

Solar and Wind Appraisal Model

2024 Public Comments

The public comment period on the draft 2024 solar and wind appraisal model opened on December 28, 2023 and ended on February 27, 2024. The department received numerous comments from interested individuals and entities. The following reflects a summary of the substantive comments received and the department's responses. Similar comments and duplicative comments have been consolidated where appropriate.

Capacity Factors

Comment 1. Capacity factors are too high and both wind and solar capacity factors should be reduced. The model significantly overestimates upstate capacity factors and underestimates downstate capacity factors. The department should use the values in the 2022 model for VDER or switch to values from NREL's models.

Response. Although the capacity factors in the draft model were based on actual data submitted by Tier 1 projects, upon review of this comment, the department has determined that it is generally true that capacity factors in the north are lower than capacity factors in the south. Therefore, the department believes it is appropriate to adjust the model to reflect that fact. To that end, the department has reverted the solar capacity factors to those used in the 2022 model.

Comment 2. The department should adjust project-specific capacity factors based on the DC/AC Ratio. This could be accomplished by prompting users to enter both DC and AC nameplate capacity, which could then be used to calculate the project-specific DC/AC Ratio to adjust a default capacity factor for a given plant type in a given NYISO Zone.

Response. This adjustment would introduce unnecessary complexity to the model and would require developers to provide the relevant information to assessors in order for assessors to utilize the model. It would also be difficult for assessors to verify the accuracy of this data.

Comment 3. The department should use P90 capacity factors instead of P50. Recent research and analysis of empirical PV system performance conducted by DNV GL found that that large solar projects tended to underperform by 6.3% vs the P50 estimate, even after adjusting for weather, leading the authors to conclude that P90 estimates are likely more appropriate for valuing PV assets.

Response. Statistically, P50 and P90 represent the confidence level of a value not being exceeded. A P50 value has a 50% probability that it will be exceeded, while a P90 only has a 10% probability of being exceeded. P50 is the median, which at this time the department believes is most appropriate, and using P90 would lead to artificially low values.

Comment 4. Wind farms have historically produced significantly less energy than the capacity factors in the model would indicate. New, lower capacity factor for wind should be used. Capacity factors for wind projects should vary by age since older wind farms tend to have lower capacity factors.

Response. The draft model relied on NYSERDA's Tier 1 database in setting capacity factors. We believe those values are reasonable. The department has not been presented with sufficient data to justify the requested adjustment.

Comment 5. It would be beneficial for system owners to provide assessors with evidence of the projects' specific estimated energy production in kWh. In addition to considering geographic zone, system size, and type of module, the model should also consider configuration, shading, orientation of modules, as well as equipment specifications. Production input should also be considered individually for each project.

Response. Implementing these suggestions would greatly increase the complexity of the model and would require developers to provide the relevant information to assessors before assessors could utilize the model. It would also be difficult for assessors to verify the accuracy of this data.

Decommissioning Expenses

Comment 6. Decommissioning expenses are included although they are an end-of-life expense. With changes in technology, panels will last longer for solar arrays and are more easily/cheaply replaced. This may result in an indefinite life of solar arrays in particular. Therefore, decommissioning should not be an expense during the project life nor included in the cash flows. Alternatively, decommissioning expenses should be a user input.

Response. The draft model's decommissioning costs were calculated based on samples of projects provided by NYSERDA. The department's understanding of this issue is that decommissioning costs are an appropriate expense for the majority of projects. The department has not been presented with sufficient data to justify the requested adjustment.

Discount Rates

Comment 7. The department's source for cost of capital appears to be the NREL. In 2021, NREL did a comprehensive study to determine the cost of capital for renewable energy projects; however, the 2023 update includes a 1% bump to the cost of equity, without significant support or review. This oversimplifies the changes in capital markets that have occurred from 2021 to the present. As of January 2021, the 20-year treasury bond yield was 1.46%, while the 20-year treasury bond had increased to 4.25% as of January, 2024. These changes have significant impacts on the cost of capital that are not accounted for by the NREL update. Provide a sample calculation arguing for a WACC of 13.19% as of 1/1/2024.

Response. In developing the model, the department attempted to use data as of the July 1, 2023 valuation date that applies to most municipalities. The department is not aware of any better sources for discount rate data as of July 1, 2023, than those set forth in the Weighted Average Cost of Capital (WACC) memo.

