

# Energy Storage Incentives

## Program Handbook

July 1, 2022 – June 30, 2023

Please ensure you are reading the most recent version of this handbook by visiting the NV Energy website: [Energy Storage Incentives](#).

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2	03/09/2022	Language Updates
3	06/27/2022	PY Date '22 and Logo Updates
4	02/16/2023	Application Fee Updates

## 1. DEFINITIONS

This section includes a list of terms that defined for common use within this program handbook.

**Alternating Current (AC):** The form in which electricity is delivered to residences and businesses. This is the type of electricity produced by the inverter and delivered to the home and the utility grid through the service panel.

**Applicant:** The party responsible for preparing the application and Incentive Claim Package in NV Energy's application portal.

**Back-up load Panel Meter:** A one directional meter that measures power being consumed by the back-up loads. This meter is unique to installations which utilize a backup load panel connected to the inverter behind the ESD meter (NV Energy's RE-3 standard, Attachment 6). This meter is installed in conjunction with an Energy Storage Meter to measure battery performance in this specific equipment configuration.

**CEC AC Sizing:** Is the California Energy Commission rating standard for measuring the nominal output power of a PV module/cell to determine the system rating and operational efficiency.

**Conditional Reservation Notice:** Once the available incentive funds have been reserved, all subsequently approved applications will receive a "Conditional Reservation Notice" in order of their application submission. If there are not enough funds remaining to cover an entire Reservation Notice, the remaining amount will be issued as a Conditional Reservation.

**Critical Infrastructure:** Facilities that support emergency services that are always available for public benefit including in the event of an emergency. These facilities may include, but are not limited to, hospitals or other medical facilities, airports, public safety facilities, public infrastructure facilities or dams, or others. NV Energy may review the facility type to determine if the facility is qualified as a Critical Infrastructure facility.

**Customer's Annual Requirements for Electricity:** The kilowatt-hours (kWh) consumed at the customer Premise in the consecutive 12 months using the highest energy usage during the two years prior to the application submittal.

**Direct Current (DC):** This is a unidirectional flow of electric charge that is typical of the output produced by a solar photovoltaic or battery energy storage system. This type of current is not typically used at a customer premise and must be converted to AC electricity with the use of an inverter before being usable at the customer premise or returned to the grid.

**AC Disconnect or Disconnect:** An electrical switching device that is designed to allow visible verification that its separation has been accomplished. The disconnect must be readily accessible, lockable, and have a clearly visible break following the regulations in Section 4.8 of the IEEE 1547-2018 standard.

**Distribution Transformer:** A transformer that provides the final voltage transformation in the electric power distribution system, stepping down the voltage used in the distribution lines to the voltage used by the customer(s).

**Energy Capacity or Usable Energy Capacity:** This is the portion of the ESD that is regularly usable for charging, discharging, and storing energy. This is a value that will be less than the maximum amount of energy can be stored as rated by the manufacturer. Incentive payments are calculated on the battery's Usable Energy Capacity.

**Equipment Costs:** Applicants are to provide the actual costs associated with the completed equipment installation in NV Energy's application portal. Equipment Costs include the materials that are necessary for the proper function of an ESD System. These costs do not include labor.

**Energy Storage Device (ESD):** A commercially available technology that is capable of retaining energy or storing energy for a period of time and delivering the energy after storage, including, without limitation, by chemical, thermal or mechanical means. An ESD is also considered a generator for the purposes of this document.

**Energy Storage Meter:** A bi-directional utility meter that may be installed with an ESD.

**Generation Meter:** The meter provided and installed by NV Energy that measures the renewable energy system's production of energy over time. This meter is required for renewable energy generation projects completed in the program and is installed in a meter socket provided by the Host Customer. This meter is also referred to as a Renewable Energy Credit (REC) meter when the renewable energy system receives an incentive from NV Energy.

**Grid:** The distribution network of NV Energy.

**Host Customer:** The NV Energy customer on record at the proposed installation location. The Host Customer name must exactly match the name on the NV Energy account. The Host Customer is responsible for making any changes to their NV Energy account prior to application. Persons listed as co-Applicants on the NV Energy account may apply as the Host Customer.

**Incentive:** Money paid for completing a qualifying energy storage system in the Residential Energy Storage and Commercial Energy Storage programs.

**Incentive Claim Package:** The collection of final documents submitted by an Applicant to claim an incentive.

**Installed System Costs:** Applicants indicate the completed system cost in the online application portal. Completed system cost includes the cost of the tangible materials and labor for the installed system. The cost of the local building authority permitting must also be listed. Other costs, including other equipment, and design and engineering may be listed as balance of cost of system. These costs are applicable only to Commercial Energy Storage Incentives.

**Installer:** The Nevada licensed electrical contractor who performs the installation and system interconnection.

**Inverter:** A device that converts DC current into AC current for use at the property where the system is located. Only grid-interactive inverters are eligible for participation in the Energy Storage programs. Please refer to NV Energy's RE-3 standard for detailed requirements.

**Large Commercial/Industrial Customer:** Non-residential customers in rate classes GS-2, LGS-1 or larger.

**Meter Set:** The installation of the net meter and energy storage metering by NV Energy. This occurs after submission of complete supporting documentation, satisfactory net metering verification, and completion of utility safety inspection.

**Net Meter:** A revenue-quality, bi-directional, utility owned and operated interval meter that measures the electricity used by the customer from the grid and the amount of electricity that the customer's renewable energy and/or ESD sends back to the grid.

**Net Metering:** Enables customers to offset the cost of their electrical consumption by measuring the difference between the electricity supplied by NV Energy and the electricity generated by the customer that is fed back to the utility over the billing period. This will be required for both solar and energy storage installations.

**Non-Profit Entity:** See Public and Other Property.

**One-Line Diagram:** Also known as a single-line diagram. A simplified document for representing an electrical power system. Typically, it is in the form of a block diagram portraying the paths for power flow within a system. Electrical components such as capacitors, conductors, circuit breakers, protection equipment, etc. can be depicted on such diagrams.

**Owned, Leased or Occupied:** Any real property, building or facilities which are Owned, Leased or Occupied under a deed, lease, contract, license, permit, grant, patent, or any other type of legal authorization.

**Participant:** A person who has been selected to participate in the Small Residential Energy Storage and Commercial Energy Storage programs.

**Power Capacity:** Also referred to as the maximum continuous output Power Capacity. It is the amount of power, in kilowatts (kW), that an ESD can deliver to the grid as rated by the manufacturer. For ESDs measured in btu/hr, the conversion is 1 watt equals 3.41 btu/hr.

**Portfolio Energy Credit (PEC):** A measured unit that represents one kilowatt hour (kWh) of renewable energy.

**Premise:** All of the real property and apparatus of a residential or non-residential customer employed in a single integrated activity operating under one name in one or more buildings and /or locations on an integral parcel of land where: (a) such buildings and/or locations are situated on a single unit of property; or (b) such buildings and/or locations are situated on two or more units of property which are immediately adjoining or adjacent, and are not divided by intervening public highways, streets, alleys, railways or waterways.

**Program year:** July 1, 2021 to June 30, 2022.

**Public and Other Property:** Any real property, building or facilities which are owned, leased, or occupied by:

- A public entity.

- A non-profit organization that is recognized as exempt from taxation pursuant to section 501(c)(3) of the Internal Revenue Code, 26 U.S.C. § 501(c)(3), as amended.
- A corporation for public benefit as defined in NRS 82.021.
- School Property: Any real property, building or facilities Owned, Leased or Occupied by:
  - A public school as defined in NRS 385.007.
  - A private school as defined in NRS 394.103, or an institution of higher education.

The term includes, without limitation, any real property, building or facilities which are owned, leased or occupied by:

- A church.
- A benevolent, fraternal, or charitable lodge society, or association.

**Public Entity:** A department, agency, or instrumentality of the State or any of its political subdivisions.

**Public Property:** Any real property, building or facilities owned, leased, or occupied by:

- A department, agency, or instrumentality of the State or any of its political subdivisions which is used for the transaction of public or quasi-public business.
- A nonprofit organization that is recognized as exempt from taxation pursuant to section 501(c)(3) of the Internal Revenue Code, 26 U.S.C. § 501(c)(3), as amended.
- A corporation for public benefit as defined in NRS 82.021.

**Reservation Notice:** The notice sent to Applicants for whom NV Energy has made an incentive reservation.

**Revenue Meter:** Also known as a billing meter, is the meter installed by NV Energy that measures the electricity used by the customer from the grid. Where there is a renewable system installed, the Revenue Meter also measures the amount of electricity that the customer's renewable energy system sends back to the grid. This meter could possibly be owned by NV Energy.

**Seller:** The party that sells or leases the renewable and/or ESD system to the host customer.

**Small Commercial Customer:** Non-residential customers in rate classes GS, GS-1 or smaller, including irrigation rate classes.

**Site Plan:** This is a top down visual layout of the installation site. It should show the location of all relevant system components including the solar system panels, the energy storage system, any and all inverters, disconnect switches, any and all meters, main service electrical panel, and any and all electrical sub panels. Any access issues should be indicated on the site plan. This could include, but is not limited to, walls, gates, or equipment installed buildings or structure that are not easily accessible.

**System Owner:** The owner of the r ESD when the incentive is paid. Systems that are on a leasing arrangement or a lease-to-own arrangement are owned by the leasing company therefore, those entities are considered the System Owner. The System Owner may be the NV Energy Host Customer, or a third party as designated by the Host Customer.

**TES:** Thermal Energy Storage.

**Utility:** NV Energy.

**Utility Interconnection:** The physical connection between the NV Energy grid and the customer generation. An Interconnection Agreement is required for a customer to have on-site electric generation connected to the NV Energy grid.

