

Instructions: Solar and Wind Appraisal Model

Updated March 16, 2022

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Beginning with 2022 assessment rolls, RPTL § 575-b requires assessors to use the appraisal model and the associated discount rates to value and place assessments on solar and wind energy systems with a nameplate capacity equal to or greater than one megawatt.

Input tab instructions

Enter the values provided by the plant owner in the fields below, where applicable. Where actual values are not available, the default values can be used.

- **NYISO zone.** Select from the 11 primary zones determined by the New York Independent System Operator (NYISO) for energy pricing. You may wish to reference page two of NYISO's [New York Load Zone Control Area map](#).
- **Plant type.** Select the type of plant to be modeled.
- **System size.** Enter the capacity (or *nameplate capacity*) of the plant. This number refers to the maximum power that can be produced by the system under optimal conditions. Enter the system size in either kilowatts (kW) for wind or kilowatts AC (kW AC) for solar.
- **Date of operation.** Enter the date operation began or, if operation has not begun, the date construction was completed.
- **Taxable status date.** Enter the taxable status date of the municipality, which is also the effective date of the appraisal.
- **Tax load.** Enter the overall full value tax rate for the property where the plant is sited. This rate should be reflective of all property taxes applicable to the property, including town, county, village, school district, and special district tax rates.
 1. For each taxing jurisdiction multiply the tax rate per thousand dollars of assessed valuation by the latest final equalization rate (**Note:** Use the actual equalization rate, not the percentage. For example: 100.0, 90.0, 25.34, etc.); and
 2. divide the product by one thousand.
 3. Sum the results of all jurisdictions to arrive at the Tax Load.

For example, a project has the following tax rates:

- Town 5.561390
- County 13.264834
- Special district 1.024976
- School 29.241161

The total of those tax rates is 49.092361.

The property is entirely in one town, so the equalization rate can be applied after the tax rates are summed.

The equalization rate is 66.

Multiple 49.092361 by 66 = 3240.0958

3240.0958 divided by 1,000 = 3.2401

The tax load to enter into the model is 3.24%.

- **Annual ground lease payment (if applicable).** Enter the annual gross land lease payment amount, if applicable. The land lease information is available from the developer.

If the land is not leased, enter \$0. As a result, the model output (*present value of cash flow*) will represent the total market value for the improvements and underlying land.

- **Annual ground lease escalator (if applicable).** If the ground lease includes an escalator clause, enter the percentage in this box. If there is no escalator, enter 0 for a constant lease.

Plants with a nameplate capacity of 5,000 kilowatts or more (*Tier One* or *Open Market*) do not require additional user inputs. For solar plants of less than 5,000 kilowatts (Value of Distributed Energy Resources or VDER) the additional user inputs below are required. The plant owner should provide this information.

- **Utility company**
- **Community or Market Transition Credit OR Community Adder.** A VDER project may have either a Community or Market Transition Credit OR a Community Adder. It will never have both.
 - **Market Transition and/or Community Credit.** The user should enter the value provided by the plant owner. The community credit is available on a limited basis in order to encourage the development of community distributed generation projects. The community credit is the successor to the market transition credit, and it is similar in structure.

For more information about these credits, visit [The Value Stack: Compensation for Distributed Energy Resources](#), published by the New York State Energy Research and Development Authority (NYSERDA).

- **Community Adder.** This credit is unique to each project. The user should enter the value provided by the plant owner. The Community Adder incentive replaces the Community Credit in places where the credit has been exhausted.

Model output

The final output of the model is on the *Model* spreadsheet tab, including:

- a breakdown of the estimated income and expenses associated with the property over the remainder of its economic life,
- the associated future cash flows, and
- *the present value of cash flow.*

How to calculate the full market value of the parcel (land value plus improvements)

- If a lease amount is entered in the Annual Ground Lease Payment field, the model output (*present value of cash flow*) represents the value of the improvements only. To arrive at the full market value of the parcel, the assessor should use standard appraisal methodology to value the land and add the result to the present value of cash flow.
- If the land is not leased (Annual Ground Lease Payment is \$0), the model output (*present value of cash flow*) represents the total market value for the improvements and underlying land.

