



MUNICIPAL OFFICIALS' GUIDE TO GRID-SCALE SOLAR DEVELOPMENT IN PENNSYLVANIA

Section 7:

Tax Implications of Land Conversions for Grid-Scale Solar Development



PennState



Credit: Randy Hampton, U.S. Department of Energy

Goals of This Publication

Our primary goal with this guide is to explain the emerging solar energy development trends occurring in the Commonwealth and what might be expected in the next few years. The guide is intended to inform municipal and county officials about grid-scale solar development so they can potentially add clear, regionally consistent language addressing the specific issues around solar energy development to their zoning ordinances and other regulations.

A resources list at the end of this publication provides sources of further information. A glossary defines unfamiliar terms. A notes section provides sources for statistics and additional information. Over time as new information becomes available to further inform this discussion, it will be added to this guide, including information about new legislation affecting solar development and the evolution of new solar technologies.

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TAX IMPLICATIONS OF LAND CONVERSIONS FOR GRID-SCALE SOLAR DEVELOPMENT

Current Status of Taxation on Grid-Scale Solar Development in Pennsylvania

The Assessment Law Committee (ALC) of the Assessors' Association of Pennsylvania (AAP) has been working since early 2021 to develop a uniform approach to taxation of grid-scale solar (GSS) projects. Below we summarize that committee's approach to valuation. This is informed by their interpretation of current statutes and case law.

Tax treatment of grid-scale solar development (GSSD) in Pennsylvania is currently (July 2022) governed by Chapter 88 of Pennsylvania's Consolidated County Assessment Law (2016). Assessment methods are based on case law, and could change as different issues are litigated or legislation passes. The ALC will

be putting forth a formal recommendation to the County Commissioners Association of Pennsylvania, with a copy to the Pennsylvania Local Government Commission. As of July 2022, no legislation addressing GSSD assessment had been submitted to the Pennsylvania legislature.

Pennsylvania's Consolidated County Assessment Law (section 8811) lists the following exception—items not subject to tax: "Machinery, tools, appliances and other equipment contained in any mill, mine, manufactory or industrial establishment shall not be considered or included as a part of the real estate in determining the value for taxation of the mill, mine, manufactory or industrial establishment." The AAP ALC is interpreting this to mean that *solar panels*



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themselves, transformers, inverters, and other equipment used in GSSD are not subject to taxation.

Pennsylvania's Consolidated County Assessment Law (section 8811) says that buildings "permanently attached to land or connected with water, gas, electric or sewage facilities" are subject to tax. It also says "that portion of a steel, lead, aluminum or like melting and continuous casting structure which encloses or provides shelter or protection for the elements for the various machinery, tools, appliances, equipment, materials, or products involved in the mill, mine, manufactory, or industrial process" are subject to taxation. The AAP ALC is interpreting these two statements to mean that *buildings associated with GSSD are taxable, including the facilities in which battery storage is housed.*

Furthermore, Pennsylvania's Consolidated County Assessment Law (section 8811) says that "No wind turbine generators or related wind energy appliances and equipment, including towers and tower foundations, shall be considered or included as part of the real property in determining the fair market value and assessment of real property used for the purpose of wind energy generation. Real property used for the purpose of wind energy generation shall be valued under section 8842(b)(2) (relating to valuation of property)."

Section 8842, Valuation of property, reads, "The valuation of real property used for the purpose of wind energy generation for assessment purposes shall be developed by the county assessor utilizing the income capitalization approach to value. The valuation shall be determined by the capitalized value of the land lease agreements, supplemented by the sales comparison data approach as deemed necessary by the county assessor. The lessee, or lessor on behalf of the lessee, shall provide the nonproprietary lease and lease income information reasonably needed by the county assessor to determine value by September 1." The AAP ALC is interpreting these statements to mean that *solar panels*

and related equipment in GSSD are not taxable; that the land on which GSSD occurs and associated taxable structures (fencing, etc.) should be valued using the income approach to value; and that leaseholders must provide a copy of their lease to the county assessor as a basis for valuation.

The AAP ALC notes that the income approach is based on "the concept that current value is the present worth of future benefits to be derived through income production by an asset over the remainder of its economic life. The income approach uses capitalization to convert the anticipated benefits of the ownership of property into an estimate of present value."

In determining recommended assessment procedures, the state's assessors also consider relevant case law once it reaches the Commonwealth Court level for cases involving the valuation of machinery and equipment at power generation facilities.

