New York State Assessors Association

116 Salina Street, Suite 8, Liverpool, NY 13088

Phone: (315) 706-3424   E-mail: admin@nyassessor.org   Web: www.nyassessor.org

To: New York State Department of Taxation and Finance

From: New York State Assessors Association, Renewable Energy Task Force

Date: November 20, 2023

Re: 2024 Solar and Wind Valuation Methodology

The New York State Assessors Association's (NYSAA) Renewable Energy Task Force respectfully requests that the New York State Department of Taxation and Finance (NYS DTF) and the New York State Energy Research and Development Authority (NYSERDA) re-draft the 2024 Wind and Solar Appraisal Model (the "Model"). We also request that NYS DTF and NYSERDA go out to bid for more appraisal services to ensure better accuracy and, particularly, a proper weighted average cost of capital ("WACC").

Not only does the model abrogate the assessor's ability to complete their duty of finding the market value for every parcel in their jurisdiction, but the model is in complete contravention of how NYS DTF values all other utility properties. Further, the discounted cash flow model fails to account for any State or Federal subsidies, grants, or other funding that is being provided to solar and wind developers to build installations. Finally, as with the initial Model, there is no mechanism to ensure local municipalities receive proper inventory information from developers, which in effect will nullify any utility of the current Model.

First and foremost, developers receive New York State and Federal energy credits (RECs), subsidies, grants, and other incentives to build solar, but the NYS DTF Model does not include these in the cash flow. 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.

The discount also appears too high, particularly when compared to PV Value and other sources that are regularly used in the industry.[1] While the rate should be lower and currently inures to the benefit of the developers, it also needs to be specific to each municipality and each New York Independent System Operator Zone. Simply put, 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. This is another reason the Model does not function properly, and valuation should be left to each local assessing unit to apply a methodology that is actually specific to each municipality.

Moreover, NYSAA is concerned that the data provided by Levitan & Associates, Inc. ("Levitan") inadvertently supports the discount rate for solar installation, based on a review of the footnoted and cited National Renewable Energy Laboratory (NREL) publications in the Levitan report. The footnotes are difficult to follow, as the report fails to include page numbers, which hinders the reader from reviewing what data is being referenced in outside reports, including referenced NREL reports. According to Levitan's website, Levitan is a "Market Design, Economics and Power Systems" firm. NYSAA is curious as to whether the data provided in their report has been confirmed by utility appraisers. See https://www.levitan.com/. NYSAA wants to be assured that the information is accurate as the 2024 model will have a tremendous impact on property valuation.

Please see Appendix A attached to this letter. This document supports NYSAA's position as it relates to appropriately calculating a WACC/Discount Rate.

Further, NYS DTF 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 so received. NYS DTF 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 NYS DTF and local municipalities, as well as a mechanism to enforce disclosure against any developer that is providing faulty information or no information at all.

Sales of solar and wind farms also do occur in the marketplace, often after five (5) years have passed the Investment Tax Credit (ITC) 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

1 The State of Vermont currently uses PV Value to value solar arrays at a statewide level.

the best indicator of value. Wind and solar projects also have energy contracts ("Power Purchase Agreements") 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.

Finally, while the Model does not account for subsidies and grants, it does account for decommissioning expenses during the life of each project – although this is 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. Conversely, if this expense is included, all income should also be included, including subsidiaries and grants.

Under the statute calling for a Solar and Wind Model, NYSAA was mandated to be part of the process, so therefore NYSAA provides this memorandum. Although NYSAA's position is that this mandate violates an assessor's constitutional duty to value all property in their municipalities, NYSAA strongly urges NYS DTF and NYSERDA to review Schedule A; which outlines the proper method for calculating a WACC/Discounted. The renewable energy goals of the State can be met through further discussion, information sharing, and guidance from expert appraisers. Let's not create a model that favors the industry at the expense of the average New York State taxpayer, but rather work together to create methodology that reflects a more accurate value for solar and wind projects.

APPENDIX A

DISCOUNT RATE

A discount rate is used to determine the present value of a series of future cash flows. The discount rate is related to risk. In an investment situation, the risk is the degree to which actual returns may deviate from expected returns. The greater the degree to which the price and returns of an investment fluctuate, the greater the financial risk. As U.S. government securities are presumed to have no risk of default, their cash flows are more certain than those of other securities and, therefore, considered risk-free.

