Ad Hoc Solar Committee Final Report to the State Tax Commission
September 14, 2021

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Introduction

The State Tax Commission directed the Utility Valuation Section of the Michigan Department of Treasury's Property Tax Division to develop personal property tables for utility transmission and distribution in 1998. These tables were developed by surveying other states, as well as taking input from local governments, the Michigan Public Service Commission, utility companies, and interested individuals. During that update, no tables for solar electrical generation were adopted. At that time all electrical generation was valued as part of the real property.

At that time there were no utility-scale installations (projects with 2 MW name plate capacity or more) of solar photovoltaic cells in Michigan. Modest commercial scale installations of solar photovoltaic cells (0.5 to 2.0 MW name plate capacity) commenced in 2011. The first utility-scale project was completed by Indiana Michigan Power in Watervliet in 2016. Projects in the 150 to 200 MW range are slated for 2021 completion in multiple Michigan communities.

The Ad Hoc Solar Committee was formed at the direction of the State Tax Commission at its August 18, 2020, meeting for the purpose of studying the Commission's recommended valuation procedures for utility-scale photovoltaic (solar electric generating) facilities. The panel members were announced at the October 20, 2020, meeting. The Committee consists of the Commission Chair, staff members within the Bureau of Local Government and School Services in the Michigan Department of Treasury, representatives from the ad valorem property tax assessment and equalization profession, and a representative from Michigan State University Extension.

As part of the process, the Committee recommended that State Tax Commission issue interim guidance on the valuation of large-scale solar facilities. At the December 15, 2020, State Tax Commission meeting, the Commission accepted the Committee's recommendation that utility-scale photovoltaic systems should be reported, classified for equalization purposes, and assessed as industrial personal property for the 2021 assessment year and valued using Table (Section) B of the Personal Property Statement, Treasury Form 632 (L-4175).

At the December 15, 2020, State Tax Commission meeting, the Solar Project Committee was charged with continuing its work into 2021 by meeting with interest groups, such as solar industry groups and local unit officials. A plan was developed considering the input of stakeholders and committee feedback. The plan was categorized into three phases with final recommendations made to the Commission at its August 17, 2021, regularly scheduled meeting.

In furtherance of its stated purpose, the Committee continued to meet during 2021 in order to recommend an ongoing valuation procedure for utility-scale solar facilities and a comparable alternative specific tax, should the legislature decide to exempt the utility-scale solar facilities in question from ad valorem assessment. The Committee sought and obtained information from various public governmental and non-governmental sources, from members of the tax assessment community, and from the industry itself. As a result of this research, the Committee presents the following discussion and factor table for use in valuing utility-scale installations (solar projects with 2 MW name plate capacity or more).

At the August 17, 2021, State Tax Commission meeting, the State Tax Commission directed the Committee to review and consider additional information from stakeholders and postponed consideration of the report to its September 14, 2021, meeting. The Committee presents this final report for the State Tax Commission’s review and consideration.

The Use of Original Cost Valuation Multipliers

There are three recognized approaches to appraising an item of tangible personal or real property: The Cost Approach, the Income Approach, and the Sales Comparison Approach.

The Committee does not deem the Income Approach, which requires the identification of an appropriate capitalization rate or discount rate, and a separately identifiable stream of revenue and expenses, practical for use in the ad valorem assessment of utility-scale solar facilities. This impracticality is due to the variations which exist from one project to the next, the atypical specific investment objectives of the investors in solar facilities and the difficulty of separating the income streams of the tangible and intangible elements of the investment. The use of the Income Approach would require the separate valuation of each individual solar facility.

The Sales Comparison Approach, which requires the use of comparable sales adjusted to reflect their similarities and dissimilarities to the subject property, is similarly impractical both because the Committee has been unable to identify even one arms-length sale of an existing facility and because the scale and complexity of the adjustments needed is too extensive.