**Watt:** The basic unit of measure of electric power. One-thousand Watts is equal to one kilowatt (kW). One million Watts is equal to one megawatt (MW). A kilowatt hour (kWh) is the unit by which residential and most business customers are billed for monthly electric usage. One kWh represents the use of one kilowatt of electricity for one hour.

## 2. PROGRAM OVERVIEW

The goal of the program is to promote market adoption of energy storage systems by providing monetary incentives. These systems are to benefit utility customers by reducing peak demand, by improving the reliability of the operation of the transmission and distribution grid, and by helping to defer utility investments in new generation, transmission, and distribution assets. This handbook outlines the requirements for receiving NV Energy incentives for installation of Energy Storage Device (ESD) systems:

Important information about the Energy Storage program:

- They were created by the Nevada State Legislature and are regulated by the Public Utilities Commission of Nevada, defined in Nevada Revised Statutes and Nevada Administrative Code Chapter 701B. The programs are subject to changes made by the Nevada State Legislature, the Public Utilities Commission of Nevada, and NV Energy.
- They are funded by NV Energy customers and administered by NV Energy.
- All program participants must qualify for, participate in and comply with all of the rules of Net Metering.
- Projects in construction prior to the issuance of a Reservation Notice or Conditional Reservation Notice are not eligible for incentive.
- NV Energy pays incentives as available per NRS 701B as long as there is available funding.
- NV Energy will install digital “smart meters” that may include bidirectional or generation meters for all program participants. The metering requirements will be defined based on the configuration, and installation of an energy storage device. Please refer to the metering standards in this document.
- NV Energy is not responsible for operation or maintenance, of energy storage systems installed through this program.
- NV Energy is not responsible for consumption changes or billing changes because of the customer’s decision to install an energy storage system.
- Installations must be permitted through the local building authority and energy storage interconnections must be performed by a Nevada licensed C-2 electrical contractor. If a contractor’s license is suspended, applications associated with the contractor are not eligible to receive a reservation notice or an incentive payment, unless the system was completed and inspected by the local building authority prior to the suspension date. Customers may select a different contractor in this scenario – refer to the Application Changes section in this handbook for more information.

### 3. ELIGIBILITY

**Applies to Energy Storage Incentive Funding:** The host customer may be required to refund some or all of the incentives they receive if the measures do not remain installed for a period of five (5) years or the expected life of the measure, whichever is greater, or the facility where the measures are installed ceases to be a bundled, full requirement's customer of NV Energy during the said time period.

#### 3.1. Host Customer Category Eligibility

Evidence of host customer category (i.e., residential or commercial) eligibility is verified against the current NV Energy account. All applications are considered non-critical infrastructure and ITC eligible unless documentation is provided to prove eligibility.

Applicants for critical infrastructure must provide evidence that the project supports emergency services always available for public benefit. Acceptable documentation includes:

- Business license.
- Statement on company or public entity letter head of entity status and/or building use.
- Business brochure or business license.

Applicants that are not eligible for the ITC must demonstrate that the entity is unable to benefit from the investment tax credit (ITC) for solar integrated energy storage installations or that they are not able to benefit from accelerated depreciation for standalone energy storage installations. Acceptable documentation includes:

- ESD contract that shows the ownership model to verify ITC eligibility or not (i.e. power purchase agreement when a third party has access to the ITC would have an incentive calculated using the ITC-eligible incentive amount).
- W9 form that demonstrates tax exemption.
- Determination letter issued by the IRS.

Public entity applicants not subject to federal income tax must demonstrate that they are governmental entities and not subject to federal income tax and therefore unable to benefit from the ITC or accelerated depreciation. Acceptable documentation includes:

- A statement on public entity letterhead of entity status and building use.
- IRS issued "governmental information letter" issued to government agencies by the IRS.

Applications are made in one of the following categories, as determined by the type of customer, facility, and system capacity rating:

#### **Customer Billing Rate Classes:**

- Residential: All residential customers.
- Non-residential billing rate customers are categorized in two rate classes:
  - Small Commercial: Non-residential customers in rate classes GS, GS-1 or smaller, including irrigation rate class.
  - Large Commercial/Industrial: Non-residential customers in rate classes GS-2, LGS-1 or larger.

**System Capacity Ratings:** For the purposes of the energy storage incentive programs, NV Energy will reference both system Power Capacity, expressed in watts or kilowatts (W or kW) and system Energy Capacity, expressed in watt-hours or kilowatt-hours (Wh or kWh). Power capacity will be used to

determine program eligibility of a system. For example, the maximum size system that can be installed in the energy storage incentive programs is 1,000 kW. Usable Energy Capacity will be used to calculate the incentive for most categories, as it is recognized to be the best metric for quantifying potential benefit of energy storage systems.

### 3.2. Installer Eligibility

Installers must have an active C-2 Nevada contractor’s license. If a contractor’s license is suspended, applications associated with the contractor are not eligible to receive a reservation notice or an incentive payment, unless the system was completed and inspected by the local building authority prior to the suspension date. Customers may select a different Installer – refer to the Application Changes section in this handbook for more information.

### 3.3. Equipment Eligibility

Please refer to the “Siting & Equipment” section below for approved storage devices and equipment.

### 3.4. Residential Storage Program

**Customers:** The Residential Storage program is for customers who plan to install solar-integrated energy storage units from 4 kW up to 100 kW capacity and either already have or will install a renewable energy system, like rooftop solar.

There are two incentive levels categorize on two different rates described below:

- **Time-of-Use (TOU) Rate:** A rate plan that lets customers who are willing to use less electricity during peak demand periods save money by shifting their usage to times with lower rates. Customers that are on a TOU rate plan receive a higher energy storage incentive amount.
- **Non-Time of Use (TOU) Rate:** A rate plan in which rates are at a flat rate despite the time of day, season, and day type.

The incentive rate is \$0.19 per watt-hour (Wh) for customers on a TOU rate and \$0.095 per watt-hour (Wh) for customers that are not on a TOU rate. The incentive payment is capped at \$3,000 per premise for customers on a TOU rate and \$1,500 per premise for customers that are not on a TOU rate, or 50% of the Equipment Cost, whichever is less.

Incentives Paid	TOU Rate (the lessor of)		Non-TOU Rate (the lessor of)	
>\$1M - \$2M	\$0.19/Watt-hour	50% of equipment costs up to \$3,000	\$0.095/Watt-hour	50% of equipment costs up to \$1,500

The incentive payment is capped at \$3,000 per premise for TOU rate and \$1,500 per premise for non-TOU rate, or 50% of the equipment cost, whichever is less.

**More Information on TOU Rates:** For more information on TOU rates, please visit [Time Of Use Rate](#).

**Capacity Thresholds:** Under the Residential Storage program, the minimum Energy Capacity for an energy storage system is 8 kilowatt-hours. The maximum Power Capacity is 1,000 kilowatts, but customers applying under the Residential Storage program will only be incentivized up until 100 kilowatts. The energy storage device must be capable of being charged by at least 75% by a renewable energy source (i.e., solar PV system).

### 3.5. Commercial (Non-Residential) Energy Storage Program

**Customers/Facilities:** The Commercial Energy Storage Incentives program is for small and large commercial and industrial customers who are going to install an energy storage system. Except for the standalone small energy storage incentive program, to qualify for a storage incentive, a renewable energy system, like rooftop solar, must already be installed or will be installed on the property.

There are two programs for commercial energy storage incentives:

- **Small Energy Storage Incentives program** for systems with 4 kW up to less than 100 kW nameplate capacity:
  - Renewable Integrated (i.e. solar + storage).
  - Standalone Energy Storage (without renewable source).
- **Large Energy Storage Incentives program** for systems with 100 kW to 1,000 kW nameplate capacity.

The incentive is classified based on three conditions, 1) the customer eligibility for the Federal investment tax credit (ITC); and 2) under the large energy storage program, whether the customer facility qualifies for a critical infrastructure designation; or 3) under the standalone small energy storage program, whether the customer entity is deemed for profit or non-profit/government.

- In the commercial market, non-profits and governments are unable to benefit from the investment tax credit (ITC) or accelerated depreciation. Therefore, a higher incentive structure is available for non-profit and government customers. If the project is financed through a third-party ownership model, then the third party can claim the ITC credit. NV Energy will determine the incentive amount by the actual transaction and ownership model, not the customer type. These types of customers would include: A department or agency of a federal, state or local government; or a public school district, an institute of higher education that is part of the Nevada System of Higher Education; an Indian tribe or tribal organization; or a corporation for public benefit as defined in NRS 82.021; or a company who is recognized as exempt from taxation pursuant to section 501(c)(3) of the Internal Revenue Code, 26 U.S.C. § 501(c)(3), as amended.

The following customers may qualify for the critical infrastructure incentive:

- Hospitals.
- Medical facilities.
- Airports.
- Public safety facilities.
- Public infrastructure facilities.
- Dams.

All applications default to ITC eligible and non-critical infrastructure categories unless documentation is provided to prove eligibility in either one or both of the categories.

Applicants for critical infrastructure must provide evidence that the project supports emergency services always available for public benefit.

Applicants categorized as non-eligible for ITC must provide evidence that the company or entity is an agency of a federal, state or local government; or a public school district, an institute of higher education that is part of the Nevada System of Higher Education; an Indian tribe or tribal organization;

or a corporation for public benefit as defined in NRS 82.021; or a company who is recognized as exempt from taxation pursuant to section 501(c)(3) of the Internal Revenue Code, 26 U.S.C. § 501(c)(3), as amended.