Discount rates are predicated on two key factors: (i) expected rates for risk-free investments and (ii) the perceived relative risk of the future cash flows. Risk refers to the level of uncertainty about future cash flows on the spectrum between complete certainty (no risk) and complete uncertainty (infinite risk). The discount rate (rate of return) must, therefore, increase with the level of risk.

We base our development of a discount rate on the weighted-average cost of capital ("WACC") method. We calculate the costs of debt and equity in the capital structure and weight them based on the selection of an appropriate capital structure, discussed next.

Capital Structure

To determine an appropriate capital structure for our analysis, we examine the debt-to- total-capital ratios of guideline companies based on financial data filed with the Securities and Exchange Commission. The total capital is computed as the market value of the common equity plus the book value of all interest-bearing debt (including preferred equity, if any). We measure the capital structure of each guideline company over the most recent eight quarters as summarized in the following figure.

EIGHT-QUARTER AVERAGE
DEBT-TO-TOTAL-CAPITAL RATIOS
OF GUIDELINE COMPANIES

Company	**Ratio**
American Electric Power Company, Inc.	45.9%
The AES Corporation	59.1%
CenterPoint Energy, Inc.	48.1%
Dominion Energy, Inc.	45.3%
Duke Energy Corporation	48.8%
Consolidated Edison, Inc.	43.3%
Edison International	56.5%
Exelon Corporation	47.2%
NextEra Energy, Inc.	28.3%
PG&E Corporation	65.8%
Public Service Enterprise Group Inc.	38.9%
Sunrun Inc.	58.6%
Sempra	38.2%
Median	47.2%

Based on the foregoing, we select a debt level of 45.0 percent (rounded).

Cost of Debt

As an estimate of the Company's cost of debt from the perspective of a hypothetical buyer, we calculate the after-tax yield on corporate bonds rated Baa by Moody's. Obligations rated Baa are subject to moderate credit risk; they are considered medium grade and as such may possess some speculative elements.[1] We determine that the after-tax cost of debt is:

$$K_d = K_D \times (1 - t)$$
$$= 6.4\% \times (1 - 28.7\%)$$
$$= 4.6\%$$

where,

K_d = After-tax cost of debt
K_D = Baa pretax yield
t = Tax rate (combined federal and state)

Based on our analysis, the cost of debt is 4.6 percent.

[1] Source: Moodys.com

Cost of Equity

The cost of equity is the minimum rate of return that a company must earn on its equity to keep the market price of its stock unchanged. We calculate this required return using the capital asset pricing model ("CAPM").

CAPM Cost of Equity

When applying the CAPM, we add a risk premium to the risk-free rate of return. For the risks that they assume, investors demand compensation in the form of anticipated higher returns. We express this relationship between risk and return in the following equation:

$$K_e = R_f + R_p$$

where:

K_e	=	Cost of equity (and return on the security)
R_f	=	Risk-free rate
R_p	=	Risk premium

This model reflects only systematic risk, that part of a security's risk that cannot be eliminated by diversification because it is related to the movement of the stock market. The assumption in this model is that investors can reduce company-specific risk by properly diversifying their portfolios and are, therefore, generally not compensated for bearing unsystematic risk.

The level of this systematic risk is represented by a company's beta coefficient, which measures the relationship between the returns on a company's equity and the returns on the overall stock market. A market index or benchmark, such as the S&P 500, is used to represent the overall stock market. Beta is composed of two elements: (i) the correlation of the stock's returns with the market's returns and (ii) the relative volatilities of the stock's returns and the market index's returns. Correlation is the extent to which a stock and the market tend to move in the same direction. The relative volatility measures whether a given movement in the market is associated with a proportionally larger or smaller movement in the stock. The formula for beta is shown in the following equation:

$$ß = \tilde{n} \times (\acute{o}_s / \acute{o}_m)$$

where:

ß	=	Beta
ñ	=	Correlation between the returns of the stock and the market
$ó_s$	=	Volatility of the stock
$ó_m$	=	Volatility of the market

Beta is determined by regressing individual stock returns against aggregate returns in the market. Stocks with betas greater than the market's beta of 1.0 tend to have a high degree of systematic risk and a strong sensitivity to market swings. Conversely, stocks with betas less than 1.0 tend to rise and fall by a lesser percentage than the market.