Instead, the Committee’s recommendation relies on the principles of the Cost Approach to Value, which seeks to estimate the current reproduction cost, if possible, or current replacement cost, and then deduct depreciation – the loss of value from all sources – from the reproduction or replacement cost. Depreciation includes physical deterioration, functional obsolescence (deficiencies in the subject property when compared to the item which would currently be used to replace it) and external, sometimes referred to as economic obsolescence (obsolescence which is not inherent in the property itself but nevertheless reduce its value). This approach, when adapted to the mass appraisal techniques necessarily relied on by assessors, is reflected in the use of original cost valuation multipliers.

Original Cost Valuation Multipliers

The most often employed method of valuing personal property in Michigan for purposes of mass appraisal (property tax assessment administration) is using original cost valuation multipliers applied to the historic cost of acquiring the property, as determined using generally accepted accounting principles. For each vintage year of acquisition, there is a corresponding multiplier which translates historic cost into an estimate of current true cash value. There are a different series of multipliers used for different types of property. These multipliers are not depreciation tables – in fact, it is even conceivable that for some types of property the multipliers will not decline - although that is generally not the case. The multipliers differ from depreciation tables in several respects:

- Financial accounting depreciation estimates the economic benefit derived from the item, both in terms of length and timing, at the outset when the vintage year grouping is initially placed in service, while mass appraisal original cost multipliers value only the survivors of the vintage year group as of each successive valuation date. The multipliers must continue to value every survivor until it is retired from service and must also reflect the removal of shorter life, retired assets.

- Financial accounting depreciation allocates the original historical cost over the accounting periods which are benefited, without determining or even caring whether the book value, after depreciation, represents the current true cash value of the property. Original cost valuation multipliers, on the other hand, seek to estimate the true cash value of the property as of each valuation date and must reflect changes in the cost of obtaining a replacement item, whether that cost is higher or lower.

- If there is variability in the economic life of the assets in the asset grouping, then the inclusion of the shorter-lived assets might initially result in a lower early vintage age multiplier. On the other hand, the early retirement of the shorter-lived assets results in a higher multiplier in later vintage years for the survivors.

Basic Assumptions Made by the Committee

The Committee's valuation recommendation is predicated on the following:

- The solar facility includes all components which are needed to make the facility operational. All costs incurred, including indirect and intangible costs such as design costs and patent rights, which would be included for booking the asset under generally accepted accounting principles, would be reported.

- The facility includes all components which are positioned up to and including, the inversion of the current. Battery storage systems are deemed to be components of the solar facility if located on-site with the solar facility. Components located after conversion of the electricity to alternating current are reported as Electric Transmission personal property using form Treasury 3589 – *Cable Television and Utility Personal Property Report*.

- Since all costs are reported based on the booking of project costs using generally accepted accounting principles (GAAP), such costs must include all amounts for which an investment tax credit was allowed or allowable, even though those costs were offset by the credit.

- If components are replaced during the project life cycle, the cost of the original component is removed from the reported cost and the cost of the replacement component is reported in the year that it is placed in service.

- The Committee's recommendation is only applicable to utility-scale solar facilities developed for the commercial sale of the electricity produced and only to projects having a rated output larger than 2.0-megawatt name plate capacity (MW NPC).

- Similarly, although the Committee could develop valuation procedures for residential and commercial photovoltaic systems, which provide onsite power to one user, it has not done so and the multipliers which the Committee proposes are not suitable for those systems. In some, or perhaps many cases, these smaller systems will be valued as real property and their value based on the contribution they make to the value of the real property. Parenthetically, for the most part, residential systems are exempt until there is a sale of the property, arising from the fact that they benefit from Mathieu-Gast non-consideration of value pursuant to MCL 211.27(p).

- A difficulty encountered by the Committee was the dramatic decline in costs which have occurred over the past ten years (the time period, which is relevant in Michigan, given the installation dates of the existing projects.) This analysis results in much lower multipliers for already installed systems than will be appropriate for newly installed systems in later years. Therefore, as previously stated, the Committee has determined and recommends to the Commission, that the valuation multipliers must be developed for each future assessment year.