Remember that the above guidelines are currently just suggestions from the AAP ALC. Ideally, these recommendations would be codified into law by the Pennsylvania legislature. However, the Franklin County, Pennsylvania, tax assessor used the above guidelines to determine taxation on four grid-scale solar developments in the county that have come online since 2020. Representatives of the AAP ALC presented their recommended tax guidelines to the County Commissioners Association Assessment and Taxation Committee in August 2022.

Effects of Pennsylvania's Clean and Green Program on GSSD Land Conversion

If acreage is valued at an agricultural assessment rate, the land use may change to a commercial or industrial assessment value instead if GSS is added. The percentage increase would vary per county and within a county, depending on location.

Pennsylvania's Clean and Green tax program, which strives in part to preserve farmland,

Steps in the income approach to value

In a summary presentation, the AAP ALC offers these steps in GSSD assessment:

1. Estimate Potential Gross Income (PGI).
2. Estimate vacancy and rent loss.
3. Subtract vacancy and credit loss from PGI, and then add miscellaneous or ancillary income; this equals Effective Gross Income (EGI).
4. Estimate expenses, fixed, operating, and reserves.
5. Subtract expenses from EGI; this equals Net Operating Income (NOI).
6. Develop a Cap Rate:
 - Determine the Effective Tax Rate
 - Add Cap Rate and Effective Cap Rate together to get final Cap Rate
7. Divide NOI by the cap rate you calculate to arrive at value.

Definitions:

Cap rate (capitalization rate): “used in the world of commercial real estate to indicate the rate of return that is expected to be generated on a real estate investment property. This measure is computed based on the net income which the property is expected to generate and is calculated by dividing net operating income by property asset value and is expressed as a percentage. It is used to estimate the investor’s potential return on their investment in the real estate market.” <https://www.investopedia.com/terms/c/capitalizationrate.asp>

Common level ratio: “A ratio that measures how a county’s base year assessments compare with current real estate market valuations.”

<https://dced.pa.gov/local-government/boards-committees/steb-ted-faq/>

Vacancy & credit loss: “In the rental industry and real estate investing market, vacancy and credit loss is the amount of money—or the percentage of net operating income—that is estimated to not be realized due to non-payment of rents and vacant units. Your vacancy and credit loss will adjust your gross potential income.”

<https://www.thebalancesmb.com/vacancy-and-credit-loss-in-real-estate-investing-2867366>

GSSD assessment steps

How to value a 500-acre solar farm by the income approach to value?

The AAP ALC offers this example of GSSD assessment using those steps:

Sample # 1 – Simple Income Approach

1. 500 acres x \$1,000/acre [lease rate] = \$500,000 = Potential Gross Income (PGI)
2. \$25,000 vacancy & credit loss (5%)
3. \$500,000 - \$25,000 = \$475,000 = Effective Gross Income (EGI)
4. \$47,500 in expenses (10%)
5. \$475,000 - \$47,500 = \$427,500 – Net Operating Income (NOI)
6. Cap rate of 8%
7. \$427,500 / 8% = \$5,343,750
8. \$5,343,750 x 82.8% = \$4,424,625
Assessment (Market Value x Common Level Ratio = Assessment)

provides preferential tax treatment for enrolled agricultural lands (for more information, see Section 5). GSSD may not occur on enrolled lands. A property in Clean and Green can be removed from the program to allow GSSD, but a rollback tax penalty worth 7 years of the difference in preferential property taxes

(the difference between the tax on the land in the Clean and Green program and the tax on the land outside the program) will be due in a cumulative one-time payment. The solar developer typically pays this (this arrangement should be stated in the lease). The penalty is not thought to be large enough to stop GSSD



Credit: Penn State MCOR

from proceeding on land formerly in the Clean and Green program.

If only part of a land parcel enrolled in Clean and Green will be developed for GSS, the entire parcel must be unenrolled at the same time, then the non-GSSD part(s) can go back into the program if the owner desires and program qualifications are met. The lump sum tax rollback penalty would still be due.

Under current Clean and Green regulations, if at least half of the energy generated is used on the farm, that land use is not a violation of the program, but this exception would not apply with GSSD.

It's possible that rules could change and allow GSS with agricultural use (agrivoltaics, see Section 5) beneath the panels to still qualify for some classifications of "agricultural" land use.

Effects of GSS Taxation on Leaseholders

Landowners considering a GSS lease should consult their attorney, and possibly the county tax assessor, about the potential tax implications. Paying for any potential increased real estate taxes with GSSD should be negotiated through the land lease. Leases typically state that the developer agrees to pay any tax increase due to the GSS.

