Assessment Department Policy 26-01
Electrical Power Systems

Purpose and Scope

Technology over the past 20 years has resulted in significant changes in how electrical energy is produced and utilized in both residential and commercial markets. It is expected that this trend will continue to expand. The purpose of this policy is to define real property tax treatment of electrical power generation and storage assets and to draw a distinction between those electrical power systems used to produce income and those that are used as an alternative to the electric utility company supply and not used for the production of income from the sale of electrical power back to the Electric Utility.

This policy does not address or pertain to electrical power generating and/or storage assets whose purpose is to produce income. Renewable energy (solar, wind) income producing projects will be valued pursuant to Real Property Tax Law (RPTL) §575-b.

Coordination with other Codes, Regulations and Standards

The only undertaking of this policy document is to establish and define real property tax treatment of Alternate and Redundant electrical power systems defined in this policy. It shall not be construed to modify, add to or diminish other legal obligations that may apply to these systems, such as but not limited to

- New York State Building Code
- Interconnection Agreements with Public Utilities, as defined in this policy, for those systems covered by this policy
- Town of Vienna Zoning Law and Planning Board Requirements
- Any other Federal, State or Local Law

In cases where this policy is found to be non-conforming with any other legal obligation, the other legal obligation will supersede that portion of this policy found to be non-conforming.

Definitions

Electric Utility – An entity engaged in the distribution and sale of electrical energy to residential and commercial customers. For the purpose of this policy, the name of that entity is National Grid, or any of its subsidiaries or future successors and assigns. New York State's Electric Utility electrical distribution system receives power from a variety of independent power producers.

Utility Electrical Power – Electrical power received from an *Electric Utility*.

Alternative Electrical Power – Electrical power produced privately and not by sources supplying an Electric Utility for the purpose of producing income. Alternative Electrical Power works with and is connected to Utility Electrical Power in that the systems are interconnected physically and by means of an Interconnection Agreement with the Electric Utility. When Electric Utility Power is unavailable, the Alternative Electrical

Power is also unavailable. This may include but is not limited to solar and wind power generation systems.

Redundant Electrical Power – Is the same as Alternative Electrical Power except that the privately owned power generation equipment includes a storage device that can maintain electrical power needs when the Utility Electric Power supply is lost. For the purpose of this policy, the storage capacity will supply electrical loads for at least 24 hours without Utility Electrical Power and without the need for refueling or recharging. This may include batteries, capacitor banks or other electrical power storage devices used in conjunction with solar and wind power generation systems. It also includes installed standby electrical generators with fuel supply and transfer switches that connect to the power distribution system when Utility Electrical Power is lost. For the purpose of this policy, the transfer switches may be automatic or manual and the fuel supply should be sufficient to provide a continuous supply of electrical power for at least 24 hours.

Kilowatt-Hour (Kw-Hr) – The standard unit of measure for electrical power. For the purpose of this policy, Kw-Hr will be used to define a 24-hour supply, in that a standby generator with a capacity of 18 Kilowatts will produce up to 432 Kw-Hrs per 24-hour period. Since generator sizing calculations must consider induction loads that require staring currents of 5 – 7 times running current, most standby generators have a steady-state and transient capacity rating. For the purpose of this policy, 80% of the steady-state capacity will be used to define the 24-hour capacity.

Ampere-Hour (or Amp Hour) – The standard unit of measure of capacity for batteries and other electrical power storage devices. A battery rated for 600-amp hours will provide a constant electrical load of 100 amps for six (6) hours. Higher or lower loads will shorten or lengthen battery availability time. For electrical loads expressed in watts or kilowatts, amps may be found using the following equations for single and three phase Alternating Current (AC) power systems:

Single phase: Power (watts) = Current (amps) x Voltage x Power Factor

$$\text{Amps} = \frac{\text{Watts}}{\text{Volts} \times \text{p.f.}}$$

Three phase: Power (watts) = $\sqrt{3}$ x Current (amps) x voltage x Power Factor