Assumptions and Determinations Based on the History and Characteristics of Photovoltaic Generation Development

The Committee's valuation recommendation is predicated on the following information obtained during the three phases of the Committee's work plan:

- Much of the data presented to or discovered by the Committee are presented in inflation-adjusted dollars (2019 US$). In both already developed systems and in systems installed in the future, the taxpayer will be reporting actual costs. It has been necessary for the

Committee to “un-adjust” the data to obtain an indication of dollars spent or which will be spent to install systems in the future. For purposes of measuring actual dollars spent, the Committee has used the cost-of-living data from U.S. Bureau of Labor Statistics. This methodology duplicates the adjustments used by the U.S. Department of Energy when reporting the cost of power purchase agreements as inflation adjusted dollars (2019 US$).[1] For 2021, the Committee has used an estimated inflation rate of 2.5% from the midpoint of multiple mid-year projections for core costs from the U.S. Bureau of Labor Statistics. For future years, the Committee has assumed an inflation rate of 2.25% because the Department of Energy is using a 2.25% inflation rate in their solar expense and longevity estimates.

- Since the first systems were completed in the 1970s, the cost of certain components of the systems have declined dramatically and their output and economic life has increased due to technological improvement and improved manufacturing techniques. Further, some costs, particularly some installation costs, have also declined as measured in constant dollars. For example, the solar modules have not only improved in design, manufacturing, and ease of installation, but the inflation adjusted cost has literally declined by 99%, as measured by output since the 1970s. Between 2010 and 2020, the cost of modules has declined by approximately 90%. However, between 2016 and 2020, the decline has moderated substantially and most recently, there is evidence that costs have increased. Further, since most of modules used today are manufactured in China, the potential for cost increases caused by tariffs exists. According to NREL H2 2020 Solar Industry update, costs between 2019 and 2020 were flat and an average 1.5% reduction in costs was observed between 2020 and 2021.[2] A constant cost of $24 per MWh PPA in (2019 US$) has been used for estimating future years in the factor table.[3]

- Although the cost of the modules and, to some extent, the inverters has declined dramatically, these components represent only a portion of the project cost. While the project costs have declined, driven largely but not exclusively by the reduction in the cost of the module and inverter components, the decline in total project cost has declined much less dramatically.

- The Committee’s investigation indicates that depending on the size of the project, the cost of the modules and of the inverters, as a percentage of the total project cost (per $Watt_{DC}$), varies between 33.06% for 5- MW and 43.62% for 100- MW, in the case of the modules, and between 4.03% for 5- MW and 5.32% for 100- MW, in the case of the inverters.[4] Given the planned output of the 2020 and 2021 Michigan facilities which are coming

[1] Bolinger, Mark, Joachim Seel, Dana Robson & Cody Warner. *Utility-Scale Solar Data Update: 2020 Edition.* Lawrence Berkeley National Laboratory, October 2020, pp. 32 (Column B50 thru B60).
[2] Feldman, David & Robert Margolis. *H2 2020 Solar Industry Update.* National Renewable Energy Laboratory, 6 April 2021, pg. 40.
[3] Cox, Molly. “Key 2020 US Solar PV Cost Trends and a Look Ahead.” *Greentech Media.* 17 December 2020. https://www.greentechmedia.com/articles/read/key-2020-us-solar-pv-cost-trends-and-a-look-ahead (Accessed 2 March 2021) and Murtaugh, Dan and Brian Eckhouse. “Solar Power’s Decade of Falling Costs Thrown Into Reverse,” *Bloomberg Green*, 24 May 2021. https://www.bloomberg.com/news/articles/2021-05-23/solar-power-s-decade-of-falling-costs-is-thrown-into-reverse (Accessed 28 May 2021).
[4] Feldman, David, *et al*., *U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020.* National Renewable Energy Laboratory, January 2021, pp. 53.

online in the 150- to 200- MW NPC range, the Committee has used a percentage of 43.62% for the installed modules and 5.32% for the installed inverters from the cost variance reported for 100- MW facilities. The balance of the project cost comes in the form of other electrical equipment costs, other structure costs (racks, etc.), labor, design, permits, transmission connection, land acquisition (but not the land itself), developer incurred taxes, interconnection fees, and developer overhead, margin, and contingencies. Although these latter costs have experienced categorical declines due largely to installation efficiencies, the Committee believes that these costs will largely track inflation in the future.

