New York State Clean Heat

Con Edison Heat Pump Program Manual

Version 2

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Version History and Description of Revisions: Con Edison Clean Heat Program Manual

Date Filed	Version	Topic	Description of Change	Section/ Page
1/12/2023	1	N/A	N/A	N/A
3/1/2023	2	C&I Incentives	Clarification on incentive caps	Section 2.5
3/1/2023	2	New Construction	Clarification that expansion of building square footage will be considered “new construction”	Section 3.6.1
3/1/2023	2	ASHP incentives	Updated launch date for Program offering for previously incentivized partial load systems to convert to full load	Section 4.2.3
3/1/2023	2	System Eligibility for SMB Projects	Included definition of BH/square foot	Section 4.3.3.2

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1. Introduction

1.1 The New York State Clean Heat Statewide Heat Pump Program

Heat pumps have been an efficient source of heating and cooling for many years, but advances in technology now allow them to effectively address heating needs in cold climates, helping customers reduce greenhouse gas emissions. To achieve statewide heat pump goals and build the market infrastructure for a low-carbon future, the New York State ("NYS") Clean Heat Statewide Heat Pump Program ("NYS Clean Heat Program") including the NYS Clean Heat Program for Con Edison (or the "Program" as defined below) offers incentives to a wide range of customer segments in coordination with a portfolio of market development initiatives to build market capacity and deliver building electrification solutions. The NYS Clean Heat Program, a collaborative effort between the New York Electric Utilities[1] and the New York State Energy Research & Development Authority ("NYSERDA") (collectively, "Joint Efficiency Providers"[2]), is designed to provide customers, contractors, and other heat pump solution providers with a consistent experience and business environment throughout New York State.

The NYS Clean Heat Program includes a range of initiatives to advance the adoption of efficient electric heat pump systems that are designed and used for space and water heating. Core to the NYS Clean Heat Program is the suite of incentives that support customer adoption of eligible heat pump technologies, which includes air source heat pump ("ASHP"), heat pump water heaters ("HPWH"), and ground source heat pump ("GSHP") systems, through promotion and pricing discounts offered by contractors and other heat pump solution providers. In addition, the program offers incentives for envelope improvements, heat pump controls, and energy recovery ventilators/heat recovery ventilators ("ERV/HRV") when paired with an eligible heat pump system. Market development efforts include support for training and qualification of contractors, processes to assure quality installations, and marketing and education to help customers understand and select among options and to operate systems optimally.

For information about incentives and programs particulars in the service territories of Central Hudson, National Grid, NYSEG/RG&E, and Orange and Rockland, please refer to the Program Manual applicable to these utilities.[3] In addition to some information that relates generally to the NYS Clean Heat Program, the information in this Program Manual (the NYS Clean Heat Program for Con Edison Program Manual) is specific to Con Edison, and as more particularly provided below.

1.2 The NYS Clean Heat Program in Con Edison's Service Territory

Due to accelerated program achievement, Con Edison filed a petition with the Commission for additional program funding in February 2022. On May 9, 2022, after reaching its cumulative 2020-2025 program

[1] The New York Electric Utilities consist of Central Hudson Gas & Electric Corporation ("Central Hudson"), Consolidated Edison Company of New York, Inc. ("Con Edison"), Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid"), New York State Electric & Gas Corporation ("NYSEG"), Orange and Rockland Utilities, Inc. ("Orange & Rockland"), and Rochester Gas and Electric Corporation ("RG&E") (collectively, "Electric Utilities").

[2] The New York Electric Utilities and NYSERDA are referred to as "Joint Efficiency Providers" for purposes of their partnership in the NYS Clean Heat Program.

[3] The Statewide Program Manual can be found at: https://cleanheat.ny.gov/contractor-resources/.

targets, Con Edison paused accepting ASHP heat pump incentive applications. On July 11, 2022, Con Edison announced that it would place all new GSHP incentive applications in non-residential categories on a waitlist pending additional program funding. On August 11, 2022, the Commission authorized additional funding for the program and required the Company to work with Staff, stakeholders and market participants to implement necessary changes to relaunch the program, including limiting monthly expenditures to $10 million until the New Efficiency New York proceeding Interim Review concludes.[4]

As discussed in coming Sections, to better control expenditures, provide market participants certainty regarding incentive availability, and foster fairness, Con Edison adopts revised incentive levels and structures, Sectoral Allocations to distribute limited funding across customer segments, and monthly allocations for residential contractors that reserve a pre-defined quantity of incentives for each contractor.

To capture these changes that were not adopted by the non-Con Edison utilities, this Program Manual covers the NYS Clean Heat Program as implemented in Con Edison's service territory (the "NYS Clean Heat Program for Con Edison" or the "Program"). The updated version (v8) of the Statewide Program Manual for the non-Con Edison utilities has been released concurrently with the release of this Program Manual.

On January 17, 2023, Con Edison ended the program pause and began accepting new applications for ASHP projects installed after that date, issued confirmation letters for GSHP projects on the waitlist and continued accepting applications for residential GSHP installations under a modified incentive structure and program design.

[4] Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative* ("NENY Proceeding"), Order Approving Funding for Clean Heat Program (issued August 11, 2022) ("Con Edison Clean Heat Order).

2. NYS Clean Heat Program for Con Edison Summary

The New York Public Service Commission has authorized budgets for the NYS Clean Heat Program, including the NYS Clean Heat Program for Con Edison. The Program offers incentives for ASHPs and GSHPs for both space heating and cooling as well as for HPWHs for water heating. Envelope improvements, heat pump controls, and ERV/HRV may also be eligible for incentives when paired with an eligible heat pump system.

For space heating and custom domestic hot water ("DHW") projects, incentives are paid directly to Participating Contractors. For the midstream HPWH Program, incentives are paid to the Participating Distributors. The project incentive amount, less any applicable Contractor Reward, is required to be passed along to the customer. Depending on the customer segment, Participating Contractors may request that the project incentive be paid to an alternate payee.

Only Participating Contractors are allowed to apply for space heating Clean Heat incentives. To become a Participating Contractor, applicants must submit a Participating Contractor Application including a Participating Contractor Agreement for the NYS Clean Heat Program for Con Edison (available at https://cleanheat.ny.gov/contractors/). Upon approval, the applicant will receive an approval notification from Con Edison and become eligible to apply for incentives in the Program.

Each GSHP installation that requires a driller must be completed by a Participating Driller. Participating Drillers are not eligible to submit for and receive incentives. Contractors who wish to become Participating Drillers must each submit an updated Participating Contractor Application.

Distributors participating in the Midstream HPWH Program must each submit an application to become Participating Distributors.

Contractors who only install HPWHs do not have to become Participating Contractors in order to submit an incentive application on behalf of a customer.

To be eligible for incentives, heat pump projects must comply with the requirements described in this document.

The Joint Efficiency Providers recommend that site owners contact a heat pump professional to assess and implement energy efficiency opportunities related to building envelope and HVAC distribution system prior to, or in coordination with, installing a heat pump system. Common thermal efficiency upgrades include attic and wall insulation, air sealing, and duct sealing. These types of improvements can help reduce energy costs and enable the installation of an efficiently sized cold-climate heat pump. Site owners can elect to receive incentives for a "Heat Pump + Envelope" project under Category 4a (see Section 3: Eligibility and Requirements for more details). Site owners can also access additional building envelope incentive programs and assistance through NYSERDA or their local utility.

The Joint Management Committee ("JMC"), which is responsible for reviewing and maintaining the NYS Clean Heat Program, follows a process for making ongoing changes to program areas including incentive structure, eligible technologies, program rules, and other features in order to be responsive to technology and market developments and to maintain market confidence and stability. In appropriate circumstances, Con Edison also reserves the right to implement necessary changes on its own. Participating Contractors will be notified electronically of any program modification or change, and reference documents are publicly available on the NYS Clean Heat Resources webpage

(https://cleanheat.ny.gov/contractor-resources).

Starting in May 2021, the JMC began a regularly recurring Participating Contractors and Industry Partners ("PC&IP") Working Group Series webinar that is open to all industry program participants. This quarterly webinar is a public forum for stakeholders to introduce topics for discussion for a larger audience and provide specific program and project feedback, as well as for the JMC members to share key program updates and changes. Stakeholders that wish to be included in this quarterly forum or propose topics for discussion can do so by emailing NYSCleanHeat@ceadvisors.com.

Details on participation and prior discussions can also be found on the NYS Clean Heat Resources webpage (https://cleanheat.ny.gov/contractor-resources/) under the "Working Group Series" heading.

While the PC&IP webinars will serve as the primary avenue for Statewide stakeholder engagement, Con Edison also hosts broad and targeted sessions for market participants and stakeholders. We invite you to reach out to the Program Administrators directly for specific issues as well. Contact information is included in Section 6 of this Program Manual.

This NYS Clean Heat Resources webpage includes other important information and resources under the following headings:

- Working Group Series
- Training and Workforce Development
- Green Jobs — Green NY (GJGNY) Residential Financing
- Ground Source Heat Pump (GSHP)
- Air Source Heat Pump (ASHP)
- Heat Pump Water Heaters (HPWH)
- Program Development, Approvals and Process Documents
- Standards and Field Assessments
- Submit Incentive Applications
- For Manufacturers

2.1 Available Incentive Funding

The NYS Clean Heat Program for Con Edison offers incentives that are specific to the technology and sector, including residential, multifamily ("MF"), small and medium business ("SMB") and commercial and industrial ("C&I"), with additional incentives available for HPWHs through both custom categories and the midstream program.

Until further notice, the NYS Clean Heat Program for Con Edison is limited to $10 million of expenditures per month. Con Edison will divide up that budget and publish sectoral allocations. The budget will be allocated into six categories: residential ASHP, residential GSHP, non-residential ASHP, non-residential GSHP, HPWH, and funds retained to administer the programs. Con Edison will accept applications up to the sectoral allocation for each sector in a given month. Applications that are submitted after that cap is reached will be waitlisted.

Projects will draw down their sectoral allocation funding with timing that is specific to sector and technology as summarized in Table 1.

Table 1: Time at which projects draw down Sectoral Allocation

Project Sector and Technology	Date a Projects Draws Down its Sectoral Allocation
Residential ASHP	Con Edison receives a complete post-installation incentive application
Residential GSHP	Con Edison receives a pre-installation application with signed customer agreement
All non-residential space heating	Con Edison issues a Preliminary Incentive Offer Letter ("PIOL")
Midstream HPWH	Con Edison receives a complete incentive application

Across all sectors, incentives are limited to the listed rates or 50% of project costs, whichever is lower.[5] Existing buildings, including gut renovations, are eligible for incentives for ASHP, GSHP and HPWH. New construction is not eligible to receive incentives for ASHP for heating. New construction is only eligible to receive incentives for GSHP for space heating, GSHP paired with other custom water solutions, GSHP paired with envelope improvements or HPWH incentives through the midstream program.

All residential ASHP must be on the Northeast Energy Efficiency Partnership ("NEEP") Cold Climate Air Source Heat Pump (ccASHP) Product List ("NEEP List")[6].

The NYS Clean Heat Program for Con Edison provides incentives under 10 categories differentiated by sector. The incentive categories are as follows:

- Category 2a — *ccASHP: Residential Full Load Heating with Integrated Controls*
- Category 2b — *ccASHP: Residential Full Load Heating with Decommissioning*
- Category 2c — *ASHP MF Full Load Heating with Decommissioning*
- Category 2d — *ASHP SMB Full Load Heating with Decommissioning*
- Category 3 — *GSHP: Residential Full Load Heating*
- Category 4 — *Custom Full Load Space Heating Applications*
- Category 4a — *Custom Full Load Space Heating Applications + Envelope*
- Category 5 — *HPWH (up to 120 gallons of tank capacity)*
- Category 6 — *Custom Hot Water Heating Applications*
- Category 10 — *C&I Custom Partial Load Space Heating Applications*

2.2 Residential Incentives

There are three categories of incentives available for residential space heating in the Con Edison service territory: Category 2a – *ccASHP: Residential Full Load Heating with Integrated Controls*, Category 2b – *ccASHP: Residential Full Load Heating with Decommissioning,* and Category 3 – *GSHP: Residential Full Load Heating*. The rates for the ASHP categories vary by building type with different rates as summarized in Table 2.

[5] Customers participating in a non-pipes alternative ("NPA") may receive incentives from the NPA that, when aggregated with Clean Heat incentives, exceed 50% of project costs.
[6] NEEP. Northeast Energy Efficiency Partnership ("NEEP") Cold Climate Air Source Heat Pump (ccASHP) Product List. Available at ASHP (neep.org).

Table 2: Residential Incentives

Category Number	Description	Single Family Home and Whole Building for 2-Dwelling-Unit Buildings	Per Dwelling Unit[7] in 2-4 family building & per individual Dwelling Unit in 5+ unit buildings
2a	ccASHP: Full Load Heating with Integrated Controls	$2,500	$1,000
2b	ccASHP: Full Load Heating with decommissioning	$8,000	$3,000
3	GSHP: Full Load Heating	$20,000/building	

For Category 2a, the integrated controls package must be connected to existing fossil fuel heating equipment and must operate the heat pump as the first stage/primary heating system. For further eligibility specifications, see Section 4.2 of this Program Manual on the Residential incentive offerings.

Both Categories 2b and 3 require the projects decommissioning of all existing fossil-fueled units. In order to be eligible for the whole building rate in cases where there are two units in the building, both units must be electrified, and any existing fossil-fuel heating equipment serving the Dwelling Unit for space heating decommissioned.

2.3 Multifamily ("MF") Incentives

Multifamily incentives are available for projects in buildings with at least five Dwelling Units. All multifamily incentives require decommissioning over the scope of the project. Incentives will be capped at $1 million per project or 50% of project costs, whichever is lower.

Table 3: Multifamily Incentives

Category Number	Description	New Construction (GSHP Only)	Existing Buildings (ASHP and GSHP)
2c	Multifamily Full Load ASHP Heating with Decommissioning	N/A	$4,000/dwelling unit
4	Custom Full Load Space Heating Applications	$125/MMBtu	$200/MMBtu
4a	Custom Full Load Space Heating Applications + Envelope - Tier 1	$125/MMBtu	$200/MMBtu
	Custom Full Load Space Heating Applications + Envelope - Tier 2	$150/MMBtu	$225/MMBtu

[7] The Program adopts the definition of Dwelling Unit from the NYSECC: "A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation."

6	Custom Domestic Hot Water ("DHW")	$125/MMBtu*	$200/MMBtu

*Custom Domestic Hot Water in new construction is only eligible for Clean Heat incentives when completed in conjunction with GSHP for space heating.

Category 2c incentives are available to buildings with 50 Dwelling Units or fewer. See Section 4.3 of this Program Manual for more details on the relevant application process, and Section 4.4 for more details on the Multifamily Program.

2.4 Small and Medium Business Incentives

Commercial customers with an average annual peak demand of 300 kW or less are eligible for SMB incentives. All SMB incentives require decommissioning over the scope of the project. Partial load projects are not eligible. New construction is not eligible for incentives for ASHPs.

Incentives will be capped at $100,000 per project or 50% of project costs, whichever is lower.

ASHP in Table 4 includes all non-GSHP technologies. Existing Buildings include gut renovations.

Table 4: SMB Incentives

Category	**Description**	**GSHP**		**ASHP**
		New Construction	Existing Buildings	Existing Buildings
2d	SMB Full Load ASHP Heating with Decommissioning (<1,000 square feet)	N/A	N/A	$2,500/project
2d	SMB Full Load ASHP Heating with Decommissioning (1,000-2,500 square feet)	N/A	N/A	$5,000/project
4	Custom Full Load Space Heating Applications	$125/MMBtu	$200/MMBtu	$150/MMBtu
4a	Custom Full Load Space Heating Applications + Envelope	$125/MMBtu	$200/MMBtu	$150/MMBtu
6	Custom Domestic Hot Water ("DHW")	$125/MMBtu*	$200/MMBtu	$200/MMBtu

*Custom Domestic Hot Water in new construction is only eligible for Clean Heat incentives when completed in conjunction with GSHP for space heating.

2.5 Commercial and Industrial Incentives

Con Edison Commercial customers with an average peak demand above 100 kW on a rolling 12-month basis are eligible for C&I Clean Heat incentives, excluding Multifamily buildings. Commercial customers between 100-300 kW may also choose to participate with Con Edison through the Small to Medium Business (SMB) sector of the Program.

Clean Heat incentives cannot exceed 50% of the project costs of the eligible Clean Heat measure(s) or 100% of each eligible measure's cost. Total Clean Heat incentives are capped at $1,000,000 for all projects, per account per year.

ASHP in Table 5 includes all non-GSHP technologies. Existing Buildings include gut renovations.

Table 5: C&I Incentives Summary

Category Number	Description	GSHP		ASHP
		New Construction ($/MMBtu)	*Existing Buildings ($/MMBtu)*	*Existing Buildings ($/MMBtu)*
4	Custom Full Load Space Heating Applications	$125	$200	$120
4a	Custom Full Load Space Heating Applications + Envelope - Tier 1	$125	$200	$120
	Custom Full Load Space Heating Applications + Envelope - Tier 2	$150	$225	$150
6	*Custom Hot Water Heating Applications*	$125*	$200	$200
10	C&I Custom Partial Load Space Heating Applications	N/A	$100	$70

*Custom Domestic Hot Water in new construction is only eligible for Clean Heat incentives when completed in conjunction with GSHP for space heating.

2.6 Modifications to Incentives

In the event of a future reduction in incentives, Con Edison will generally honor the previous higher rate for projects that have a signed customer commitment as of the date of the announcement of the lower incentive rates. To be eligible for such treatment, Participating Contractors must submit signed contracts and additional supporting documentation as required, within two weeks of announcement of reduced incentives.

Con Edison may change the incentive offerings (including but not limited to total incentive amount, Participating Contractor Reward, timing, recipient, incentive structure, and cap) at any time. Con Edison may further limit the number of incentives per Participating Contractor, site owner, site, or meter. Program changes could result in changes to this Program Manual. Changes will be e-mailed to Participating Contractors and posted at the Clean Heat Contractor Resources Page (https://cleanheat.ny.gov/contractor-resources). The incentive amount for any project will be based on the incentive offering and program rules that are in effect at the time of application except in cases where alternative incentive rates are being honored as described above. Participating Contractors are prohibited from cancelling submitted incentive applications and re-applying if the new incentive payment results in a higher amount. Con Edison may structure incentive payments differently to accommodate unique situations.

2.7 Coordination with NYSERDA Programs

NYSERDA implements programs to promote the adoption of electric heat pump technologies, such as through its NYS Clean Heat Market Enablement portfolio. When projects are eligible for both NYS Clean Heat program incentives as well as NYSERDA program funding sources, projects may be eligible to receive funding from both – provided that each program supports achievement of distinct outcomes.

In each project scenario, total combined funding from the NYS Clean Heat program and NYSERDA programs shall not exceed:

- 70% of total heat pump project cost, for market rate participants
- 85% of total heat pump project cost, for most Low-to-Moderate Income ("LMI") participants as defined by the Statewide LMI Program Manual.[8]

Additional specific guidance may apply to a specific NYSERDA program and shall be made clear in the respective program's description.

Con Edison may limit total combined funding for any project at any time.

2.8 Financing Options

2.8.1 Green Jobs – Green New York Financing

NYSERDA administers the Green Jobs – Green New York ("GJGNY") Residential Financing Program, which was authorized by Title 9-A of Article 8 of the Public Authorities Law of the State of New York, as amended (known as the Green Jobs – Green New York Act) to finance energy audits and energy efficiency retrofits or improvements, including solar energy and other renewable installations, for the owners of residential one- to four-family buildings ("GJGNY Loan").