### 3.5.1. Commercial Small Energy Storage Incentives Program

**Renewable Integrated Energy Storage Systems:** For energy storage systems with 4kW up to less than 100kW nameplate capacity connected to a renewable source of energy (i.e., solar + storage):

Eligible for ITC	Non-Eligible for ITC
\$0.32/Watt-hour	\$0.42/Watt-hour

The incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 50% of the installed system cost.
- \$50,000 per premise (i.e., for the total project cap).

**Standalone Energy Storage Systems:** For standalone energy storage systems (without an integrated renewable source) with 4kW up to less than 100kW nameplate capacity are required to participate in a time varying rate program (i.e. time-of-use or other) for at least five years. The incentives for eligible customers are shown below:

For Profit	Non-Profit/ Government
\$0.45/Watt-hour	\$0.55/Watt-hour

The incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 50% of the installed system cost.
- \$50,000 per premise (i.e., for the total project cap).

### 3.5.2. Commercial Large Energy Storage Incentives Program

As a consideration for the receipt of the incentive, the applicant grants NV Energy the right to remotely control the ESD system pursuant to the terms of a demand response or equivalent program approved by the Public Utilities Commission of Nevada. By receiving the incentive, the applicant agrees to participate in such a demand response or equivalent program and enter into any agreement with NV Energy contemplated by the program. This applies only to the Large Energy Storage Program.

The ESD system must be compliant with the OpenADR2.0b standard communications protocol. NV Energy’s technical advisory services are available for applicants to better inform them of the technologies and options they have to meet these remote control and standard communications requirements. When submitting a Large Energy Storage Program application, NV Energy may host a project kickoff meeting with the applicant to discuss these requirements in more detail.

For systems with 100kW to 1,000kW nameplate capacity:

CRITICAL INFRASTRUCTURE		NON-CRITICAL INFRASTRUCTURE	
Eligible for ITC	Non-Eligible for ITC	Eligible for ITC	Non-Eligible for ITC
\$0.50/Watt-hour	\$0.60/Watt-hour	\$0.40/Watt-hour	\$0.50/Watt-hour

For ITC projects the incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 70% of the installed system cost.
- \$300,000 per premise for non-Critical Infrastructure projects.
- \$400,000 per premise for Critical Infrastructure projects.

For Non-ITC projects the incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 70% of the installed system cost.
- \$400,000 per premise for non-Critical Infrastructure projects.
- \$500,000 per premise for Critical Infrastructure projects.

**The maximum amounts that can be covered for critical and non-critical infrastructure for new construction and public entities are 50% of the installed system cost.**

**Capacity Rating Thresholds:** Under the Commercial Large Energy Storage Incentives program, the minimum Power Capacity rating for an energy storage system is **100 kilowatts**. The maximum Power Capacity rating is **1,000 kilowatts**. The energy storage device must be capable of being charged by at least 75% by a renewable energy source (i.e., solar PV system).

## 4. SITE PLAN

This is a top down visual layout of the installation site and must show where the Energy Storage Device is proposed to be installed. The metering configuration must comply with NV Energy's RE3 Net Metering Standard which can be found at the bottom of this website:

[Electric Service Standards for Southern Nevada.](#)

The site plan should show the location of all relevant system components including any and all inverters, disconnect switches, any and all meters, main service electrical panel, and any electrical sub-panels. Any access issues should be indicated on the site plan. This could include, but is not limited to, walls, gates, or equipment installed inside buildings or structures that are not easily accessible.

**Meter and Disconnect Switches:** All Utility meters and disconnect switches shall be located on the exterior of the building or in an electrical supply room that is easily accessible to NV Energy personnel. The appropriate number of meters and disconnect switches should be included in the site plan and technical diagrams depending on the systems and system configurations.

**Inverter:** Any and all inverters should be clearly indicated on the site plan. For AC coupled solar and energy storage integrated systems, there should be at least two inverters included in the site plan.

**Technical Diagrams:** The Application must also include technical diagrams, either single-line or three-line diagrams, that show the electrical connections for all relevant electrical systems on site. This would include any existing or previously installed renewable generation, distributed generation, or energy storage equipment in addition to any ancillary components. Technical specification, including any telecommunications protocols or equipment, for all included electrical systems should also be provided. This includes inverters, energy storage systems (or battery modules), renewable energy systems, or others.

## 5. ENERGY STORAGE SYSTEM SITING AND EQUIPMENT

All completed energy storage systems must adhere to the following siting requirements:

- Completed systems will be reviewed and may be inspected following submission of the Incentive Claim Package to confirm compliance with program rules. (See Inspection section for more details.)
- Energy storage equipment must be new and must have the following minimum warranties:
  - ESD – 10 years (product).
  - Inverters – 7 years (product).
  - Labor and Workmanship – 2 years.

### 5.1. Residential Equipment and Configuration Requirements

- Chemical, mechanical, or thermal type systems.
- Commercially available.
  - This means that the principal components of the system must be available for purchase to the general development community through conventional purchase channels.
- New and never previously installed.
- Permanently installed.
- UL listed.
- Connected to a net metered solar system on the customer's service.
- Operated in parallel to the grid.
- 100 kW Maximum Power Capacity.
- Metered in accordance with energy storage interconnection standards.
- Capable of being used for future demand response programs.
- Energy Capacity of at least 8 kWh or equivalent.
  - Thermal energy storage system ratings to be calculated according to Appendix A of this handbook.
  - Mechanical energy storage system capacity calculations are subject to review and approval by the NV Energy.

### 5.2. Commercial Equipment and Configuration Requirements

- Chemical, mechanical, or thermal type systems.
- Commercially available.
  - This means that the principal components of the system must be available for purchase to the general development community through conventional purchase channels.
- New and never previously installed.
- Permanently installed.
- UL listed.
- Connected to a net metered solar system on the customer's service.
- Operated in parallel to the grid.
- 1,000 kW Maximum Power Capacity.
- Metered in accordance with energy storage interconnection standards.
- Capable of being used for future demand response programs.
- Power capacity of at least 100 kW or equivalent.
  - Thermal energy storage system ratings to be calculated according to Appendix A of this handbook.
  - Mechanical energy storage system capacity calculations are subject to review and approval by the NV Energy.

## 6. ENERGY STORAGE SYSTEM SIZING

### 6.1. Renewable Integrated

To qualify for an incentive, the minimum solar PV Power Capacity to energy storage system Power Capacity ratio must be **0.35**.

The solar PV system Power Capacity to energy storage system Power Capacity<sup>1</sup> ratio is defined by the following equation.

$$\frac{\text{Solar PV System Power Capacity } (CEC_{ac} \text{ kW})}{\text{Energy Storage System Power Capacity } (kW_{ac})}$$

If the minimum ratio requirement is not met, the customer must propose a system design that meets the requirement of the 0.35 ratio.

This method of sizing your proposed energy storage system is structured so that customers will be able to qualify for the Internal Revenue Service (IRS) Investment Tax Credit (ITC) as result of meeting the aforementioned minimum ratio requirement. The IRS may choose to audit filings that claim this tax credit. Customers are required to demonstrate that their systems operate within the guidelines outlined by the IRS. For more information on the ITC, please consult your accountant.

Applicants must adhere to the following energy storage system sizing requirements:

- Applicants of the Residential Energy Storage Program must install an energy storage system with an Energy Capacity of at least 8 kilowatt-hours to qualify for an incentive.
- Applicants of the Commercial Energy Storage Program must install an energy storage system with a Power Capacity of at least 100 kilowatts.
- Under both the Commercial and Residential Energy Storage Programs, the Power Capacity of the system must not exceed 1,000 kilowatts.

### 6.2. Standalone Energy Storage

Energy storage systems in this category must be sized for commercial systems that are greater than 4 kW and less than 100 kW continuous output power capacity.

### 6.3. System Additions

Host Customers may interconnect additional capacity at a premise with existing Energy Storage capacities. System addition applications are subject to special terms that require review and approval by NV Energy.

The list below addresses some of the considerations for system additions:

- The placement of the additional storage with regards to the utility metering requirements as documented in the RE-3 Net Metering standard.
- The size of the total Power Capacity shall be less than 100KW to eligible for the standalone energy storage incentive.

**Ask before you add!**

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<sup>1</sup> The name plate rating of the battery system is used for the energy storage system power capacity (kW).

## 7. EQUIPMENT AND UTILITY INSTALLATION STANDARDS

All solar PV and ESD installations must meet NV Energy's standards and metering requirements as outlined in NV Energy's Rules and Standards, and National Electric Code ("NEC") requirements, all National Fire Protection Agency ("NFPA") standards, and other federal or local ordinances. This handbook highlights some of the more commonly used Standards for general metering installations and net metering specific installations. Other Standards will need to be referenced to address staking & trenching, conduits, boxes and vaults, or other installation requirements as needed. A comprehensive list of the NV Energy Standards can be found at:

[Electric Service Standards for Southern Nevada](#)

[Electric Service Standards for Northern Nevada](#)

### 7.1. Net Metering Standards

The following documents will provide information on the requirements for how net metering systems must be installed and the type of equipment that can be used. These two NV Energy standards must be met and will be inspected for compliance during the meter inspection phase of the project. These two standards are common standards that apply to net metering systems but these are not an exhaustive list that may apply. The full list of standards can be found on the general NV Energy Standards websites listed above.

**RE-3: Net Metering Requirements:** One of the standards that is relevant to solar and energy storage installations is the **RE-3 Standard**. This standard includes the approved installation configurations document in One-line Diagrams and can be found at the bottom of the NV Energy standards website. The document will discuss the Utility's design requirements for Net Metering systems to operate in parallel with the Utility's electric system to ensure the safety of people and property and the integrity of the electrical system. ESDs that are paired with a Net Metering System are included in this standard.

