NYSERDA Bulk Storage Incentive Program Manual
Version 1, Revised March 11, 2019

Summary:

NYSERDA's Bulk Storage Incentive Program provides financial support for new energy storage systems over 5 megawatts (MW) of power measured in alternating current (AC) that primarily provide wholesale market energy, ancillary services and/or capacity services. Systems may be interconnected at the transmission, sub-transmission or distribution level and may provide distribution services in addition to wholesale services. Incentive funds will be deployed through a NYSERDA-administered declining block incentive. Eligible energy storage systems are commercially available chemical, thermal, or mechanical systems.

These incentives are designed to compensate for benefits accruing over a 20-year life of the storage asset such as cost savings resulting from reducing soft costs and accelerating the cost decline curve, environmental benefits such as carbon savings (peak/off-peak arbitrage by charging from cleaner energy off-peak to displace the need for more emitting fossil-based generation during peak periods), hosting capacity improvements, and improving system resiliency. This 20-year life includes augmentation as required of the storage technology.

This Program Manual is based on the March 11, 2019 Implementation Plan filed with the Department of Public Service and may be updated after its initial filing. A current version of this manual will be available at https://www.nyserda.ny.gov/energystorage.

I. Project Eligibility

The Bulk Storage Incentive Program is available in all Investor Owned Utility (IOU) service territories and corresponding New York Independent System Operator (NYISO) Zones, and on Long Island in NYISO Zone K, with the exception of Con Edison's service territory where incentives will be provided exclusively under Con Edison's Bulk Storage Dispatch Rights RFP. This exclusion will be re-examined after evaluating the results of the utility's first Bulk Storage Dispatch Rights RFP. Projects installed on Long Island in Zone K are also eligible subject to the availability of Regional Greenhouse Gas Initiative (RGGI) funds.

Projects must meet the following minimum project eligibility requirements in order to apply for an incentive under this Program.

- Completed its Facility Study in the New York Independent System Operator (NYISO) interconnection process, which is Stage 9 in the NYISO interconnection queue and the point at which the interconnection cost allocations are calculated (see NYISO interconnection stage list below, with more information contained within NYISO's OATT 22 Attachment P – Transmission Interconnection Procedures), or completed the equivalent distribution utility study if connecting directly into the distribution system.
- Executed agreement demonstrating site control for the duration of the project's lifespan.
- Completed draft Environmental Impact Study with a negative declaration as evidenced by meeting minutes of the local government or written approval.
- If applicable, proof that the required Article 10 Application has been deemed compliant.

NYISO Interconnection Queue Stages
1: Scoping Meeting with NYISO Pending
2: Feasibility Study Pending
3: Feasibility Study In Progress
4: System Impact Study Pending
5: System Impact Study In Progress
6: System Impact Study Approved
7: Facility Study Pending
8: Rejected Cost Allocation/Next Feasibility Study
9: Facility Study In Progress
10: Accepted Cost Allocation
11: Interconnection Agreement
12: In Construction
13: In-Service for Test
14: In-Service

Projects must also adhere to the following requirements:

- NYSERDA will only award one project per meter or per NYISO single point identifier (PTID).
- The energy storage system must be comprised of new products, electrically interconnected within New York, and that are NYISO-eligible to provide energy, capacity, and/or ancillary services.
- The storage system may not be relocated within New York without NYSERDA's written approval.
- If a project is relocated outside New York, NYSERDA will seek a return of its incentive funding from the developer or asset owner of record, calculated based on a pro-rata share of a 20-year life that the storage system would not remain in New York.
- The storage equipment must consist of commercial products carrying a manufacturer's warranty. The warranty must cover the entire energy storage system including ancillary equipment and power electronics. Experimental, beta, or prototype equipment is not eligible.
- The storage system must be certified to meet minimum safety requirements by a Nationally Recognized Testing Laboratory as evidenced by specific UL listings defined in the Program Manual. These will evolve to meet current best practices in the storage industry. These UL listings must be received by the time that the system enters commercial operation.
- Energy storage systems and components must comply with all manufacturers' installation requirements, applicable laws, regulations, codes, licensing, and permit requirements. This includes, but is not limited to, SEQR; Article 10; the International Building Code Series as amended by the New York State Uniform Code Supplement; the National Electric Code; New York State's Standard Interconnection Requirements; and all applicable State, city, town, or local ordinances or permit requirements, and any additional requirements of the local AHJ.
- The system must be designed to maintain a minimum round-trip efficiency defined in Section IX and installed in accordance with the design and system components submitted in the application and approved by NYSERDA.