Comment 8. The discount rate appears too high, particularly when compared to PV Value and other sources that are regularly used in the industry. The rate should be lower and specific to each municipality and each New York Independent System Operator (NYISO) Zone. The same discount rate for a solar or wind system cannot be used in the North Country and in Rockland or Westchester County. These zones have different electricity rates and economics. Future cash flows cannot be based on the same discount rate when there are very clear differences in electricity prices in each zone. The department should rely on the Capital Asset Pricing Model (CAPM) for calculating a WACC/discount rate.

Response. The granularity of data required to derive discount rates (WACCs) for each technology type and in each NYISO zone is not publicly available. The WACC memo identifies the department's assumptions, and we have not received any data that demonstrates those assumptions are unreasonable. The CAPM analysis submitted with this comment used a sample group of very large utility companies (not just renewables developers). The sample group included ConEd, Dominion, Duke, Exelon, NextEra, PG&E and PSEG, among others. We do not consider those utility companies to be an appropriate peer group because they are not just renewable developers, and most do not operate exclusively in New York State.

Host Community Agreements

Comment 9. Host Community Agreement (HCA) payments are a significant cost item omitted from the department's model. Recommends either: (1) Adding a fixed cost of between \$3/KW and \$4.5/KW of installed capacity subject to annual inflationary increases or (2) allowing each project to submit their modeled HCA payments.

Response. There was a small HCA expense embedded in the operating expenses in the 2022 model. While attempting to update that data for the 2024 model, the department determined that there was not sufficient support for that expense. The department does not currently have sufficient evidence to justify including an HCA expense of \$3/KW or any other amount. The HCA expense was therefore removed from the model. Furthermore, it would be difficult for assessors to verify such an expense.

Market Transition Credit/Community Credit

Comment 10. Recommends defaulting the market transition credit/community credit (MTC/CC) to zero for VDER projects. Suggests the addition of rows specific to the Inclusive Community Solar Adder (ICSA) as an optional input for VDER projects. Under the draft model, a project that receives both the Community Adder and ICSA can omit a portion of their rebate from the valuation assessment. With the phasing out of the Community Adder, the ICSA will become more prevalent in the market and therefore will need to be accounted for.

Response. The 2022 model had a default value of \$0 for the MTC/CC. Last year, the department was informed that numerous assessors were unable to obtain MTC/CC amounts when requesting that information from property owners. This led to artificially low values because

assessors were unable to replace the default value with appropriate credit amounts. When drafting the 2024 model, the department attempted to procure information about the MTC/CC amounts received by each property. The parties in possession of that data declined to disclose it to the department. The department concluded that the only way to ensure the appropriate MTC/CC amount is entered for each property is to set the default at the highest possible credit amount and leave it to property owners to communicate with the assessor if a lesser amount is appropriate.

Upon review, the department has determined that it is appropriate to add an input for the ICSA.

Users can enter an ICSA value in the Community Adder field.

Nominal vs. Real

Comment 11. Price forecasts are not deflated on the price forecasts tab or in the revenue projections tab. It is typical for price forecasts to be completed in nominal dollars. By increasing the nominal dollar revenue projection at the rate of inflation, the department is double counting growth. Further, if applying a real dollar rate to the energy projections there should be a subject deflation. Suggests changing the model to function in nominal dollars.

Response. Revenue is not being artificially increased by the use of real dollars because revenue forecasts were entered into the model in real dollars. The final model allows users to toggle between real dollars and nominal dollars for informational purposes. The resulting value is not affected by this option.

Operating Expenses

Comment 12. Operating expenses (OpEx) are substantially lower than those in the 2022 model. These reductions are not appropriate considering the impact of inflation and rising labor costs since the prior model was published. The model also includes smaller inconsistencies. For example, the operation and maintenance (O&M) costs for systems with trackers appear to be lower than O&M costs for fixed tilt systems. However, systems with trackers have more moving parts and complexity; if anything, the tracker systems should have a higher O&M cost estimate.

Response. The OpEx values were developed using publicly available data sources as of the July 1 2023 valuation date. The principal data source was the [NREL ATB](#) (National Renewable Energy Laboratory Annual Technology Baseline published on June 28, 2023). The Tier 1 project-specific OpEx costs have fallen slightly for PV projects (more significantly for land-based wind), when compared to the previous NREL ATB dataset used in the original model, explaining the direction of the values. The VDER (and net-metering) PV OpEx costs were tied to NREL commercial PV projects. This resulted in an increase to the VDER OpEx costs in comparison to the values used in the original model. The OpEx for PV system with tracking is higher than the OpEx for fixed PV systems.