**RE-1: Generator Device:** The **RE-1 Standard** will discuss the Utility's planning and design requirements for generators connected to and operating in parallel with electrical systems to ensure the safety of the people and property as well as the integrity of the electrical system. This standard is often used for Rule 15 interconnections.

### 7.2. Relevant General Metering Standards

The following documents will provide information on metering equipment requirements and standards associated with a Net Metering system. These two NV Energy standards must be met and will be inspected for compliance during the meter inspection phase of the project.

**RPM-G: Material Requirements:** The material requirements will discuss the minimum manufacturing requirements for utility metering and service equipment that is rated 0-600V. These requirements are based on practices that are necessary to supply uniform satisfactory and safe service. This will describe the type of equipment that NV Energy meters can connect to complete certain ESD installations.

**RPI-G: Installation Requirements:** The installation requirements are based on NV Energy practices that are deemed necessary to supply uniform satisfactory and safety service. This will provide information related to the specifics on where to install meter sockets, how they are wire, and other installation related details.

### 7.3. Generating Facility Interconnections Requirements

The following link to the document below discusses **Rule 15**, which describes the interconnection, operating and Metering requirements for Generating Facilities intended to be connected to the Utility's electric distribution system over which the Public Utility Commission has jurisdiction. This document applies only to Generating Facilities with a net Power Capacity of **20,000 kilowatts** or less unless otherwise required in federal or state law.

[Rule 15 South](#)

[Rule 15 North](#)

### 7.4. Fire Protection Standards

The National Fire Protection Association has established the criteria for minimizing the hazards associated with energy storage systems with the **NFPA 855 Standard**. This standard for the installation of stationary energy systems can be found here: [NFPA 855](#).

## 8. INCENTIVE CALCULATION

### 8.1. Residential Energy Storage

The maximum eligible incentive for an application is calculated and reserved during the initial application process and is listed on the Reservation Notice. The method for incentive calculation and incentive payment are determined by the Energy Capacity of the proposed ESD as well as the billing rate category of the customer. Incentives will be based on a dollar per watt-hour (\$/Wh) rate for this Program Year at levels stated below.

**Incentive Calculation:** The calculation of the incentive payment is listed below.

$$\text{Incentive Payment} = \text{Energy Capacity (Wh)} \times \text{Incentive Level (\$/Wh)}$$

Where,

*Energy Capacity* - The maximum amount of usable energy an ESD can retain measured in watt-hours (Wh). See Definitions section for more detail.

*Incentive Level* - The incentive rate that applies to the Time of Use or Non-Time of Use Customer.

*Incentive Payment* - The total incentive to be paid to the customer.

**Incentive Cap:** The energy storage incentive payment will not exceed the lesser of:

- The maximum amount listed on the Incentive Reservation Notice.
- The calculated Incentive Payment.
- 50% of the Equipment Costs (See Incentive Claim for details).
- \$3,000 per premise (i.e., for the total project cap) for TOU customers.
- \$1,500 per premise for non-TOU customers.

**Example 1:** You are a residential TOU customer installing an energy storage device that has an Energy Capacity of 18,000 Wh. The costs of the project are \$7,800 for equipment and \$8,000 for installation. The initial incentive calculation is equal to an incentive of \$3,420 (18,000 Wh x \$0.19/Wh) or 50% of the equipment costs (\$7,800 X .50 = \$3,900). However, the initial incentive calculation exceeds the project cap per premise of \$3,000, so the incentive will be capped at \$3,000.

**Example 2:** You are a residential non-TOU customer installing two energy storage devices that each have an Energy Capacity of 13,500 Wh and Equipment Costs of \$8,000. The initial incentive calculation is equal to an incentive of \$2,565 (27,000 Wh x \$0.095/Wh). However, the initial incentive calculation exceeds the project cap per premise of \$1,500. Therefore, the final incentive calculated will be capped at \$1,500.

### 8.2. Commercial (Non-Residential) Energy Storage Program

#### 8.2.1. Small Energy Storage Incentives Program 4kW – 100kW

The maximum eligible incentive for an application is calculated and reserved during the initial application process and is listed on the Reservation Notice. The method for incentive calculation and incentive payment are determined by the Energy Capacity of the proposed ESD as well as the customer type. Incentives will be based on a dollar per watt-hour (\$/Wh) rate for this Program Year at levels stated below.

**Incentive Calculation:** The calculation of the one-time incentive payment is listed below.

$$\text{Incentive Payment} = \text{Energy Capacity (Wh)} \times \text{Incentive Level}(\$/\text{Wh})$$

Where,

*Energy Capacity* - The maximum amount of usable energy an ESD can retain measured in watt-hours (Wh). See Definitions section for more detail.

*Incentive Level* - The incentive rate that applies to the Customer based on their eligibility (i.e. ITC eligible, non-ITC eligible, For Profit, or Non-Profit/Government applicant).

*Incentive Payment* - The total incentive to be paid to the customer.

**Note:** Incentives will be available on a first-come, first-served basis until funds are exhausted.

**Incentive Cap:** The incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- \$50,000 per premise (i.e., for the total project cap).
- 50% of the installed system costs for renewable integrated systems.
- 50% of the installed system costs for standalone energy storage systems.

### 8.2.2. Large Energy Storage Incentives Program 100kW-1000kW

As a consideration for the receipt of the incentive in the Large Energy Storage Program, the applicant grants NV Energy the right to remotely control the storage equipment pursuant to the terms of a demand response or equivalent program approved by the Public Utilities Commission of Nevada. By receiving the incentive, the applicant agrees to participate in such a demand response or equivalent program and enter into any agreement with NV Energy contemplated by the program. The ESD system and inverter must be compliant with the most recent versions of the Underwriter's Laboratories ("UL") standard 1741 and Institute of Electrical and Electronics Engineers ("IEEE") standard 1547. The communications protocols used by the equipment to remotely control the battery must use one of the standard protocols required by IEEE and UL. NV Energy's technical advisory services are available for applicants to better inform them of the technologies and options they have to meet these requirements. When submitting a Large Energy Storage Program application, NV Energy may host a project kickoff meeting with the applicant to discuss these requirements in more detail.

Differing incentive rates are available for critical and non-critical infrastructure customers planning to install energy storage systems. Commercial facilities that are deemed to be Critical Infrastructure are prioritized and are eligible to receive a higher incentive amount. Applicants for critical infrastructure must provide evidence that the project supports emergency services always available for public benefit.

The following customers may qualify for the critical infrastructure incentive:

- Hospitals.
- Medical facilities.
- Airports.
- Public safety facilities.
- Public infrastructure facilities.
- Dams.

For systems with 100kW to 1,000kW nameplate capacity:

CRITICAL INFRASTRUCTURE		NON-CRITICAL INFRASTRUCTURE	
Eligible for ITC	Non-Eligible for ITC	Eligible for ITC	Non-Eligible for ITC
\$0.50/Wh	\$0.60/Wh	\$0.40/Wh	\$0.50/Wh

**Incentive Calculation:** The calculation of the one-time incentive payment is listed below.

$$\text{Incentive Payment} = \text{Energy Capacity (Wh)} \times \text{Incentive Level} (\$/\text{Wh})$$

Where,

*Energy Capacity* - The maximum amount of usable energy an ESD can retain measured in watt-hours (Wh). See Definitions section for more detail.

*Incentive Level* - The incentive rate that applies to the ITC eligible or non-ITC eligible Customer, and to facilities deemed as Critical Infrastructure or Non-Critical Infrastructure.

*Incentive Payment* - The total incentive to be paid to the customer.

**Incentive Cap for Non-ITC Qualified Projects:** The incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 70% of the installed system cost.
- \$400,000 per premise for non-Critical Infrastructure projects.
- \$500,000 per premise for Critical Infrastructure projects.

**Example 1:** You are a customer installing an energy storage device that has an Energy Capacity of 1,000,000 Wh on a premise that is deemed as Non-critical Infrastructure and Non-ITC eligible. The initial incentive calculation is equal to an incentive of \$500,000 (1,000,000 Wh x \$0.50/Wh). However, the initial incentive calculation exceeds the Non-critical Infrastructure project cap per premise of \$400,000, thus the incentive will be capped at \$400,000.

**Incentive Cap for ITC Qualified Projects:** The incentive payment will not exceed the lesser of:

- The maximum amount listed on the Reservation Notice.
- The calculated Incentive Payment.
- 70% of the installed system cost.
- \$300,000 per premise for non-Critical Infrastructure projects.
- \$400,000 per premise for Critical Infrastructure projects.

**Example 2:** You are a customer installing an energy storage device that has an Energy Capacity of 750,000 Wh on a premise that is deemed as Critical Infrastructure and ITC eligible. The total installed system cost for the project is \$500,000. The initial incentive calculation is equal to an incentive of \$375,000 (750,000 Wh x \$0.50/Wh). However, the initial incentive calculation exceeds 70% of the installed system cost which is \$350,000 (70% of \$500,000). Therefore, the final incentive will be \$350,000.

**The maximum amounts that can be covered for critical and non-critical infrastructure for new construction and public entities are 50% of the installed system cost.**

## 9. APPLICATION PROCESS

### 9.1. Application Submittal

Applications are submitted online through the online application portal that is accessed through the NV Energy website.