The following projects are not eligible for the Bulk Storage Declining Incentive Program:

- Projects that have been dispatched by the NYISO into the day-ahead, real-time, or ancillary services markets prior to March 11, 2019.
- Projects owned by IOUs or the New York Power Authority.
- Projects with a paired renewable and storage system and compensated through a NYSERDA-awarded Renewable Energy Credit (REC) contract.
- Projects awarded an IOU Bulk Dispatch Rights contract.
- Projects that receive a NYSERDA Retail Storage Incentive.

II. Contractor Eligibility

Contractors are fully responsible for all aspects of their energy storage projects funded under the Program and must demonstrate relevant prior experience. The Contractor must provide a single point of responsibility for the installation, maintenance, and operation of the storage system for the life of the project. The Contractor may use subcontracted teams to fulfill these obligations. Regardless of the teaming arrangement, however, the Contractor remains fully responsible for all aspects of the project.

A Contractor must be registered to do business in New York State. The Contractor must meet all program requirements, including required insurance coverage and have the capability to provide or ensure that warranty services are provided on all storage systems installed. A Participating Contractor must comply with all local authority requirements for registration and licensing. Participating Contractors are prohibited from using NYSERDA's logo on their website or any marketing materials.

In its first project application to NYSERDA, the Contractor must submit evidence demonstrating that the Contractor and core project team have prior experience developing bulk energy storage, wind, PV, or other electric power generation installations. Contractors will also be evaluated on past performance in other NYSERDA and utility programs, if applicable. Contractors must submit a quality assurance plan, organizational chart, and resumes for key personnel. A project application will not be approved if the Contractor has unresolved performance issues in this or other New York State or utility programs. In subsequent project applications, the Contractor will attest that no material changes have occurred to the company or key staff.

NYSERDA reserves the right to deny project applications if the contractor is delinquent on other NYSERDA-funded projects. Any Contractor that moves forward with the installation of a project that does not yet have an approved status by NYSERDA does so at the Contractor's own financial risk. Incentives are not awarded until a project has achieved an approved status.

A Participating Contractor is responsible for:

- meeting all program requirements, as set forth in the Bulk Storage Incentive Program Manual in effect at the time
- obtaining all necessary permits and approvals
- adherence to its obligations under contract with NYSERDA
- warranties
- installation and quality of the project, including compliance with local siting regulations

Participating Contractor Resources:
Local permitting authorities, electric utilities, developers, and integrators in New York State will have access to technical assistance resources through NYSERDA. Services include market information and guidance, technical assistance, trainings, project technical and economic screenings, permitting and interconnection guidance, and site visits by expert consultants that have been retained by NYSERDA. Participating Contractors can also access fact sheets, guides, webinars, and workshops or conferences online at www.nyserda.ny.gov/energystorage or by contacting energystorage@nyserda.ny.gov.

III. Incentive Structure

The proposed incentives will be offered at a fixed amount per usable kWh of installed storage capacity measured in AC at the Commercial Operation Date. This capacity will be verified through NYSERDA's Quality Assurance inspection. Projects providing wholesale capacity services will receive the stated incentive rate. Projects providing only energy arbitrage or ancillary services will receive 75% of the stated incentive rate. Tables 1 and 2 provide the current incentive levels. Refer to the NYSERDA Energy Storage dashboard for MWs and MWhs committed and remaining funding available in the IOU service territories and on Long Island.

All projects will reserve and lock in their incentive rate at the time a completed application is submitted and approved by NYSERDA.

Table 1. Incentive Levels for Projects Less than 20 MW in Total Size
The incentive level is based upon the year in which an accepted project application is submitted to NYSERDA since projects less than 20 MW do not need to pursue the NYISO Class Year process.