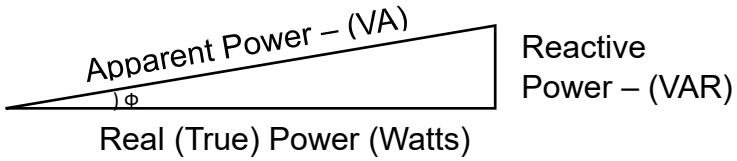
$$\text{Amps} = \frac{\text{Watts}}{\sqrt{3} \times \text{Volts} \times \text{p.f.}}$$

For the purpose of this policy, voltage and amperage is the Root Mean Squared (RMS) value of an alternating current (AC) waveform that is typically used by most measurement instruments.

Electric Utility Power for residential use is typically single phase. Single phase power will be assumed for the purpose of this policy. Commercial customers may use three phase power and will be determined as needed to implement this policy.

Electric Utility Power for residential customers is generally 240 volts. 240 volts will be assumed for the purpose of this policy. Electrical Voltage for commercial customers may exceed 240 volts and will be determined as needed to implement this policy.

Electric Utility Power generally operates with a lagging power factor at or above 0.9. This is necessary for electric grid stability and limits reactive loading of electrical generating equipment in AC power systems. It is applicable to both residential and commercial customers. A power factor of 0.9 will be assumed for the purpose of this policy. Power factor is a measure of energy usage efficiency. It is expressed as a ratio of real (true) power to apparent power and can be demonstrated using the power triangle.



The angle between Real and Apparent Power is the circuit impedance phase angle, where:

Power Factor = Real Power/Apparent Power

and

Real Power/Apparent Power = cosine of the angle Φ

More simply stated, a power factor of 0.9 means that 90% of the current passing through an AC circuit is producing real work (usable power) while the remaining 10% is non-productive (Reactive Power) that results in the generation of heat that must be dissipated to prevent damage to electrical components and circuits.

Interconnection Agreement – a business contract between the Electric Utility and an electric customer for the purpose of connecting a distributed energy project located at the electric customer's site to the Electric Utility's electrical distribution system. This agreement outlines the technical requirements and policies for interconnecting renewable energy sources, such as photovoltaic (solar) systems, to the grid. Standardized Interconnection Requirements promulgated by the New York State Public Service Commission and Electric Utility National Grid can be found at New York State Standardized Interconnection Requirements and Application Process . At the time this policy was developed, the standardization document was dated December 2019.

Off-Grid – shall be defined by this policy as the intentional physical separation of a building improvement from Utility Electrical Power. To be considered Off-Grid, the building improvement must not have any readily available means of obtaining Utility

Electrical Power. The use of fuses, breakers, disconnect switches, transfer switches (manual or automatic) does not meet the definition of physical separation as it applies to Off-Grid. This definition is intended to apply to relative permanency of the physical separation. Therefore, a temporary unintended physical separation caused by natural or man-made phenomena is not included within the scope of this definition. The Assessor shall have sole discretion as to the application of this definition to a particular electrical power system installation.

Policy for Alternative Electrical Power Systems

Alternative Electrical Power systems installed under an Interconnection Agreement shall not be used as a sole basis to increase the taxable assessed value of real property, whether installed on residential or commercial real properties.

Basis:

1. Electrical power, whether Electric Utility Power or Alternative Electrical Power is included within the scope of valuing a primary acre. A primary acre (or portion thereof) is valued on the basis that it is improved for the purposes of supporting a residential or commercial improvement. With Alternative Electrical Power, the benefit of electrical power exists **only** when the Electric Utility Power is available. Interconnection Agreement technical specifications require that the Alternative Electric Power system be divorced from the Electric Utility electrical distribution system upon the loss of the Electric Utility Power. The Alternative Electrical Power must remain disconnected until the Electric Utility Power is restored.

2. This policy precedent for electrical power is consistent with other services assumed to be available when valuing a primary acre. For example, the value of a primary acre (or portion thereof) also assumes a potable water supply and provisions for waste water treatment. For water related services, it does not matter whether the service is provided publicly or privately, the value of equivalent primary land will be the same.