GSSD assessment steps for Clean and Green

The rate for taxation (millage) does not change for Clean and Green properties. The assessment is reduced because the land is taxed on the use value rather than the market value. Here's an example from the AAP ALC showing the different assessment value for the Clean and Green program:

How to value 1,359.56-acre proposed solar farm?

Sample # 2: \$500 per acre lease rate for forested land

1. PGI = \$679,780
2. Vacancy & credit loss -5% = \$33,989
3. EGI = \$645,791
4. Expenses 10% = \$64,579
5. NOI = \$581,211
6. Loaded cap = 10.2% (using 8.5% cap and effective tax rate of 1.7%)
7. Market Value = \$581,211 / 10.2% = \$5,698,155

8. Assessed value = \$1,327,670

*Millage 67.82, Total tax on land only
\$90,042, Tax per acre = \$66.23*

$$\$1,327,670 \times (67.82/1,000) = \$90,042 / 1,359.56 = \$66.23$$

Currently under Clean and Green the assessed value per acre is \$50.18 and the tax is \$3.40 per acre. (\$50.18 x 0.06782 = \$3.40)

Currently, the non-Clean and Green assessed value would be the "base year" rates established during the county's last reassessment, \$257.71 per acre and the tax is \$17.48 per acre. (\$251.72 x 0.06782 = \$17.48)

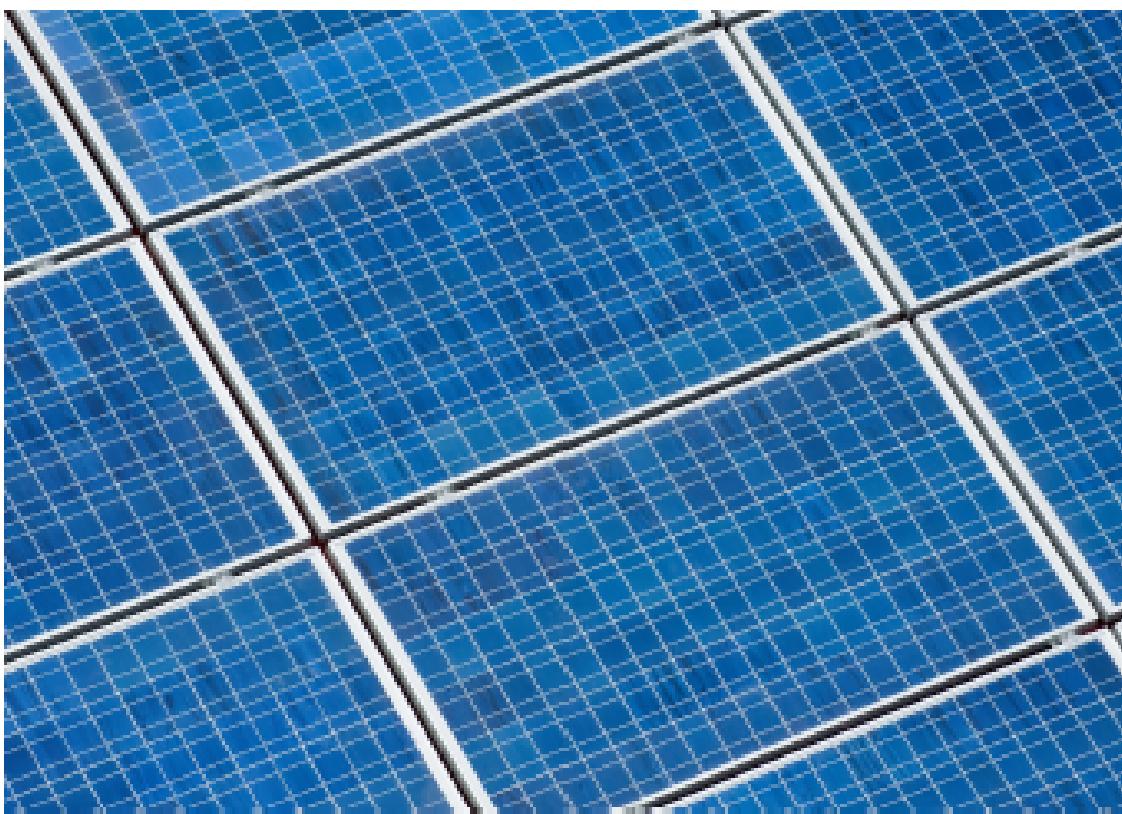
With the lease calculations above, the assessed value per acre would be \$976.54 and the tax would be \$66.23 per acre.

$$\$5,698,155 [\text{market value}] \times .233 [\text{CLR}] = \$1,327,670$$

$$\$1,327,670 / 1,359.56 [\text{acres}] = \$976.54 \times 0.06782 = \$66.23 \text{ per acre}$$