The GJGNY Residential Financing Program offers three types of GJGNY Loans, which are unsecured loans up to twenty-five thousand ($25,000) dollars for one- to four-family residential energy efficiency improvements or renewable energy system projects. The Smart Energy Loan ("SEL") requires the Customer to make monthly loan payments directly to NYSERDA's loan servicer, Concord Servicing Corporation ("Concord"). The On-Bill Recovery ("OBR") Loan allows Customers to repay the GJGNY Loan through an installment charge on a bill from one of the involved electric or gas utilities (Central Hudson, Con Edison, Long Island Power Authority, National Grid – Upstate, New York State Electric and Gas Corporation, Rochester Gas and Electric Corporation, or Orange and Rockland Utilities). The utilities then remit repayments to Concord, who coordinates data communications with each utility. The Renewable Energy Tax Credit Bridge Loan ("Bridge Loan") is a short-term loan product that enables customers to finance federal and state tax credits and New York City ("NYC") Real Property Tax Abatement for eligible renewable energy system costs. Customers will make a balloon payment of principal and interest at loan maturity via statement billing/check or automatic clearing house ("ACH") payment.

NYSERDA also administers Companion Loans, which are funded by the New York Green Bank, a division of NYSERDA. The Companion Loan will be available to Customers that have fully utilized the GJGNY Loan

[8] New York State Affordable Multifamily Energy Efficiency Program, Program Manual Version 1.5, p 15 (Filed October 17, 2022). Available at https://www.nyserda.ny.gov/-/media/0E28A40DFFC94FFD9501280DC4700311.ashx

for their energy efficiency or renewable energy system project and need additional loan funding to pay for remaining project costs. Companion Loans are an unsecured loan modeled after the SEL (repaid by statement billing/check or ACH payment). The Companion Loan is not eligible for OBR.

Complete details of these residential financing options can be found on the NYSERDA Residential Financing Options webpage (https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Programs).

The ability to provide access to GJGNY and Companion Loans through the GJGNY Residential Financing Program is reserved exclusively for Participating Contractors, including the NYS Clean Heat Program Participating Contractors. At no time may a non-participating subcontractor of a Participating Contractor represent itself as having the ability to access GJGNY or Companion Loans. The Participating Contractor shall ensure that the GJGNY and Companion Loans are utilized only for the installation of those eligible measures and accessories identified in the supporting documentation submitted to, and satisfactorily approved by, the GJGNY Residential Financing Program.

The participation enrollment requirements, roles, and responsibilities of a Participating Contractor offering a GJGNY Loan can be found in the Green Jobs – Green New York Residential Program Manual, hereby incorporated in this Program Manual by reference and located on NYSERDA's Become a Loan-offering Contractor (https://www.nyserda.ny.gov/All-Programs/Become-a-NYSERDA-Qualified-Contractor/Become-a-Loan-offering-Contractor). Participating Contractors are required to additionally execute the GJGNY Participation Agreement to participate in the GJGNY Residential Financing Program.

If a Participating Contractor wishes to offer financing other than GJGNY financing, they will need to comply with all applicable NYS and federal laws and regulations including NYS Banking Law.

2.8.2 Con Edison Clean Heat Financing

Con Edison's Clean Heat Financing Program connects Con Edison's customers and participating contractors to a qualified network of select third-party finance providers that provide funding for various building types to increase the adoption of clean heat technologies. With Clean Heat Financing, building owners have access to new financing alternatives to cover the costs of clean heat upgrades using third-party ownership.

To learn more about Con Edison's Clean Heat Financing Program, please visit https://www.conEd.com/CleanHeatFinancing, or email ConEd@CleanHeatFinancing.com.

3. Eligibility and Requirements

Projects and Participating Contractors must meet the requirements in this Program Manual for incentive eligibility.

3.1 Site Eligibility

Eligible sites include new and existing buildings owned or controlled by an active Con Edison customer where an eligible heat pump system for space heating, hot water heating, and/or process heating is being installed.

3.2 Eligible Technologies

Eligible measures are grouped into several major categories:

(1) Air Source Heat Pumps for space heating applications, including:
   a. Cold Climate Air-to-Air Mini-Split Heat Pumps
   b. Cold Climate Air-to-Air Single Packaged Heat Pumps
   c. Air-to-Air Large Commercial Unitary Heat Pumps (single packaged or split system)
   d. Air Source Variable Refrigerant Flow Heat Pumps
   e. Packaged Terminal Heat Pumps
   f. Single Package Vertical Heat Pumps
(2) Ground Source Heat Pumps for space and water heating applications
(3) Heat Pump Water Heaters for domestic and service water heating applications, including:
   a. Air-to-Water HPWHs
   b. Ground Source Heat Pump Desuperheaters
   c. Dedicated Water-to-Water Heat Pump added to Ground Loop
(4) Non-Code Required Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs) paired with eligible heat pumps
(5) Building Envelope Upgrades paired with eligible heat pumps
(6) Advanced controls paired with eligible heat pumps

Heat pump systems used for space heating must be designed for both heating and cooling; cooling-only systems are not eligible for Clean Heat incentives. The eligibility of each group of technologies for incentives is summarized by category in Table 6.

Table 6: Space Heating Eligibility by Technology and Category

Technology	Residential (2a, 2b, or 3)	Non-Residential (2c, 2d, 4, 4a, 10)
Mini-splits (MSHP)	Yes	Yes
Central ccASHP	Yes	Yes
Commercial Unitary (Split or Single)	No	Yes
ASVRF	Yes	Yes
ccPTHP	Yes	Yes
SVHP	No	Yes
GSHP	Yes	Yes
GSVRF	Yes	Yes

Custom technologies beyond those listed in Table 6 may be eligible to apply for Clean Heat incentives in the custom categories subject to Con Edison approval.

With the exception of Category 10 - C&I Custom Partial Load Space Heating Applications, all heat pump systems shall be designed and sized for full-load heating defined as satisfying at least 90% of the building heating load or of the project's scope of work.

The installation of used or refurbished equipment and components is not permitted under the program. For projects installed at new construction sites, all components installed as part of an approved GSHP or HPWH system must be new. For projects installed at existing sites, the heat pumps must be new and any system subcomponent or subassembly such as controls or ductwork that is replaced should be replaced by a new subcomponent or subassembly.

Heat pump projects are eligible for incentives when they replace other technologies and fuels (e.g., fuel oil, natural gas, propane, biomass, or electric resistance) in existing buildings. Heat pump projects are not eligible to receive Clean Heat incentives when they replace like-for-like technologies (e.g., ASHP-for-ASHP or GSHP-for-GSHP).

All heat pumps must be installed by Participating Contractors and must be installed *after* January 17, 2023.

Refer to Section 4 of this Program Manual for project application submission requirements including when to submit during a project's life cycle and required timeframes for heat pump installation.

3.2.1 System Sizing

The use of ASHPs in cold climates is growing rapidly, but system sizing and selection practices have not always kept up with the wide range of applications that are now available. System performance, comfort, and energy efficiency can be significantly impacted by poor sizing and system selection. The ASHP and any connected ductwork must be properly sized for the application to meet the building heat load requirements, ensure occupant comfort and satisfaction, and optimize system performance and energy savings. Participating Contractors must review and use the NEEP G*uide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates*[9] to assist in sizing and selecting ccASHP equipment where applicable.

To be eligible for incentives, all heat pump systems must be sized in compliance with applicable state and municipal code.[10] Residential heating and cooling equipment and appliances shall be sized in

[9] NEEP. "Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates". Available at https://neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf

[10] ECCCNYS 2016, Section R403.7 and 2016 New York City Energy Conservation Code (NYCECC), Section R403.7. ECCCNYS 2016 and 2016 NYCECC require that systems serving multiple dwelling units, where commercial code is applicable, follow Sections C403 and C404 of the respective codes. In general, heat pumps installed in dwellings where residential code is applicable are required to be sized per ACCA Manual S. The intent is to match the equipment capacity closely to the load calculations of ACCA Manual J. In addition to program requirements regarding sizing heat pumps relative to the heating load, Manual S sets a maximum low-speed heat pump cooling capacity (which corresponds to minimum capacity on NEEP Cold Climate Heat Pump List information sheets) of 115% of the total Manual J cooling load for multi-speed or variable-speed heat pumps. As an alternate, if the sensible heat ratio (SHR) is ≥ 95%, the maximum low-speed cooling capacity may be 15,000 Btu/h greater than the total Manual J cooling load for multi-speed or variable-speed heat pumps. For a single-speed water-to-water heat pump utilizing a buffer tank, the limit of 115% applies only to indoor coils that provide cooling from the buffer tank.

accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.[11] Applicable exceptions shall apply.[12]

Participating Contractors are also encouraged to use additional design manuals as applicable to the system, including ACCA[13] Manual D: Duct Design,[14] ACCA Manual T: Air Distribution,[15] and ACCA Manual B: Test, Adjust and Balance.[16.] All ASHP installers seeking to become Participating Contractors must provide documentation that they have completed a manufacturer-sponsored ASHP Sizing and Design Training course. Effective March 1, 2023, all existing participating ASHP contractors are required to take their preferred manufacturer's version of the ASHP Sizing and Design training and submit documentation of completion. A grace period of three months following the effective date allows additional time for compliance with the existing Participating Contractor training requirement. Available trainings are posted on the Clean Heat Connect trainings calendar (located at https://cleanheatconnect.ny.gov/calendar/sizinganddesign) and updated regularly.

Equipment installed in commercial buildings must be sized in accordance with heating and cooling load calculations following ANSI[17]/ASHRAE[18]/ACCA Standard 183-2007 (RA2017) or other code-approved equivalent computational procedure.[19] The output capacity of heating and cooling equipment shall not be greater than that of the smallest available equipment size that exceeds the calculated loads. A single piece of equipment providing both heating and cooling (such as a heat pump or heat pump system) shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.[20]

All heat pump systems for full-load space heating shall be designed and sized to satisfy at least 90% of the building heating load ("BHL") at design conditions, with the ability to distribute heat adequately

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The NYS Clean Heat Program considers the above cooling capacity limits to be best-practice targets, not absolute program rules. Contractors must make a good faith effort to select equipment whose combined low-speed cooling capacity is within the above guidelines.

[11] 2020 Residential Code of NYS, Section 14, Section M1401.3 Equipment and appliance sizing

[12] The Joint Efficiency Providers coordinated with NY Department of State ("DOS") and others to provide an efficient path for activity under the NYS Clean Heat Program providing for the ability to confirm the eligibility of additional heat pump installations. This coordination resulted in a DOS-issued Technical Bulletin (TB-7005-ECCNYS) clarifying the process of approving alternate methodologies for the calculation of heating and cooling loads and the sizing of residential heating and cooling equipment. One such alternative sizing methodology resource, Alternate Methodology to Demonstrate Energy Code Compliance: Heat Pump Sized to Meet Heating Design Load can be found under the Resources page of https://cleanheat.ny.gov/contractors/.

[13] Air Conditioning Contractors of America

[14] ACCA Manual D: Duct Design: Method used to determine the overall duct layout including the individual duct sizes.

[15] ACCA Manual T: Air Distribution: Method used to determine how to distribute airflow.

[16] ACCA Manual B: Test, Adjust and Balance: Method designed to test and balance HVAC equipment in an order that speeds up and improves the balancing process.

[17] American National Standards Institute

[18] American Society of Heating, Refrigerating, and Air-Conditioning Engineers

[19] ECCCNYS 2016, Section C403.1.1 Calculation of heating and cooling loads

[20] ECCCNYS 2016, Section C403.3.1. The intent of this section is to provide some flexibility in design for systems such as heat pumps that provide both heating and cooling. For a commercial building that has a higher building heating load ("BHL") than building cooling load ("BCL"), the heat pump system capacity shall be as small as possible so as to adequately satisfy the BHL, while minimizing oversizing for the cooling function to the extent possible with available equipment. For commercial buildings for which BCL is higher than BHL the heat pump system capacity shall be as small as possible so as to adequately satisfy the BCL, while minimizing oversizing for the heating function.

across all occupied spaces in the project scope. All heat pump systems for projects in categories that require decommissioning (*e.g.*, Categories 2b, 2c, 2d, 3, 4 or 4a) must be sized to meet 100% of the load over the project scope at design conditions. In cases where a building has a higher Building Cooling Load ("BCL") than BHL, the system must be sized to satisfy full BCL as required by relevant municipal or state code.

Category 10 - *C&I Custom Partial Load Space Heating Applications* offers incentives for heat pump systems defined as a prioritized, first-stage heat pump systems installed alongside a supplemental, second-stage heating system for the purpose of providing heating. The supplemental heating system may be either a new or existing system. A partial load system has a total system heating capacity that satisfies less than 90% of the BHL at design conditions.

Category 6 - *Custom Hot Water Heating Applications* projects may also be considered for partial load heating, provided the incentive application sufficiently justifies this approach. If a proposed Category 6 *Custom Hot Water Heating Applications* project is a partial-load heating system, the project application must include an explanation as to:

- Why additional electrification beyond the project's proposed design is not feasible at the time of installation
- How a verifiable and reliable control strategy will be employed to ensure that the heat pump is prioritized for heating.

Each partial-load heating system will be subject to a review on a case-by-case basis.

The following are examples of heat pump systems qualifying for full load heating:

- *Full Load Heating Example 1:* the heat pump system provides 110% of the heating load for an entire commercial building. Since the system provides more than 90% of the heating load for the building, it qualifies as a full load heating system.
- *Full Load Heating Example 2:* the heat pump system is an independent heating system that satisfies 100% of the heating load of served 3 floors of a 10-floor commercial building. The remaining 7 floors will be heated using the existing boilers. In this case, the program will consider the 3 floors in the scope of the project. Since the heat pumps satisfy more than 90% of the heating load for the areas they serve, they qualify as full load heating systems. The participating contractor has submitted justification for completing three of ten floors.
- *Full Load Heating Example 3:* the heat pump system is a GSHP that serves 100% of the load in 90% of a residential house with the remaining 10% fulfilled by ASHP. The project will be eligible for full-load Category 3 incentives.

Equipment sizing may be determined using applicable equipment documentation, including:

- NEEP Cold Climate Air Source Heat Pump List product information sheet, if equipment is NEEP-listed.[21] For NEEP-listed equipment, the heating capacity shall be based on the equipment's NEEP certificate maximum heating capacity values, while the cooling capacity shall be based on the equipment's NEEP certificate minimum cooling capacity values. Project applications shall include the NEEP specification sheet with the corresponding version number of the NEEP equipment requirements, as applicable at the time of installation.

[21] Information on performance of qualifying NEEP Cold Climate ASHPs is available at: ASHP (neep.org).

- AHRI certificate, where the product is not NEEP-listed
- Manufacturer engineering documentation, where the product is not NEEP-listed
- Manufacturer-developed software that is capable of assigning equipment capacity at entered design heating and cooling temperature, in accordance with ACCA Manual S, Standard 183, or other code-approved equivalent computational procedure

The Program reserves the right to request additional justification or documentation regarding heat pump system sizing, including for systems that have sizing ratios substantially greater than 120% BHL and 115% BCL.

Refer to Appendix 2 for more information on how to calculate heating and cooling sizing ratios.

Calculation of the BHL shall be at the 99% dry bulb heating design temperature for the most relevant ASHRAE (2021) location. Calculation of the BCL shall be at the 1% dry bulb cooling design temperature for the same ASHRAE location. Design temperature requirements in this Program Manual may be superseded by the local Authority Having Jurisdiction ("AHJ"). In such cases, contractors must provide documentation citing the applicable local requirement. Refer to Table 7 below for ASHRAE (2021) dry bulb heating and cooling design temperatures for various locations across New York State.

Table 7: Dry Bulb Design Temperatures

City Name	2021 ASHRAE	
	99% Heating Dry Bulb (deg F)	1% Cooling Dry Bulb (deg F)
New York City - Central Park	17.3	87.9
New York City - JFK	17.5	86.7
New York City - LaGuardia	17.9	89.8
White Plains	12.9	86.4

Load calculations may use dry bulb temperatures that differ from those in Table 7, but in those cases, must be within five degrees (+/-) of the applicable values in Table 7.

3.2.2 Equipment Installation

To be eligible for Program incentives, Participating Contractors and their agents must install systems and system components in accordance with manufacturer specifications and installation requirements, and in compliance with all applicable laws, regulations, codes, licensing, and permit requirements including, but not limited to, the New York State Environmental Quality Review Act, the Statewide Uniform Fire Prevention and Building Code and State Energy Conservation Construction Code, the National Electric Code, Fire Codes, and all applicable state, city, town, or local ordinances and/or permit requirements. Participating Contractors and their agents must also follow best practices for all aspects of installation, including the appearance of the property upon project completion. Con Edison may verify adherence to these requirements and determine incentive eligibility based on its findings.

Outdoor units should be installed above the local snow line. The appropriate corresponding snow line can be determined using the NYS Clean Heat Prescriptive Categories Incentive Calculator and Statewide

Custom Clean Heat Calculator found on the NYS Clean Heat Resources webpage (https://cleanheat.ny.gov/contractor-resources/). Systems must be installed to pass all requirements of the Con Edison Field Inspections and Oversight process detailed in Section 5, and its associated Inspection checklists.

3.2.3 Air-Source Heat Pumps

Air-source heat pumps transfer heat between the inside of a building and the outside air. A heat pump's refrigeration system consists of a compressor and two coils made of copper tubing (one inside and one outside), which are surrounded by aluminum fins to aid heat transfer. In the heating mode, liquid refrigerant in the outside coils extracts heat from the air and evaporates into a gas. The inside coils release heat from the refrigerant as it condenses back into a liquid. A reversing valve, near the compressor, can change the direction of the refrigerant flow for cooling as well as for defrosting the outside coils in winter.

Under the NYS Clean Heat Program, to be eligible for a program incentive, ASHP systems must either be listed on the NEEP Product List[22] or meet the criteria established in this Program Manual and the NYS Clean Heat Implementation Plan for equipment that is not covered by the NEEP Product List.

There are several categories of ASHPs eligible for the NYS Clean Heat Program, including:

(1) Central ccASHPs that are identified on the NEEP Product List
(2) Ductless or partially ducted mini-split heat pumps ("MSHP") that are identified on the NEEP Product List and qualify as ccASHP. These include "single-head" (one indoor air handler per outdoor compressor) and "multi-head" or "multi-split" (more than one indoor air handler per outdoor compressor) units.
(3) Commercial Unitary (i.e., Large Commercial) ASHPs (Split or Single Package)
(4) Air Source Variable Refrigerant Flow ("ASVRF")
(5) Packaged Terminal Heat Pumps ("ccPTHP")
(6) Single Package Vertical Heat Pumps ("ccSPVHP")

The heat pump system that is installed must be capable of operating year-round.

3.2.3.1 Central Cold Climate ASHPs

Central Air Source Heat Pumps listed by NEEP as ccASHPs have cooling capacities less than 65,000 Btu/h and are not contained within the same cabinet as a furnace with rated capacity greater than 225,000 Btu/h.[23] These units are typically sized to provide heating and cooling to the whole building through a central duct distribution system. They are generally a retrofit solution for existing buildings that are replacing central air conditioners, which were installed in conjunction with a separate heating system (typically a fossil fuel or electric furnace) that shares the same duct distribution system.

All individual heat pumps in the installed system must be listed by NEEP as ccASHPs, tested under AHRI test standard 210/240, powered by single-phase electricity, have cooling capacities <65,000 Btu/h, and

[22] The current specification and listed eligible units are available at https://neep.org/ASHP-Specification.
[23] Code of Federal Regulations ("CFR") 10 CFR part 430, Subpart A, § 430.2 Definitions: definition of central air conditioner or central air conditioning heat pump: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=29d99fa0a367f0166b9cc8528ad29023&mc=true&n=pt10.3.430&r=PART&ty=HTML#se10.3.430_12.

may not be installed in the same cabinet as a furnace with heating capacity ≥225,000 Btu/h.

The Participating Contractor shall verify and document the system's operation with the equipment manufacturer's specifications.

3.2.3.2 Cold Climate Mini-Split Heat Pumps

Cold climate MSHPs are ccASHPs that can circulate refrigerant between an outdoor unit containing a variable capacity compressor and one or more indoor air handlers ("indoor units"). Cold climate MSHPs are often referred to as "ductless mini-splits" because they are typically ductless but can also be installed with short duct runs that enable single indoor units to serve more than one room at a time. For existing homes and businesses that have no central ductwork, cold climate MSHPs are a viable and energy efficient solution.

To be eligible for Clean Heat incentives, cold climate MSHPs must be on the NEEP ccASHP Product List and tested under AHRI test standard 210/240.