Applications are reviewed within ten (10) business days<sup>2</sup> to confirm that the Host Customer is eligible for the category and that all required documentation is provided. If defects are noted, the Utility and Applicant shall cooperate in a timely manner to establish a satisfactory Application. Applications are approved based on the order in which complete applications are submitted.<sup>3</sup>

Important communications are sent by email to program participants. Accurate email addresses are required for ALL program participants, including Host Customers.

Deficient applications will not be processed. Deficient applications that are not corrected within 20 days of the Applicant being notified of the deficiency are canceled and the application fee (explained in the Application Fee section) is forfeited.

The chart below shows the documents required for the initial application:

Documents Required	Net Metering Solar + Energy Storage Incentive Application	Energy Storage Only Incentive Application
Copy of the contract or energy services agreement for the sale and installation of the system	✓	✓
Site plan	✓	✓
Energy Storage Technical Specification Includes: Data/Specification sheet with nameplate or Power Capacity listed	✓	✓
One line-diagram	✓	✓
Evidence of Host Customer category eligibility (Residential, Commercial, Critical Infrastructure, Profit, Non-Profit/Government, ITC eligible or non-ITC eligible)	✓	✓

#### Contract or agreement must include:

- Names and signatures of the NV Energy Host Customer and the Installer. Host Customer name on the contract or agreement must match the name on the application.
- The physical address of the installation.
- The Power Capacity, Energy Capacity of the energy storage system or other clear indication of the proposed system size.
- Inverter specification information.

<sup>2</sup> Rule 15 Paragraph D.1.b.

<sup>3</sup> NRS 701B.210.3.

## 9.2. Application Fees

Per NV Energy’s Rule 15 Tariff, an application fee is required for all incentivized power generation system applications and for non-incentive power generation system applications in the Nevada Power territory. The fee must be received by NV Energy before the application will be reviewed for approval.

Since the fee may be paid by the customer or the solar company, customers should communicate with their solar company before submitting payment. If NV Energy receives duplicate fee payments for the same application, the first payment is posted and subsequent payments are returned.

The fee may be submitted by check and SpeedPay. The application number, generated when the application is submitted, must be written on checks. Application fee checks are not accepted prior to submission of an application. Cash is not accepted.

**Application fees may be mailed to:**

NV Energy Renewable Energy Programs  
 6100 Neil Road  
 Renewables S2A35  
 Reno, NV 89511

If the fee is not received within 30 days of submission of the application, the application will be cancelled.

The application fees for projects in the South (NPC) are as follows:

Generating Facility Capacity	Initial Review Fee per Application
Less than 10kW	\$130
10kW-24.9kW	\$200
25kW-1,000kW	\$500

The application fee for projects in the North (SPPC) is \$84.00.

## 9.3. Reservation Notice

Once an application has been reviewed and approved, the Applicant, Host Customer, Installer and System Owner are sent a Reservation Notice by email that indicates that incentive funds have been reserved for the project. The notice lists the approved size of the energy storage system and the calculated incentive amount. The Host Customer has sole rights to the Reservation Notice.

A system that is less than 100kW has a reservation that expires one year from the date the Reservation Notice email is sent from NV Energy’s application portal. An Applicant for a system that is less than 100kW in capacity may seek up to two 6-month extensions for the Reservation Notice by submitting written notice to NV Energy prior to the expiration of the original Reservation Notice.

A system that is between 100kW and 1,000kW has a reservation that expires 18 months from the date the Reservation Notice email is sent from NV Energy’s application portal. An Applicant for a system that is between 100kW and 1,000kW in capacity may seek up to three 6-month extensions for the Reservation Notice by submitting written notice to NV Energy prior to the expiration of the original Reservation Notice.

If an Applicant is seeking an extension to the Reservation Notice, they must provide proof or progress and intent to complete the system installation. Proof of progress is subject to review and approval by NV Energy and may include, without limitation evidence that substantial percentage of project construction has been completed, evidence of that the principal components of the system have been purchased and delivered to the installation location, or evidence of substantial non-refundable payments of installation costs. Applicants must also provide an attestation, signed by the Host Customer, Installer and System Owner, of intent to complete the system and acknowledgment that project will not be eligible for incentive if not completed by the extended expiration date.

Applicants may check the status of their application by signing into NV Energy's application portal. "Active" status indicates that a Reservation Notice has been issued.

If the project construction begins prior to the Reservation Notice being issued, the Applicant will then forfeit their incentive. Applicants will also forfeit their eligibility for the incentive if the Applicant withdraws from participation in the Residential or Commercial Energy Storage Program. Lastly, the Applicant will forfeit their incentive if the installation of the ESD is not complete within 12 months after the date on which the Applicant is selected for participation in the Residential or Commercial Energy Storage Program.

#### 9.4. Application Changes

**Installation Location:** Applicants and Host Customers may change the installation address of a reservation to another address with the same Host Customer. Changes must be requested in writing to NV Energy and are subject to system sizing rules. The new installation location is recorded in NV Energy's application portal, but the Reservation Notice is not revised. The terms of the original Reservation Notice apply to the new installation location.

**Applicant or Installer:** Host Customers may change or rescind affiliation with any of the parties of the original application with written notice to NV Energy. The Installer may be changed by either the Applicant, System Owner, or the Host Customer with written notice to NV Energy.

**Host Customer:** The Host Customer name for an application may be changed before project completion and interconnection by the original Host Customer with written request to NV Energy. A copy of a recent utility bill in the name of the new Host Customer must be provided with the change request.

**Reservation Notices:** Reserved incentives listed on the Reservation Notice cannot be changed. An Applicant can choose to withdraw their Application and reapply if construction on the ESD has not been started. New applications are subject to incentive levels and the availability of incentive funds at the time of the new application. New Applications require a new non-refundable \$35 application fee, and a new Reservation Notice will be sent.

## 10. INCENTIVE CLAIM

The Applicant requests interconnection of the system and payment of the incentive for a completed project by submitting the incentive claim prior to the expiration date listed on the Reservation Notice.

The incentive claim is submitted online through NV Energy’s application portal, similar to submitting the original application.

If an Incentive Claim Package is incomplete and suspended, the Applicant has 60 days to make corrections. If the correction is not received within 30 days, NV Energy will send a final notice indicating that the Applicant has 30 days to correct or their application will be canceled. In the case that an incentive application is canceled the system may still be connected but the reserved incentive funds and the application fee is forfeited.

The incentive claim must include the following:

Documents Required	Net metering Solar PV and Energy Storage Incentive Application	Energy Storage only
Signed Interconnection Agreement	✓	✓
Signed Incentive Claim Form	✓	✓
A copy satisfied building permit	✓	✓
Equipment and Labor Invoice	✓	✓
Photos (PDF) of Installed System	✓	✓

**Satisfied Building Permit:** Must come from the local jurisdiction indicating the date of satisfactory final solar system inspection. Satisfaction of a permit is shown via a copy of final inspection results and date, which is a separate document than the permit. Required is a copy of the permit with an attached copy of the inspection passed results. In the case of jurisdictions that do not have a building official, verification by a Nevada licensed professional engineer is required attesting to compliance with all applicable state, county, and federal codes, and ordinances.

**Equipment Costs:** Applicants indicate the completed system’s Equipment Cost in the online application portal. Equipment costs include the materials that are necessary for the proper function of an ESD system. These costs do not include labor.

**Installed System Costs:** Applicants indicate the completed system cost in the online application portal. System cost includes the cost of the tangible materials and labor for the installed system. The cost of the local building authority permitting must also be listed. Other costs, including other equipment, and design and engineering may be listed as balance of cost of system. These costs are applicable only to Commercial Energy Storage Incentives.

**Cost of Tangible Materials and Labor:** The reasonable cost of materials and labor for permitting, panels, battery, inverters, the balance of system components and any other costs that are directly related to and required for the operation of a solar energy or energy storage system. The term does not include such costs for improvements to a building or site which are not necessary to accommodate a solar energy or energy storage system. Such improvements include but are not limited to carports or shade structures, fencing, roof coverings, parking lot surfaces, lighting, and components for battery back-up systems.

## 11. INSPECTIONS

**Program Inspection:** The Program Inspection may be conducted for any project. The program inspection verifies the information contained in the incentive claim, including:

- Installed energy storage equipment.
- Installation location and siting.

**Interconnection Safety Verification:** The Interconnection Safety Verification is an inspection to confirm the system's compliance with NV Energy standards and is performed by the NV Energy Meter Operations department. If the system passes the safety verification, the appropriate meters are installed, and the system may be operated.

If the system does not satisfy the requirements of either the program post inspection or interconnection safety verification, NV Energy will contact the Installer and/or Host Customer to inform them of the issue. Re-inspection may be necessary after corrections are made.

NOTE: Systems may not be energized prior to successful final verification by NV Energy. The customer will not receive kWh credit for energy put back into the grid until the NV Energy meter(s) is set. All projects must comply with applicable NV Energy construction standards which can be found at [nvenergy.com](http://nvenergy.com).

The use of a battery backup system on a grid connected system requires advance review and approval by NV Energy in order to ensure safe interconnection and that all energy produced by the system is recorded on the generation meter.

Modifications to customer-owned electrical service equipment may compromise the original equipment listing. All modifications shall be approved in writing by the authority having jurisdiction, the manufacturer, or a nationally recognized testing laboratory.

## 12. INCENTIVE PAYMENTS

Incentive payments are processed only after satisfaction of required inspections and the installation of the appropriate meters. Completed systems must be storing energy before incentive payments may be issued.

Payments are issued to the Payee as indicated on the Incentive Claim Form. Payees must provide NV Energy with a W-9 Form in the same name as the payee on the Application. NV Energy will issue an Internal Revenue Service 1099-MISC to all Payees at the end of each year in which incentives are paid. To protect Payee privacy, W-9 forms are not submitted in the NV Energy application portal but are submitted directly to NV Energy. Incentive payments are not made until the W-9 is provided. A one-time payment issued as a bank check will be administered for both Commercial and Residential Energy Storage projects.

