Interconnection Voltages*

| | Substations | | Transmission Lines | |
|---|---|---|---|---|
| **Rating (kV)** | **Min. Project Nameplate Capacity (MW)** | **Max. Distance between project and POI (miles)** | **Min. Project Nameplate Capacity (MW)** | **Max. Distance between project and POI (miles)** |
| 69 | 20 | 1 | 30 | 1 |
| 115, 138 | 50 | 2 | 80 | 2 |
| 230 | 100 | 2 | 150 | 2 |
| 345 | 150 | 2 | 250 | 2 |
| 500 | 250 | 2 | 400 | 2 |

Based on USSEC's assumption that 20 MW is the minimum nameplate capacity for commercially viable, utility-scale interconnection at 69 kV (see Table 1 above), USSEC applied this interconnection feasibility transmission screen to all sites with suitable areas of 120 acres or more (assuming 6 acres/MWac net of various assumed set-backs).

The procedure for estimating solar development potential described thus far in this report accounts only for land use constraints, physical features, and interconnection feasibility. Other critical development risk factors, however, can be significant impediments to project viability, and these are moving targets that cannot be quantified in advance as part of a detailed screening process. For example, risks associated with securing the applicable federal, state, and/or local permits required to build and operate solar projects at each site, as well as availability of the actual injection capacity on the transmission or distribution system are not knowable without significant exploration and investment of time and money on each project site. Similarly, the site viability screening analysis described above does not consider each site owner's willingness to host a solar energy generation facility. Finally, the site viability screening analysis does not address the real challenges of achieving commercial viability of each site, a significant obstacle to project viability due to the higher cost of development and financing on contaminated sites and landfills. Consequently, the final step in estimating utility-scale solar development potential at the contaminated sites was to account for these additional development risk factors which often restrict or in many cases prevent development of prospective project sites:

- Permitting risks;
- Transmission injection capacity;
- Site owner's willingness to host a solar project; and
- Commercial viability (including financiers' reluctance to assume the additional liabilities inherent to contaminated project sites).

In the experience of USSEC members and consistent with data available from PJM on the percentage of planned generation projects that have historically withdraw from the transmission interconnection queue[11], at least two-thirds of otherwise viable projects initiated are never constructed due to one or more of these development risk factors. In the final step of USSEC's estimation of solar development potential, USSEC applied adjustment factors of 20% to 40% that were thus applied to obtain a realistic range of estimated development potential for utility-scale solar projects at the contaminated sites.

See Appendix A for a diagram depicting the steps described above that USSEC employed to estimate the development potential for utility-scale solar projects on contaminated sites in Maryland.

### Methodology for Estimating Development Potential for Small and Medium-Scale Solar Projects on Contaminated Sites

Small and medium-scale solar projects require less land and are interconnected at lower voltages that are more common across the state compared to the voltages required for utility-scale solar projects. While USSEC found that few of the contaminated sites are likely to host utility-scale projects, a number of the sites are likely candidates for hosting small and medium-scale solar projects. To estimate the development potential for such projects, USSEC divided the sites into three tiers according to the size of the suitable areas: 1) sites with 20 or more suitable acres, 2) sites with between 10 and 20 suitable acres, and 3) sites with fewer than 10 suitable acres. USSEC assumed project nameplate capacity averages of 10 MWac, 2.0 MWac, and 500 kWac (0.5 MWac) for the three size tiers, respectively, based on the average sizes of the suitable areas for each tier and 6 acres per MWac (net of various assumed set-backs). As it did for the other sites, USSEC then applied development risk adjustment factors to obtain a range of reasonably expected solar development potential for small and medium-scale solar projects across all the contaminated sites with suitable areas.

USSEC did not individually analyze –or apply geographic screens to— sites listed in the two databases as being smaller than 10 acres in size as such sites are not large enough to host large-scale solar facilities and because statewide GIS data for medium and distribution voltage-level transmission systems are proprietary and not readily available. For these sites, USSEC simply assumed that 100% of the acreage listed in the original databases is suitable to host solar farms. If the geospatial screens described above were applied to these smaller sites, USSEC presumes that, as was the case for the individually screened sites (10 acres or larger), portions of each of the small sites would similarly not be useable for solar project infrastructure, i.e. that the suitable area would be less than the amount used in this analysis.