3.2.3.3 Commercial Unitary Systems/Large Commercial ASHPs

Large commercial ASHPs are systems that have either of the following characteristics:

- Include individual heat pump appliances that are powered by three-phase electricity or
- have rated cooling capacities ≥65,000 Btu/h

In addition, systems must consist of multi-speed or variable speed compressors. Constant speed systems are not eligible for incentives.

Large commercial ASHPs are a retrofit solution for businesses and multifamily buildings that currently have rooftop or central air conditioners, which were often installed in conjunction with a separate heating system.

Commercial ASHPs must meet the ENERGY STAR® specification for Light Commercial HVAC, which covers heat pumps with cooling capacity ranging from 65,000 Btu/h up to 240,000 Btu/h.[24] Systems with individual heat pump appliance sizes of 240,000 Btu/h and above, must have efficiencies that meet or exceed local energy code efficiency requirements. These systems are tested under AHRI Test Standard 340/360.

3.2.3.4 Air Source Variable Refrigerant Flow Heat Pump Systems

Air Source Variable Refrigerant Flow (ASVRF) systems are engineered direct exchange (DX) multi-split systems that circulate refrigerant between a variable capacity compressor and multiple indoor air handlers, each capable of individual zone temperature control. They provide some major advantages, including the ability for heat recovery that allows them to heat and cool different zones simultaneously, optimized performance across a range of zonal comfort levels and partial load conditions, and the avoidance of ductwork or the need for secondary circulation fluids such as chilled or heated water. Because they circulate refrigerant and allow for a separate outside air ventilation system, they require less ceiling space than conventional systems.

[24] ENERGY STAR Light Commercial HVAC specification: https://www.energystar.gov/products/heating_cooling/light_commercial_heating_cooling/light_commercial_hvac_key_product_criteria.

All ASVRF systems tested under AHRI standard 1230 are eligible. ASVRF systems up to 240,000 Btu/h cooling capacity must meet or exceed current ENERGY STAR® Light Commercial HVAC Key Product Criteria.[25] For systems with capacities greater than those covered by ENERGY STAR®, heat pump efficiencies must meet or exceed local energy code. The Program will adopt a NEEP cold-climate ASVRF specification when it is issued.

The Participating Contractor applying for incentives shall document that non-residential systems are sized according to the requirements of Section 3.2.1.

ASVRF systems must comply with ASHRAE Standard 15-2019 Safety Standard for Refrigeration Systems and Designation and Classification of Refrigerants, which addresses refrigerant capacities and possible leakage, especially if the system serves small rooms, which could cause oxygen depletion. In addition, the ASVRF systems must comply with ASHRAE Standard 34-2019 Addendum L, which establishes the maximum refrigerant concentration limit ("RCL") of 26 lbs./1,000 ft^3 of room volume for occupied spaces. Systems must be installed to pass all requirements of the NYS Clean Heat quality control program and its associated Field Assessment checklists. More information on inspections can be found in Section 5.

3.2.3.5 Cold Climate Packaged Terminal Heat Pumps (ccPTHP)

A packaged terminal heat pump (PTHP) is a wall sleeve and a separate un-encased combination of heating and cooling assemblies specified by the builder, intended for a single zone and for mounting through the wall. It includes a prime source of refrigeration, separable outdoor louvers, forced ventilation, and heating availability by builder's choice of hot water, steam, or electricity. A PTHP utilizes reverse cycle refrigeration as its primary heat source and is equipped with supplementary heating via hot water, steam, or electric resistance heat.

Packaged terminal heat pumps are tested under AHRI standard 310/380. To be eligible for the program, each unit in the system must be on the NEEP Product List, i.e., be a ccPTHP (see also, NEEP Cold Climate PTHP Specification[26]).

3.2.3.6 Single Package Vertical Heat Pumps

A single package vertical heat pump (SPVHP) is an air-cooled commercial package air conditioning and heating equipment that is factory-assembled as a single package, has components that are arranged vertically, and is intended for exterior mounting on, adjacent interior to, or through an outside wall. These units may be powered by a single- or 3-phase current and may contain one or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum or sleeves. SPVHPs utilize reverse cycle refrigeration as their primary heat source and may be equipped with supplementary heating via hot water, steam, gas, or electric resistance heat.

Single package vertical heat pumps are tested under AHRI standard 390. To be eligible for the program, SPVHP must meet or exceed the criteria listed in the NEEP Cold Climate SPVHP Specification[27].

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[25] Like central ASHP, VRF systems are also covered under the ENERGY STAR Light Commercial HVAC specification: https://www.energystar.gov/products/heating_cooling/light_commercial_heating_cooling/light_commercial_hvac_key_product_criteria

[26] The current specification and listed eligible units are available at https://neep.org/ASHP-Specification

[27] The current specification and listed eligible units are available at https://neep.org/ASHP-Specification

3.2.4 Ground Source Heat Pumps

Ground source heat pumps (GSHPs), also known as geothermal heat pumps, achieve high efficiency by exchanging thermal energy with the ground or with groundwater instead of outside air. GSHP systems work well in cold climates because of their ability to maintain capacity at low ambient air temperature. GSHPs are installed in all building sectors and are expected to provide heat to the whole home or whole building.

GSHP systems also take advantage of the heat generated by the indoor compressor, particularly in cooling mode, by providing a desuperheater loop that pre-heats domestic hot water. GSHPs distribute heating and cooling in the building through a ducted air system, a water loop, refrigerant lines, or a combination of these. System performance depends on an effective ground heat exchanger design and proper installation. The ground heat exchanger design can be highly site-specific, given the variability of site conditions that affect ground conductivity or loop designs.

There are several categories of GSHPs eligible for the NYS Clean Heat Program, including:

(1) Open-Loop GSHPs
(2) Closed-Loop GSHPs
(3) Direct GeoExchange GSHPs
(4) Console GSHPs
(5) Non-Console GSHPs less than >24,000 Btu/h (2 tons)
(6) Ground-Source Variable Refrigerant Flow Systems (GSVRFs)

General Well/Borehole/Loop Field Requirements

- All projects must comply with New York State Department of Environmental Conservation ("DEC") regulations for geothermal well drilling, which may be found at https://www.dec.ny.gov/lands/61176.html.
- Projects in New York City must comply with NYC Department of Environmental Protection rules concerning drilling and excavation, including insurance requirements.
- For non-DX systems, only polyethylene piping is appropriate for underground loop field piping.
- For large scale systems, Participating Contractors must show rated walls and ceilings and specify firestopping of pipe penetrations.
- All well/bore fields must provide adequate well/bore spacing and thermal dispersion to accommodate the thermal load and thermal balance.
- For large GSHP systems, provide emergency eye washes on site during installation, as required by OSHA.
- Piping must be stored on site in a manner that prevents damage and the introduction of foreign matter. Piping shall be kept free from damage, debris, and foreign matter during installation.
- Grout and admixtures must be received and stored in a way that protects them from moisture and contamination.
- Manifolds installed underground or in a buried enclosure must have proper valves, pressure, and temperature ports.
- All equipment and system parts should be labeled per IGSHPA and ASHRAE guidelines.
- Performance tests must be verifiable. Temperatures, pressures, flow rates, control valve operation, controls, balancing reports, sequence or operations, power measurements, software, start-up and commissioning efforts and reports are all subject to review and observation.

- Projects must meet all setback requirements enforced by the local authority having jurisdiction.
- It is also recommended that GSHP systems meet the ANSI/CSA C448 Series-16 standard.

Vertical-Loop Systems

Any vertically bored, closed-loop GSHP system must have a borehole depth that is sufficient to provide a minimum entering water temperature to the heat pump of 30°F in heating mode and a maximum entering water temperature to the heat pump of 90°F in cooling mode. The system must be designed in accordance with manufacturer specifications and installation requirements.

Exception: Vertically bored ground loops designed for a minimum entering water temperature >25°F and <30°F in Department of Energy Climate Zones 5 and 6 shall be considered eligible provided they meet the following additional criteria:

1. Heat Pumps shall be designed to provide at least 100% of the building heating load without supplemental heating.
2. Requires submission of loop sizing documents signed off by a New York State Professional Engineer or Certified GeoExchange Designer.

Closed-Loop Systems

Unless specifically superseded by the requirements detailed in this Program Manual, the design and installation of closed loop GSHP systems (including ground-loop and interior systems) must comply with the standards and practices outlined in the most recent edition of the Closed-Loop/Geothermal Heat Pump Systems: Design and Installation Standards edited by the IGSHPA Standards Committee and published by the International Ground Source Heat Pump Association. These standards are available online at https://igshpa.org/manuals on the IGSHPA website.

Table 8 presents program requirements for the maximum allowable rated pumping power at design conditions (based on duty point), as well as good-practice guidance based on an ASHRAE GSHP Design Guide[28] for large systems and field measurements for small systems.

Table 8: Maximum Allowable and Good Practice Pumping Power for Closed-Loop GSHP Systems in watts (W) per AHRI rated full-load heating or cooling capacity of the installed system

[28] Kavanaugh and Rafferty (2014). Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

GSHP System Size	Maximum Allowable Pumping Power in watts (W) per 10,000 Btu/h of full-load heating capacity OR in watts (W) per ton of full-load cooling capacity	Good Practice Pumping Power in watts (W) per 10,000 Btu/h of full-load heating capacity OR in watts (W) per ton of full-load cooling capacity
Individual GSHP units in residential and small commercial applications where each GSHP unit has its own dedicated loop pump	100	Less than 75
Large GSHP systems with multiple heat pump units served by centralized ground loop pumping	85	Less than 60

Closed Loop Antifreeze Protection Requirements: Propylene glycol (CAS No. 57-55-6), methanol (CAS No. 67-56-1) and ethanol (CAS No. 64-17-5) are the three presumptively acceptable antifreeze additives for use in the loop field. Use of any other antifreeze requires prior approval from the Joint Efficiency Providers. The acceptable denaturants for ethanol additives are denatonium benzoate (CAS No. 3734-33-6), ethyl acetate (CAS No. 141-78-6), isopropanol (CAS No. 67- 63-0), pine oil (CAS No. 8002-09-3), and tertiary butyl alcohol (CAS No. 75-65-0).

Large systems with ethanol and methanol must comply with Section 1207 of the 2020 Mechanical Code of New York State and, therefore, "the flash point of transfer fluid in a hydronic piping system shall be not less than 50°F above the maximum system operating temperature."

The maximum allowable concentration of methanol is 12.5% by weight. The maximum allowable loop field temperature in small systems using methanol as an antifreeze is 75°F. In addition, the designer and installer should ensure the loop field operating temperature is at least 50°F lower than the flash point of methanol at all times.

The maximum allowable concentration of ethanol is 10% by weight. The maximum allowable loop field temperature in a small system using ethanol as an antifreeze is 70°F. In addition, the designer and installer should ensure that the loop field operating temperature is at least 50°F lower than the flash point of ethanol at all times.

For loop fields with glycol or organic antifreeze, the Participating Contractor must sterilize with a chlorine shocking protocol that is similar to what is required in potable water plumbing systems. If the manufacturer recommends specific disinfection, the Participating Contractor should follow the manufacturer's protocols.

Horizontal-Loop Systems

Horizontal loops must be installed below the frost line and have a surface area that is sufficient to provide a minimum entering water temperature of 30°F to the heat pump in heating mode and a maximum entering water temperature of 90°F to the heat pump in cooling mode. Systems must be designed in accordance with manufacturer specifications and installation requirements. Incentive applications must include the file from the horizontal-loop design software showing inputs and system

design specifications.

Exception: Horizontal ground loops designed for a minimum entering water temperature >25°F and <30°F in Department of Energy Climate Zones 5 and 6 shall be considered eligible, provided that they meet the following additional criteria:

- Heat pumps shall be designed to provide at least 100% of the Building Heating Load without supplemental heating
- Requires submission of loop sizing documents signed off by a New York State Professional Engineer or Certified GeoExchange Designer

Open-Loop Systems
A standing column well must include a bleed circuit, drywell, or locally approved receptor to maximize thermal efficiency based on available water production.

Incentive applications must quantitatively explain the method for determining pressure and flow rate. All projects must comply with DEC regulations for geothermal well drilling, which can be found at https://www.dec.ny.gov/lands/61176.html on the DEC website.

All projects must comply with ANSI/CSA/IGSHPA C448.6, *Installation of open-loop systems ground water heat pump systems.* All standing column well projects must comply with ANSI/CSA C448.7, *Installation of standing column well heat pump system.*

Table 9 presents program requirements for the maximum allowable rated pumping power at design conditions (based on duty point), as well as good-practice guidance.

Table 9: Maximum Allowable and Good Practice Pumping Power for Open-Loop GSHP Systems in watts (W) per AHRI rated full-load heating or cooling capacity of the installed system

GSHP System Size	Maximum Allowable Pumping Power in watts (W) per 10,000 Btu/h of full-load heating capacity OR in watts (W) per ton of full-load cooling capacity	Good Practice Pumping Power in watts (W) per 10,000 Btu/h of full-load heating capacity OR in watts (W) per ton of full-load cooling capacity
Individual GSHP units in residential and small commercial applications where each GSHP unit has its own dedicated loop pump	140	Less than 105
Large GSHP systems with multiple heat pump units served by centralized ground loop pumping	120	Less than 90

Direct Exchange System
Direct exchange (DX) heat pumps, which circulate a refrigerant typically through a closed-loop copper pipe system (whereas most systems utilize plastic pipes that circulate water or a water-antifreeze

mixture), must meet the following additional conditions:

- DX systems must have a minimum loop field length of 100 feet per 12,000 Btu/h of heating capacity.
- DX wells require cathodic protection ensuring a minimum expected well life of 25 years.
- DX system owners must certify that they will undergo an end-of-life decommissioning that includes full-refrigerant recovery.
- The refrigerant must be R-410A unless otherwise approved by the Joint Efficiency Providers.
- The entire well depth interval for DX wells is grouted with thermally enhanced grout with hydraulic conductivity below 1 x 10-7 centimeters/second.
- A permanent placard must be attached to the heat pump unit, detailing the following:
    - loop field refrigerant content, type, and volume
    - loop location description
    - loop piping material
    - required maintenance schedule on loop field, refrigerant, and heat pump
    - planned decommissioning date and process, consistent with loop field useful life
- DX systems must also comply with ANSI/CSA/IGSHPA C448.8, "Installation of direct expansion heat pump systems."
- DX GSHP systems must use only ACR B280 Copper Piping for Underground Loop Field.
- DX GSHP systems must conform to requirements of ASHRAE Standard 15-2019.

Large GSHP System-Specific Requirements

- For large systems, a loop field design includes:
    - Loop/site plan
    - Loop sizing report (flexible)
    - Loop field pressure drop calculations
    - Antifreeze type and concentration
    - System documentation must include a piping schematic accurately representing below grade and above grade piping strategy
- Large systems with ethanol and methanol must comply with Section 1207 of the 2015 Mechanical Code of New York State and, therefore, "the flash point of transfer fluid in a hydronic piping system shall not be less than 50°F above the maximum system operating temperature."
- Large systems must implement the following:
    - Show rated walls and ceilings and specify firestopping of pipe penetrations
    - Detail cross connection control devices in the design
    - Conform to the requirements and standards of ASHRAE 15

Thermal Conductivity Tests

For any new construction or retrofit for which a new vertically bored, closed-loop ground loop greater than 300,000 Btu/h system heating capacity is being installed, a test borehole must be drilled prior to system design to more accurately determine the soil's thermal conductivity and enable accurate system modeling and design optimization. Testing should conform to the requirements detailed in the latest edition of the ASHRAE Applications Handbook and must report undisturbed ground temperature.

Test boreholes are recommended, but not required, for projects with system capacities between 135,000 Btu/h and 300,000 Btu/h.

3.2.4.1 Open-Loop GSHPs, Closed-Loop GSHPs, and Direct GeoExchange GSHPs

To be eligible for program incentives, single phase GSHPs must meet or exceed Geothermal ENERGY STAR® specifications.[29] These systems must have a closed loop ground heat exchanger circulating a water/antifreeze solution, an open loop heat exchanger, or a direct expansion (DX) heat exchanger. ENERGY STAR® eligibility is based on the following test procedures to determine GSHP appliance Energy Efficiency Ratio ("EER") and Coefficient of Performance ("COP"):

- Closed Loop Systems:
  - ISO 13256-1-1998 "Water-source heat pumps – Testing and rating for performance – Part 1: Water-to-air and brine-to-air heat pumps" for water to air models; OR
  - ISO 13256-2-1998 "Water-source heat pumps – Testing and rating for performance – Part 2: Water-to-water and brine-to-water heat pumps" for water-to-water models.
- Direct Exchange Systems: AHRI 870 (I-P/2016) and AHRI Standard 871 (SI) – 2016 "Performance Rating of Direct GeoExchange Heat Pumps"

Eligibility for any GSHP less than 135,000 Btu/h of cooling capacity may be obtained from an AHRI rating certificate. For units larger than 135,000 Btu/h cooling capacity, which are not rated by AHRI, manufacturer specification sheets may be used instead, provided the units have been tested in accordance with the applicable test procedure.

For multi-stage systems for which AHRI certificates are not available, the EER and COP must be calculated using the following equations:

- EER = (full load EER + part load EER)/2
- COP = (full load COP + part load COP)/2

Calculation of the EER and COP values must be determined using the following AHRI-rated data:

- Ground loop heat pump (GLHP) for closed-loop system
- Direct GeoExchange for DX systems

3.2.4.2 Console GSHPs

Console GSHP systems must meet or exceed the minimum efficiencies listed in Table 10 below. GSHP console units must have an AHRI-rated EER and an AHRI-rated COP. These systems do not need to meet or exceed the ENERGY STAR® Geothermal heat pump specification efficiency requirements.

Table 10: Efficiency Requirements for Console Units

System Type	EER	COP

[29] ENERGY STAR references:
https://www.energystar.gov/products/heating_cooling/heat_pumps_geothermal/key_product_criteria
https://www.energystar.gov/sites/default/files/specs//private/Geothermal_Heat_Pumps_Program_Requirements%20v3.1.pdf
https://www.energystar.gov/productfinder/product/certified-geothermal-heat-pumps/results

Water-to-Air		
Closed-Loop Water-to-Air	14.0	3.0
Open-Loop Water-to-Air	14.0	3.0
Water-to-Water		
Closed-Loop Water-to-Water	N/A	N/A
Open-Loop Water-to-Water	N/A	N/A
Direct Exchange		
Direct Exchange	N/A	N/A

The EER and COP must be calculated using the following equations:

- EER = (full load EER + part load EER)/2
- COP = (full load COP + part load COP)/2

3.2.4.3 Non-Console GSHPs less than >24,000 Btu/h (2 tons)

GSHP systems that are not console units and have AHRI-rated cooling capacities less than 24,000 Btu/h (2 tons) must have AHRI-rated EER and AHRI-rated COP efficiencies greater than the efficiencies shown inTable 11. These systems do not need to meet or exceed the ENERGY STAR® Geothermal heat pump specification efficiency requirements.

Table 11: Efficiency requirements for non-console units with AHRI-rated cooling capacities < 24,000 Btu/h

System Type	EER	COP
Water-to-Air		
Closed-Loop Water-to-Air	15.0	3.2
Open-Loop Water-to-Air	20.0	4.1
Water-to-Water		
Closed-Loop Water-to-Water	16.6	3.1
Open-Loop Water-to-Water	20.1	3.5
Direct Exchange		
Direct Exchange	N/A	N/A

3.2.4.4 Ground-Source Variable Refrigerant Flow Systems (GSVRFs)

GSVRFs must meet the applicable minimum efficiency requirements in the preceding tables. These systems do not need to meet or exceed the ENERGY STAR® Geothermal heat pump specification efficiency requirements.