2019	2020	2021	2022	2023	2024	2025
$110/kWh	$100/kWh	$90/kWh	$80/kWh	$70/kWh	$60/kWh	$50/kWh

Projects up to 20 MW will have 18 months to achieve commercial operation upon receiving the incentive award. Projects that do not achieve commercial operation by the required date will be cancelled unless a request for an extension has been submitted to NYSERDA and approved. NYSERDA may extend this time period based on extenuating circumstances outside the developer's control, as determined at NYSERDA's sole discretion.

Table 2. Incentive Levels for Projects Greater than 20 MW in Total Size
The incentive level is based upon the Class Year in which the project will be examined since any project over 20 MW must pursue the NYISO Class Year process in order to offer energy, ancillary services and/or capacity services.

First NYISO Class Year to Begin After Filing of this Plan (estimated to begin in 2019)	Second NYISO Class Year to Begin After Filing of this Plan (estimated to begin in 2021-22)
$85/kWh	$75/kWh

Projects above 20 MW will have 24 months to achieve commercial operation upon completion of the NYISO Class Year process. Projects that do not achieve commercial operation by the required date will be cancelled unless a request for an extension has been submitted to NYSERDA and approved. NYSERDA may extend this time period based on extenuating circumstances outside the developer's control, as determined at NYSERDA's sole discretion.

Changes to the Incentive Level:
Initial incentive levels and block sizes may be adjusted based on market factors, and NYSERDA will monitor uptake in each region and sector. Market conditions are expected to change, and adoption in individual regions and sectors may exceed or fall below projections. Cost data, project economics and adoption trends will be obtained from a NYSERDA storage cost components survey conducted in the first quarter of each calendar year, storage incentive applications, aggregated data from IOU procurements, market research studies, and developers. NYSERDA will re-examine the incentive levels and structure as necessary to optimize the Program's ability to achieve overall program goals. Redesign may include the reallocation of funds and capacity among sectors and regions.

NYSERDA will share information with all stakeholders regarding program progress and market conditions by making data and analysis publicly available. If changes are necessary, NYSERDA will provide sufficient notice to enable a smooth transition after gathering market data, consulting with stakeholders, and guidance from DPS staff. Changes will not reduce the size of an already awarded project that meets all requirements of this Program.

IV. Demonstrating Continued Project Viability

Upon application approval, NYSERDA will provide an award letter to the Participating Contractor and issue a contract to the Participating Contractor. The Contract will serve to reserve the incentive funds for the project. The approved project must maintain good standing in the NYISO or distribution utility interconnection queue in order to continue reserving funds. NYSERDA will verify this progress through project advancement demonstrated in the interconnection queue, discussions with the NYISO or distribution utility, and periodic reports from the Contractor demonstrating progress in meeting project development milestones.

The following major project development milestones must be demonstrated to NYSERDA as they are achieved in order to continue reserving incentive funds. Failure to provide evidence of these milestones may result in award termination. A brief project update must be provided to NYSERDA at least every 90 days.

- The developer must accept its interconnection cost allocation to continue reserving incentive funds for the project.
- Execute the interconnection agreement.
- Apply for and receive all required government permits and approvals including SEQR, Article 10 if applicable, Building Permit, Electrical Permit, and Fire Permit. Developers must keep approved permits current and not expired.
- Close project financing or demonstrate evidence of self-financing.
- Commence construction and complete construction.

- Provide NYSERDA with a commissioning report documenting the results of commissioning in accordance with manufacturer specifications.
- Enter commercial operations which is defined as when the project has begun being dispatched by the NYISO into the wholesale day-ahead, real-time, or ancillary services markets.
- The Contractor may assign the project and NYSERDA award or payments to subsequent purchasers at any stage in compliance with this Program Manual. The Contractor shall provide NYSERDA with necessary documentation to demonstrate the purchaser meets all eligibility requirements. If the project has not yet begun commercial operation, the Contractor shall provide NYSERDA with evidence of the proposed new Contractor's prior experience developing bulk energy storage, wind, PV, or other electric power generation installations.

Project Cancellation or Modification:
Requests to cancel a project must be done by submitting a request for cancellation to energystorage@nyserda.ny.gov. Should a project wish to move forward after cancellation, the Participating Contractor must submit a new project application in the portal. In this case, the incentive level and all rules in effect at the time the new application is submitted will apply. After an award has been encumbered, changes may be made to lower the number of MWs and MWhs based on the results of a NYISO or utility interconnection study. Such changes may be requested of NYSERDA by contacting energystorage@nyserda.ny.gov. Projects may not be increased in size without applying for a new incentive at the incentive level then in place. The site location may not change.