See Appendix B for a diagram depicting the steps used to estimate the development potential for small and medium-scale solar projects at contaminated sites in Maryland.

## Results

### Development Potential for Utility-Scale Solar Projects on Contaminated Sites

[11] https://www.pjm.com/planning/services-requests/interconnection-queues.aspx

The analysis described above resulted in USSEC's identification of sites suitable for hosting between 74 and 148 MWac of utility-scale solar energy production. Seventy percent of the original 108,760 acres across the sites 10 acres or larger were eliminated based on errors in site acreage listed in the EPA database (e.g. a single site under 2 acres in size was incorrectly listed in the EPA database as 21,250 acres), parcel ownership (e.g. removal of sites owned by the U.S. Dept. of Defense), and duplicate listings. An additional 14% of the acreage was removed due to land-use constraints and physical features. As shown in Table 2 below, 6,566 suitable acres remained after all geographical screens were applied. Absent interconnection feasibility considerations, such acreage could potentially host up to 1,094 MW of solar generation facilities. Application of the transmission interconnection feasibility criteria described above resulted in further reduction of the solar potential on the remaining acreage to 370 MW, since only 4 of the 191 sites 10 acres or larger met the aforementioned interconnection criteria (i.e. the majority of sites examined were located too far away from transmission lines or substations of appropriate voltage to accommodate a viable utility-scale solar farm).

*Table 3: Suitable Acreage Screening Summary*

| | Area Reduced in Each Screening Step (acres) | Remaining Area After Each Screening Step (acres) | Area Reduction as share of Original Area |
|---|---|---|---|
| **Original Data** | | **108,760** | |
| Screen | | | |
| Parcel ownership, duplicates/overlap, boundary verification | 76,739 | 32,021 | 70.2% |
| Buffers from/around parcel boundaries, roads, structures, parking lots, streams/bodies of water, 100-year flood plains, and Critical Areas | 15,620 | 16,401 | 14.3% |
| Forested areas | 5,388 | 11,012 | 4.9% |
| Slope | 2,721 | 8,291 | 2.5% |
| Areas under cultivation in USDA research program[12] | 1,726 | 6,566 | 1.6% |
| Interconnection feasibility[13] | 4,896 | 1,670 | 4.5% |
| **Final** | | **1,670** | **98.0%** |

After further adjusting for the additional development risk adjustment factors discussed above (permitting risks, transmission injection capacity, site owners' willingness to host solar projects, and commercial viability), the utility-scale solar development potential was further reduced to a range of 74 to 148 MWac.

## Development Potential for Small and Medium-Scale Solar Projects on Contaminated Sites

[12] Applied only to USDA Beltsville Agricultural Research Center Superfund site (EPA reference no. 55033)
[13] Sites analyzed for interconnection feasibility based on capacity (MW), not acreage. Capacity figures were converted to acreages for comparison purposes.

Using the methodology described above for determining development potential for small and medium-scale solar projects on contaminated sites, USSEC estimates that the 370 sites may be suitable for hosting between 140 and 279 MWac of small and medium-scale solar projects interconnected at distribution and medium-voltage levels.

## Aggregate Results

Aggregating the results for both utility-scale and small and medium-scale projects, USSEC estimates that the contaminated lands in Maryland could host between 214 and 427 MWac. The results are summarized in Table 3 below.

*Table 4: Aggregate Solar Development Potential on Contaminated Lands in Maryland*

| | Size Tier[14] | No. of sites[15] | Total Original Area (acres) | Total Suitable Area (acres)[16] | Avg. Size of Suitable Area per Site (acres) | Net Solar Development Potential before Risk Adjustment (MW)[17] | Assumed Average Nameplate Capacity (MW) | Risk Adjustment for Injection Capacity, Owner Interest, and Commercial Viability | | Estimated Solar Development Potential (MW) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **Low** | **High** | **Low** | **High** |
| **Utility-Scale Projects** | Sites 120 acres or larger | 15 | 14,815 | 4,309 | 287.3 | 370 | N/A | 20.0% | 40% | 74 | 148 |
| **Small/ Medium-Scale Projects** | Sites 20 acres or larger | 53 | 27,605 | 3,401 | 64.2 | 530 | 10 | 20.0% | 40% | 106 | 212 |
| | Sites between 10 and 20 acres | 24 | 970 | 334 | 13.9 | 48 | 2.0 | 20.0% | 40% | 9.6 | 19.2 |
| | Sites under 10 acres | 239 | 25,391 | 855 | 3.6 | 120 | 0.5 | 20.0% | 40% | 23.9 | 47.8 |
| **Total** | | | | | | | | | | **214** | **427** |