Credit: American Public Power Association, Unsplash, CC



Credit: Wayne National Forest, CC BY 2.0, via Wikimedia Commons

GSS Differs from Other Land Use Impacts in Relation to Public Services

GSS may be an ideal land use for local government, assuming the tax level increases to some extent, because this land use requires minimal services from local government. GSSD does not bring children needing education or a facility requiring significant amounts of municipal water, or any requirement for sewer capacity. There might be minor law enforcement issues such as vandalism. Especially as on-site battery power storage becomes more common on these sites, there is a potential fire safety hazard requiring first responders to have specialized training. The site will be a major construction project both during construction and during decommissioning at the end of the lease, which will bring significant short-term truck traffic and potential road impacts.

Pending Taxation Changes Being Considered at the Municipal, County, and/or State Level

As mentioned above, as of July 2022, no legislation addressing GSSD assessment had been submitted to the Pennsylvania legislature. Tax assessment methods could change as different issues are litigated or legislation passes.

There is debate about the co-location of agriculture with GSSD—called “agrivoltaics” (see Section 5)—and how that may affect taxation. What degree of agricultural activity should count as agriculture for tax benefits? How many sheep need to graze the land per acre? What if the groundcover is a wildflower mix meant to support pollinators—does that count as agriculture? Would states make the general assumption that New York State has so far: if the land is under solar panels it’s not considered for agricultural taxation? This is a topic for debate and may change, but the AAP ALC generally does not see agrivoltaics qualifying a GSS project for agricultural land use taxation.



Credit: Markus Spiske, Unsplash, CC



Credit: Werner Slocum, NREL

Estate and Succession Planning with Solar Leases

Pennsylvania's farmers are increasing in average age, and there's often a lack of succession planning for what will happen to the farm business and the land after the current operator retires, is unable to continue farming, or passes away. Adding in a GSS lease further complicates this issue.

Besides the desire to pass along the land and perhaps a business, estate planning is often driven by the desire to minimize taxes. Federal estate and gift taxes are unlikely to affect most landowners because the federal estate and gift tax exclusion amount is more than \$12 million per person, but these federal tax laws can and do change with the political climate.

Currently, Pennsylvania inheritance tax is the foremost concern in most situations. The rate differs depending on who is receiving the asset, and ranges from 0% for a spouse to 15% when the recipient is someone other than a child, grandchild, or sibling. Certain agricultural and family business exemptions would exempt most farm business assets from inheritance tax. But GSSD may cause

those exemptions to be inapplicable for the real estate used for GSS. Further guidance is needed from the Pennsylvania Department of Revenue, and a court case may be necessary for a final decision of how the incorporation of agrivoltaics (Section 5) to a GSSD may affect farm taxation.

Leaseholders may pursue valuation discounting of their potential future earnings if the solar developer decides to exercise the lease option and develop the property for solar. This can produce very sizable reductions in future taxes, but this planning must be done during the option phase of a lease. The reduction in taxation takes into account the uncertainties of whether the company will decide to exercise the lease option, the future prospects of the solar industry, and other factors. Valuation discounting requires appraisal and valuation of the leasehold interest by an appraiser or certified public accountant.

With any succession plan, there are various tools that can be used to transfer and transition assets and to minimize taxes. These tools for transfer and transition include limited liability companies (LLCs) and trusts. Every

case is different in succession planning, so property owners are encouraged to talk to a qualified estate and succession planning attorney and/or tax planner.

Conclusion

Assessment of GSSD in Pennsylvania is currently in flux (July 2022). The Assessment Law Committee of the Assessors' Association of Pennsylvania has analyzed Pennsylvania's Consolidated County Assessment Law and relevant case law and developed recommendations for valuing GSSD. They state:

- Solar panels themselves, transformers, inverters, and other equipment used in GSSD are not subject to taxation.
- Buildings associated with GSSD are taxable, including the facilities in which battery storage is housed.
- The land on which GSSD occurs and associated taxable structures should be valued using the income approach to value.

- Leaseholders must provide a copy of their lease to the county assessor as a basis for valuation.

The ALC will put forth a formal recommendation to the County Commissioners Association of Pennsylvania, with a copy to the Pennsylvania Local Government Commission, on GSSD valuation. As of July 2022, no legislation addressing GSSD assessment had been submitted to the Pennsylvania legislature. Assessment methods could change as different issues are litigated or legislation passes.