## 13. CANCELLATION, WITHDRAWAL AND FORFEITURE

**Cancellation:** An application that has not yet been approved and issued a Reservation Notice may be cancelled by written or verbal request from the Applicant, Installer, System Owner or Host Customer.

**Withdrawal:** An application that has been issued a Reservation Notice may be withdrawn from the program by written request directly from the Host Customer to NV Energy. A Withdrawal Form is also available in the online application portal.

**Forfeiture:** An application is forfeited if the complete Incentive Claim Form is not submitted by the expiration date listed on the Reservation Notice.

Reserved incentive funds for withdrawn and forfeited applications are returned to the program and these applications are no longer eligible for payment. Host Customers may reapply to the program, but subsequent applications are subject to the program rules in place at the time of the new application.



## 14. CONTACT INFORMATION

More information on NV Energy's programs and services can be found on our website at [nvenergy.com](http://nvenergy.com).

Website: [Clean Energy](#)  
Email: [cleanenergy@nvenergy.com](mailto:cleanenergy@nvenergy.com)  
Toll-Free: 866-786-3823  
Fax: 775-402-0339

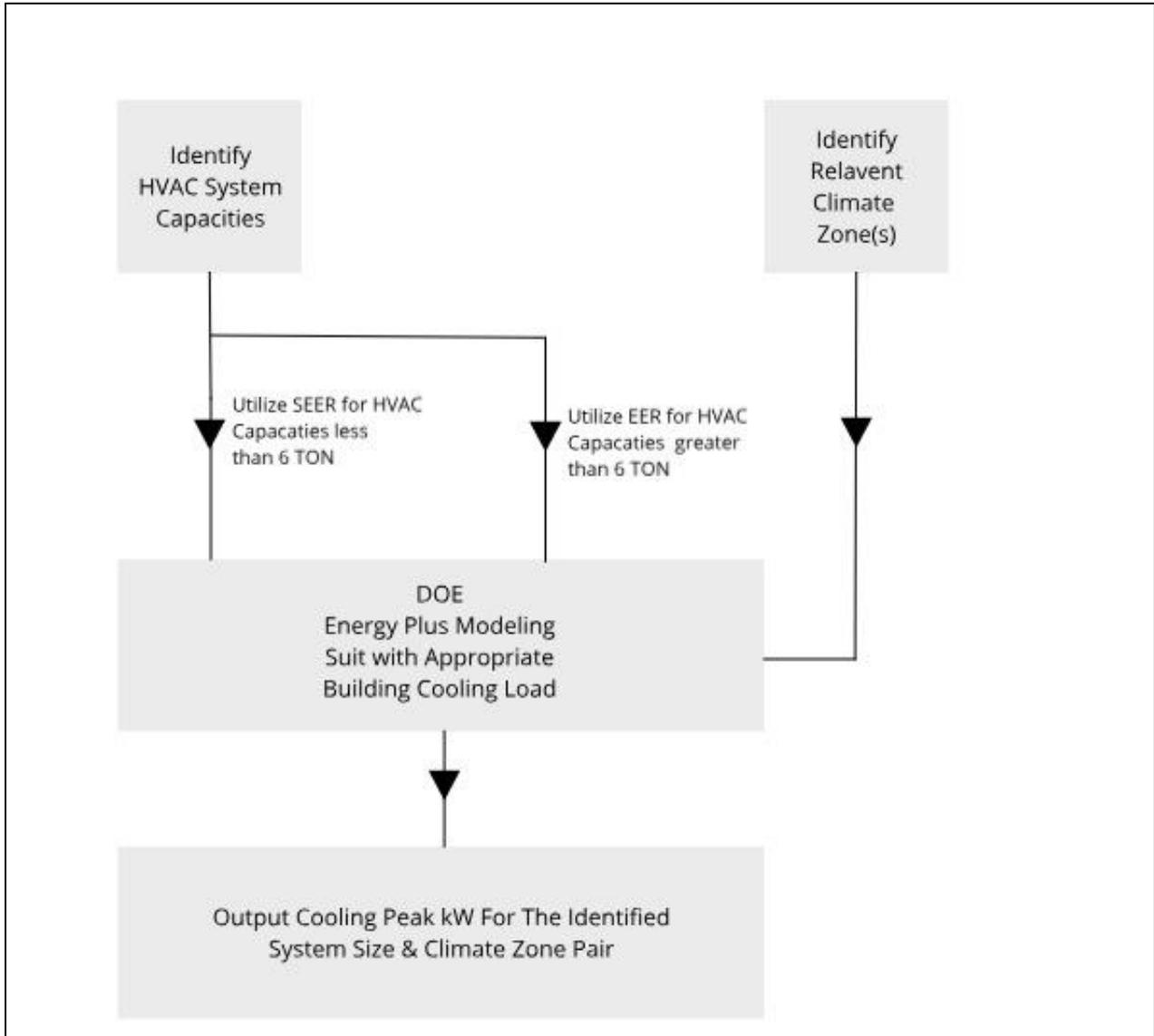
Application Portal: [PowerClerk](#)

## 15. APPENDIX A

### 15.1. NV Energy Storage Incentive – Conversion Tables for HVAC-Integrated Thermal Energy Storage System

This appendix sections details the approach, reference tables and procedures for the accurate estimation of incentive amounts for HVAC-integrated thermal energy storage system applications up to 250 tons in cooling energy capacity.

#### HVAC System Capacities v. Relevant Climate Zone Modeling Approach:



## 15.2. HVAC System Capacity Evaluation

**Model overview:** HVAC system capacity ranges of 1-5 TON, 6-20 TON, and 50-250 TON were identified for residential and commercial cooling demand modeling. The energy modeling environment was designed for two climate zones. The first climate zone encompasses Las Vegas, NV and the second climate zone encompasses Reno, NV. Weather data for both sites were used in the form of typical meteorological year (TMY) data sets. The evaluation of the HVAC system capacity ranges within the identified climate zones was performed utilizing The Department of Energy (DOE) Energy Plus Software Engine. Modeling specifications and results for the three capacity ranges have been detailed below.

### Model Description: System Capacity Range 1 – 5 TON | SEER 8 – 15 | Las Vegas, NV & Reno, NV:

Model cases were designed to appropriately test the equipment capacity range of 1 – 5 Tons. Each model utilized a combination of a specific system capacity, climate zone and equipment efficiency measured in SEER (Seasonal Energy Efficiency Ratio) ranging between 8 SEER – 15 SEER.

SEER 8		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.9	2.8	3.7	5.5	6.4	7.3	9.2
RENO, NV	5B	1.2	1.8	2.4	3.6	4.3	4.9	6.1

SEER 9		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.7	2.5	3.4	5.1	5.9	6.8	8.4
RENO, NV	5B	1.1	1.6	2.2	3.4	3.9	4.5	5.7

SEER 10		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.5	2.3	3.1	4.6	5.4	6.2	7.7
RENO, NV	5B	1.0	1.5	2.0	3.1	3.6	4.1	5.2

SEER 11		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.4	2.1	2.8	4.2	4.9	5.6	7.0
RENO, NV	5B	0.9	1.4	1.8	2.8	3.3	3.8	4.7

SEER 12		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.2	1.8	2.5	3.8	4.4	5.1	6.3
RENO, NV	5B	0.8	1.2	1.7	2.5	3.0	3.4	4.3

SEER 13		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	1.0	1.6	2.2	3.3	3.9	4.5	5.6
RENO, NV	5B	0.7	1.1	1.5	2.2	2.6	3.0	3.8

SEER 14		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	0.9	1.4	1.9	2.9	3.4	3.9	4.9
RENO, NV	5B	0.6	1.0	1.3	2.0	2.3	2.6	3.3

SEER 15		kW Offset Table with Source Multiplier of 1.						
		Equipment Tonnage (in Tons)						
Climate Zone	DOE Climate Zone	1	1.5	2	3	3.5	4	5
LAS VEGAS, NV	3B	0.7	1.1	1.6	2.5	2.9	3.3	4.2
RENO, NV	5B	0.5	0.8	1.1	1.7	2.0	2.3	2.9

**Model Description: System Capacity Range 6 – 20 TON | EER 7.68 – 12.3 | Las Vegas, NV & Reno, NV:**  
 Model cases were designed to appropriately test the equipment capacity range of 6 – 20 Tons. Each model utilized a combination of a specific system capacity, climate zone and equipment efficiency measured in EER (Energy Efficiency Ratio) ranging between 7.68 EER – 12.3 EER.