A table listing all 401 sites included in the EPA and MDE databases, data compiled by USSEC as part of its analysis, notes, and references is available in Appendix C. GIS files showing the suitable area polygons generated by USSEC for each site are available upon request.

## A Note on Projects under 2 MW in Capacity

Projects under 2 MW in nameplate capacity in Maryland may only sell their power to municipalities, hospitals, agricultural institutions, schools, and universities. Due to the steep drop in SREC prices since 2016, these “virtually net metered” projects have not been economically

[14] Size tiers based on suitable area per site.
[15] This table includes 316 sites because 54 of the 370 unique sites reviewed by USSEC were eliminated from consideration based on site ownership (e.g. DoD), open landfill status, or current land use constraints (e.g. forest cover, residential or commercial development).
[16] Sites 10 acres and larger were individually screened by USSEC for suitable area. Sites under 10 acres were not screened individually by USSEC.
[17] For utility-scale projects, this is the net development potential after screening for interconnection feasibility. For small and medium-scale projects, USSEC estimated this potential by multiplying the number of sites by the assumed average project nameplate capacity.

viable. The only market that has been viable for projects under 2 MW has been the Community Solar Energy Generating Systems (CSEGES) pilot program (the Pilot).

The Pilot was adopted by the state legislature in 2016 and is a three-year program limited to 193 MWs in total capacity. The program has further restrictions on application timing, capacity caps per utility, and capacity caps by program category (one of which includes Brownfield projects up to 6 MW) as well as stringent eligibility requirements involving applications for local permits, transmission interconnection, and site control.[18]

The length of time between issuance of an RFP (the typical process for Brownfield sites) and signing of site control documents, therefore, makes it difficult for solar projects contemplating Brownfield sites to qualify for the Pilot. In addition, once accepted into the program, a project must reach commercial operation within 12-18 months. Brownfields and landfills are likely to have lengthy permit processes (due to the number of entities involved and complexities in facility design and engineering control for sites containing hazardous materials) that pose significant challenges to meeting this timeline.

Only two Brownfields applied to the program in the first year. For the second and third year of the program, the remaining capacity in the program totals 36.6 MWs. Therefore, despite USSEC's finding of the potential for up to 67 MWs of small-scale projects (under 2 MW in capacity), it is unlikely more than 36 MWs will be built unless the Pilot is extended and the administrative challenges associated with successfully developing solar projects on contaminated sites under the Pilot are legislatively addressed.

## A Note on Commercial Viability

While USSEC's estimates of solar development potential attempt to account for commercial viability as part of the risk adjustment factors discussed above, generally, the analysis may not fully reflect the binary challenge to project viability that is presented by the additional costs associated with financing, constructing, and operating solar energy generation facilities on currently or formerly contaminated sites. Publicly available data indicate that such additional costs can be prohibitive, often in excess of twice the cost of a comparable project on non-contaminated lands. For example, the recently announced 18 MWdc Annapolis Landfill project cost approximately $2.7 million/MWac to bring to operation, which is more than twice the cost of a comparable project on uncontaminated lands.[19] Because the higher costs associated with such projects are largely driven by additional equipment requirements (e.g. ballasted systems), they are unlikely to experience the degree of cost declines observed across the industry in recent years.