Table 12: Efficiency requirements for GSVRF

Equipment Type	Cooling Capacity (Btu/h)	Min. EER at 77F EWT	Min. COP at 32F EWT	Testing Procedure
Ground Source VRF multisplit system	<135,000	14.7	3.4	AHRI 1230
	≥135,000	12.1	3.1	AHRI 1230
Ground Source VRF multisplit system with heat recovery	<135,000	14.5	3.4	AHRI 1230
	≥135,000	11.9	3.1	AHRI 1230

Table 13: Efficiency requirements for GSVRF heat pumps tested under AHRI 1230 groundwater source configuration, however intended to be used in a ground source configuration

Equipment Type	Cooling Capacity (Btu/h)	Min. COP at 50F EWT	Testing Procedure
Groundwater Source VRF multisplit system	<135,000	3.6	AHRI 1230
	≥135,000	3.3	AHRI 1230

Table 14: Efficiency requirements for Water Source VRF heat pumps tested under AHRI 1230 water source configuration, however intended to be used in a ground source configuration.

Equipment Type	Cooling Capacity (Btu/h)	Min. EER at 86F EWT	Min. EER at 86F EWT (with heat recovery)	Min. COP at 68F EWT	Testing Procedure
Water Source VRF multisplit system	<65,000	13.2 EER 17.6 IEER	13 EER 17.4 IEER	4.7	AHRI 1230

	> 65,000 < 135,000	13.2 EER 17.6 IEER	13 EER 17.4 IEER	4.7	AHRI 1230
	≥ 135,000 < 240,000	11.0 EER 15.4 IEER	10.8 EER 15.2 IEER	4.4	AHRI 1230
	≥ 240,000	11 EER 13.2 IEER	10.8 EER 15.2 IEER	4.3	AHRI 1230

EER and COP calculations for such systems must be calculated using the full-load EER and full-load COP.

GSHPs may have additional requirements specific to the type of ground heat exchanger to which the GSHP system is coupled. Systems must be installed to pass all requirements of the Con Edison Field Inspections and Oversight program and its associated inspection checklists. More information on quality control is included in Section 5: Field Inspections and Oversight.

3.2.5 Heat Pump Water Heaters and Ground Source Water-to-Water Heat Pumps

In addition to space heating, the NYS Clean Heat Program for Con Edison also promotes the use of heat pump technology for heating domestic hot water, as a replacement or in new construction in lieu of common electric resistance or fossil fuel water heaters. As with space conditioning heat pump technologies, for retrofit applications, the program will require that applicants report the existing water heating fuel that is being replaced; for new construction, the replaced unit will be determined on a case-by-case basis, based on contemporary construction practice in the area.

As with space conditioning, heat pump water heaters can be air-source or ground-source technology, and must be sized according to manufacturers' recommendations.

The Program offers incentives for residential HPWH through a Midstream Program discussed in Section 4.6. This Program incentivizes HPWH with a tank up to and including 120 gallons, and a current rating ≤24 amps and voltage ≤250 volts[30] that meet or exceed ENERGY STAR® Residential Water Heater requirements.

Air Source HPWH with tank capacity larger than 120 gallons [31] shall receive incentives based on $/MMBtu of annual energy savings, under Category 6 *Custom Hot Water Heating Applications*.

3.2.5.1 Air-to-Water Heat Pump Water Heater

Air-to-Water HPWHs are water heater tanks that heat domestic hot water using an onboard air source heat pump that extracts heat from the air in the building surrounding the unit. They use a secondary electric resistance as a back-up to ensure that the water temperature meets the desired setpoint during times of high demand. Air source HPWH models come in two versions (integrated and split-system HPWH) and both versions are eligible for incentives under the Program.

[30] 10 CFR 430.2 – Definitions.
[31] https://www.energystar.gov/products/water_heaters/commercial_water_heaters/key_product_criteria

Air-to-water HPWH with up to 120 gallons of tank capacity are eligible for Category 5 incentives. Larger systems and custom applications are eligible for Category 6 *Custom Hot Water Heating Applications.*

To be eligible for an incentive under the Program, an air-to-water HPWH must meet or exceed ENERGY STAR® water heater specifications.

3.2.5.2 Ground Source Desuperheaters and Dedicated DHW Water to Water Heat Pumps

Ground source systems can reduce DHW energy consumption by two optional methods: 1) Using a GSHP unit with a desuperheater or 2) adding a water-to-water heat pump (WWHP) to the ground loop that is dedicated to meeting the DHW load.

Desuperheaters are available on most GSHP models. A desuperheater recovers heat from the GSHP's compressor during both cooling and part-load heating mode and transfers it to the DHW tank. Thus, they satisfy a portion of the building's annual DHW load. They therefore require some form of complementary water heating.

Full-load DHW WWHPs can either be installed as a priority zone on a GSHP HVAC system, or as a stand-alone system. They are designed to provide all of the building's DHW needs.

Desuperheaters and WWHP are eligible for Category 6 *Custom Hot Water Heating Applications* incentives.

A full-load DHW WWHP must meet or exceed ENERGY STAR® Geothermal Heat Pump specification requirements[32] or the efficiency requirements listed in Section 3.2.3 for Non-ENERGY STAR® Compliant Geothermal Heat Pumps to be eligible for incentives. Ground Source DHW WWHPs (up to 120-gallon tanks), are eligible for $/equipment unit incentives under Category 8 *Dedicated DHW WWHP*.

Dedicated Ground Source DHW WWHPs (>120 gallons) shall receive incentives based on $/MMBtu of energy savings under Category 6 *Custom Hot Water Heating Applications*.

Equipment Installation:

Ground Source HPWH loop requirements are the same as those for GSHP, described in Section 3.2.3.

3.2.6 Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs)

Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs) reduce heating and cooling loads while maintaining required ventilation rates by facilitating heat transfer between outgoing conditioned air and incoming outdoor air. ERVs and HRVs employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of pre-conditioning outdoor air prior to supplying the conditioned air to the space, either directly or as part of an air-conditioning system. When paired with a heat pump system, the ERV/HRV can significantly reduce the size of the required HVAC system.

[32] ENERGY STAR Program Requirements for Geothermal Heat Pumps. Current link: https://www.energystar.gov/sites/default/files/specs//private/Geothermal_Heat_Pumps_Program_Requirements

For the purposes of this measure, ERVs and HRVs are distinguished as follows:

- ERV: Transfers both sensible (heat content) and latent (moisture content) heat between supply and exhaust airstreams.
- HRV: Transfers sensible heat only between supply and exhaust airstreams.

Only those ERV/HRVs not required by federal, state, local or municipal codes or standards and that are paired with an eligible heat pump system are eligible for Category 4 *Custom Space Heating Applications* incentives under the Program.

3.2.7 Envelope Measures (for Category 4A: Heat Pump + Envelope)

The building envelope, which includes the walls, windows, roof, and foundation, forms the primary thermal barrier between the interior and exterior environments. The building envelope plays a key role in determining optimal comfort levels, ventilation, natural lighting, and energy needed for heating and cooling. Envelope improvements help regulate indoor climate (temperature control, air quality, etc.) and protect against the outdoor environment (drafts, condensation, etc.).

Without a properly insulated building envelope, the heating and cooling systems will not work as effectively, making this an essential element in creating a higher-performing building. Eligible building envelope upgrades or retrofits should be quantifiable and directly impact heat pump sizing and include locating and sealing air leaks, increasing wall/roof insulation, window replacement, and weatherstripping windows and doors.

The impact from the building envelope upgrades should be captured in the load calculations for pre- and post-conditions calculated per Manual J or ACCA 183.

Projects otherwise eligible for Category 4 *Custom Full Load Space Heating Applications* a significant envelope upgrade. The envelope upgrade must produce a quantifiable impact on the heat pump sizing to be eligible for a packaged approach (refer to Section 3.2.6.1 below). When combined, the existing building envelope will be used as a baseline for calculating energy savings for existing buildings including those undergoing a gut rehab. New construction projects must use the New York State code as the baseline for savings analysis, and where applicable also comply with local code. Eligibility for Clean Heat incentives may be governed by compliance with applicable code. The incentives will be offered based on the MMBtu savings from both the envelope measures and the HP measures based on the tier for which a project qualifies. If an ERV/HRV is installed alongside an eligible heat pump plus envelope project, the ERV/HRV will also be incentivized at a Category 4a rate.

Eligible measures may include:

- Exterior: window replacements, window film
- Opaque shell: wall insulation, continuous insulation, window walls, curtain walls, exterior façade
- Air leakage sealing, air barrier continuity
- Roof insulation

3.2.7.1 Eligibility Tiers for Category 4A: Custom Full Load Space Heating Applications +

Envelope

Category 4a offers incentives to projects that reduce their dominant load, either BHL or BCL, via improvements to the building envelope. To be eligible for Category 4a, projects must exceed the requirements captured in Table 15. To be eligible for Tier 1, existing buildings must lower their dominant load by at least 5%, while buildings undergoing a gut rehab or new construction must exceed applicable code, whichever is more stringent, by at least 5%. To be eligible for Tier 2, existing buildings must lower their dominant load by 30% from existing conditions, while buildings undergoing gut rehabs or new construction must exceed the relevant code, whichever is more stringent, by 10%. The savings will be measured off the Incentive Baseline in the final column.

Table 15: Eligibility Tiers for Category 4a

Construction type	Eligibility Criteria	Tier 1 Requirement	Tier 2 Requirement	Incentive Baseline
Existing buildings	Exceed existing condition	> 5%	>30%	Existing condition
Existing buildings - Gut Rehab	Applicable code (NYSECC or NYCECC)	> 5%	>10%	Existing condition
New Construction (GSHP only)	Applicable code (NYSECC or NYCECC)	> 5%	>10%	Applicable code (NYSECC or NYCECC)

3.2.7.2 Infiltration Guidance

Projects should adhere to guidelines for natural (unpressurized) air changes per hour (ACH_N) at heating design conditions.[33] Blower door testing should be used to verify rates of air exchange that are different from these guidelines, as described in the whitepaper. Pre-inspection can identify exceptions requiring justification and review. Please see the table below for details.

Table 16: Infiltration Guidance

Infiltration Level by project type	Maximum Allowed ACH_N at Design Heating Load[34]
New construction or gut rehabs Tight – Non-operating windows or best quality windows; sealed penetrations in envelope; vapor barrier	0.3
Existing building retrofit Average – Standard quality windows; major penetrations	0.7

[33] Infiltration Guidance for Buildings at Design Conditions - For the NYS Clean Heat Program. Hugh Henderson, Bruce Harley. May 1, 2022. Accessible on the NYS Clean Heat Resources webpage: https://cleanheat.ny.gov/contractor-resources/.

[34] Listed maximum values cannot be exceeded unless written documentation justifying a higher value is provided and approved by the Program.

sealed; vapor barrier; glass less than 20% of wall area	

3.2.8 Advanced Controls for Heating Electrification

Advanced Controls are defined as those that provide automatic start, stop, adjustment, and optimization of eligible heat pump systems using two-way communication between control system and building equipment with sensors, controls logic, and algorithms.

Only controls that are paired with an eligible custom heat pump system can receive incentives under the Program. Eligible controls will be incentivized at the same rate as the corresponding heat pump it is controlling. As an example, if controls are installed to optimize operation of an eligible Category 4 heat pump, then the controls will receive a Category 4 incentive. Similarly, if controls are installed to optimize operation of an eligible Category 4A heat pump, then the controls will receive a Category 4A incentive.

3.2.9 Additional Project Eligibility Criteria

For scenarios in which project eligibility is not clearly defined, the following shall be used to determine eligibility:

- Fossil fuel (heating oil, natural gas, steam generated by fossil fuel, etc.) energy consumption must be reduced by the new electric technology or application.
- The heat pump technology must use staged, multi-speed or variable-speed heat pumps and must displace at least half of annual baseline heating energy consumption or alternative case fossil fuel consumption for Category 10 *C&I Custom Partial Load Space Heating Applications.* Fuel savings cannot include fossil fuel system efficiency savings; in savings calculations, fossil fuel baseline efficiency (including distribution) must equal proposed (boiler) system efficiency.
- For categories with a decommissioning requirement, existing heating systems must be decommissioned.
- The new electric technology or application:
    - Must decrease the overall annual site energy consumption
    - Shall meet or exceed applicable minimum efficiency specifications to meet applicable codes and standards

3.3 Warranty Requirements

All ASHPs, including ASVRF

Each qualified residential and small commercial ASHP receiving an incentive under the Program must include a minimum five (5) year manufacturer's warranty for parts including the compressor.

Full Load Residential Space Heating GSHP Systems

Category 3 *GSHP: Full Load Heating*

For small GSHP systems, including desuperheaters and WWHPs, Participating Contractors must

transfer to the system owner the manufacturer's/distributor's/dealer's warranty. At a minimum, such warranty must cover all parts and equipment against breakdown or malfunction and the warranty period must be no less than five (5) years. In addition, the warranty will cover the full costs, including labor and repair or replacement of components or systems.

The Participating Contractor must also provide additional warranty coverage that fully covers the labor and design services provided by the Participating Contractor (and any of its subcontractors). The warranty period must be no less than three (3) years. Participating Contractors must present to the site owner any optional extended warranty up to the maximum supported by the manufacturer.

Custom GSHP Systems

Category 4 *Custom Space Heating Applications*

For large GSHP systems, the minimum manufacturer's warranty must be at least one-year parts and labor, as required by law. Participating Contractors must present to the customer any optional extended warranty up to the maximum supported by the manufacturer.

HPWH Systems

Category 5 *HPWH (up to 120 gallons of tank capacity)*

Each air-to-water HPWH system receiving an incentive under the Program must include a minimum ten-year manufacturer's warranty for parts and tank.

Category 6 *Custom Hot Water Heating Applications*

Each HPWH system receiving an incentive under the Program must include a manufacturer's warranty for parts and tank.

3.4 Operation and Maintenance Requirements

Electrified heating systems are often a new type of appliance for the site owner, so it is important that owners understand how to effectively operate and maintain their new systems. Participating Contractors must inform site owners about system operation and maintenance, including on the use of these systems in both heating and cooling modes. A detailed manufacturer's operation handbook as well as a maintenance manual containing information on the major components and a schedule of required system maintenance must be provided by the Participating Contractor.

The manual must include maintenance and testing requirements of antifreeze solutions used on the project. It must include any startup/commissioning documentation for the system(s). For large systems, the O&M manual must include as-built drawings.

For ccASHP and cold climate MSHP installations under incentive Categories 2a and 2b, the Program requires that Participating Contractors provide site owners with the "Get the Most Out of Your Air Source Heat Pump" tip sheet which can be found at https://cleanheat.ny.gov/assets/pdf/CHC-ASHP-tips-fs-1-v1_acc.pdf.

The Program strongly recommends that GSHP systems include a performance monitoring system. Recommended best practices for performance monitoring of GSHP systems can be found at https://cleanheat.ny.gov/contractor-resources/under the Ground Source Heat Pump (GSHP) drop-down

menu.

Participating Contractors should strongly encourage system owners to purchase a maintenance agreement.

3.5 Engineering Savings Analysis Requirements for Custom Categories 4, 4A, 6 and 10

Each application in the custom categories shall include a detailed engineering analysis showing energy savings in net MMBtu related to the project measures. Savings may be calculated through one of the following methods:

1. Statewide Custom Clean Heat Program Savings Calculator
2. Engineering Modeling
3. Temperature Bin Method

In the case of ERV/HRV installation measures, the latest version of the TRM Energy and Heat Recovery Measure may be used to calculate energy savings.

All calculations must be clear and transparent utilizing standard engineering methodologies, including a listing of source values. Energy savings analyses may be accepted in the following formats:

- Unlocked Microsoft Excel spreadsheet (PDFs not accepted) showing all equations, parameters, formulas, and assumptions used to calculate savings.
- Whole-building energy modeling using approved simulation software. The approved list of modeling software is based on current computational capabilities and familiarity of the respective utility and is therefore utility specific. Contact an account manager for a complete list of their pre-approved software.

3.5.1 Statewide Custom Clean Heat Program Savings Calculator

The Statewide Custom Clean Heat Program Savings Calculator (Clean Heat Calculator) is an Excel-based tool that has been developed to assist Participating Contractors applying to the NYS Clean Heat Program with calculating energy savings and incentives for various types of heat pump technologies. The Statewide Custom Clean Heat Program Savings Calculator user guide contains an updated list of technologies for which the Clean Heat Calculator calculates savings and incentives.

The Clean Heat Calculator should be used as the default method to calculate energy savings for the custom categories (4, 4a, and 10).

Applicants may bypass using this calculator, opting instead to calculate savings using their own custom bin analysis or energy modeling approach.

The Program may request to use the statewide calculator to estimate savings if an applicant submits a model that is difficult to understand or ambiguous.

3.5.2 Energy Modeling

Whole-building energy models shall be prepared using an approved modeling software and shall be simulated following one of the compliance paths prescribed in NYS ECC 2020. The model shall be developed using a "Stacked" parametric approach, where energy savings are modeled by starting with the proposed design model, and gradually transforming this analysis into the minimally code compliant baseline design by subtracting the Energy Efficiency Measures ("EEMs") one-by-one in the following order:

- HVAC measure(s)
- Base load measure(s) such as lighting, process loads, plug loads, etc.
- Envelope measure(s)
- Non-interactive measures such as service water heating

If there are several EEMs of the same type, for example several HVAC EEMs, the order in which they are modeled relative to each other is not prescribed to allow flexibility in supporting the specific project circumstances and may be determined by the entity performing the modeling based on communications with the customer. For example, if a design includes a high efficiency make-up air unit, and energy recovery is considered as a design alternative, the energy recovery EEM should be modeled (subtracted from the proposed design) first, to show the added energy savings for this option, with the unit efficiency EEM modeled (subtracted) second.

With the stacked approach, the difference between the sum of EEM savings and the total savings of the proposed design relative to the baseline is attributed entirely to the impact of components that differ between the baseline and proposed models but are not included in any EEM.

If a project involves new construction or gut rehab, review additional new construction and gut rehab criteria in Section 3.7 below.

3.5.2.1 Modeling Submittals

The simulation reports with the following information for the baseline, proposed design, and each energy measure model must be included in the report appendix:

- Monthly Energy End-use Summary (such as PS-E: Energy End-Use Summary for All Meters)
- Overall annual building energy consumption including all fuels and meters (such as BEPS: Building Energy Performance Summary and BEPU: Building Utility Performance)
- Energy cost summary (such as ES-D: Energy Cost Summary)
- Information on hours when space/system loads are not met (such as BEPS/BEPU)
- System design parameters report (SV-A: System Design Parameters for HVAC)

3.5.3 Establishing Baselines

Establishing the baseline's equipment type or efficiency is necessary for calculating energy savings for any project, especially for a custom project. This section defines the types of baselines used by the Program and the general requirements for each baseline type. Baselines will depend on the facility's type and vintage and scope of work.

3.5.3.1 Baseline Equipment Types

Equipment baselines are defined as the type of equipment that would have been installed without the

Program's influence. In other words, the savings baseline should represent customer choice in the absence of the Program, not optimal behavior or policy goals.

3.5.3.1.1 Existing Facilities

The default baseline equipment type for the existing facilities is the existing equipment type and efficiency compliant with the minimum code efficiency per ECCNYS (Energy Conservation Construction Code of New York State). However, the customer may instead choose to select a baseline in accordance with contemporary construction practice for the area and based on an evaluation of the technology's cost effectiveness. Suppose a baseline that differs from the existing system is selected. In that case, the applicant shall provide a separate analysis supporting its selection, showing that the baseline chosen aligns with contemporary construction standards and is cost-effective from both an installation and life cycle standpoint.

3.5.3.1.2 New Construction and Gut Rehab

For all eligible new construction or gut rehab projects in the program, the default heating fuel type has been set to natural gas. Applicants shall select an alternative fuel if natural gas service is not available or if access is not economical in the project's area.

3.5.3.2 Baseline Efficiencies (except Category 4a) [35]

Baseline system efficiencies for all categories except Category 4a shall be based on minimally code-compliant equipment in accordance with the latest Energy Conservation Construction Code of New York State ("ECCCNYS") prescriptive code values. There are three exceptions to this requirement:

1. Project qualifies as a Special Circumstance Replacement in accordance with the TRM[36] requirements – i.e. Early Replacement or Extended Life. For Special Circumstance Replacements (Section 3.8), the existing equipment efficiency shall be used for the baseline condition in accordance with the TRM two step analysis method.