- Although the Committee has discussed whether it is appropriate to provide separate multipliers or additional valuation procedures for facilities which track the sun and for facilities that feature storage of the electricity, it does not recommend any special treatment at the present time. The Committee has identified only one facility that tracks and although such systems produce more electricity, they also have a higher installed cost and do not always operate as intended. Currently, the Committee believes that the increased cost/increased production of facilities offset each other and that the same valuation multipliers should be used.

- As far as the Committee can determine, there is only one Michigan facility which features battery storage: Circuit West in the City of Grand Rapids with a 500- MW battery. This facility is smaller than the 2- MW and above range covered by the updated factors. Such storage is included in projects based primarily on their relationship to the grid at-large or to a specific user of the electricity generated and no separate multipliers have been developed for battery components. If the Committee is asked to develop multipliers for smaller systems or if new projects feature battery storage, then it may be appropriate in those circumstances to address the valuation of battery storage.

- Although the rate of technological change in the photovoltaic industry has reduced dramatically, one of the significant uncertainties experienced by the Committee in completing its assignment is the possibility that future technological change will affect the future projections necessarily made by the Committee. The Committee has projected no further reduction in the project costs. To err on the side of conservatism, the Committee has assumed that the economic life of the entire project is measured by the life of the most durable component, the racking system. Due to the potentially shorter economic life of PV modules and inverters, there may come a time when the modules and inverters will be traded out, perhaps in their entirety, while the balance of the facility including other equipment and project development costs representing the greater part of the project cost continues in service.

- The Committee’s investigation has led it to conclude that the racking and support systems have an anticipated economic life of 25 years, on average, for systems installed before 2018, and 30 years on average, for future planned systems. This economic life determination should be revisited periodically, and the appropriate economic life calculations updated for future tables.

- The Committee investigation indicates that the inverters have an economic life of 14 years on average. This economic life determination should be revisited periodically, and the appropriate economic life calculations updated for future tables.

- The Committee has determined that the modules currently have not only a relatively long economic life, but that they are warranted by their manufacturer for a long functional life, typically 25 to 30 years or more, depending on the date of installation. A module is in a state of failure when its efficiency has dropped below 80% of its original performance. The Committee investigation indicates that the modules are warrantied for and have an anticipated economic life of 25 years for systems installed before 2018 and at least 30 years for future planned systems. This economic life determination should be revisited periodically, and the appropriate economic life calculations updated for future tables.

- The Committee has determined that the efficiency of the modules declines as they age and adopted the Actual Indexed Capacity Factor Weighted Average as published by Berkeley Labs. These factors are released annually and are normalized to a multiplier of 1.00 for the most current year. A future functional adjustment of 1.1% as projected by Berkeley Labs[5] has been used to create future factor estimates.

- The system residual multiplier has been determined in anticipation that the useful economic life of some systems or system components may extend past the anticipated 30-year period. These facilities may have components that have greater than expected economic life for the facility and may be re-powered and/or re-racked instead of decommissioned. Additionally, even if the facility is decommissioned, the committee anticipates that certain components will have salvage value. The Committee has adopted a minimum factor of 0.12 in anticipation of these factors.

- Although the first Michigan utility-scale solar installation was constructed in 2016, the Committee recognizes that earlier commercial-sized systems may be expanded or re-powered and/or re-racked to exceed the minimum 2 MW-NPC size necessary to be included on the utility-scale table. In anticipation of this potential increase in capacity, factors have been developed back to the earliest known commercial-scale installation date. Taxpayers would be instructed to report the surviving costs of the older system components in the year they were placed in service and report expansions, new modules, inverters, and re-racking costs in the year they were placed in service.

Tax Incentives Available to the Developers of Solar Facilities

As part of its process, the Committee solicited written commentary from interested parties related to the preliminary report and proposed tables. Additionally, the Committee offered stakeholders an opportunity to address the Committee and provide specific input and feedback on the preliminary report and demonstration solar factor tables at the June 23, 2021, Committee meeting.