Comment 13. O&M fails to include subscriber management costs, which should be added to VDER projects at a rate of \$15.93/kW-DC/year.

Response. The department does not have sufficient data to support including a subscriber management cost for VDER projects at a rate of \$15.93/kW-DC/year or any other rate.

Comment 14. The modeled project life should be changed from 25 years to 20 years based on the average life of existing projects.

Response. The department believes that it is appropriate to use a 25-year period, which is the typical warranty period for renewable energy assets like photovoltaic panels.

Comment 15. Assuming inverters will be replaced on a 15-year cycle is unrealistic. Most inverter manufacturers offer only a 5-year limited warranty on inverters. We frequently see inverters require major maintenance or replacement as early as year 10. We believe the model should therefore be updated to reflect a shorter useful life of inverters.

Response. The department does not currently have sufficient data to justify reducing the 15-year inverter life.

General/Other

Comment 16. The 2024 draft model differs substantially from the previous version. The solar and wind energy industry supported the legislation enacted through the 2021-2022 State Budget that directed the department to publish a standard methodology for real property tax assessment for solar and wind energy systems because a standard and fair appraisal methodology increases certainty and convenience for both taxing jurisdictions and renewable energy development companies. If successive versions of the model contain radically different values for critical components of the valuation formula, and produce dramatically different valuations, this undermines legislative intent and erodes the value of the model for both developers and assessors alike. We appreciate the need to ensure that the values in the model are accurate and defensible, but we urge the department to prioritize consistency wherever possible to mitigate unnecessary confusion and disruption in the market.

Response. The department acknowledges that substantial variations in value from year to year can be problematic for both property owners and municipalities. However, RPTL 575-b directs us to publish a model utilizing the discounted cash flow approach, update it periodically as appropriate, annually publish discount rates, take into account economic and cost characteristics of different geographic regions, and consider regionalized market pressures. The statute does not indicate that we should disregard data or otherwise modify our findings to create more consistent valuations from year to year. As the law currently exists, we do not believe it would be appropriate to do so, particularly where market conditions have changed substantially as they have in the two years since the previous model was published.

Comment 17. The 95% assumption for *fraction of offtaker credits to owner* for VDER projects is not realistic in most cases. The fraction of bill credits that flow to VDER projects should be changed from the current 95% to 90%.

Response. Upon review, the department has determined that the vast majority of VDER projects fall between 95% and 90%. Therefore, the department believes it is appropriate to average these credits to 92.5% within the model.

Comment 18. Reviewing the forecasted power prices for NYISO zones D and A from S&P Capital IQ forecasted as of Q4 2023, the annual expected energy price is substantially below the department's projection.

Response. In forecasting power prices, the department used a proprietary, nationally recognized energy forecast that was most recently published prior to the 7/1/2023 valuation date.

Comment 19. The model should not include the value of land in the value it produces.

Response. The model only includes the value of land when lease information is not entered. When lease information is not available, the model determines a value for the improvement and sufficient land to support that improvement. The assessor is able to value land using any method they deem appropriate. For more information, see [Land Valuation and the Solar and Wind Appraisal Model](#).

Comment 20. The model is not consistent with how the department values all other utility properties.

Response. RPTL 575-b requires the department to develop a solar and wind appraisal model using the discounted cash flow approach.

Comment 21. There is no mechanism to ensure municipalities receive proper inventory information from developers.

Response. The department has attempted to structure the model in a way that does not make assessors dependent on receiving inventory or other information from property owners. In last year's model, assessors had problems receiving MTC/CC data from property owners. As a result of that lack of communication from property owners, many properties had no MTC/CC attributed to them even though the MTC/CC was a source of income that should have been considered. The department has restructured the MTC/CC input in 2024 to default to the highest possible credit amount. It is up to property owners to communicate with assessors if a lesser MTC/CC amount is appropriate.