3. Alternative Electrical Power systems installed under an Interconnection Agreement are not income producing, meaning that the systems are designed to provide only the electrical power needs of the property owner. This consideration is enforced by the Interconnection Agreement.

4. The contributory market value of Alternative Electrical Power has not been established. While some appraisal professionals feel that an Alternative Electrical Power system adds value, others maintain that it does not add value or can even depreciate value because of increased maintenance for the system itself or to the structures (e.g., roof) that support these systems. Real property sales transactions can also be encumbered by financing arrangements related to the installation of Alternative Electrical Power systems that can last a decade or more.

Policy for Redundant Electrical Power Systems

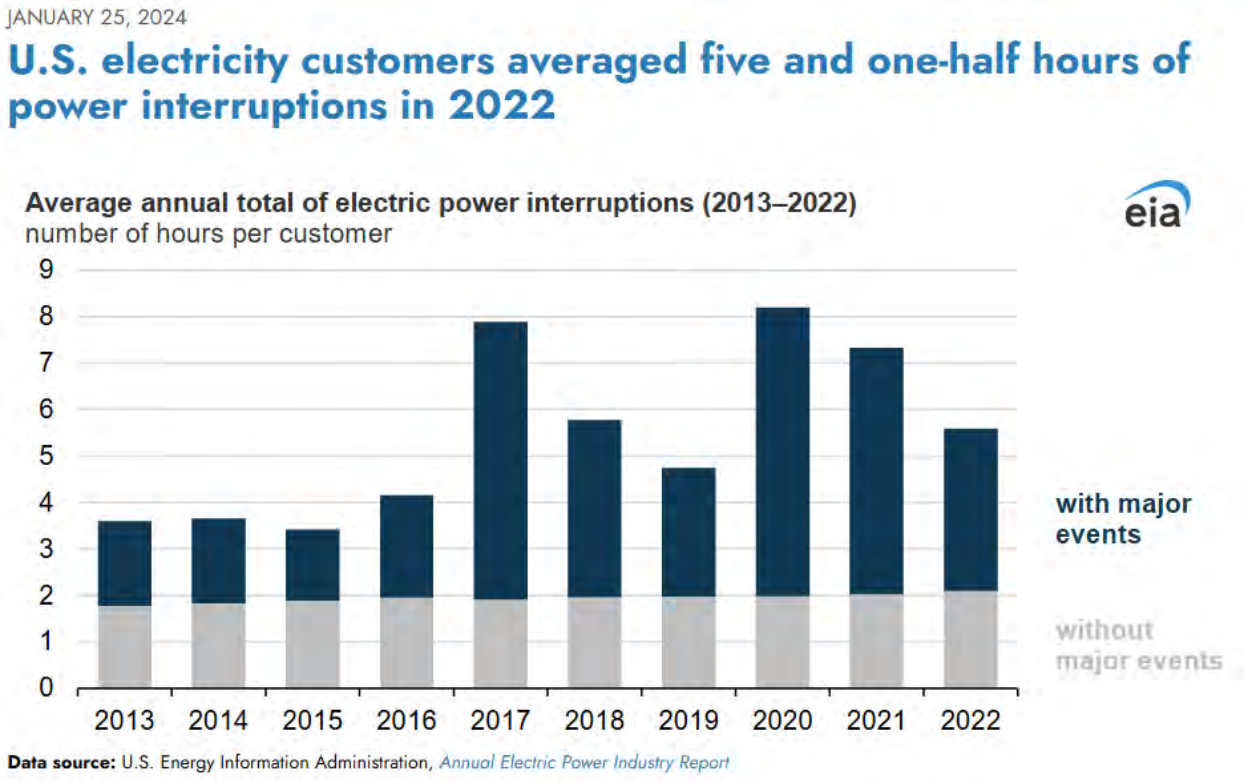
Redundant Electrical Power systems, whether installed under an Interconnection Agreement or not, may be used as a sole basis to increase the taxable assessed value of a property, whether installed on residential or commercial properties. Where redundancy is added to an otherwise Alternative Electrical Power system, only the portion that provides redundancy shall be valued and added to the Total Assessed Value of the property. The valuation of Redundant Electrical Power systems will be determined using the cost approach to value. This policy does not apply to temporary portable generators as they do not meet the definition of a Redundant Electrical Power system.