2. Projects involving new construction or gut rehab whose design demonstrates compliance with Section 406 of the latest ECCCNYS or the New York City Energy Conservation Code ("NYCECC") by providing more efficient HVAC performance shall set the baseline system efficiencies to exceed the minimum code efficiency requirements by 10%.

3. LMI projects should use the existing equipment type and efficiency as the baseline condition

3.5.3.3 Baseline Efficiencies - Category 4a

Baseline system efficiencies for:

3.5.3.3.1 Existing Facilities and Gut Rehab - Category 4a

The energy savings from the package of envelope upgrades and heat pump installations are based on the existing conditions. The thermal performance of the building envelope, as well as the HVAC system

[35] Refer to the statewide LMI Implementation Plan for more information on baseline efficiencies for Low- to Moderate Income projects:
http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=18-M-0084

[36] The New York State TRM can be found on the Department of Public Service website here:
https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD?OpenDocument

type and efficiency, should reflect the current conditions found at the project. The participating contractor should provide separate analyses for the envelope upgrades and heat pumps. The documentation should clearly describe the existing building envelope and age and performance data for the existing HVAC system, such as cut sheets stipulating existing efficiency and boiler combustion tests.

The heat pump analysis should calculate incremental energy savings related to the heat pump equipment based on the upgraded building envelope conditions.

3.5.3.3.2 New Construction – Category 4a

The baseline for all eligible new construction projects in the program is code-compliant equipment per the latest ECCCNYS.

The default building envelope baseline shall be set to the ECCCNYS code minimum compliant performance. Upon final incentive payment, the participating contractor should provide a Department of Buildings ("DOB") or AHJ-approved set to confirm the building envelope baseline.

The default heating fuel type has been set to natural gas at the minimum ECCCNYS code efficiency. Applicants shall select an alternative fuel when the new natural gas service is unavailable, or access is not economical in the project's area.

3.6 Additional Requirements for New Construction and Gut Rehab

3.6.1 New Construction and Gut Rehab Eligibility

New construction and gut rehab projects installing heat pump technologies complying with Program requirements are eligible for incentives. Incentives will apply to the portions of the scope of work related to heat pump installations. Additional requirements for new construction projects are outlined in this section.

When buildings undergo renovations that include an expansion of square footage, such as the addition of new floors, the newly added square footage will be considered new construction. Thus, the new square footage will only be eligible for GSHP incentives. The square footage that existed before the renovation will be considered an existing building and are eligible for both GSHP and ASHP incentives.

3.6.2 Energy Code Compliance

New construction and gut rehab projects must demonstrate minimum compliance with the applicable local Energy Code 2020, e.g., Energy Conservation Construction Code of New York State (ECCCNYS) or New York City Energy Conservation Code (NYCECC) in one of the following ways:

- **Prescriptive**: Each discrete component complies with specific requirements
- **Component Performance Alternative**: Prescriptive approach that allows trade-offs between some components (some can be below code if others are above)
- **Total Building Performance**: Using an energy model, show the entire building's compliance with code. With this method, performance trade-offs are allowed, meaning that some components in the proposed design may be less efficient than the minimally code-compliant like component in the baseline. In these instances, a trade-off must be made to "make up" for a component that

does not comply with code. For example, a building owner might choose to install a more energy efficient heat pump system to "make up" for putting in more window area than allowed by the code.

If trade-offs are taken, applicants must provide a side-by-side comparison table between proposed and baseline identifying the areas where trade-offs are made (i.e., building or system elements that do not comply with the prescriptive requirements of the code, elements exceeding requirements, and building elements or systems modeled to provide additional energy savings to offset the non-complying elements). The savings will be calculated based on the proposed heat pump design net of any trade-offs.

Projects that follow the total building performance path and whose design includes trade-offs must set their savings baselines per minimally code compliant ECCCNYS prescriptive code values. While energy models created per Appendix G or Section 11 of ASHRAE 90.1 may be used for program eligibility, the Appendix G or Section 11 baselines shall not be used to calculate savings.

Con Edison reserves the right to modify energy savings baselines for buildings that make trade-offs on a case-by-case basis.

3.6.3 New Construction and Gut Rehab Energy Savings Analysis

New construction and gut rehab projects that follow a prescriptive approach, preparing a COMcheck or Tabular analysis, to demonstrate compliance with energy code may opt to submit an energy analysis using Excel calculations, *i.e.*, the statewide calculator, or a whole building energy model. The modeling methodology is discussed in Section 3.6.2.

When a project uses a "Total Building Performance" compliance path or trade-offs, the applicant shall submit a whole building energy model for review. Excel calculations will not be accepted for these projects.

3.7 Early Replacement Projects

Projects may qualify for early replacement if they meet the criteria summarized below as defined in the Technical Resource Manual ("TRM").[37] For full details, refer to Appendix M in the latest version of the TRM for guidelines for early replacement conditions.

For existing cooling and/or heating equipment to be eligible for early replacement under the Program:

1. Proposed work must involve a retrofit or substantial improvement to an existing facility and must include the entire portion of the building within project scope.
2. The savings baseline for calculating energy savings must be based on the existing heating and/or cooling equipment type installed at the facility.
3. At the time of application to the Program, the existing equipment cannot exceed its Effective Useful Life ("EUL") and should have at least one year of its EUL remaining (Refer to Appendix P in the latest version of the TRM for EUL for various heating/cooling equipment).

[37] New York Standard Approach for Estimated Energy Savings from Energy Efficiency Programs – Residential, Multi-Family, and Commercial/Industrial Measures, ("TRM") Version 10, effective January 1, 2023. See Appendices M & N.

4. The existing equipment must be fully functioning.

A facility's existing cooling and heating systems shall be evaluated separately against the criteria noted above to determine whether each individually qualifies for early replacement. One or both systems may be eligible.

3.7.1 Required Project Documentation

In addition to the requirements listed in this Program Manual and any applicable supplementary guidelines issued for the proposed energy conservation measures, early replacement projects must submit the following documentation:

- Cooling/heating capacity of the existing equipment
  - Supported by manufacturer's equipment data sheets or industry standard performance testing results for existing equipment
  - Supported by manufacturer's equipment data sheets or AHRI certificate
- Age of the existing equipment
  - Supported by original invoice, bill of sale, construction permit, service log, or nameplate date

3.8 Special Circumstance

Special circumstance replacement does not change the incentive category for a project. Qualifying for special circumstance replacement may affect the project baseline, which affects the energy savings calculated for the project. Thus, special circumstance replacements may benefit projects whose incentive rates are calculated on a $/MMBtu saved basis in accordance with custom categories.

Only projects in existing buildings can be eligible for special circumstance replacement. New Construction projects do not qualify for special circumstance replacement.

There are two criteria for existing cooling and/or heating equipment to be eligible for special circumstance replacement under the Program. Full details on special circumstance replacements are found in Appendix M of the latest version of the TRM.

1. Age Rule
2. Energy Use Rule

3.8.1 Age Rule

1. The savings baseline for calculating energy savings must be based on the existing heating and/or cooling equipment type installed at the facility.
2. At the time of application, existing cooling and/or heating equipment must exceed its EUL by at least 25% (Refer to Appendix P in the latest version of the TRM for EUL for various heating/cooling equipment).
3. If the equipment is determined to be less than 125% of its EUL, it is not eligible for special circumstance extended life treatment regardless of consumption or any other factor.
4. There must be a history of significant repair or replacement with existing equipment.
5. Existing equipment must be fully functioning.

3.8.2 Energy Use Rule

1. For cases in which the age of the existing equipment cannot be determined relative to 125%, the Energy Use Rule may be considered for eligibility; existing equipment energy consumption must exceed that of the new high efficiency model by at least 35% for chillers, and 20% for all other HVAC types to do the same amount of work.

A facility's existing cooling and heating systems shall be evaluated separately against the criteria noted above to determine whether each individually qualifies for extended life replacement. It is noted that one or both systems may be eligible.

3.8.3 Required Project Documentation

The minimum documentation required for all special circumstance projects is listed below. These requirements are in addition to the requirements listed in this Program Manual and any applicable supplementary guidelines issued for the proposed energy conservation measures.

1. Cooling/heating capacity and performance of the existing equipment:
   - Supported by manufacturer's equipment data sheets or industry standard performance testing results for existing equipment
   - Supported by manufacturer's equipment data sheets or AHRI certificate
2. Age of the existing equipment
   - Supported by original invoice, bill of sale, construction permit, service log, or nameplate date
3. Actual repair cost, including component replacement for at least the past 3 years
   - Supported by invoices or proof of payment
   - Total repair cost must be added and summarized in a document

Incentives for projects applying for prescriptive incentives in Categories 2a, 2b, 2c, 2d or 3 are not affected by early replacement/extended life (ER/EL).

4. Participating in the Program

4.1 Become a Participating Contractor

To participate in the NYS Clean Heat Program in Con Edison's service territory, ASHP installers, ASHP designers, GSHP installers, GSHP designers, and GSHP drillers[38] must first become Participating Contractors in the NYS Clean Heat Participating Contractor Network. Contractors who only install HPWH do not need to become Participating Contractors to submit an incentive application on behalf of a customer through the midstream HPWH program. When a contractor is accepted as a Participating Contractor, they will receive approval notification emails and be eligible to apply for incentives in the program.

To become a Participating Contractor, contractors must submit the following completed documents via the NYS Clean Heat Participating Contractor Portal:

- Con Edison Participating Contractor Agreement
- NYS Participating Contractor Application
- IRS Form W-9
- Certificate of Insurance Policy (minimum $1 million)
- Sector-specific documentation

For additional information on the NYS Clean Heat Program Contractor enrollment, visit Become a Participating Contractor: NYS Clean Heat webpage.

Contractors working in the following segments are required to submit the additional technology or sectoral specific documentation.

[38] GSHP Drillers must also be approved by the Electric Utilities through this process to become Participating Drillers, but only participating installers and designers may submit incentive applications.

Sector	Required Documentation
ASHP installer	- U.S. Environmental Protection Agency Section 608 Technician Certification - ASHP Manufacturer-sponsored Installation Training Certificate (or comparable) - ASHP Manufacturer-sponsored Cold Climate Air Source Heat Pump Sizing and Design Training
ASHP Designer	- An active NYS Professional Engineering license OR active NYS Registered Architect license
GSHP Contractor	- A copy of a current (and in good standing) International Ground-Source Heat Pump Association ("IGSHPA") accredited installer certificate
GSHP Designer (Category 3)	- A current (and in good standing) IGSHPA accredited installer certificate OR an active Certified GeoExchange Designer ("CGD") certificate from the Association of Energy Engineers ("AEE")/IGSHPA
GSHP Designer (Category 4)	- A current CGD certificate from AEE/IGSHPA OR an active NYS Professional Engineering license OR active NYS Registered Architect license
GSHP Driller (Vertical Loop Field)	- Active registration (in good standing) and certification for open-loop geothermal well drilling by the NYS Department of Environmental Conservation OR - National Ground Water Association Certified Vertical Closed-Loop Driller (CVCLD) certificate
GSHP Driller (Direct Exchange "DX")	- Training certificate from a DX Ground Source Heat Pump manufacturer
Weatherization Contractors	- Home Improvement License (where applicable)
Residential Contractor	- Contractor Verification Attestation Form

Effective March 1, 2023, all ASHP Participating Contractors are required to take their preferred manufacturer's version of the ASHP Sizing and Design training and submit documentation of completion. A grace period of three months following the effective date allows additional time for compliance with the existing Participating Contractor training requirement. Available trainings are posted on the Clean Heat Connect trainings calendar (located at https://cleanheatconnect.ny.gov/calendar/sizinganddesign) and updated regularly.

In addition to the steps noted above, each Participating Contractor must have two attendees from their company attend one of Con Edison's in-person Clean Heat Program training sessions. In lieu of in-person attendance, Contractors may complete a 10-question assessment with a passing grade of 70%. Multifamily and SMB contractors are required to attend a sector-specific training. All Participating Contractors should be prepared to submit a full application to become a Participating Contractor on Relaunch.

A Contractor's access to monthly incentive allocations, as described in **Section 4.2** of this Program Manual and access to Con Edison's Online Intake Tool, will be restricted until contractors complete the assessment and upload updated documentation.

4.1.1 Residential Contractor Verification "Attestation" Form

The Con Edison Residential Contractor Participation Agreement specifies that all projects must be installed in accordance with manufacturer specifications and installation requirements and compliance with all applicable laws, regulations, codes, licensing, and permit requirements, including, but not limited to, the New York State Environmental Quality Review Act, the Statewide Uniform Fire Prevention and Building Code and State Energy Conservation Construction Code, the National Electric Code, Fire Codes, and all applicable State, city, town, or local ordinances and/or permit requirements.

All Participating Contractors must verify that the projects installed in Con Edison's service territory are in accordance with the aforementioned requirements by signing a Contractor Verification Attestation form. Contractors who contest or fail to sign a verification form will be required to provide a copy of permits for each job submitted through the Program.

4.2 Residential Program Requirements and Application Process

This Section of this Program Manual covers the residential sector of the Clean Heat Program. The residential program supports both cold climate air-source heat pump (ASHP) and ground-source heat pump (GSHP) measures installed in Con Edison's residential service area.

4.2.1 Residential Contractor Allocations

The Program will allocate a share of the monthly funding available to the Residential ASHP and GSHP sectors to contractors that request an allocation. This process will be refreshed quarterly and is designed to give Participating Contractors more transparency and certainty around incentive availability while helping the Company run the program effectively. By refreshing the allocations on a quarterly basis, Con Edison will seek to allocate a fair percentage of the monthly sectoral allocation among high- and low-volume contractors, reserve funding to allow new contractors to enter the program without delays, and allow room to grow for contractors with a dedicated track record of success.

To create fair allocations, the Program will ask contractors in both the ASHP and GSHP segments to submit forecasts of their monthly activity. ASHP contractors should submit their forecasts for the quantity and value of applications submitted per month based on completed installations. By contrast, GSHP contractors should include the number and value of signed contracts with customers in their forecast. The Program will use each Contractor's forecast as an input along with other factors including historical performance and program budget availability to create a monthly allocation for each contractor.

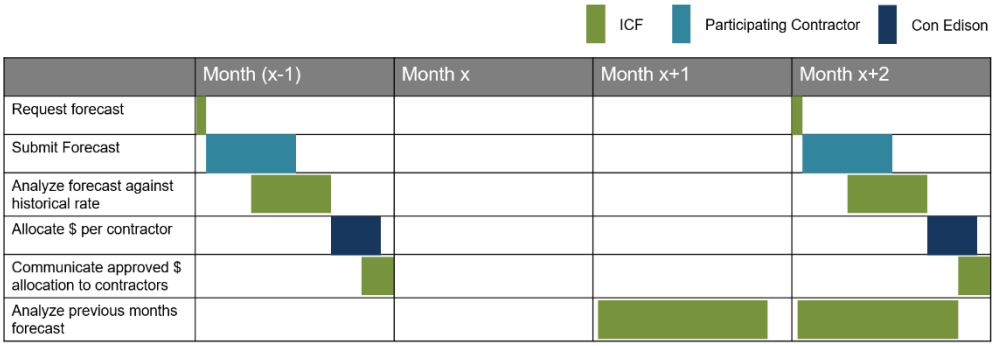
Con Edison will not approve applications that exceed a Contractor's monthly allocation unless the Company has granted prior approval. Contractors who wish to submit applications above their allocation in a given month should reach out to their account manager. Depending on both levels of overall and sectoral Program activity, Con Edison may allow for additional applications in a month. Alternatively, Con Edison may ask the contractor to submit those applications and have them count against the subsequent months' allocation.

For questions about allocation availability, contractors should contact their account manager**.**

On or around the first day of the last month in each quarter (March, June, September, and December) the program team will send a similar allocation request to high-volume contractors. In turn, those forecasts will help the Con Edison Program team assign monthly allocations for the subsequent quarter. Additionally, for the highest-volume ASHP contractors, the account management team will follow up weekly to see how Contractors are trending against their monthly allocation. There will be regular communication with GSHP Contractors as well.

At this time, the Program does not plan to ask smaller volume contractors to submit forecasts every quarter beyond Q1 2023. Contractors that fall under this category will be provided with a default allocation thereafter based on participation in prior quarter(s).

Figure 1: Quarterly Timeline for Allocation Request Forecasts:



Monthly allocations awarded to Residential Participating Contractors will be fixed each month and unused allocations will not roll over into that contractor's allocation in subsequent months. In the first quarter of 2023, Con Edison will launch a dashboard on its OIT where contractors will be able to view their allocations and progress against their allocation. Contractors who wish to receive a larger allocation, or larger allocation than their default allocation, may submit an updated Allocation Request Form for the following quarter.

ASHP projects will draw down their sectoral allocation and their contractor allocation on the date Con Edison receives a complete post-installation application. GSHP projects draw down their sectoral allocation and contractor allocation on the day Con Edison receives the pre-installation application with a signed customer contract.

4.2.2 Incentive Eligibility

To be eligible for residential Clean Heat incentives, a customer must:

- Be a Con Edison electric customer with an active Con Edison account number[39]
- Be located in a building consisting of 1-4 dwelling units OR be pursuing a project electrifying 1-4 dwelling units in a building with greater than five dwelling units
- Be located in a dwelling unit that has not previously received incentives for full-load

[39] GSHP projects in new construction may not need to provide a customer account number at the time of initial application.

electrification from the NYS Clean Heat Program

Customers whose dwelling units previously received partial load Clean Heat incentives, will be eligible to apply for full-load Clean Heat incentives at a future date in 2023.

New construction projects are only eligible for GSHP incentives. Gut renovations and existing buildings are eligible for both GSHP and ASHP incentives.

4.2.3 Incentives

The NYS Clean Heat Program in Con Edison's service territory offers residential incentives for space heating for four types of projects:

- Category 2b: ASHP Full-load heating with decommissioning
- Category 2a: ASHP Full-load heating with integrated controls
- Category 3: GSHP full-load heating with decommissioning[40]
- Categories 2a, 2b and 3: Existing ASHP partial load projects converting to full-load heating with decommissioning or integrated controls. These projects will be eligible to apply to the program at a future date in 2023.

Integrated controls units must be attached to existing heating units and operated such that the heat pump serves as the primary source of heat from the combined heat pump and legacy system.

Decommissioning projects must be performed in such a way that the legacy heating system is disabled.[41] Systems may be removed, disabled, or disconnected consistent with the appropriate decommissioning checklist.

Clean Heat incentives must be identified on an invoice to the customer, with incentive amounts to be paid directly to the Participating Contractor upon program approval. Incentives listed in this section are effective as of January 17, 2023.

4.2.3.1 ASHP Incentives

Table 17: Residential ASHP Incentives

Program Manual Building Type	Category 2a: Full-load ccASHP with Integrated Controls	Category 2b: Full-load ccASHP with Decommissioning
Single Family Detached	$2,500	$8,000
Single Family Attached	$2,500	$8,000
Two-unit building – Both Dwelling Units	$2,500	$8,000
Two-unit building – One Dwelling Unit	$1,000	$3,000
Single units for buildings with 3 or more Dwelling Units	$1,000	$3,000

[40] For existing buildings, all existing fossil heating systems must be decommissioned. For new construction, the GSHP system must be the only system for heating for the building.
[41] Residential decommissioning projects may include electric resistance heating not to exceed 10% of BHL.

ASHP rates are available for ccASHP mini-splits, central systems, and PTHPs.

All incentive rates are capped at 50% of project costs. Each dwelling unit must be separately metered and comply with all applicable laws and regulations regarding dwelling units.

At a future date in 2023, the NYS Clean Heat Program for Con Edison will offer incentives for customers in Dwelling Units which had previously received Category 1 (partial load incentives) to transition to full load heating. Incentives planned for this offering are shown in Table 18, but are subject to change.