V. Submitting a Project Application

Contractors must submit project applications for incentives through the NYSERDA Web Portal. Electronic signatures may be obtained through NYSERDA's DocuSign account, which is available in the portal. Incomplete applications will not be reviewed. Project applications must meet all Technical Requirements in Section IX and submit the following as part of the Project Application:

- A copy of the completed Facility Study in the NYISO interconnection process or the equivalent distribution utility study if connecting directly into the distribution system.
- An executed agreement demonstrating site control for the duration of the project's lifespan.
- Completed draft Environmental Impact Study with a negative declaration as evidenced by meeting minutes of the local government or written approval.
- If applicable, proof that the required Article 10 Application has been deemed compliant.
- Approved Special Use Permit from the local municipality.
- Type of energy storage system and product description including manufacturer equipment specifications for all major components of the storage system, such as the storage component (e.g, battery), inverter, converter, controller and additional system components.
- Site plan including location and layout of all energy storage system components, including storage system, inverters/chargers, management system disconnects, point of interconnection, and meter.
- Installation schedule: realistic installation and interconnection schedule taking into account timeline requirements of permitting agencies and commissioning.
- Estimate of total project costs through commercial operation including development, equipment, construction, and commissioning.
- Completed and signed NYSERDA project application.

The following items must be submitted when completed and may be provided with the project application or after an award has been reserved.

- Electrical drawing: use standard symbols to clearly describe the energy storage system. Either a one- or three-line drawing is acceptable and must indicate:
    - Quantity, conductor size, and insulation type of all energized (hot) conductors, neutral/grounded conductors, and ground conductors.
    - Type and characteristics of all raceways, conduit, and enclosures.
    - The voltage and amperage ratings of all switches, inverters/chargers, batteries, electrical panels, and other relevant equipment as applicable. The rating of the main service panel and its main breaker must be given.
    - The quantity, manufacturer, and model of the inverters/chargers, and electrical storage system components.
- A decommissioning plan addressing the manner in which the energy storage system and its components will be recycled or safely disposed at the end of life or following system damage or failure, including the methods and tools necessary to indicate how the system and its components will be decommissioned and removed from the site, and how the site will be restored to its original state, if necessary. The decommissioning plan must include disposal options that comply with applicable New York State Environmental Conservation Law requirements, transportation requirements from the New York State Department of Transportation, and any other applicable laws or regulations, including State and Federal environmental laws and requirements of the local AHJ;
- Round-trip efficiency for the storage system;
- Proof of any received safety certifications detailed in the Technical Requirements under Section IX (note: these UL listings must be received by commercial operation); and
- Proof of storage system manufacturer warranty.

Design Review:
Once an application has been received by NYSERDA, the project may undergo a technical and financial review (design review). NYSERDA will review technical specifications, including the site plan and drawing, for compliance with program rules. NYSERDA will review the system sizing for feasibility. Projects that are approved will be approved at the incentive rate that existed at the time when the application was submitted. The Contractor is responsible for ensuring the energy storage system is installed in accordance with the design and system components submitted in the application and approved by NYSERDA. However, NYSERDA's approval of the project application does not guarantee the system design, engineering, construction and/or installation of the energy storage system is proper or in compliance with any particular laws (including patent laws), regulations, codes, or industry standards. Energy storage systems not installed according to the NYSERDA-approved design must have a project modification submission on file. The project modification must be approved before the incentive payment is made. Upon inspection, if it is determined the system is not installed as approved, the contractor may not be eligible for incentive payments.

VI. Quality Assurance

NYSERDA maintains the integrity of its program through an independent Standards and Quality Assurance (SQA) team, which manages the Quality Assurance (QA) system for the program. The Participating

Contractor is responsible for ensuring compliance of the system with all applicable laws, regulations, rules and standards, including requirements of the local AHJ.

The QA program has several components, including, but not limited to: a review of qualifications and credentials, paperwork audits, establishment of program standards, and comprehensive field and photo inspections. QA field and photo inspections include verification of the contracted scope of work, accuracy of the site analysis, comparison of installation to submitted design drawings, National Electric Code, International Building Codes with New York State Uniform Code Supplement compliance, and the overall delivered quality of the energy storage installation. The NYSERDA SQA team, or its representatives, may make a reasonable number of visits to the installation site before, during, and after installation of an energy storage system to assess overall compliance.