Basis:

1. Redundant Electrical Power systems do not have the same limitations as Alternative Electrical Power systems in that they may operate independently of Utility Electrical Power. For example, a whole house standby generator installation generally consists of a generator capable of supplying the entire electrical load normally serviced by Utility Electrical Power, a fuel supply to maintain system operation for an extended period (typically propane tanks), and transfer switches (automatic or manual) that disconnect power from the Electric Utility power grid and connect the standby generator to supply house loads. It is therefore the specific intent of these systems to operate and provide electrical power when the Utility Electrical Power is not available. In the case of solar, wind or other renewable energy source, batteries or other electrical power storage devices eliminate the dependency of system operation on the Utility Electrical Power. This redundancy provides flexibility and convenience that adds value beyond what is considered in the valuation of a primary acre (or portion thereof).
2. A whole house standby generator installation shall be assumed capable of providing electrical power for at least 24 hours without refueling if the installation includes a separate fuel tank, whether the tank is rented or privately owned. A property owner challenging this assumption must provide the assessor with the necessary inputs to calculate capacity duration, including generating equipment rating (Kw), fuel storage volume, fuel type, electrical power system type (single or three phase) and fuel consumption rate at 80% rating. A value of 80% of generating equipment rating is a reasonable expected upper bound for loading of the electrical generating equipment averaged over a 24-hour period.
3. An electrical storage device shall be assumed capable of providing electrical power for at least 24 hours without recharging. A property owner challenging this assumption must provide the assessor with the necessary inputs to calculate capacity duration, including generating equipment rating (Kw), electrical storage device capacity (Amp-Hours), electrical system voltage and electrical power system type (single or three phase). An electrical system load of 80% of system capacity

will be assumed when calculating electrical storage capacity. A value of 80% electrical load is a reasonable expected upper bound for loading of the electrical storage equipment averaged over a 24-hour period.

4. Most Utility Electrical Power outages are less than 24 hours. A capacity of providing electric loads for 24 hours without refueling or recharging provides a reasonable basis for defining a redundant power supply.



5. The method for determining 24-hour capacity will be based on a calculation using the Kw rating of the electrical generating equipment or Amp-Hr rating of the electrical storage device.

6. The contributory market value of Redundant Electrical Power has not been established as described under the policy for Alternative Electrical Power systems. However, the cost approach to value is an acceptable method of determine the value of an improvement.

Policy for Off-Grid Electrical Power Systems

An Off-Grid electrical power system shall be treated as an Alternative Power Electrical Power system even if the system contains components that meet the definition of a Redundant Electrical Power System.

Basis:

An Off-Grid electrical power system does not contain the necessary elements to qualify as a Redundant Electrical Power system as defined by this policy and its value is therefore considered in the valuation of a primary acre (or portion thereof).

Responsibility and Rights of Taxpayer

In the case of a differing opinion on the application of this policy as it applies to the Real Property Tax treatment of a particular electric power system installation, the property owner has sole responsibility for demonstrating the applicability of this policy to their specific installation to obtain more favorable tax treatment. The property owner shall retain the right to be heard by the Board of Assessment Review (BAR) or any other taxpayer remediation available under New York State Real Property Tax Law (RPTL) when the Assessor makes a determination using this policy that the taxpayer deems unfavorable.

Survivability

If any portion or provision of this policy is found to be unenforceable or in non-conformance with any other legal obligation by an entity having legal jurisdiction to make such determination, the remaining portions and provisions of this policy shall remain enforceable to the extent that such remaining portions and provisions are useable without the portion or provision found to be unenforceable or non-conforming.