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[5] Bolinger, Mark, Joachim Seel, Dana Robson & Cody Warner. *Utility-Scale Solar Data Update: 2020 Edition*. Lawrence Berkeley National Laboratory, October 2020, pp. 26 (Column E28 thru E39).

The Committee’s preliminary report indicated that the Committee was not going to recommend an adjustment in the original cost valuation multipliers to reflect tax incentives which benefited most of the existing projects but would not be available to a hypothetical purchaser of any of those projects. For the most part, the existing projects qualified for a 30% Federal Investment Tax Credit (hereinafter “ITC”) plus five-year optional, accelerated ACRS [income tax depreciation] for the balance of the project cost.

The ITC was extended for another two years in the 2021 Omnibus Spending bill passed December 2020. For projects where the equipment was purchased prior to December 31, 2019, the 30% credit remains. The ITC is then reduced to 26% for systems commencing construction in 2020 thru 2022 and to 22% for systems commencing construction in 2023 and 2024. Current legislation reduces the ITC to 10% in systems commending after 2025. Notably, however, if the project is sold within six years of the date that it was placed in service, there is a recapture provision which reverses the benefit of the ITC. The Committee is aware of Tax Tribunal and other judicial opinions that determined that the ITC or the Production Tax Credit should be considered in valuing wind energy systems but does not believe that these decisions are relevant, given the change in the economics of the solar industry, the phased reduction of the benefit, the existence of the recapture provisions, and the differing income tax implications among investors.

During the feedback session, the primary concern raised by various stakeholder groups was the Committee’s decision not to incorporate certain investment tax credits within the proposed factor tables. Those addressing the Committee indicated that, because ITC affects the likely selling price of existing solar parks, the decision not to consider the ITC in the tables results in an inflated value of the property.

After considering the information received following the publication of the preliminary report, the Committee was not persuaded that adjusting the proposed factors was appropriate. The Committee based its determination on the following:

- The Committee believes that a previous decision based on an appraisal using an income shortfall methodology to determine economic obsolescence in the cost approach is not reliable. The Committee has concluded that the use of an income shortfall methodology suffers from the same limitations as the income approach itself. Specifically, the investment objectives of potential investors, the identification of capitalization rates, and separation and projection of future revenue and expenses is unreliable.

- The Committee further notes that under appraisal theory, economic obsolescence is only applied after the application of physical deterioration and functional obsolescence. Therefore, even if relevant, the actual effect of any asserted economic obsolescence is significantly diminished by the fact that it would only be applied after the application of physical and functional loss of value. This diminishment is enhanced by the fact that for the first six years the project is in service, the original investor stands in no better position than does a prospective purchaser, arising from the recapture provision.

- The Committee believes that the ITC extension was part of a fiscal stimulus package to alleviate the economic impacts of the coronavirus pandemic and incentivizing alternative energy development and was not intended to provide the means of making an economically unsupportable investment feasible. Since the project costs have declined dramatically, it is unclear that there is independent economic justification for the ITC, except as a stimulus. The Committee believes that this fact is reflected by the phased reduction of the ITC and the recapture provision.

- The Committee further believes that the value should be based solely on the project's economic viability. The Committee does not believe that the values determined using the proposed multipliers fail to justify (support) the investment. It notes that appraisal theory is predicated on the Principle of Substitution and that today, a potential investor could not timely develop a project which would benefit from the 30% ITC and soon may not be able to develop a project which benefits from any ITC greater than 10%. Further, even this 10% credit might be subject to recapture. Finally, there may be significant income tax incentives available to a prospective purchaser. Therefore, a prospective purchaser would not necessarily compare the purchase of an existing project unfavorably with the alternative of constructing a new project, particularly since a new project would require significant time to plan, design, and build.

- The Committee is mindful of the fact that the task is to value the asset not the investment. Several judicial decisions have recognized that true cash value is not always the same as the investment value. In fact, the investment value is a difficult concept, particularly in cases where there are tax incentives which may only be useful to investors who are in certain individual circumstances. The Committee believes that the value of a solar facility's property is not measured solely by its investment value and that the utility of the property itself, as measured against the value calculated through the use of the proposed valuation multipliers, is sufficient to support the investment.