Pennsylvania's Clean and Green tax program provides preferential tax treatment for enrolled agricultural lands. Currently, GSSD may not occur on enrolled lands. If property is removed from the program for GSSD, a rollback tax penalty is due. The penalty is not thought to be large enough to stop GSSD from proceeding on farmland formerly in the Clean and Green program.

Landowners considering a GSS lease should consult their attorney and county tax assessor



Credit: Thinnapob Proongsak/Shutterstock.com

about the potential tax implications and be sure that their lease addresses the payment of additional property taxes due to GSSD.

For More Information

Assessment Law and Procedure in Pennsylvania, 17th ed. Pennsylvania Bar Institute.

<https://www.pbi.org/ProductCatalog/Product.aspx?ID=43554>

New York Solar Guidebook for Local Governments. New York State Energy Research and Development Authority.

<https://www.nyserda.ny.gov/solarguidebook>

Notes

p. 3: Chapter 88 of Pennsylvania's Consolidated County Assessment Law.

Source: 2016 Pennsylvania Consolidated Statutes, Title 53 – Municipalities Generally, Chapter 88 – Consolidated County Assessment. Justia.

<https://law.justia.com/codes/pennsylvania/2016/title-53/chapter-88>

pp. 3-4: All information about proposed tax treatment of GSSD in Pennsylvania.

Source: Call with Charles "JR" Hardester, Lawrence County, Pennsylvania, assessor, and Josh Zeyn, Tioga County, Pennsylvania, assessor, July 8, 2022.

p. 4: "If acreage is valued at an agricultural assessment rate, the land use may change to a commercial or industrial assessment value instead if GSS is added."

Source: Call with Randy Waggoner, Perry County, Pennsylvania, assessor, June 23, 2022.

p. 6: "If only part of a land parcel enrolled in Clean and Green will be developed for GSS..."

Source: Utility-Scale Solar for Municipal Officials. T. Murphy. Penn State Extension webinar, Jan. 18, 2022.

p. 6: "Typically, the lease states that the developer agrees to pay the higher taxes due to the GSS equipment."

Source: Call with Charles "JR" Hardester, Lawrence County, Pennsylvania, assessor, and Josh Zeyn, Tioga County, Pennsylvania, assessor, July 8, 2022.

p. 7: "To cover these increased costs, the developer may negotiate lower lease payments to cover this cost, commit less to community philanthropy, or negotiate a higher power purchase agreement, so essentially all costs are offset."

Source: Call with David Kay, senior extension associate, Cornell University, June 10, 2022.

p. 8: "In the U.S. Southwest and Midwest, GSS revenues help average out tax collections...." (paragraph)

Source: Utility-Scale Solar: Land Use, Policy and Emerging Ordinances. M. R. Badissy, Penn State Extension. Sept. 23, 2020.

<https://extension.psu.edu/utility-scale-solar-land-use-policy-and-emerging-ordinances-an-interactive-q-and-a>

pp. 8-9: All information about GSS taxation in New York State.

Source: Call with David Kay, senior extension associate, Cornell University, June 10, 2022.

p. 8: "Numerous states have tax penalties for converting land in agricultural tax assessment categories to GSSD."

Source: Approaches to Balancing Solar Expansion and Farmland Preservation: A Comparison across Selected States, T. Grout & J. Ifft, Cornell University. EB 2018-04, May 2018.

<https://dyson.cornell.edu/wp-content/uploads/sites/5/2019/02/Cornell-Dyson-eb1804.pdf>

p. 9: "In Michigan, land enrolled in the state's farmland preservation program under a 7-year contract gets a tax break."

Utility-Scale Solar: Land Use, Policy, and Emerging Ordinances, An Interactive Q and A Webinar. S. Mills. Penn State Extension webinar. Sept. 23, 2020.

<https://extension.psu.edu/utility-scale-solar-land-use-policy-and-emerging-ordinances-an-interactive-q-and-a>

p. 9: Massachusetts has GSSD-specific incentives for redevelopment of brownfields.

Source: Developing Solar Photovoltaics on Contaminated Land. Commonwealth of Massachusetts.

<https://www.mass.gov/lists/developing-solar-photovoltaics-on-contaminated-land>

p. 9: GSS Differs from Other Land Use Impacts in Relation to Public Services

Source: Call with David Kay, senior extension associate, Cornell University, June 10, 2022.

p. 10: Estate and Succession Planning with Solar Leases

Source: Estate and succession planning with solar leases. J. Kiessling. Penn State Extension webinar, July 26, 2022.

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c9qnnzimr](https://psu.mediaspace.kaltura.com/media/Clip+of+Estate+planning+with+Solar+Leases/1c9qnnzimr)