EER 7.7		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	10.9	12.7	13.6	14.5	15.4	16.3	18.1	22.6	27.2	36.2
RENO, NV	5B	7.4	8.8	9.5	10.2	10.9	11.6	13.0	16.6	20.1	27.3

EER 8.5		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	9.9	11.6	12.4	13.2	14.0	14.8	16.5	20.6	24.7	33.0
RENO, NV	5B	6.7	8.0	8.6	9.3	9.9	10.6	11.9	15.1	18.4	24.8

EER 9.2		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	9.0	10.5	11.2	12.0	12.7	13.5	15.0	18.7	22.4	29.9
RENO, NV	5B	6.1	7.2	7.8	8.4	9.0	9.6	10.8	13.7	16.7	22.5

EER 9.9		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	8.1	9.4	10.1	10.8	11.5	12.1	13.5	16.9	20.3	27.0
RENO, NV	5B	5.5	6.5	7.1	7.6	8.1	8.7	9.7	12.4	15.0	20.4

EER 10.6		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	7.2	8.5	9.1	9.7	10.3	10.9	12.1	15.2	18.2	24.3
RENO, NV	5B	4.9	5.9	6.4	6.8	7.3	7.8	8.7	11.1	13.5	18.3

EER 11.2		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	6.5	7.6	8.1	8.6	9.2	9.7	10.8	13.6	16.3	21.7
RENO, NV	5B	4.4	5.3	5.7	6.1	6.5	7.0	7.8	10.0	12.1	16.4

EER 11.8		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	5.7	6.7	7.2	7.7	8.2	8.6	9.6	12.0	14.5	19.3
RENO, NV	5B	3.9	4.7	5.1	5.4	5.8	6.2	7.0	8.9	10.8	14.6

EER 12.3		kW Offset Table with Source Multiplier of 1.									
		Equipment Tonnage (in Tons)									
Climate Zone	DOE Climate Zone	6	7	7.5	8	8.5	9	10	12.5	15	20
LAS VEGAS, NV	3B	5.1	5.9	6.3	6.8	7.2	7.6	8.5	10.6	12.8	17.1
RENO, NV	5B	3.5	4.1	4.5	4.8	5.1	5.5	6.2	7.8	9.5	12.9

**Model Description: System Capacity Range 50 – 250 TON | EER 7.68 – 12.3 | Las Vegas, NV & Reno, NV:** Model cases were designed to appropriately test the equipment capacity range of 50 – 250 Tons. Each model utilized a combination of a specific system capacity, climate zone and equipment efficiency measured in EER (Energy Efficiency Ratio) ranging between 7.68 EER – 12.3 EER.

EER 7.7		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	64.3	124.4	184.5	244.5	304.6
RENO, NV	5B	60.8	113.9	167.0	220.1	273.3

EER 8.5		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	60.8	116.6	172.5	228.3	284.2
RENO, NV	5B	57.1	106.4	155.8	205.1	254.5

EER 9.2		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	57.4	109.3	161.1	213.0	264.8
RENO, NV	5B	53.5	99.3	145.1	190.8	236.6

EER 9.9		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	54.3	102.3	150.4	198.4	246.5
RENO, NV	5B	50.1	92.5	134.9	177.3	219.7

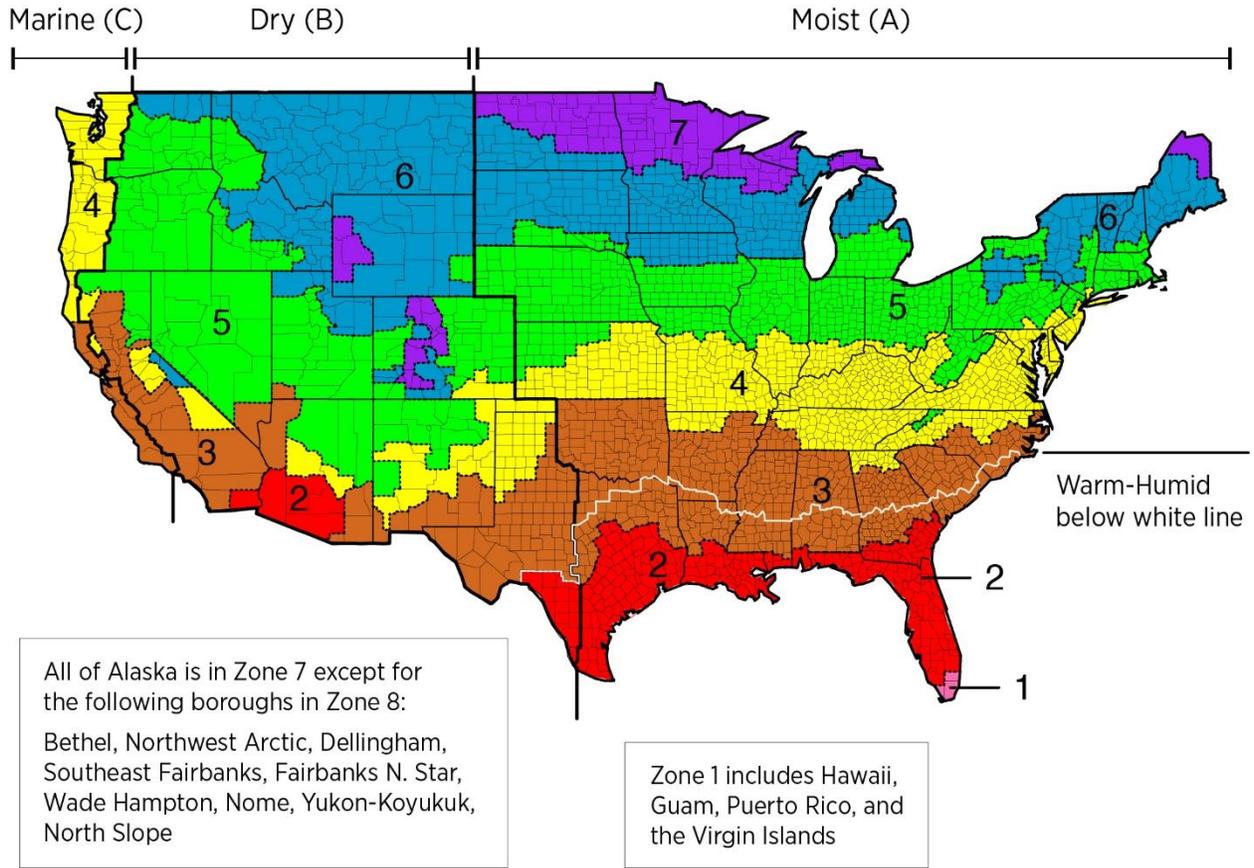
EER 10.6		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	51.3	95.8	140.3	184.7	229.2
RENO, NV	5B	47.0	86.2	125.4	164.6	203.8

EER 11.2		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	48.5	89.6	130.7	171.9	213.0
RENO, NV	5B	44.0	80.2	116.4	152.7	188.9

EER 11.8		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	45.9	83.9	121.8	159.8	197.8
RENO, NV	5B	41.2	74.6	108.0	141.5	174.9

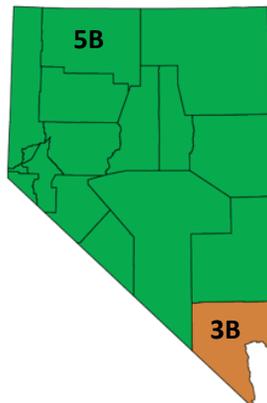
EER 12.3		kW Offset Table with Source Multiplier of 1.				
		Equipment Tonnage (in Tons)				
Climate Zone	DOE Climate Zone	50	100	150	200	250
LAS VEGAS, NV	3B	43.5	78.5	113.6	148.6	183.7
RENO, NV	5B	38.6	69.4	100.2	131.1	161.9

**DOE Climate Zones Map:**



*Credit: IECC Climate Zone Map*

**State of Nevada, Detailed View:**



*Credit: Building Codes Assistance Project*

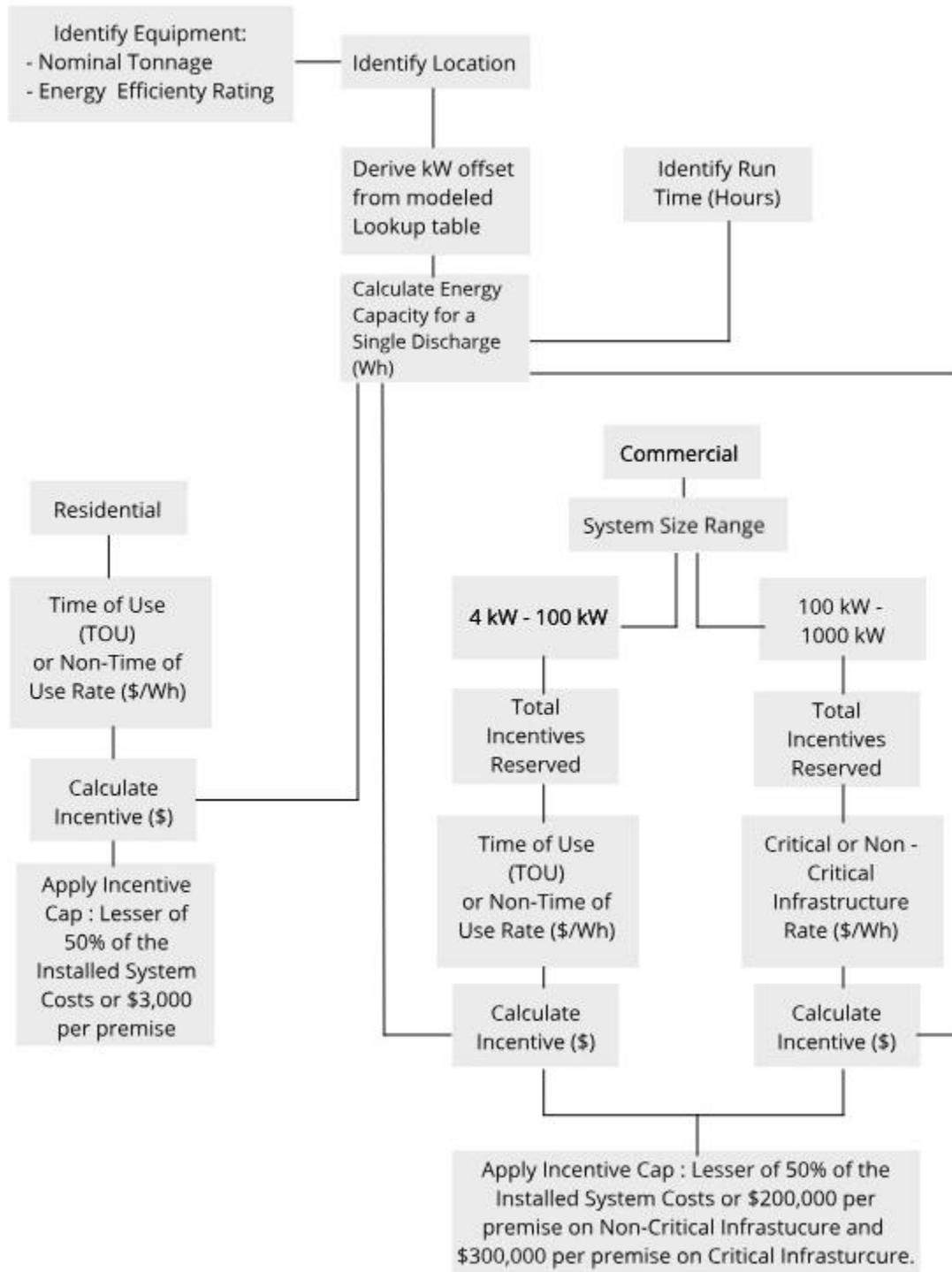
### 15.3. Energy Storage Incentive Calculations