- Any assertion that the lack of availability of the ITC to an investor purchasing an existing system will negatively affect the price paid, assumes that in the future, the net revenue will not be sustained at or increased to a sufficient level if the ITC is not available to a subsequent purchaser. The Committee questions whether this is true. The United States economy becomes more invested in solar every year not because the price of the electricity is less (in fact, it is more), but because of both government environmental mandates and the commitments of citizens and business to clean energy. The Committee believes that the demand for solar generated electricity will not decline but will increase, relative to other sources, even if the price of its electricity increases due to a reduction in tax incentives. If this occurs, then existing systems may experience increased profits – profits which cannot be obtained by newly built systems - and the investment value of the existing systems may increase, not decline.

Following the feedback session, a sample discounted cash flow analysis was provided for the Committee's review. The sample discounted cash flow utilized both the Investment Tax Credit and bonus depreciation available for renewable energy. Given the timing of receipt, a thorough evaluation of the analysis was not possible as the Committee would need to verify the revenue and expense data, analyze the appropriateness of the discount rate or rates, and study the potential for changes in the revenue steam in the future. However, in reviewing these materials, the Committee noted the following:

- The discounted cash flow analysis asks that the Committee use data to find an impairment in the value of a tangible asset based on the asserted experience of facilities which are being productive with a guaranteed rate of return and taking advantage of an Investment Tax Credit.

- An assessor is not permitted to value these types of facilities at an amount higher (or lower) than is indicated by their basic utility. An assessor must value the asset and not value the investment. The Committee cannot justify valuing the property lower than its indicated replacement cost less physical and functional deterioration based on data obtained from facilities that are earning a rate based on their actual construction cost, when all of the facilities being valued are either constructed without a rate set by the Public Service Commission (PSC) rate at all or have a PSC rate which is adequate based on their cost.

Solar Factor Table

The Committee's proposed table for the upcoming assessment year is presented below.

Table 1: Solar Factor for 2022 assessments

Year	Average PPA Price	Cost Factor	Weighted Physical % Good	Indexed Capacity Factor Weighted Average	Cumulative Factor (min 0.12)
2009 & prior					0.12
2010	$109.94	0.228	52.59%	0.895	0.12
2011	$90.97	0.275	56.76%	0.887	0.13
2012	$72.72	0.344	60.92%	0.901	0.18
2013	$60.39	0.415	65.09%	0.921	0.24
2014	$50.06	0.500	69.26%	0.916	0.31
2015	$43.97	0.570	73.42%	0.931	0.38
2016	$36.74	0.682	77.59%	0.971	0.51
2017	$37.39	0.670	81.76%	0.978	0.53
2018	$28.58	0.876	85.93%	0.985	0.74
2019	$24.16	1.037	90.44%	0.978	0.91
2020	$24.23	1.034	94.64%	0.989	0.96
2021	$25.05	1.000	98.58%	1.000	0.98

Due to inflationary uncertainty, tariffs, changing technology and efficiencies realized as the industry matures, the Committee recommends that the solar utility factor table be updated on an annual basis. This update would be based on the most recent cost information available, and the Committee proposes that the updates be presented to the State Tax Commission annually at the November meeting for review and approval. The Committee requests the opportunity to reconvene in 2025 in order re-examine the factor table and make further recommendations to the State Tax Commission.

Alternative Specific Tax

Through its work, the Committee determined that the cost approach, specifically original cost valuation multipliers, was the most appropriate method for valuing utility-scale solar energy projects. Specific taxes may be developed many different ways during the legislative process. For informational purposes, the Committee developed an alternative specific tax based on value (without incentives or reductions) utilizing the same methodology utilized to develop the solar factor table, updating over a twenty-five-year time period. It should be noted that the specific tax reviewed and considered by the Committee is for informational purposes only. Neither the State Tax Commission nor the Ad Hoc Solar Committee have the authority to enact a specific tax for utility-scale solar installations. It is anticipated that any proposed alternative specific tax adopted by the Legislature would be based on a per megawatt of name plate capacity cost; therefore, the Committee's analysis, detailed below, is based on that assumption.