Table 18: ASHP incentive rates for premises that previously received a partial load incentive

Program Manual Building Type	Full load with Integrated Controls Conversion Incentive	Full load with Integrated Controls Conversion Incentive
Single Family Detached	$1,250	$4,000
Single Family Attached	$1,250	$4,000
Two Dwelling Unit building – Both Dwelling Units	$1,250	$4,000
Two Dwelling Unit building – One Dwelling Unit	$500	$1,500
Single units for buildings with 3 or more Dwelling Units	$500	$1,500

4.2.3.2 GSHP Incentives

The incentive rate for residential GSHP projects is $20,000 per building or 50% of project costs, whichever is lower. GSHP projects for existing buildings must include decommissioning of the existing heating system. GSHP projects may include ASHP as an ancillary heating system over a minority area of the project. The inclusion of the ASHP does not change the incentive of $20,000 per building or 50% of total project costs. Projects that include ASHP must make note of the difference by square footage and heating load in the Manual J floor by floor plan.

Ground loops must comply with applicable state and local laws and International Ground-Source Heat Pump Association (“IGSHPA”) standards.

For projects installed at new construction sites, all components installed as part of an approved GSHP system must be new. For projects installed at existing sites, the heat pumps must be new and any system subcomponent or subassembly such as controls or ductwork that is replaced should be replaced by a new subcomponent or subassembly. The installation of used or refurbished equipment and components is not permitted under the program.

4.2.3.3 Incentive examples by building types

Building and project type determines the value of incentive for which each residential project is eligible. Eligible sites for residential Clean Heat projects include residential buildings owned or controlled by an active Con Edison customer where an eligible heat pump system for space heating is being installed as a retrofit. For GSHPs, the building types can also include newly constructed buildings.

The building types eligible for the single-family/whole building rate of $8,000 per Dwelling Unit for a

decommissioning incentive are illustrated in Table 19.

Table 19: Residential Single-Family/Whole Building Examples

Building Type	Illustrative picture	Description
Single family detached		A building with one Dwelling Unit that does not share any walls with other conditioned residential buildings.
Single family attached		A building with one Dwelling Unit that shares at least one wall with another residential building
Two Dwelling-Unit Building		A building with two Dwelling Units in this case separated by a single vertical wall. This building type is eligible if the project installs heat pumps and decommissions existing heating systems in both Dwelling Units.

In two Dwelling-Unit buildings where one of two units is electrified, it is eligible for the per dwelling rate ($3,000 for decommissioning, $1,000 for integrated controls, $1,500 for the category 1 conversion). If the project electrifies both units, they are eligible for the single-family/whole building rate for the whole project. If a project electrifies three or four dwelling units in a building with four or fewer dwelling units, the project incentives will be equal to the number of dwelling units multiplied by the relevant per Dwelling Unit rate.

Projects which electrify between one and four Dwelling Units in a multi-family building with five or more Dwelling units, like that in figure 3, are eligible for the per Dwelling Unit rate (e.g., $3,000 for decommissioning, $1,000 for integrated controls, $1,500 for the category 1 conversion).

4.2.4 Residential Application Process

There are four basic stages for a residential application listed here and described below:

1. Contractor Pipeline and Allocation

2. Initial Project Documentation
3. Project Installation and Technical Review
4. Final Review and Payment

Residential incentive applications qualifying for incentives must be submitted within 30 days after the installation is complete.

Stage 1 - Pipeline and Allocations

This stage describes the activities before a Participating Contractor is ready to submit an incentive for a specific project. Before applying for residential Clean Heat incentives, all contractors must first become a participating contractor and provide Con Edison with their monthly allocation requests. Contractors who fail to provide an allocation request or newly added contractors will be provided with a default allocation of 1 project per month within the quarter they sign up to participate. Please refer to Section 4.1 for more on how to become a Con Edison Residential Participating Contractor, and Section 4.2.1 for the monthly Contractor allocation process.

Stage 2 - Initial Documentation

This stage includes the activities that are undertaken while a Participating Contractor contracts with a customer and before the project is installed. For GSHP projects, Participating Contractors must submit a pre-installation application and upload a copy of a signed customer contract within 14 days of contract signing subject to available budget within the Contractor's allocation. When a Participating Contractor submits the initial documentation for the GSHP project, this draws down the monthly allocation.

This step is optional for ASHP projects and would not impact a contractor's monthly ASHP allocation.

Con Edison offers a tool for Participating Contractors to verify customer eligibility for Clean Heat incentives. To conduct a look-up, Participating Contractors will need to enter a customer's 14-digit account number, meter number, or premise address. If the premise is eligible for Clean Heat incentives, the system will provide Contractors with an eligibility key. Premises that have already received full-load Clean Heat incentives are not eligible for additional.

Additionally, the Program will offer a pre-application option for ASHP contractors that the Company plans to roll out in Q1 2023. One calendar day after a pre-installation application is received, a system automated pre-approval notification is sent to the Participating Contractor via email that confirms eligibility, and incentive details, including the estimated incentive amount. Documentation required for the pre-installation application is captured in the box at right.

When the pre-application process becomes available for ASHP projects in existing buildings the pre-approval confirmation will expire in 30 days for existing buildings.

For GSHP projects, the incentive offer provided in the project pre-approval confirmation email will expire in 180 days for projects in existing buildings and the sooner of September 1, 2025 or 24 months

Box 1: Data Fields for Pre-Installation Application

- Project Name
- Eligibility Key
- Premise Address
- Building Type
- Multifamily Building (Y/N)
- No. of Dwelling Units
- Building Load
    - ASHP full load with integrated controls or decommissioning
    - GSHP with decommissioning)
- Estimated total Project Cost
- Planned Installation Date
- Signed customer agreement (for GSHP projects)

from the date of the confirmation email for new construction. The Participating Contractor may request an extension of time to complete projects by submitting an email to Con Edison listed in Section 0 explaining the reason for the delay. Extensions may be granted at Con Edison's discretion.

Stage 3 – Installation and Technical Review

This stage includes the activities that occur after the Participating Contractor completes installation of the project and submits the final application for incentives and required supporting documentation. Incentive applications are due no later than 30 days after the heat pump system is installed and operational.

The application processing system will calculate if the new application package will cause the Participating Contractors to exceed their monthly allocation and prevent submission. In this circumstance the Contractor will be invited to save their package and submit in the following month. Contractors approaching their monthly allocation, who still wish to submit projects, should reach out to the Residential Program team for permission to exceed their allocation.

Data fields previously provided in Stage 2 marked with an asterisk (*) in Box 2, will be pre-populated and are not editable during this step. If any of the pre-populated information has changed, Contractors will be required to "cancel" the current pre-application submission. Once cancelled, Contractors will then be able to "clone" the previous submission and choose to "edit" and amend the relevant data fields and submit. Contractors will then be able to return to this application the following calendar day to submit their application package.

Documentation Requirements – ASHP and GSHP projects

All projects are required to submit the following documents as part of the application:

- **Completed program application** – Relevant fields and documents are listed below.
- **Cutsheets for System Capacity** – Specific model(s) and product ratings being used in the project must be reflected on the cutsheets
- **Customer Invoice** – The invoice must clearly indicate the costs of the project, separated by labor and materials with a total and the value of the Clean Heat incentive clearly labeled as a discount from Con Edison. The invoice must also indicate for the manufacturer, model number and number of each unit installed.

Box 2: Final Application Data Fields

- ***Eligibility Key****
- Customer Name
- ***Premise Address****
- ***Account Number****
- ***Building Type****
- Installation Date
- Year built
- Building Cooling Load (BCL) at design temp
- Total System Cooling Capacity at design temp
- Building Heating Load (BHL) at design temp
- Total System Heating Capacity at design temp
- Total Project Costs (Labor + Equipment – excluding tax)[1]
- System Cost for Equipment (as a percentage)
- Status of Existing Equipment (decommissioned or removed)
- Was Clean Heat financing used on this project?
- Total building square footage
- Manual J conditioned square footage
- Replaced Heating fuel of system
- Replaced Electric Heating System (if applicable)
- Replaced Fossil Fuel Heating System (if applicable)

- **Customer Participation Acknowledgement** – Confirmation that customer agrees to terms and conditions, and recognizes the incentive amount provided.
- **Floor by Floor Manual J** – Latest heating and cooling load calculations showing that the heat pump system design and appliance selection has been performed in accordance with ACCA Manual J, ANSI/ASHRAE/ACCA Standard 183-2007 (RA2017) or other code-approved equivalent computational procedure depending on building type. Manual J calculations should be submitted in PDF format, unless otherwise requested.
- **Photo Submission** – Two types of photos must be submitted to verify the equipment's proper installation: a longshot of the compressor and nameplate photos. The longshot photo must be taken at such range as to show the installed compressor and another identifying element (e.g., the siding) of the building. Serial numbers must be legible in nameplate photos to avoid a project moving into a flawed status.

- **Decommissioning Checklist (if applicable)**

The Program will review the application package for all projects to confirm the incentive and savings based on as-built conditions and as-installed costs. All documentation must be complete and accurate before a project will be approved for payment. When an application is incomplete or inaccurate, Con Edison will contact the Participating Contractor to request the missing and/or correct information. Participating Contractors have 30 days from the date Con Edison or ICF notifies them to complete their application, unless otherwise indicated. If the missing and/or incorrect application is not resolved within the specified timeline, including resolution of inspection flags, the application will be cancelled and will not receive an incentive.

Projects outside the recommended BHL/SF guidelines in Table 20 will be subject to additional technical review, including higher inspection rates.

Table 20: Recommended BHL/SF Ranges by Building Age

Year Built	Minimum BHL/SF	Maximum BHL/SF
Pre-1945; uninsulated Brick	30	45
Pre-1945 Insulated	25	45
Pre-1979	20	35
1979-2006	15	30
2007 or later	15	25

Stage 4 – Final Review and Payment

Con Edison has set a target of 10% of projects by contractor fora Post-Installation Programmatic Inspection to confirm that the work was conducted in accordance with the incentive application. Con Edison will withhold incentive payments for projects selected for Programmatic Inspection until after the inspection is complete and any issues found on site which call for remediation are addressed. Projects not selected for a Programmatic Inspection will be reviewed and processed for payment. All projects may be subject to a QAQC Inspection discussed below. Contractors should inform customers of

the possibility of up to two inspections at the time of installation.

Rejection or modification of an incentive application is at Con Edison's sole discretion.

The Program will pay residential ASHP or GSHP incentives to Participating Contractors upon incentive approval. Each Participating Contractor will be reimbursed for an amount not to exceed the instant discount amount provided to Customer at the time of install, and as documented in the site owner invoice or contract. High volume contractors may apply to receive incentive payments via ACH, so that eligible Participating Contractors can receive incentive payments directly into their bank accounts without the need for paper checks. The minimum threshold to be eligible for ACH are deposits totaling $100,000 annually.

Through participation in the Residential program, Participating Contractors will be required to comply with a Quality Assurance/Quality Control (QA/QC) process for the purpose of ensuring quality installations and improving program processes.

4.2.5 Residential Savings Calculations

4.2.5.1 Savings Methodology for ASHP

For ASHP projects, Con Edison will calculate savings using a deemed savings approach based on the conditioned square footage and age of the building. Con Edison will work with other stakeholders across the state to add the deemed savings methodology to the *The New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs - Residential, Multi-Family, and Commercial/Industrial,* known as the Technical Resource Manual ("TRM") by April 1, 2023.

4.2.5.2 Savings Methodology for GSHP

Con Edison uses the methodology outlined in the TRM and best practices to estimate energy savings for GSHP heat pump installations.[42]

4.2.5.3 Savings Methodology for GSHP VRF

GSHP VRF systems in residential buildings are eligible for GSHP incentives but the savings for the measure are not defined in the TRM. Therefore, projects with GSHP VRF systems must use an alternative calculation method, such as the statewide Custom Clean Heat Program Savings Calculator.

The Statewide Custom Clean Heat Program Savings Calculator is an Excel-based tool that has been developed to assist Participating Contractors applying to the NYS Clean Heat Program with calculating energy savings and incentives for several different types of heat pump technologies. Refer to the Statewide Custom Clean Heat Program Savings Calculator user guide for an updated list of relevant technologies whose savings and incentives can be calculated using the Clean Heat Calculator.

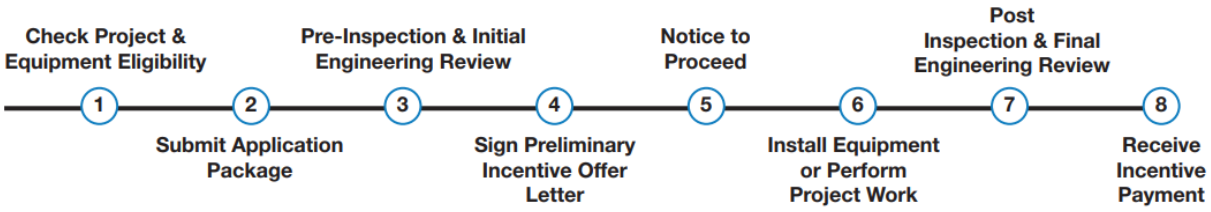
The Clean Heat Calculator should be used as the default method to calculate energy savings for GSHP VRF systems. Under certain circumstances, applicants may bypass using this calculator, opting instead to

[42] The New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs - Residential, Multi-Family, and Commercial/Industrial, known as the Technical Resource Manual (TRM), https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD

calculate savings using their own custom bin analysis or energy modeling approach, as approved by Con Edison.

4.3 Non-Residential Program Requirements and Application Process

Non-residential projects submitted to the Program will follow the general process outlined below. Steps are dependent on whether project measures fall under prescriptive incentive categories or custom incentive categories.



1. Check Project and Equipment Eligibility

Confirm that the customer, site, proposed measures, and contractors qualify for the program as specified in the Eligibility Requirements in this Manual.

2. Submit Application Package

Depending on the customer segment (see below for more information), contractors should submit applications via the following channels:

- *C&I*: Customers & Participating Contractors should submit applications via email to cleanheatcommercial@coned.com with a subject line of **New C&I Clean Heat Application – [Applicant Name]**.
- *SMB and MF*: Customers & Participating Contractors should upload applications to SMART (Willdan's project management web portal, available at https://sbdi.smart-willdan.com/ for SMB and https://mf.smart-willdan.com for Multifamily). Incomplete submissions will be rejected.

An application package is required for all Clean Heat projects and may include the documentation listed below. Descriptions of the required documentation can be found in Section 4.3.1.

Documentation for SMB projects is defined in Section 4.3.3.4 Program Pathway (Prescriptive vs Custom).

When submitting an application package, Participating Contractors must label these documents with the appropriate file names shown below:

- **Completed program application for the current year:** (*Filename: Address_Application*)
- **W-9 of the incentive recipient:** (*Filename: Address_ W9 Form*)
- **Scope of Work:** (*Filename: Address _ Statement of Work*). Must include the following:
  1. **Cutsheets for Proposed Equipment:** *(Filename: Address _ Cutsheet – [Make - Model #])*
  2. **Cost Estimate for Proposed Work***:* (*Filename: Address _ Cost Estimate*)
  3. **Project Timeline**: (*Filename: Address _ Project Timeline*)
  4. **Design Drawings**: (*Filename: Address _ Design Drawings)*
  5. **Load Calculations**: (*Filename: Address _ Load Calc*)
  6. **Energy Savings Analysis**: *(Filename: Address _ Calculations)*

7. **Building Information**: *(Filename: Address _ Building Info)*
8. **Other measure specific documentation**: (*Filename: [Specify Document Type based on measure-specific requirements])*

3. Pre-Inspection & Initial Engineering Review

a. Initial Engineering Review

Con Edison will review the application's technical documentation for completeness to verify equipment technical eligibility, project incentive category, baseline and assumptions used in the energy analysis to determine preliminary savings and incentives for the project.

During the review process, the reviewing engineers might request further information and documents to complete their review of a project.

b. Pre-Installation Inspection

All projects are subject to an onsite pre-installation inspection of existing heating and cooling systems after the initial technical review. Scheduling of inspections is coordinated with the customer and Participating Contractor based on the customer's availability. The inspection verifies the existing site conditions, including HVAC and other building systems, as consistent with the scope of work and Program requirements.

In the case of new construction projects, a document review will be conducted to produce the Preliminary Incentive Offer Letter and Notice to Proceed.

For multifamily projects, inspections will require access to a minimum of 10% of the total building dwelling units.

For SMB projects, some projects may receive virtual inspections, in which case Participating Contractors must follow the detailed guidelines provided by the program.

c. Measurement & Verification

Measurement and Verification (M&V) may be required for projects in which the technology or project has a high degree of savings uncertainty, is an unknown or unique application, is comprised of a complex group of measures, or is part of a Non-Wires or Non-Pipeline Solutions area. The overall intent of M&V is to mitigate risk to the program by reporting more accurate savings through metering and data collection. It involves a more robust approach to measuring the energy conservation measure and its application. The M&V approach will utilize various methods to obtain insights into energy conservation measures (ECMs), assess their application as well as their impact on savings and incentives.

4. Sign Preliminary Incentive Offer Letter

Once the customer receives the PIOL, they must sign and return it within 30 days. The estimated dates for installation start and completion must also be provided on the signed PIOL. *For SMB and Multifamily only*, once the PIOL is returned, the Participating Contractor can begin the installation. *For C&I,* the Participating Contractor must wait until the pre-inspection is complete and they have received a Notice to Proceed.

Projects will draw down their sectoral allocation on the date Con Edison issues a PIOL.

Table 21 gives the timelines on which projects must be completed from the date of the PIOL.

Table 21: Installation Timelines

Category	Existing Buildings
Prescriptive	12 Months
Custom	24 months

In the event of unusual delays, the Participating Contractor may request timeline extension to complete the project. Extension requests are subject to the sole discretion of Con Edison. Extensions beyond June 2025 will not be accepted.

5. Notice to Proceed

For C&I projects only, following the signed PIOL, Con Edison will issue a Notice to Proceed at which point project work may begin.

6. Install Equipment or Perform Project Work

The Participating Contractor must submit project completion documents as soon as the project is completed. A project is considered complete when the eligible scope is installed and operational, and the project is ready for post-inspection. The completion documents include:

1. **Customer Acknowledgement Form:** (*Filename: Customer Acknowledgement Form*)
2. **DOB Permit:** (*Filename: DOB Permit*)[43]
3. **Final Invoice:** (*Filename: Invoice*)
4. **Decommissioning Checklist (if applicable):** (*Filename: Decommissioning Checklist*)
5. **Electric Service Ruling:** (*Filename: Electric Service Ruling*)
6. **Updated Scope of Work (if applicable):** (*Final* to the file name)
7. **Warranty:** (Filename: *Warranty*)

7. Post-Installation Inspections & Final Engineering Review

a. Post-Installation Inspections

Con Edison will conduct an on-site post-installation inspection to confirm that all work was installed in accordance with the SOW provided with the initial application. Post-installation Inspections will be conducted after all approved heat pump measures have been installed and the completion paperwork has been submitted. The inspections team will assess the quality of workmanship of the heat pump installation, including verifying proper installation and functioning of the equipment and that work has been performed in accordance with the approved scope of work in compliance with Program rules.

Similar to pre-installation inspection, the inspectors will need access to at least 10% of dwelling units in the multifamily sector, as well as 100% of all condensers.

b. Final Engineering Review

Con Edison will review the completion paperwork and findings from the post-installation inspection, revising the energy savings calculations, as necessary, to reflect as-built conditions and as-installed costs, and determine the final project savings and incentive. If the oversight, including on-site

[43] SMB prescriptive projects in Category 2d may sign a waiver in lieu of a DOB permit.

inspections finds any conformances, the Program may require that those be fixed before issuing payment.

If the final project differs from the SOW and the PIOL, the incentive will be adjusted to match the final installation. For projects with a requirement to submit DOB drawings, if the final project differs from the DOB-approved design drawings, a DOB-approved PW4 must also be submitted.

In the event that the energy savings were to increase, a higher incentive than what was listed on the PIOL cannot be guaranteed.

c. Quality Assurance/Quality Control

Some projects will be selected for QAQC activities, such as a secondary inspection or an additional engineering review. The goal of QAQC is to protect the Program from fraud and provide actionable insights for program improvement and efficiency. QAQC is performed by a third-party contractor on behalf of Con Edison. Projects may be selected at random or based on other criteria including size, savings or incentives. QAQC activities are not optional, and the participant is expected to cooperate fully with any effort by Con Edison or its contractors and subcontractors to make follow-up visits to customer facilities, provide supporting documentation, and other requests in support of this effort. Additionally, Participating Contractors may be subject to utility-specific reviews and/or assessments to verify program measure implementation and acquisition. Contractors with concerns about the QAQC process should reach out to their account manager.