The purpose of the QA inspection is to provide NYSERDA with an opportunity to evaluate the accuracy of the site analysis and design paperwork and verify the system was installed according to all program requirements. The QA inspection also includes selected health, safety, and performance items, and specific compliance items per applicable code.

Pre-commissioning field or photo inspections as well as post-commissioning QA field or photo inspections will be conducted on each project funded under this Program. The Energy Storage project inspections will confirm that the installed storage equipment (MW/MWh AC) is as approved by the program, ensure general quality of the storage installation complies with codes, standards and industry accepted practices and inspect that appropriate metering and data logging are in place. The storage system must be commissioned in accordance with manufacturer specifications, and a commissioning report must be provided to NYSERDA.

QA field and photo inspections are conducted by a qualified independent third party, using comprehensive field inspection QA checklists that will be made available to Participating Contractors and inspection processes approved by NYSERDA. These inspections will be scheduled at the site operator's convenience. Every effort will be made to accommodate the schedule of the Participating Contractor, but the site operator's schedule and efficient scheduling of inspections shall take precedence.

Following an inspection, either field or photo, NYSERDA will produce a detailed report and determine whether the project fully complies with all program requirements and meets acceptable standards of workmanship. The QA inspection report will provide details of all evaluated elements of the project and list any nonconformances identified. The inspection report will provide an overall score of the project and identify a pass or fail. Projects that have nonconformances related to critical (health and safety) or major (system performance) attributes will automatically fail. Projects that have only nonconformances to minor or incidental attributes may pass or fail based on the number and type of nonconformance observed. Participating Contractors are required to respond to NYSERDA with proof of corrective action for those projects that received a failed inspection report. The Participating Contractor is responsible for correcting all nonconformances identified in the time required by NYSERDA, determined by NYSERDA at its sole discretion based on the degree of nonconformance.

NYSERDA has the right to provide a copy of the QA report or specific information from the field or photo inspection directly to the customer, AHJ, or the NYISO or interconnecting utility based on health, safety, and compliance concerns. In an emergency, NYSERDA or its representatives may shut down the system and will notify the contractor of such action as soon as is possible.

VII. Measurement and Verification

All projects will be required to undergo ninety (90) days of M&V to verify that the system is operating as intended. All projects funded under this program must utilize a NYISO or electric distribution utility revenue grade meter to record the net energy charged and discharged (kWh) from the energy storage system. The meter must be accurate to within ± 2% according to all applicable ANSI C-12 testing protocols and certified for accuracy by a Nationally Recognized Testing Laboratory (NRTL).

A NYSERDA quality assurance contractor shall be provided interval data showing 15-minute charge and discharge data from the energy storage system through an automated data transfer. This shall be established prior to the QA inspection, and this data shall be provided for at least five years. NYSERDA will use this data to verify system performance and extrapolate grid benefits from operation of the energy storage system. In addition, the project location, energy storage type, use case, MW and MWh size will be displayed on NYSERDA's DER Integrated Data System at https://der.nyserda.ny.gov/. Net cumulative MWh discharged may also be displayed on the DER portal, in no more granular data than cumulative quarterly totals.

NYSERDA may also generate a third-party case study at a future date, with permission from the Participating Contractor. If a project is selected for case study analysis, NYSERDA or NYSERDA's QA contractor may request the Participating Contractor to provide additional data.

VIII. Payment Terms

Payments will not begin until after the following items have been submitted and approved by NYSERDA:

- all required siting and permitting approvals;
- permission to operate, if required, from the NYISO or electric distribution utility;
- documentation of entering commercial operation demonstrated by dispatch by NYISO into the day-ahead, real-time, or ancillary services markets;
- a decommissioning plan and any other remaining items from Section IV; and
- completion of NYSERDA's quality assurance requirements including verifying usable capacity, and resolution of any issues identified.

The incentive amount will be paid in four equal payments of 25% each over three years as follows:

- Payment 1 upon completion of the above including the system beginning commercial operation defined as the project being dispatched by the NYISO into the wholesale day-ahead, real-time, or ancillary services markets.