Additionally, in its testimony in support of HB 934, legislation proposed in the Maryland General Assembly during the 2018 legislative session that would have altered the state's net metering and community solar programs in order to facilitate the development of a 30 MW solar facility on Montgomery County's landfill, representatives of Montgomery County testified to the prohibitively higher costs associated with installing large-scale solar projects on contaminated sites: "The goal of the bill is to allow a County to install larger solar energy projects on County-owned buildings and land. Without the benefits of net metering, many projects with a capacity greater than 2 MW

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[18] https://www.psc.state.md.us/electricity/community-solar-pilot-program/community-solar-pilot-program-frequently-asked-questions/

[19] News articles describe the project as having a nameplate capacity of 18 MWdc, which is equal to a nameplate capacity of 12.9 MWac.

are not financially viable."[20] It could thus be argued that absent a specific policy mechanism that addresses the high cost and financing challenges of solar development on contaminated lands, USSEC's range of development risk factors result in an overly optimistic estimation of solar development potential on such lands.

## Conclusion

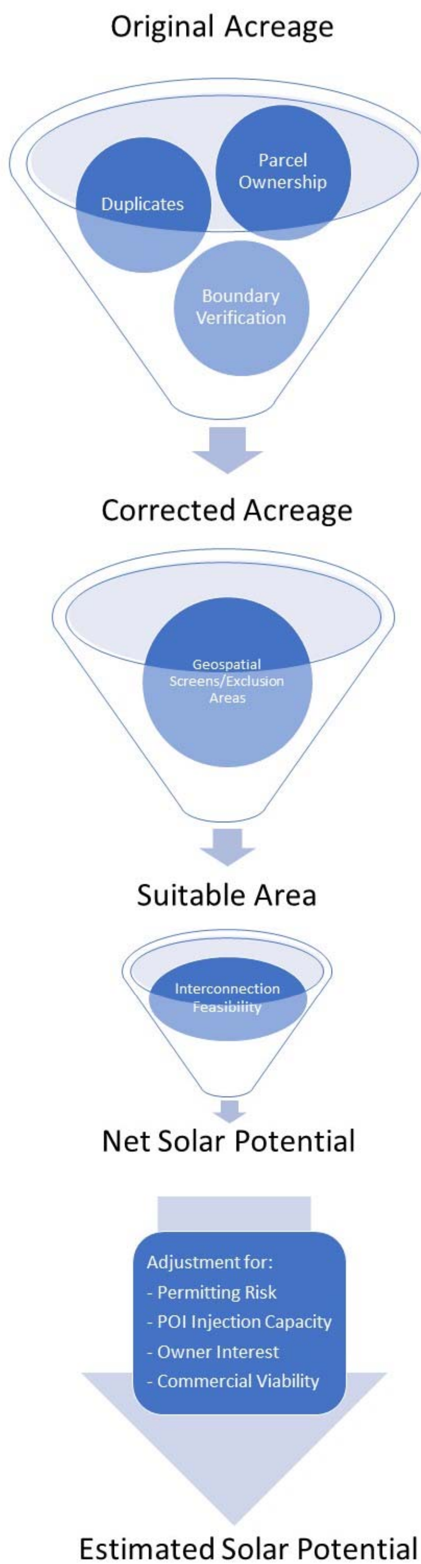
USSEC supports the policy goal of facilitating solar development on contaminated lands in the state of Maryland. However, USSEC's analysis of the available databases of contaminated sites indicates that the solar development potential on such lands is limited to a total capacity between 214 MW and 427 MW. To put these figures into context, legislation proposed in 2018 to increase Maryland's Renewable Portfolio Standard would have required approximately 5,000 MW of solar in Maryland by 2030.[21]

USSEC concludes that solar development on Maryland's contaminated sites, while attractive from a land-use perspective, is a significantly smaller opportunity than has been assumed by some advocates of such development. When combined with the high cost of bringing such projects on-line, USSEC's analysis indicates that, in order to meet the state's and region's renewable energy goals, incenting development of solar farms on contaminated sites can play only a small role in Maryland's overall solar siting strategy. USSEC hopes that this analysis will inform the ongoing discussions regarding state and local renewable energy and land use policies that address development of solar energy on Maryland's contaminated lands.

[20] Public testimony submitted by Delegate Charles Barkley, Maryland House of Delegates, on behalf of Montgomery County in support of H.B. 934, March 5, 2018.
[21] The Clean Energy Jobs Act was co-sponsored by a majority of legislators in 2018 and will be reintroduced in 2019. The Bill's 14.5% solar carveout translates to approximately 6,000 MW of solar in Maryland, including a mix of distributed solar and ground-mounted solar farms.