In developing a specific tax amount for utility-scale solar installations, the Committee worked with the Office of Revenue and Tax Analysis in order to project future tax revenues based on the U.S. Department of Energy, U.S. Energy Information Administration (report by Sargent & Lundy) benchmark solar facility cost per kilowatt of $1,313 (2019 US$) for a 150-mW name plate capacity fixed tilt solar installation. This cost was adjusted to Michigan, using the averages of the Detroit and Grand Rapids factors. Since 2019, solar installation costs have declined 1.5%.[6] Inflation between 2019 and 2020 was 1.81% and is estimated at 2.5% for 2020 to 2021.[7] Given this information, the Committee further adjusted the cost data to reflect these projected changes.

While the Committee initially considered the state average tax rate less school operating and State Education Tax (SET) millage, the Committee received specific stakeholder feedback that such a millage estimate would overstate the taxes likely to be paid on utility-scale solar development for the reason that these installations are likely to occur in rural areas with lower millage rates. As a result, the Committee compiled a list of all utility-scale solar facilities to establish an average Industrial Personal Property millage rate for all known installations. Twenty-three sites were identified, adjacent sites were combined, and the average 2020 Industrial Personal Property millage rate being levied against all known and under construction

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[6] Feldman, David & Robert Margolis. *H2 2020 Solar Industry Update.* National Renewable Energy Laboratory, 6 April 2021, pg. 40.

[7] Projected annual inflation rate in United States from 2010 to 2026. https://www.statista.com/statistics/244983/projected-inflation-rate-in-the-united-states/ (Accessed 04/19/2021)

sites in 2021 was 28.1536 mills. This is slightly less than the 29.76 mills utilized in the initial calculation.

The Committee used the proposed solar factor table methodology projected for a twenty-five-year time period to estimate the total taxes paid over the life of an installation. These projections assumed flat costs after 2022 and an inflation rate of 2.25% per anum as used by the Department of Energy in their solar expense and longevity estimates. Using various discount rates, including a blend of the bond and equity return, the state interest rate for refunds and tax due, and the U.S. Treasury 30-year rate, the present value of these future tax payments was calculated. Based on these calculations, the annual alternative specific tax ranged from $11,857 per megawatt of nameplate capacity to $13,272 based on the 2020 average millage rate for existing or under construction solar installations (28.1536 mills) for industrial personal property. The cost factors that would affect a 2021 installation into the future are illustrated below (Table 2).

Table 2: Predicted Factors for a 2021 Solar Installation in Future years

Year	Age	Factor
2022	0	0.98
2023	1	0.95
2024	2	0.93
2025	3	0.90
2026	4	0.87
2027	5	0.84
2028	6	0.81
2029	7	0.77
2030	8	0.74
2031	9	0.71
2032	10	0.67
2033	11	0.64
2034	12	0.60
2035	13	0.56
2036	14	0.53
2037	15	0.49
2038	16	0.46
2039	17	0.42
2040	18	0.38
2041	19	0.35
2042	20	0.31
2043	21	0.27
2044	22	0.23
2045	23	0.19
2046	24	0.15
2047	25	0.12

The Committee finds a value-based, alternative specific tax amount equal to $12,700 per megawatt of nameplate capacity. This alternative specific tax amount does not consider any incentives or reductions related to alternative energy policies which were deemed outside the scope the State Tax Commission and the Committee.

The Committee acknowledges that other states, including Ohio and Wisconsin, have adopted variations of an alternative, specific tax below the $12,700 per megawatt of nameplate capacity for certain solar installations (ranging from $4,000 to $9,000 per megawatt of nameplate capacity). However, the Committee notes that these alternative tax amounts may not, necessarily, be based on the same ad valorem valuation principles relied on by the Committee; rather, the Committee believes these amounts to be incentivized by the legislatures of these states as a means to promote alternative energy development. The Committee recognizes that any alternative specific tax amount will be determined by the legislative process and may reflect other incentives and policies deemed necessary and essential for the furtherance of the development of alternative energy options in the state.

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