8. Receive Incentive Payment

After the Con Edison Program team finalizes the Project's energy savings and incentives, Con Edison will issue an incentive check to the incentive recipient designated on project documents.

4.3.1 Supporting Documentation Description

Application & W-9

- Applications must include a copy of a signed legal contract between the participating contractor and the customer, with terms and conditions. Incomplete applications, or applications with inaccurate and/or incomplete customer/customer's representative details are not accepted. Account name must match the name of the Con Edison account holder
- The W9 must match the name of the payee as indicated on the program application and must be latest version available on IRS website at the time of application to the program.

Scope of Work

A detailed scope of work that specifies all equipment related to the proposed measure, includes a description of the existing system operation, and provides the following additional details:

- Describes the extent of work and indicates whether the scope involves gut rehab.
- Provides a description of existing heating and cooling systems and building envelope, or in the case of gut rehab, a counterfactual case that describes the equipment and building envelope that would have been installed but for the Clean Heat Project.
- Specifies the type of heat pump technology being proposed for installation, quantity of new units, and proposed system application (e.g., domestic hot water heating, space heating and cooling). Specifies whether equipment is ducted or ductless.

- Provides design capacity, efficiencies, and proposed sequence of operations for new heat pump installation
- Specifies what percentage of the design heating/cooling load the new heat pumps are proposed to accommodate. See Required Equipment Sizing for details regarding equipment sizing.
- Specifies whether supplemental heating, via either an existing heating system or new heating system, is required to accommodate the design heating load. If a supplemental heating system is required, provide an explanation as to the following:
- In the case of a partial load project, describes why additional electrification above and beyond the proposed design is not feasible.
- In the case of a decommissioning project, describes the existing heating system's decommissioning plan.
- Identifies the on-site personnel that will learn & operate the control module(s).

For Gut Renovations: Specify which energy code compliance pathway (*i.e.*, Tabular Analysis, COMcheck, or Performance Path) design follows to demonstrate compliance with the applicable 2020 energy code and whether design trade-offs have been taken.

A completed Scope of Work must also include the supporting documentation listed below:

1. Cutsheets & AHRI/NEEP certificates

Specific model(s) and product ratings being used in the project must be submitted with the project application to properly determine equipment eligibility. Model numbers must be highlighted on the cutsheets before submission to the program. AHRI and NEEP certificates of the proposed equipment are required as well.

2. Cost Estimate for Proposed Work

Applicants shall submit a cost estimate for the proposed work with its initial application. Installation costs as provided to the customer, including labor and materials, date of the proposal generated, and the customer's representative's details to whom it was submitted must be submitted with the project application for the proposed heat pump scope. Labor and material costs shall be presented separately as an itemized list, and costs shall be limited to the equipment cost and labor cost. Other costs such as taxes, internal labor costs, shipping, administrative costs, project management, construction management, permitting, or similar costs will not be included with total project cost when calculating incentive caps.

3. Project Timeline

Applicants must include anticipated timeline of installation beginning and completion.

4. Design Drawings

For projects with more than 350 MMBTU savings (CHP calculator output), appropriate city/county construction permit copies are required along with the associated documents such as mechanical, architectural & EN shop drawings. If the site/project is deemed to not require filing a city/county permit per the applicable city/county legislation, a detailed explanation will be required along with any supporting documentation, for e.g., a letter from NYC Department of Buildings, etc. Drawings do not need to be DOB approved during the initial review phase. Large Commercial and Industrial Customers may submit this at

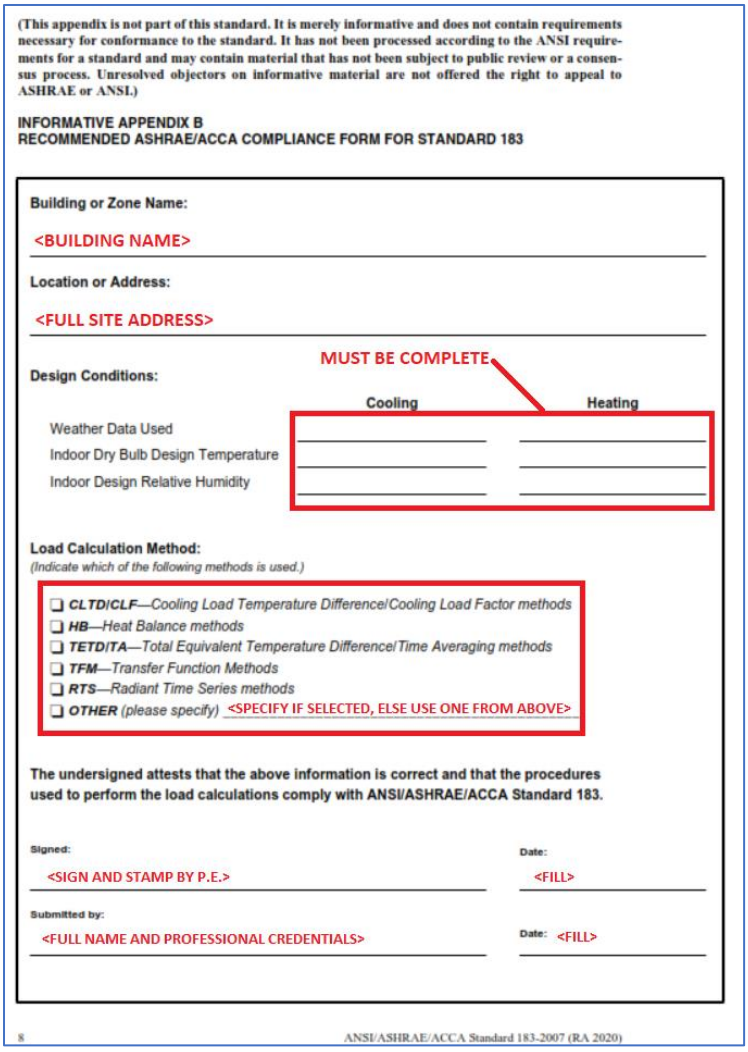
5. Load Calculation

- For commercial spaces & buildings, BHL & BCL shall be calculated following ANSI/ASHRAE/ACCA

Standard 183-2007(RA2020), ACCA Manual N 5th ed., or other code-approved equivalent computational procedure, and the Participating Contractor must submit a load calculation report.

- Calculation of the building's design heating load shall be at the 99% dry bulb heating design temperature for the most relevant ASHRAE 2017 location.
- Calculation of the building's design cooling load shall be at the 1% dry bulb cooling design temperature for the most relevant ASHRAE 2017 location.
- Software files detailing the project's load calculation analysis may be requested by the program team at their discretion.
- Every load calculation report copy must have a completed and signed copy of the ASHRAE 183 Compliance form, for reference, see **Error! Reference source not found.**.
- The heat pump designer responsible for sizing the system must be the one performing and approving the load calculation. If a project has a building permit filed for the onsite work, it must share the responsible registered P.E./R.A. with the load calculation report.
- **Technical requirements**:
  a) **Load calculation method**: a procedure used to calculate the cooling or heating load of a zone or building. Load calculation methods that comply with ANSI/ASHRAE/ACCA Standard 183-2007 include, but are not limited to:
     1. the cooling load temperature difference/cooling load factor (CLTD/CLF) family of methods,
     2. total equivalent temperature difference/time averaging (TETD/TA) methods,
     3. transfer function methods (TFMs),
     4. radiant time series (RTS) methods, and
     5. heat balance (HB) methods.

  b) Load calculation analysis must be zone-by-zone or room-by-room type; block load calculations will not be accepted.



(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal to ASHRAE or ANSI.)

INFORMATIVE APPENDIX B
RECOMMENDED ASHRAE/ACCA COMPLIANCE FORM FOR STANDARD 183

Building or Zone Name:
<BUILDING NAME>

Location or Address:
<FULL SITE ADDRESS>

Design Conditions:
MUST BE COMPLETE

	Cooling	Heating
Weather Data Used		
Indoor Dry Bulb Design Temperature		
Indoor Design Relative Humidity		

Load Calculation Method:
(Indicate which of the following methods is used.)

- ❑ CLTD/CLF—Cooling Load Temperature Difference/Cooling Load Factor methods
- ❑ HB—Heat Balance methods
- ❑ TETD/TA—Total Equivalent Temperature Difference/Time Averaging methods
- ❑ TFM—Transfer Function Methods
- ❑ RTS—Radiant Time Series methods
- ❑ OTHER (please specify) <SPECIFY IF SELECTED, ELSE USE ONE FROM ABOVE>

The undersigned attests that the above information is correct and that the procedures used to perform the load calculations comply with ANSI/ASHRAE/ACCA Standard 183.

Signed: <SIGN AND STAMP BY P.E.>
Date: <FILL>

Submitted by: <FULL NAME AND PROFESSIONAL CREDENTIALS>
Date: <FILL>

8 ANSI/ASHRAE/ACCA Standard 183-2007 (RA 2020)

Figure 2 ASHRAE 183 Compliance Form

6. Savings Calculations

The Statewide Custom Clean Heat Program Savings Calculator (Clean Heat Calculator) is an Excel-based tool that has been developed to assist Participating Contractors applying to the NYS Clean Heat Program with calculating energy savings and incentives for various types of heat pump technologies. The Statewide Custom Clean Heat Program Savings Calculator user guide contains an updated list of technologies for which the Clean Heat Calculator calculates savings and incentives.

The Clean Heat Calculator should be used as the default method to calculate energy savings for the custom categories (4, 4a, and 10).

Applicants may bypass using this calculator, opting instead to calculate savings using their own custom bin analysis or energy modeling approach. All calculations must be clear and transparent, utilizing standard engineering methodologies, including a listing of source values.

7. Building Information

Description should specify building type and the floors or building areas impacted by the project. Include whether any other measures are being installed to contribute to additional heating or cooling relief,

such as building envelope upgrades (e.g., weatherization, sealing, insulation, etc.).

8. Other measure specific documentation

Projects may be required to include other documentation specified in this Program Manual specific to the technology or category. For example, SMB projects applying for prescriptive incentives based on square footage must submit floor plans.

Project Completion Documents

1. Customer Acknowledgement Form

Customer and Participating Contractor signed Customer Acknowledgement Form. Only material and labor costs directly related to incentivized measures should be included on the completion form.

2. DOB Permit

Approved Department of Buildings permit submission including EN-drawings and energy analysis (COMcheck, tabular analysis). Permits are not required for SMB projects applying for prescriptive incentives; however, the Participating Contractor must provide a signed waiver confirming that they have complied with all local building laws.

3. Final Invoice

Applicants shall submit a final invoice, documenting actual material and labor costs for the installation, with all completion documents. The final invoice must include all the information listed below to meet the documentation requirements. The document must be labeled as an invoice and cannot be labeled as a proposal and include the following elements as in **Error! Reference source not found.**.

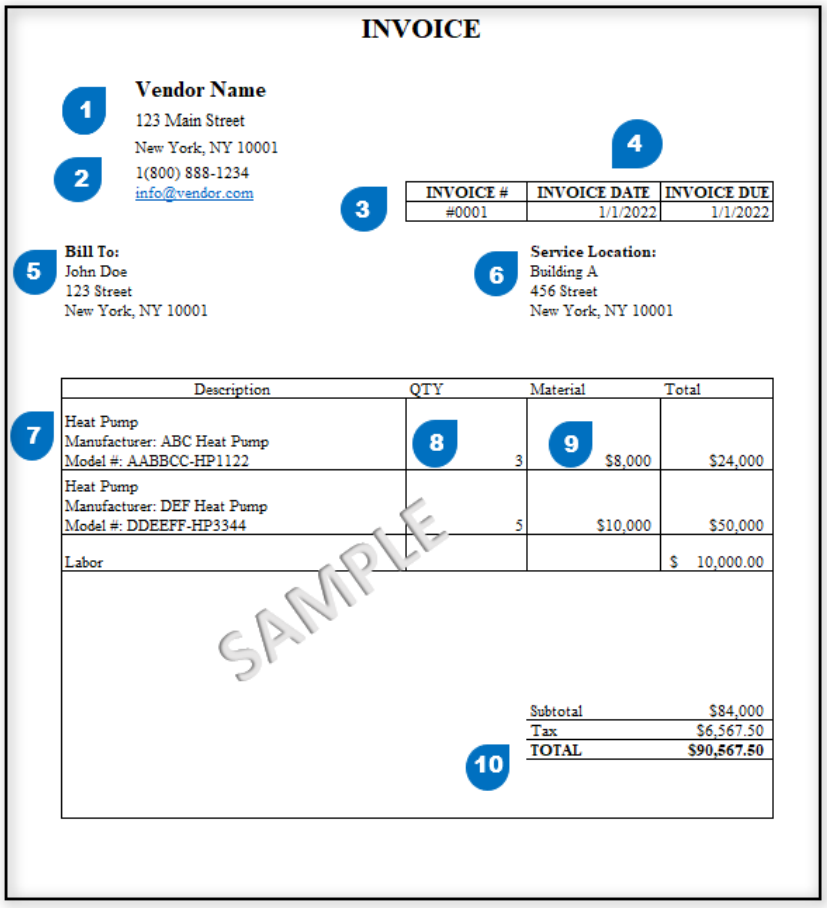
Project Costs and Invoicing Requirements

Material and labor costs submitted to the program are subject to Con Edison review and may be capped for incentive calculations at the company's sole discretion. Internal labor costs will not be included with total project cost when calculating incentive caps. When submitting invoices with the Customer Acknowledgement Form, customers must provide Con Edison with detailed invoices identifying the following:

- Contractor name and address
- Contractor contact information
- Customer representative's details, project's address, related to the items listed in the scope of work that was approved by the program. Changes to approved scope of work must be submitted to the program team for approval
- Itemized description of equipment installed – Make and model number(s) are required in both cost proposal and the final invoice. Serial number(s) are not required in the cost proposal but are required in the final invoice.
- Quantity, purchase date and delivery date of equipment installed: This is required to verify the quantity of equipment installed aligns with the Con Edison Program application.
- Invoice Number
- Installation date and invoice issue date
- Itemized labor and material costs for all installed equipment
- Material costs associated with decommissioning existing fossil heating systems as applicable
- The final invoice provided to Con Edison must be the same invoice the customer is receiving and match the Customer Acknowledgement Form.

- Unless otherwise specified, project cost is limited to the equipment cost and labor cost. Other costs such as taxes, internal labor costs, shipping, training, admin costs, or similar costs will not be included with total project cost when calculating incentive caps.
- Each line item must include a brief description. For example, include the equipment tag for an air handler as “AHU 13B”, as well as make, model and serial number.
- Unless specified in the incentive application, the Participating Contractor would be the default recipient of the approved incentive amount.
- If a Participating Contractor is receiving incentives on behalf of a customer, a line item stating “Con Edison Incentive Credit” with an invoice credit must be documented on the invoice. The invoice credit must reflect the same incentive amount the customer would receive had they completed the submission themselves for the same project. In the event a custom project submitted for incentives is a portion of a larger scope, the customer will provide invoice(s) that clearly outline the specific project description and costs that is being applied to the project in the program.

Figure 3: Sample Invoice



1. Contractor name and address

2. Contractor contact info

3. Invoice #

4. Install date/ Invoice date

5. Customer name and address

6. Installation site

7. Make and model # installed

8. # Units installed

9. Unit cost

10. Total cost including labor

4. Decommissioning Checklist

Completed decommissioning checklist (as applicable)

5. Electric Service Ruling

All projects must be reviewed by and receive a 'service adequate' electric service ruling from Con Edison Energy Services. A Master Case ID ("MCID") will be issued by Con Edison Energy Services when the project is submitted for review. The MCID shall be provided to the Program as early as possible, but no later than notification of construction completion, to serve as record that consultation with Con Edison Energy Services has occurred. Final incentive payments will be contingent on receipt of the MCID and a 'service adequate' electric service ruling from Con Edison Energy Services. For more information, refer to the Con Edison Blue Book that is located on the Con Edison's Energy Services Resource Web Site.

6. Updated Scope of Work

If any aspect of the scope of work changed during installation, the relevant documents must be updated and resubmitted.

7. Warranty

Each qualified residential and small commercial ASHP receiving an incentive under the Program must include a minimum five (5) year manufacturer's warranty for parts including compressor. Warranty terms must be included in at least one document supplied to the customer – it could be included in the final invoice, and/or in the contract between the customer and the Participating Contractor. This requirement does not apply to large commercial and industrial customers.

4.3.2 Multifamily Program Eligibility and Requirements

This Section of this Program Manual is designed to provide Participating Contractors with the information they will need to participate in the multifamily sector of the Clean Heat Program and supplements the application process outlined above in section 4.3. The multifamily program supports cold climate air-source heat pump (ASHP), ground-source heat pump (GSHP), and heat pump water heater (HPWH) measures installed in Con Edison's electric service area.

4.3.2.1 Incentive Eligibility

Buildings with five or more Dwelling Units are eligible for the Clean Heat multifamily incentives. Existing buildings are eligible for incentives for ASHP, HPWH and GSHP. New construction projects are only eligible for GSHP incentives. New construction projects are not eligible for ASHP incentives, including when used to supplement GSHP projects. New construction projects can participate in midstream HPWH program or receive custom incentives when paired with GSHP for space heating. New construction projects pursuing standalone custom hot water with ASHP for space heating are not eligible for incentives.

Mixed-used buildings with both multifamily and commercial spaces should apply to the program with the dominant use type, determined on a case-by-case basis. In most cases, where more of a building's square footage is dedicated to multifamily uses, this will lead mixed-use buildings to apply in the multifamily program.

All existing buildings are subject to decommissioning of the existing heating system for the building's space-heating scope of work. For example, if the project applies for incentives for the whole building, it must decommission the existing heating system used for space heating throughout the whole building. Alternatively, if a project applies for incentives for a wing of the building, it must decommission the existing heating elements in that wing. The existing heating system is permitted to heat other areas of the building which were not in the scope of the Clean Heat project.

To be eligible for residential Clean Heat incentives, a customer must meet the following criteria:

- Have an active Con Edison electric account
- The building must be occupied year-round
- Projects submitted after January 17, 2023 should not have begun installation[44]

Projects in the following categories are not eligible for Clean Heat incentives:

- Sites that received incentives from a previous Clean Heat Program
- Common-area-only-scope of work

In cases where a project covers 1-4 Dwelling Units in a multifamily building, it is eligible for residential incentives in category 2a or 2b, but not multifamily incentives in category 2c or 4.

4.3.2.2 Incentives

Incentives are available on a first-come, first-served basis. All incentives are limited to 50% of project costs or $1 million, whichever is lower. Project costs include those related to equipment, labor, decommissioning, and project design.

The NYS Clean Heat Program in Con Edison's service territory offers incentives for the following types of multifamily projects:

- Category 2c — ASHP Full-load heating with decommissioning in buildings with 50 or fewer Dwelling Units
- Category 4 — Custom full load space heating applications with decommissioning
- Category 4a — Full-load heat pump projects with envelope upgrades and decommissioning
- Category 6 — Custom Hot Water Heating Applications

Table 22: Multifamily incentive Rates

Category Number	Description	New Construction (GSHP Only)	Existing Buildings Incl. Gut Rehab
2c	Full-load ASHP (Buildings under 50 units)	N/A	$4,000/Dwelling Unit
4	Custom existing buildings	$125/MMBtu	$200/MMBtu
4a	Tier 1	$125/MMBtu	$200/MMBtu
	Tier 2	$150/MMBtu	$225/MMBtu
6	Custom Domestic Hot Water ("DHW")	$125/MMBtu	$200/MMBtu

4.3.2.3 Program Pathway (Prescriptive vs Custom)

All projects will require a floor-by-floor Manual J Load Calculation report.

[44] Installation is defined as having installed any indoor or outdoor mechanical equipment.