Comment 22. The department provides the model and discount rates based on documentation provided by individual developers. However, the local assessing units often are not provided the documentation

the state will use to determine the model and discount rates. This puts local assessing units in a difficult place and unable to confirm the data and discount rates they are receiving from the state. Further, there is no process to verify the accuracy of the data received. The department is asking assessors, with no verification or ability to confirm its validity, to blindly accept information from each solar or wind developer, which likely will be self-serving to ensure lower assessments. For the model to work, there needs to be mandatory reporting to both the department and local municipalities, as well as a mechanism to enforce disclosure against any developer that is providing faulty information or no information at all.

Response. The data used in creating the model and discount rates came from various authoritative sources. The model was not created using data provided by *individual developers*. The draft model was provided to the public, who were given 60 days to review the model and provide the department with comments. The public was welcome to provide the department with alternative data to consider during the public comment period. The model users' guide provides information for how assessors can retrieve each input. Most or all inputs can be found without developer assistance. The users' guide recommends that developers be required to attest to the veracity of any information they provide.

Comment 23. Sales of solar and wind farms also do occur in the marketplace, often after five years have passed and the Investment Tax Credit recapture exposure is no longer relevant. Assessors should use the sale prices to factor into their valuation of solar and wind farms, as the arms-length sale of a subject facility is the best indicator of value. Wind and solar projects also have power purchase agreements (PPAs) with local utilities that have higher pricing than spot pricing. If such a contract exists, it should be used for the electricity price in the model, not lower pricing that is not actually used.

Response. RPTL 575-b requires the department to create a model using the discounted cash flow approach, not the market/sales approach. Even if the statute authorized the department to utilize the market/sales approach, sales of solar and wind generating facilities are often portfolio sales, meaning the price of individual generating facilities is often not publicly available. Similarly, PPAs are often confidential, and unless structured to transfer to a buyer, would not be considered in a negotiated sale price.

Comment 24. A long-term annual inflation metric of 2.5% for expenses is too low. Expenses for operation and maintenance of solar projects are primarily tied to labor rates of skilled laborers such as electricians under contracts with annual price increases pegged to the National Average Wage Index, as published by the Social Security Administration, which has escalated an at compound annual growth rate of 4.5% since 1951. Moreover, the prevailing wage rules under the Inflation Reduction Act will further escalate the costs of operating and maintaining solar projects.

Response. The department believes that using the National Average Wage Index for inflation would produce artificially low values because expenses are comprised of more than just labor costs.

Comment 25. The model should include added expenses for community solar projects. Community solar subscriber acquisition, management, and re-acquisition are significant cost drivers. Consolidated billing can lower these expenses to a certain extent, but consolidated billing requires a 1% fee to the managing utility. The model does not recognize any of these costs. Moreover, the assumptions that project owners will only need to offer a 5% offtake discount and successfully find subscribers for 100% of offtake may well prove overly aggressive. As more and more VDER projects come online—as close to a certainty as exists given New York’s ambitious clean energy deployment targets—competition for offtake will only get fiercer, necessitating steeper discounts and making it more difficult to find sufficient offtake for all projects.

Response. The department did not receive sufficient data regarding subscriber acquisitions, management, or reacquisition costs to justify inserting those expenses in the model.

Comment 26. The model fails to account for any state or federal subsidies, grants, or other funding, including renewable energy credits (RECs) that is being provided to solar and wind developers to build installations. There is no manner in which the Model can be deemed accurate when it includes all expenses, including decommissioning expenses that will not occur until the facility is no longer producing electricity, but fails to include the incentives and credits that allowed the developer to build the installation, and to build it profitably at that.

Response. The model does account for various credits and incentives provided to developers, including the market transition credit, community credit, community adder, and inclusive community solar adder. The model does not include RECs as revenue because those credits have been determined to be intangible assets that should not be included in the value of real property assessments.

Comment 27. The model should be modified to allow users to accurately model projects that are under development and have an expected *Start Date of Plant Operation* date in the future. It is common for a solar developer and a municipality to negotiate a PILOT agreement 1-2 years before a solar energy system or wind farm is expected to be operational. The model allows users to specify a future start date of plant operation, however, when a user makes this selection, the model provides an error stating that *Tax Status year cannot be before Date of Operation* and the model does not function. The user is not able to modify the *Taxable Status Year* to align with the *Start Date of Plant Operation*.

Response. The model is intended to be used for 2024 assessment rolls only. It was created to comply with the provision of RPTL 575-b. The model was not created for the purpose of negotiating PILOTs.