We select a beta by analyzing weekly returns of the guideline companies and the S&P 500 over a two-year period. To account for reversion toward the market beta, the guideline companies' observed betas are adjusted by taking the sum of: (i) two-thirds of the observed beta and (ii) one-third of the market beta. As financial leverage magnifies the returns to equity holders, we unlever the adjusted betas to remove the effects of the guideline companies' capital structures, and relever the results based on our selected capital structure for the Company on a prospective basis. This analysis is shown in the following figure.

GUIDELINE COMPANY BETAS

Guideline Companies	**Observed Beta** (1)	**Adjusted Beta** (2)	**Debt / Capital** (3)	**Debt / Equity** (4)	**Tax Rate** (3)	**Unlevered Beta** (5)
American Electric Power Co.	0.48	0.66	45.9%	84.7%	6.8%	0.37
The AES Corporation	1.11	1.08	59.1%	144.8%	23.8%	0.51
CenterPoint Energy, Inc.	0.68	0.78	48.1%	92.6%	25.7%	0.46
Dominion Energy, Inc.	0.50	0.66	45.3%	82.7%	17.7%	0.39
Duke Energy Corporation	0.49	0.66	48.8%	95.4%	9.8%	0.35
Consolidated Edison, Inc.	0.45	0.64	43.3%	76.4%	19.4%	0.39
Edison International	0.78	0.85	56.5%	129.8%	9.8%	0.39
Exelon Corporation	0.65	0.77	47.2%	89.4%	16.2%	0.44
NextEra Energy, Inc.	0.81	0.87	28.3%	39.5%	18.5%	0.66
PG&E Corporation	0.74	0.82	65.8%	192.8%	26.0%	0.34
Public Service Enterprise Group	0.69	0.79	38.9%	63.7%	21.5%	0.53
Sunrun Inc.	2.41	1.94	58.6%	141.5%	26.0%	0.95
Sempra	0.63	0.75	38.2%	61.9%	20.3%	0.50
Median			47.2%			0.44
Selected			45.0%			0.44

Selected unlevered beta	0.44
Selected debt / equity ratio (4)	81.8%
Selected relevered beta (6)	0.69

Notes:
(1) Based on two years of weekly data. Market benchmark: S&P 500
(2) Two-thirds observed beta, plus one-third market beta of 1.0
(3) Average of eight trailing quarters
(4) D / E ratio = (D/C) / [1 - (D/C)]
(5) Unlevered guideline company beta = adjusted beta / [1 + (1 - t) × (D /E)]
(6) Relevered subject company beta = unlevered beta × [1 + (1 - t) × (D /E)]

When the median unlevered beta is relevered, it becomes 0.69, which we use in our CAPM analysis.

We measure the risk premium as the selected beta times the difference between the expected return on the market and the risk-free rate. The CAPM equation then becomes:

$$K_e = R_f + ß_s \times (R_m - R_f)$$

where,

K_e = Cost of equity
R_f = Risk-free rate
$ß_s$ = Stock's beta
$R_m - R_f$ = Equity risk premium

We consider various measures of equity risk premia, which generally range from

4.0 percent to 7.0 percent. We select an equity risk premium of 6.0 percent, based on our review of various studies.[2, 3]. For the risk-free rate, we select the yield on 20-year United States Treasury bonds as of the Valuation Date. We calculate the cost of equity as:

$$K_e = 4.9\% + (0.69 \times 6.0\%)$$
$$K_e = 9.1\%$$

Based on our analysis, the cost of equity as indicated by the CAPM is 9.1 percent.

Conclusion of Discount Rate

Based on the 9.1 percent cost of equity indicated by the CAPM, we select a 9.0 percent cost of equity (rounded). Having computed the cost of debt and the cost of equity, we develop a WACC from the following equation:

$$\text{WACC} = K_d \times ù_d + K_e \times ù_e$$

where:

WACC	=	Weighted average cost of capital
K_d	=	Cost of debt, after-tax
$ù_d$	=	Weighting of debt
K_e	=	Cost of equity
$ù_e$	=	Weighting of equity

$$\text{WACC} = (4.6\% \times 45.0\%) + (9.0\% \times 55.0\%)$$
$$\text{WACC} = 7.0\% \text{ (rounded)}$$

Based on our analysis, we select a discount rate of 7.0 percent.

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[2] Fernandez, Martinez, & Acin, *Market Risk Premium and Risk-Free Rate Used For 80 Countries in 2023: A Survey*, University of Navarra - IESE Business School, 2023.

[3] Aswath Damodaran, *Equity Risk Premiums (ERP): Determinants, Estimation and Implications - The 2023 Edition*.