Energy storage incentives can be calculated utilizing the current NV Energy Solar Incentives & Energy Storage Incentives Programs Handbook, coupled with the kW offset that can be derived from the kW offset table for 1-5 Ton, 6-20 Ton and 50-250 Ton. The incentive calculations are as follows:

Ex a: Calculating Incentive rate for a residential 5 Ton Unit

1. The kW offset can be derived by identifying the Location, Equipment Tonnage, and Equipment SEER / EER.
  - a. 5 Ton unit at 8 SEER in Las Vegas will have a kW offset of **9.20 kW** (Reference 1-5 ton model evaluation table above).
2. A usage/discharge time is selected in hours.
  - a. For this example, **4 hours**.
3. Calculate the total energy for the usage/discharge time in Wh (the incentive rate is in Wh).
  - a.  $9.20 \text{ kW} * 1000 * 4 \text{ hrs} = \mathbf{36,800 \text{ Wh}}$ .
4. Identify the Incentives Type:
  - a. Residential.
    - i. Total Incentives Reserved.
    - ii. Time of Use or Non Time of Use (TOU) Rate.
    - iii. Incentives Cap.
      1. Lesser of \$3,000 or 50% of Equipment Cost.
  - b. Commercial.
    - i. System Size Range.
      1. 4 kW – 100 kW Capacity.
        - a. Total Incentives Reserved (\$ Range).
        - b. Time of Use or Non Time of Use (TOU) Rate (\$/Wh).
      2. 100 kW – 1,000 kW Capacity.
        - a. Total Incentives Reserved (\$ Range).
        - b. Critical or Non-Critical Infrastructure Rate (\$/Wh).
        - c. Incentives Cap.
          - i. Critical : Lesser of \$300,000 or 50% of Equipment Cost.
          - ii. Non Critical : Lesser of \$200,000 or 50% of Equipment Cost.
    - c. For this example:
      - i. Residential Incentive.
      - ii. Total Incentives Reserved = \$0 - \$1 Million.
      - iii. TOU (\$/Wh).
      - iv. Resulting Incentive = **\$0.220 /Wh**.
  5. Calculate Incentive as the energy usage/discharge calculated times the identified incentive rate.
    - a.  $36800 \text{ Wh} * \$0.220 / \text{Wh} = \mathbf{\$8,096.00}$ .

### Energy Storage Incentive Calculation Flow Chart:



Example Incentive Calculations table for a combination of various locations, and incentives types is provided below:

Equipment Nominal Tonnage (Tons)	SEER / EER	Location	kW Offset (kw)	Discharge Time (HOURS)	Energy Capacity (Single Discharge) (Wh)	Incentive Type / Rate Type	Incentive Rate (\$)	Calculated Incentive (\$)	Actual Incentive (\$)
1	8 SEER	Las Vegas	1.85	4	7,400	Residential TOU	\$0.22	\$1,628.00	\$1,628.00
1	8 SEER	Reno	1.15	4	4,600	Residential TOU	\$0.22	\$1,012.00	\$1,012.00
5	8 SEER	Las Vegas	9.20	4	36,800	Residential TOU	\$0.22	\$8,096.00	Lesser of \$3,000 or 50% of Equipment Cost
5	8 SEER	Reno	6.10	4	24,400	Residential TOU	\$0.22	\$5,368.00	Lesser of \$3,000 or 50% of Equipment Cost
10	7.68 EER	Las Vegas	18.1	4	72,400	Commercial ITC-Eligible (4kw – 100kW) Capacity	\$0.32	\$23,168.00	\$10,860.00
10	7.68 EER	Reno	13	4	52,000	Commercial ITC -Eligible (4kw – 100kW) Capacity	\$0.32	\$16,640.00	\$7,800.00
100	7.68 EER	Las Vegas	124.4	4	497,600	Commercial Non-Critical Infrastructure ITC Eligible (100kw – 1000kW) Capacity	\$0.40	\$199,040.00	\$199,040.00
100	7.68 EER	Reno	113.9	4	455,600	Commercial Non-Critical Infrastructure ITC Eligible (100kw – 1000kW) Capacity	\$0.40	\$182,240.00	\$182,240.00

## 16. APPENDIX B

### 16.1. NV Energy Storage Incentive – Incentive Calculation Approach for Refrigeration Thermal Energy Storage System (Cold Storage)

This appendix section details the approach and procedures for the accurate estimation of incentive amounts for Refrigeration Thermal Energy Storage Systems applications up to 1,000 kW of refrigeration peak load offset.

**Purpose:** Provide a comprehensive method for calculating Thermal Energy Storage (TES) load shifting capabilities for larger commercial grade users with the intention of shaving and/or shifting on-peak refrigeration demands using energy modeling information provided by customer and/or TES vendor, on-site measurements, and equipment specifications.

**Overview:** This document applies to thermal energy storage systems integrated with refrigeration applications designed to offset peak energy consumption of a direct expansion refrigerant-based refrigeration systems.

Incentive calculations for refrigeration thermal energy systems are based on the following parameters of the refrigeration system:

- Compressor load: number of compressors, nameplate compressor power, measured peak compressor power.
- Condenser load: number of condenser fans, nameplate condenser fan power, measured peak condenser fan power.
- Evaporator load: number of evaporator fans, nameplate evaporator fan power, measured peak evaporator fan power.
- Parasitic losses: if any, as specified by the refrigeration system manufacturer or system designer.

The ability of a proposed refrigeration thermal energy system to offset refrigeration system’s electric loads for a specific discharge duration period under peak operation conditions is assumed and typically estimated during a feasibility study and thermal modeling analysis conducted by the vendor. The total refrigeration system loads offset capacity (kW) multiplied by the avoided equipment runtime (hours) provides the total energy storage capacity that the thermal energy storage system can provide in a single discharge.

Refrigeration thermal energy systems may be tested upon project construction completion to validate they can provide enough thermal energy to turn off the compressor(s) and condenser(s) of the accompanying refrigeration system(s) for the discharge duration period specified in the customer incentive application.

### 16.2. Refrigeration Load Shift and Energy Storage Methodology

#### 16.2.1. Data Inputs

##### Compressors

ID / Name	Location	Nameplate kW	Measured Peak kW

<b>(a) Total Compressor(s) Peak kW:</b>			

**Condensers**

ID / Name	Location	Nameplate kW	Measured Peak kW
<b>(b) Total Condenser(s) Peak kW:</b>			

**Evaporators**

ID / Name	Location	Nameplate kW	Measured Peak kW
<b>(c) Total Evaporator(s) Peak kW:</b>			

**Parasitic Losses**

Description	Peak kW
<b>(d) Total Parasitic Losses (kW):</b>	

**Avoided Refrigeration Equipment Runtime**

<b>(e) Avoided Runtime (Hours):</b>	
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Note: The Avoided Runtime, typically 6 to 8 hours in Nevada, is estimated by the refrigeration thermal energy storage system vendor and/or system designer. It is customer’s responsibility to provide this metric and supporting thermal modeling documentation.

**16.2.2. Calculations**

**kW Offset:** The “kW Offset” metric represents the total electric refrigeration equipment load’s coincidental peak power avoided when the refrigeration thermal energy storage system in operating in discharge mode.

The “kW Offset” is calculated as follows:

$$\text{kW Offset} = (a) + (b) + (c) + (d)$$

Where:

- (a) = Total Compressor(s) Peak kW
- (b) = Total Condenser(s) Peak kW
- (c) = Total Evaporator(s) Peak kW
- (d) = Parasitic Losses kW

The calculated “kW Offset” is used to determine the appropriate incentive category under the NV Energy Energy Storage Incentives Program. For example, refrigeration thermal energy storage applications showing a “kW Offset” between 100kW and 1,000kW will be eligible under the Large Energy Storage Program, whereas applications showing less than 100kW will be eligible under the Small Energy Storage Program.

**kWh Offset:** The “kWh Offset” metric represents the energy storage capacity of the refrigeration thermal energy storage system when it operates in discharge mode.

The “kWh Offset” is calculated as follows:

$$\text{kWh Offset} = (\text{kW Offset}) * (\text{Avoided Runtime, Hours})$$

The calculated “kWh Offset” is used to determine the appropriate incentive levels (\$/kWh) under the NV Energy Energy Storage Incentives Program.