Note: For future reference, for each project, assessors may wish to save a copy of the model on a local drive.

Glossary

Before tax discount rate – WACC. ORPTS determines the discount rates for solar and wind properties in consultation with NYSERDA. The discount rates are based on the economic principle of weighted average cost of capital (WACC). The cost of capital is a forward-looking measure comprising the time value of money and investor risk. It considers the expected rate of return that market participants require to attract funds to a particular investment. The cost of capital is synonymous with the discount rate that is typically utilized in renewable energy discounted cash flow analysis.

Date of operation. Date the plant began operating or, if the plant is not yet operating, the date construction was completed.

Demand reduction value (DRV) rate. The amount that a project reduces the utility's future needs to make grid upgrades. This field is pre-filled in the model based on the utility company selected.

EBITDA. Earnings before interest, taxes, depreciation, and amortization. The model utilizes this approach.

Loaded discount rate. The sum of the selected base discount rate before tax plus the municipal tax load.

Market transition and/or community credit. The community credit is available on a limited basis in order to encourage the development of community distributed generation projects. The community credit is the successor to the market transition credit, and it is similar in structure. Photovoltaics projects in utility territories that have fully expended their community credit may be eligible for the community adder—an upfront incentive that is administered by NY-Sun.

Max annual contract quantity. Maximum megawatt-hours the contract will reimburse each year.

NYISO zone. New York State is broken into 11 main zones for energy pricing by the New York Independent System Operator (NYISO). NYISO controls the electrical grid. See NYISO's [New York Load Zone Control Area map](#).

Plant type. Three plant types are modeled in the 2022 version of this tool: solar – fixed axis, solar – tracking, and land based wind.

- **Land based (onshore) wind.** Wind turbines capture the motion of wind to produce energy. Land Based (Onshore) Wind turbines have been built throughout New York State. Offshore Wind Turbines, which are not reflected in the 2022 model, have yet to be constructed in New York.
- **Solar – fixed axis.** Fixed axis solar refers to panels mounted on stationary racks. Panels do not move, and efficiency is lower when the sun angle is not optimal.
- **Solar – tracking.** Tracking solar arrays are mounted on movable racks that keep an optimal angle of the sun during each hour of the day. Efficiency is higher than fixed arrays, but costs for installation and maintenance are higher as well. As of now, the only existing or planned solar tracking arrays in New York State are *single axis*: arrays that move side-to-side. (Dual-axis arrays are capable of two-dimensional motion.)

System age at taxable status date. The number of whole years since the date of operation as of a given taxable status date.

System size. The capacity (or nameplate capacity) of the generating system. This refers to the maximum power that could be generated by the system under optimal conditions. Most generators (especially renewables) will never fully achieve this rating. However, if such a rating *is* accomplished, it lasts for a very short duration of time. For this model, system size is required in Kilowatts (kW) for wind or Kilowatts AC (kW AC) for solar.

Taxable status date. Municipalities assess property as of its condition and ownership on the taxable status date. In most towns, taxable status date is March 1, but the date does vary. You can find the taxable status date of a municipality by searching in [Municipal Profiles](#) and selecting *Assessment Roll Dates*.

For purposes of the appraisal model, taxable status dates is the effective date of the appraisal.

Tax load. Calculated by multiplying the tax rate per thousand dollars of assessed valuation by the equalization rate and dividing the product by one thousand. The result is a capitalization rate surcharge, known as a *loaded cap rate*. The use of a capitalization/discount rate surcharge effectively removes the real estate taxes as an expense item and results in an estimate of market value assuming fair and equitable taxation.

Tier 1. A reimbursement structure provided by NYSERDA and the New York State Public Service Commission (PSC). It is used for any solar plants with a nameplate capacity greater than 5,000 kilowatts.

Utility company. The utility company serving the location of the plant.

Value of Distributed Energy Resources (VDER). The reimbursement structure provided by NYSERDA and the PSC. It is used for any solar plants with a nameplate capacity equal to or less than 5,000 kilowatts. This includes energy value, capacity value, environmental value (excluded), demand reduction value, and the community credit.