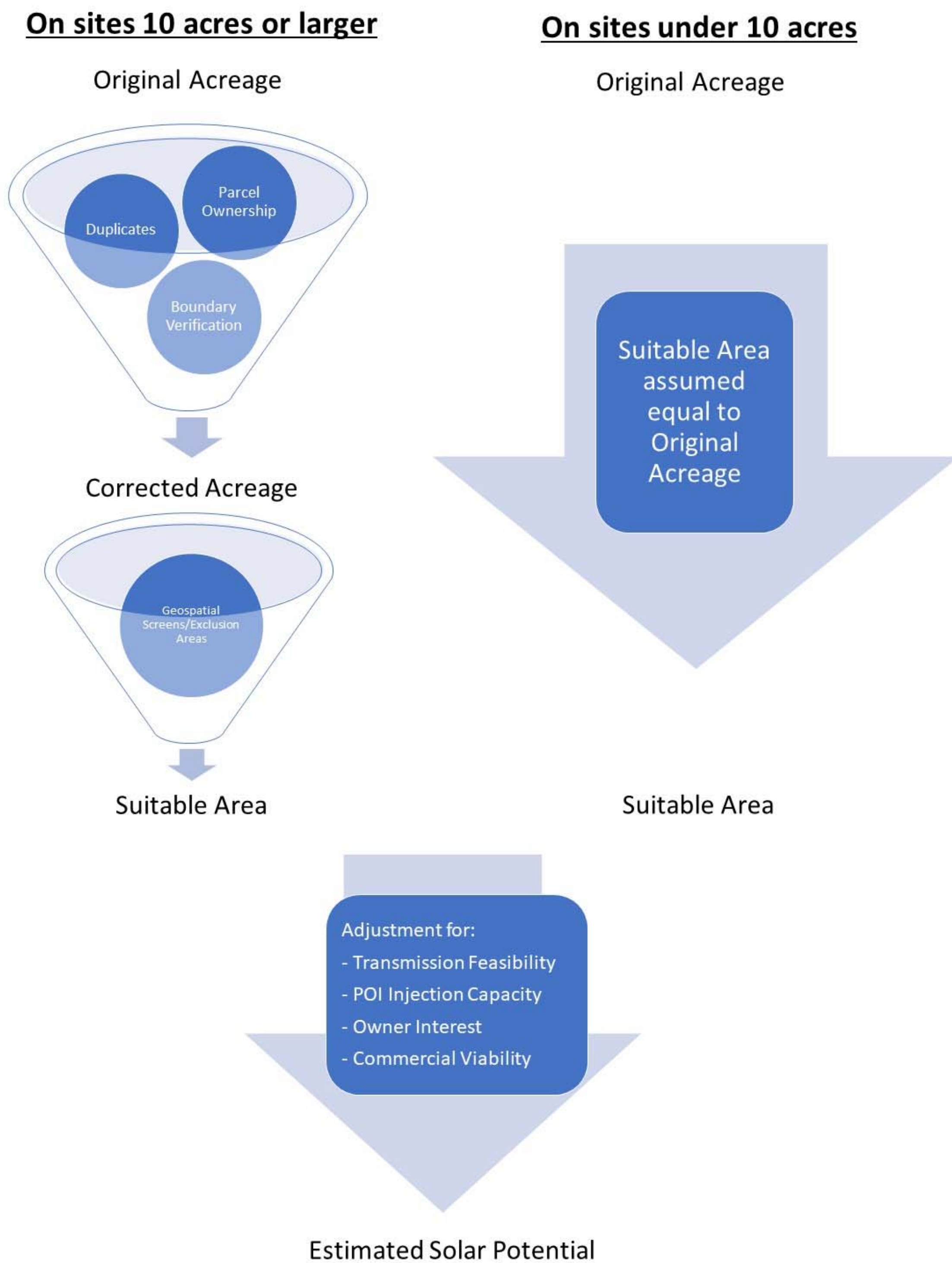
# Appendix A

## Methodology for Estimating Development Potential for Utility-Scale Solar Projects



Appendix B

# Methodology for Estimating Development Potential for Small-Scale Solar Projects



Appendix C

# Contaminated Sites Analyzed by USSEC

Complete List of Data, Notes, Results, and References