- Payments 2, 3 and 4 will be made after each of the next 12 months of commercial operation and following submission of charge/discharge interval meter data to NYSERDA's M&V contractor.

- Projects seeking capacity rights may choose to provide ancillary services while still completing the CRIS process. In this case, the first and second payments will be made upon providing the

necessary documentation to NYSERDA. Additional payments will not be made until the project receives and begins providing capacity services.

The Participating Contractor may request payments be made to another entity by contacting NYSERDA at energystorage@nyserda.ny.gov. The contractor and payee must sign the project application agreeing to the payee assignment. All rights and responsibilities will remain with the contractor. Payees will not have access to the NYSERDA portal.

IX. Technical and Other Requirements

The following additional technical requirements apply to all projects funded under this Program.

Permanently Installed in New York State

Systems must be installed in New York, electrically interconnected within New York and permanently installed for 20 years or until end of life, whichever is greater. Physical permanence is determined by physical and electrical connections in accordance with industry practice for permanently installed equipment and securing the system to a permanent surface. Barge-based energy storage systems are considered permanent installed.

Clawback

If a project is relocated outside New York during the first 20 years of commercial operation, NYSERDA will seek a return of its incentive funding from the developer or asset owner of record, calculated based on the portion of the 20 years that the system would not remain in New York.

NYSERDA reserves the right to seek reimbursement of payments if, at any time, it learns that an approved energy storage system was not actually installed, was not installed as required under the Bulk Energy Storage Incentive Program or NYSERDA Agreement, was not installed according to the approved system design, was completely installed prior to NYSERDA's approval of the project application, or is no longer operating in accordance with the rules of the Bulk Energy Storage Incentive Program or the NYSERDA Agreement.

Energy Storage System Warranty

The storage equipment must consist of commercial products carrying a manufacturer warranty. The warranty must cover the entire energy storage system including ancillary equipment and power electronics. Experimental, beta, or prototype equipment is not eligible.

Grid Connected

The energy storage system must be connected to the transmission, sub-transmission or electric utility's distribution system and must be operated for meeting New York State electric system needs.

Safety Certifications: Listed to UL or CAN Standards

All eligible energy storage systems must be certified for safety by a Nationally Recognized Testing Laboratory (NRTL) as evidenced by listing to UL 9540 or CAN 9540 (Standard for Energy Storage Systems and Equipment) with subcomponents meeting each of the following standards that are applicable based on the storage type (chemical, thermal, mechanical): UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications), UL 1642 (Standard for Lithium Batteries), UL

1741 or UL 62109 (inverters and power converters). These listings must be received by the time that the system is seeking permission to operate from the electric distribution utility. In all cases energy storage systems must satisfy the requirements of the local AHJ. A field evaluation may also be conducted by an NRTL to the applicable product safety standard(s).

Inverter Requirements

All inverters must be certified as meeting all applicable standards of IEEE and UL and approved by the NYISO or applicable electric utility.

Round Trip Efficiency

All energy storage systems must be designed to maintain a minimum 80% round-trip efficiency during the system life. Roundtrip efficiency is considered the difference between kWh used to charge the system and kWh discharged from the system during a single cycle (i.e., alternating current in kWh used to fully charge the system from 0% usable state of charge vs. the alternative current in kWh withdrawn or displaced by the system when discharging from a 100% usable state of charge to a 0% usable state of charge in normal operations).

Other Components

All components of each energy storage system including, but not limited to, charge controllers, wiring, and metering equipment must be new equipment and certified as meeting the requirements of all relevant national, New York State, local codes and standards, and any additional requirements of the local AHJ.

Structural Requirements

The contractor is responsible for determining that a building is structurally able to support the addition of an energy storage system without overstressing the structure or increasing the load beyond acceptable national and State limits.

Compliance with Laws and Codes

Energy storage systems and components must comply with all manufacturers' installation requirements, applicable laws, regulations, codes, licensing, and permit requirements. This includes, but is not limited to, SEQR; Article 10; the International Building Code Series as amended by the New York State Uniform Code Supplement; the National Electric Code; New York State's Standard Interconnection Requirements; and all applicable State, city, town, or local ordinances or permit requirements, and any additional requirements of the local AHJ.