Prescriptive Projects

A building is eligible to proceed under the prescriptive pathway, under category 2c, if it contains 50 Dwelling Units or fewer. Projects receiving the prescriptive rate must electrify and decommission either the whole building or an identifiable portion of the building. In cases where a project electrifies 1-4 Dwelling Units in a multifamily building, that project is eligible for residential incentives at the per Dwelling Unit rate, not the multifamily rate.

Prescriptive projects may not combine their project with a custom project at the same time and location. For example, a prescriptive project which relied on a central ASHP system could not also seek custom incentives for installation of a complementary ERV/HRV.

Custom Projects and Approved Calculation Approaches

A project is eligible to apply for incentives under the custom incentive rates, in categories 4, 4a and 6 if it contains more than 50 Dwelling Units or is installing a custom technology. The technologies which are approved for the custom pathway are listed below.

All projects applying for incentives under the custom categories must submit savings calculations using either the latest version of the Statewide Custom Clean Heat Program Savings Calculator or a custom Excel model.

4.3.2.4 Multifamily Savings Calculations

For projects in category 2c, electrifying 30 apartments or fewer, Con Edison will calculate savings using a deemed savings approach to be added to the TRM by April 1, 2023.

For projects in category 2c electrifying between 30 and 50 apartments, Con Edison will use the savings calculations prescribed in the TRM.

For custom projects in categories 4, 4a and 6, applicants and Con Edison follow methodologies outlined in Section 3.

4.3.3 Small and Medium Business Program Eligibility and Requirements

This Section of this Program Manual is designed to provide Participating Contractors with the information needed to participate in the small and medium business (SMB) sector of the Program. The SMB program supports cold climate air-source heat pump (ASHP), ground-source heat pump (GSHP), and heat pump water heater (HPWH) measures installed in Con Edison's electric service area.

4.3.3.1 Incentive Eligibility

Existing buildings are eligible for incentives for ASHP, HPWH, and GSHP. New construction projects are only eligible for incentives for GSHP i and HPWH when installed in conjunction with GSHP. New construction projects are not eligible for ASHP incentives, including when used to supplement GSHP projects. New construction projects can participate in midstream HPWH program or receive custom incentives when paired with GSHP for space heating. New construction projects pursuing standalone custom hot water or custom hot water with ASHP for space heating will not be eligible for incentives.

Mixed-used buildings with both multifamily and commercial spaces should apply to the program with the dominant use type, determined on a case-by-case basis. In most cases, where more of a building's square footage is dedicated to multifamily uses, this will lead mixed-use buildings to apply in the multifamily program.

All existing buildings are subject to decommissioning of the existing heating system for the building's space-heating scope of work.

To be eligible to participate in the SMB sector of the Program, all the following statements must be true:

- The customer must have an active direct metered Con Edison electric account and, when installed, the heat pumps' usage must be billed to this account.
- The customer must have an average peak demand of less than 300 kW on a rolling 12-month basis.
- The customer has not previously received Clean Heat incentives.
- The site must be occupied year-round.
- Equipment must be installed *after* the customer signs and submits a signed Preliminary Incentive Offer Letter ("PIOL") from Con Edison, allows for pre-installation inspection, and receives a Notice to Proceed ("NTP") from Con Edison.

Installed HPs must be used for heating to displace existing fossil fuel or electric space heating and/or DHW usage and cannot be used *only* for cooling.

- Installed HPs must be used for heating to displace existing fossil fuel or electric space heating and/or DHW usage and cannot be used *only* for cooling.

4.3.3.2 System Eligibility

The Program expects that projects applying for the prescriptive incentives should fall within the minimum and maximum BH/square foot guidelines in Table 23 for each business sector. BH/square foot is defined as the actual equipment heating output at 17F. The Program may accept projects outside of these ranges on a case-by-case basis with a reasonable, documented justification.

Table 23: Recommended Range BH/SF for SMB Projects

Building Sector	Min BH/SF	Max BH/SF
Restaurant /Fast Food	20	30
Big Box Retail	15	35
Small Retail	20	40
Schools	18	35
Office	15	30
Religious Institutions	20	35
Grocery Stores	20	35
Auto Repair	25	45
Hospital and Healthcare	20	40
Assembly	20	30
Fitness Centers	20	35
Warehouses	8	20
Light Industrial	25	50
Hotels	15	30

4.3.3.3 Incentives

Incentives are available on a first-come, first-served basis. All incentives are limited to 50% of project costs or $100,000, whichever is lower. Project costs include those related to equipment, labor, decommissioning, and project design.

The Con Edison Clean Heat offers incentives for the following types of projects in the SMB program:

- Category 2d: ASHP Full-load heating with decommissioning (required for all projects with a floor area of 2,500 square feet or less)
- Category 4: Custom full load heat pump space heating applications with decommissioning
  Category 4a: Full-load heat pump projects with envelope upgrades and decommissioning
- Category 6: Custom Hot Water Heating Applications

Table 24 offers a summary of the SMB incentive offerings.

Table 24: SMB Incentive Rates

Category	Description	GSHP		ASHP
		New Construction	Existing Buildings incl. Gut Rehab	Existing Buildings incl. Gut Rehab
2d	SMB Full Load ASHP Heating with Decommissioning (<1,000 square feet)	N/A	N/A	$2,500/project
2d	SMB Full Load ASHP Heating with Decommissioning (1,000-2,500 square feet)	N/A	N/A	$5,000/project

4	Custom Full Load Space Heating Applications	$125/MMBtu	$200/MMBtu	$150/MMBtu
4a	Custom Full Load Space Heating Applications + Envelope	$125/MMBtu	$200/MMBtu	$150/MMBtu
6	Custom Domestic Hot Water ("DHW")	$125/MMBtu*	$200/MMBtu	$200/MMBtu

*Only applicable when completed with conjunction with GSHP for space heating.

4.3.3.4 Program Pathway (Prescriptive vs Custom)

Prescriptive Pathway
A project is eligible to proceed under the prescriptive pathway, under category 2d, if its floor area is 2500 square feet or fewer. Projects receiving the prescriptive rate must electrify heating and decommission the existing heating system for the entire project area, as required for all SMB projects.

For projects in category 2d, Con Edison will use the savings calculations prescribed in the TRM.

Participants in the prescriptive pathway *only* may choose to sign a waiver confirming that they have complied with all local building laws rather than provide a DOB permit as part of their final documentation.

Custom Pathway
A project is eligible to apply for incentives under the custom incentive rates in categories 4, 4a, and 6 if it has a floor area greater than 2500 square feet (for ASHP) or for any GSHP project.

All projects applying for incentives under the custom categories must submit savings calculations using the latest version of the NYS Clean Heat Program Savings Calculator.

Required Documents

In addition to all documents specified at the beginning of Section 4.3 above, applicants for SMB incentives must also submit with their initial application:

- **Floor Plan Sketch:** A floor plan for all the spaces within the scope of the project. To-scale floor plans are preferred but not required; however, all wall length and height measurements and total floor area measurements must be accurate. (*Filename: Address_Floor Plan*)
- **Photo Documentation:** Timestamped and geotagged pictures of the existing space, along with pictures of the existing heating and cooling equipment. Submission template and instructions will be provided by Willdan Energy Solutions. (*Filename: Address_Existing Photo #* before installation, or *Address_Installed Photo #* after installation)

Table 25: Required Documentation for SMB Projects

SMB CHP Documentation Table				
	Pre-Install Documentation		**Post-Install Documentation**	
	Prescriptive	**Custom**	**Prescriptive**	**Custom**
Program Application	**Required**	**Required**		
W-9	**Required**	**Required**		
Scope of Work	**Required**	**Required**	**Required****	**Required****
Contract	**Optional**	**Required**		
Cutsheets	**Required**	**Required**	**Required****	**Required****
AHRI/NEEP Certificates	**Required**	**Required**	**Required****	**Required****
Cost Estimate	**Required**	**Required**		
Floor Plans	**Required**	**Required**		
Mechanical Drawings	**Optional**	**Required**	**Required****	**Required****
Permits	**Optional**	**Required**		
Project Timeline	**Optional**	**Required**		
Load Calculation Report	**Required**	**Required***		
Energy Savings Analysis Tool	**Required**	**Required**		
Photo Submission	**Required**	**Required**	**Required****	**Required****
*Submitted by a Registered Design Professional - completed, stamped, signed. **Documentation required if scope of work changes from pre-install stage to post-install stage.				

4.3.4 Commercial & Industrial Program Eligibility and Requirements

This Section focuses on the incentives available to Commercial and Industrial ("C&I") customers and Participating Contractors who serve those customers. Eligible technologies include air-source heat pumps, heat pump water heaters and ground source heat pumps. In addition, the program offers incentives for envelope improvements and energy recovery ventilators/heat recovery ventilators (ERV/HRV) when paired with an eligible heat pump system. To get started, Participating Contractors or customers can determine a project's eligibility, submit an application package, or speak with an Energy Advisor by sending an email to: cleanheatcommercial@coned.com.

4.3.4.1 Incentive Eligibility

Con Edison Commercial customers with an average peak demand that exceeds 100 kW on a rolling 12-month basis are eligible for C&I Clean Heat incentives, excluding Multifamily buildings. Commercial customers with an average peak demand that is between 100-300 kW on a rolling 12-month basis may instead choose to participate with Con Edison through the Small to Medium Business (SMB) sector of the Program.

The customer must not have applied for or received an incentive from another Con Edison program or from another utility for the same project. Customers who have applied for or received an incentive from the New York State Energy Research and Development Authority (NYSERDA) may be eligible to stack incentives consistent with NYSERDA program rules and the requirements in Section 2.7 Coordination with NYSERDA Programs.

The Con Edison customer of record listed on the application is a directly metered commercial or industrial customer.

As part of the application process for C&I projects, there will be a PIOL, an on-site pre-installation inspection and a NTP. Con Edison will issue the PIOL after reviewing the application. The PIOL must be signed by the customer or responsible party and returned to Con Edison. Upon receipt of the signed PIOL, Con Edison will conduct a pre-installation inspection to verify existing conditions at the facility. After completion of the pre-installation inspection, Con Edison will issue an NTP. Only after Con Edison issues a NTP may the Participating Contractor install equipment on site.

4.3.4.2 Incentives

Incentives are available on a first-come, first-served basis. Incentives cannot exceed 50% of the project cost for eligible measure(s) or 100% of each measure cost. Total incentives are capped at $1,000,000 for all projects, per account per year. Material and Labor costs submitted are subject to Con Edison review and may be capped for incentive calculations at its sole discretion.

Table 26: C&I Incentives Summary

Category Number	Description	GSHP		All Other Clean Heat Technology
		New Construction ($/MMBtu)	Existing Buildings incl. Gut Rehab ($/MMBtu)	Existing Buildings incl. Gut Rehab ($/MMBtu)
4	Custom Full Load Space Heating Applications	$125	$200	$120
4a	Custom Full Load Space Heating Applications + Envelope - Tier 1	$125	$200	$120
	Custom Full Load Space Heating Applications + Envelope - Tier 2	$150	$225	$150
6	Custom Hot Water Heating Applications	$125	$200	$200
10	Custom Partial Load Space Heating Applications	N/A	$100	$70

4.3.4.3 Category 10 – Partial-load custom space heating

Incentives under Category 10 – Partial-load custom space heating are available to existing buildings and gut renovations only. A partial load heating system is a prioritized, first stage, heat pump system installed alongside a supplemental, second stage, heating system for the purpose of providing heating. The supplemental heating system may be either the existing system or a new system. New fossil and electric resistance heating systems are not eligible for Clean Heat incentives. A partial-load system can

either be a system with a heating capacity under 90% of the BHL at design conditions or a system that provides >90% of the BHL at design conditions but does not decommission the existing heating system.

Additional requirements for eligibility for partial-load incentives:

- Energy consumption from the existing heating source (e.g., heating oil, natural gas, steam, etc.) must be reduced by the new electric technology or application.
- Technology must use staged, multi-speed or variable-speed heat pumps
- Project must displace at least 50% of annual baseline heating consumption or alternative case fossil fuel consumption.
- Fuel savings cannot include fossil fuel system efficiency savings in savings calculations; the fossil fuel baseline efficiency (including distribution) must equal the existing or upgraded (boiler) system efficiency.

Con Edison reserves the right to not offer partial-load heating incentives to projects which do not meet the articulated requirements or spirit of the Program.

4.3.4.4 Exemption from Decommissioning

To qualify for full load heating incentives, the NYS Clean Heat Program for Con Edison requires the decommissioning of existing heating system unless the building qualifies a critical facility as defined in Table 27. Critical facilities may qualify for full load C&I incentives subject to the approval of Con Edison without decommissioning or cutting/capping their existing systems, if their heat pump system meets at least 90% of the BHL at design conditions and the incentives application successfully shows that the heat pump systems are prioritized over the existing heating system.

Table 27: Critical Facilities Exempt from Decommissioning

Critical Facilities		
Airports	Emergency Shelter	Nursing Home
Cable Television Facility	Fire Facility	Paramedic and Rescue Facility
College or University	Flood Control Structures	Police Facility
Cellular Telephone Facility	Fuel Transfer/Loading Facility	Prison/Correctional Facility
Dialysis Facility	Hospital	Radio Broadcasting Facility
Electric Utility Facilities	Landline Telephone Facility	Schools
Emergency Cooling Center	Mass Transit (e.g. tunnels, bridges, ferry terminals, major rail facility)	Television Broadcasting Facility
Emergency Management Office	Military Bases	Wastewater Delivery/Treatment Facility
Emergency Medical Facility (Urgent Care)	Natural Gas Utility or Pipeline Facility	Water Supply System

4.4 Midstream Heat Pump Water Heaters (HPWH)

The Con Edison Midstream HPWH Program offers incentives to increase the adoption of high-efficiency HPWHs in Con Edison's electric service territory. Con Edison offers two channels for participation: the Distributor Channel and the Retail Channel.

Projects will draw down their sectoral allocation on the date Con Edison receives an application for a HPWH incentive.

4.4.1 Distributor Channel

In the Distributor Channel, Con Edison offers an incentive to distributors for each HPWH that they sell, and the distributors are responsible for passing through incentives and application management.

4.4.1.1 Eligibility

Customer eligibility: Any non-NYPA Con Edison electric customer is eligible to participate.
Distributor eligibility: Distributors are entities who purchase eligible equipment directly from the manufacturer for resale. To participate, distributors must complete the enrollment documents including but not limited to the distributor participation agreement form, and a W-9 form.
Installer eligibility: Installers are not required to enroll in the program and may purchase qualifying equipment from participating distributors for sale at qualifying customer sites.
Equipment Eligibility: A residential duty air-source HPWH with a tank up to and including 120 gallons, and a current rating ≤24 amps and voltage ≤250 volts. Units must meet or exceed ENERGY STAR® Residential Water Heater requirements.
Quantity Eligibility: Any sales of two (2) or more HPWH units to the same installation address must be pre-approved by Con Edison.

4.4.1.2 Process to Participate

Step 1. Become a participating distributor
Interested distributors shall return the enrollment materials including the distributor participation agreement form, which outlines the terms and conditions of the program, and a completed W9 form. Interested distributors can contact Con Edison's program implementer Energy Solutions at heat-ne@energy-solution.com or 617-440-5468 to request the enrollment materials and an introductory meeting about the program requirements.

Step 2. Confirm project eligibility
The participating distributor confirms the project eligibility by visiting the nyrebates.com online system to match the site address and make/model to the respective list of eligible equipment, or by contacting the program implementer, Energy Solutions to confirm eligibility.

Step 3. Provide the incentive
The participating distributor must provide the customer's $1,000 per unit incentive as either a discount to the installer or a credit after the sale to be passed through to the end-use customer. The installer is responsible for installing the equipment, but the distributor may submit an application based on sales before the HPWH is installed at a customer's premise.

Step 4. Submit the application
The participating distributor submits the relevant data from the sale through the Energy Solutions online incentive system, nyrebates.com. This includes but is not limited to the following fields:

- Customer name
- Installation address
- Installation building type
- Sale invoice number
- Previous water heater fuel type (unless it is new construction)
- Equipment manufacturer
- Equipment model number
- Equipment serial number
- Equipment quantity
- Equipment cost per unit
- Contractor name
- Contractor contact information

Step 6. Application review
The Con Edison Program team reviews and processes all applications to determine the eligible incentive amounts and if any questions arise during review, will reach out to the relevant distributor application processing contact.

Step 7. Receive incentive reimbursement
Con Edison will pay incentives to distributors as often as weekly for approved incentive applications.

Step 8. Installation verification
Con Edison may select a random selection of customers for an inspection to confirm the installation information reported in the application.

4.4.1.3 Incentives

Description	Incentive Unit	Customer Incentive Amount	Installer Incentive Amount	Distributor Incentive Amount
ENERGY STAR® HPWH: Retail (up to 120 gal of tank capacity)	$/unit	$1,000	$50	$50

4.4.1.4 QA/QC

Customer eligibility verification:
Using the site address and contact information that are submitted by the distributor, a random sample of locations will be visited to confirm equipment was installed at the site address.

4.4.2 Retail Channel

Con Edison will begin to incentivize heat pump water heater through retailers in 2023. This Program Manual will be updated ahead of the launch.

5. Field Inspections and Oversight

Con Edison will maintain the integrity of the Program through a standardized field inspection and oversight process. This process is aimed to provide assurance that Participating Contractors have demonstrated compliance with program rules and requirements. There will be two types of on-site inspections: Programmatic Inspections and Quality Assurance/Quality Control ("QAQC") inspections.

Programmatic Inspections will focus on driving quality installations and contractor performance and will be conducted by Con Edison or its implementation contractors using standardized checklists to assess projects submitted by Participating Contractors. The inspection checklists provide the criteria that will be used to evaluate the accuracy of heat pump system design, documentation, and functionality of installations. Con Edison inspection checklists can be found online at the Contractor Resources Page (https://cleanheat.ny.gov/contractor-resources/).

In addition to the Programmatic Inspections, Con Edison will perform routine QAQC activities to monitor program processes and performance. These QAQC activities will be performed by an independent third party for additional oversight, including secondary reviews of projects which have received a Programmatic Inspection, and to inform improvement of program processes.

Con Edison Programmatic Inspections and QAQC activities for the program will be managed independently of the Statewide Clean Heat Quality Service Provider (QSP) Field Assessment process. Statewide contractor status would not be impacted by Con Edison programmatic inspections or QAQC results, but findings from Con Edison QAQC inspections will be shared with fellow Joint Efficiency Providers to promote statewide coordination. In particular, Con Edison will share results from QAQC inspection checklist items that are consistent with the statewide checklist items.

A Participating Contractor's status in the NYS Clean Heat Program for Con Edison will be contingent upon quality installations recognized by successful Programmatic Inspections. Contractors will be expected to remediate any nonconformances found in either Programmatic or QAQC Inspections within 30 days of such a finding. Con Edison will take progressive disciplinary action to drive contractor performance and may take actions when a contractor does not remediate any issue within 30 days of being notified of such a finding.

Con Edison will coordinate as closely as practicable with other Joint Efficiency Providers regarding contractor performance. For example, if Con Edison takes disciplinary action against a contractor, Con Edison will notify the other Joint Efficiency Providers. Similarly, Con Edison will be aware of any disciplinary actions taken by other Joint Efficiency Providers, which may instigate disciplinary actions from Con Edison as appropriate. For example, a contractor removed from the NYS Clean Heat Program for Con Edison, would no longer be listed as eligible in the Con Edison territory on the statewide maintained database. Con Edison contractors will qualify through the statewide application process with additional requirements.

Across all customer segments, Participating Contractors should make customers aware that participating in Clean Heat includes inspection processes. Participating Contractors should make every effort to facilitate scheduling and conducting inspections and failure to allow sufficient inspections may be cause for disciplinary action.

5.1 Field Inspection Categories

Program staff conduct field inspections to verify site conditions associated with Clean Heat projects. Field inspections are categorized as follows:

- ***Pre-Installation Programmatic Inspections (applicable to SMB, MF, and C&I segments)***: Pre-installation inspections are completed before the start of any work associated with a Clean Heat project in the non-residential segment. Typically, such inspections verify existing site conditions prior to the installation of heat pump systems.
- ***Post-Installation Programmatic Inspections***: Post-installation inspections are completed after successful installation of the heat pump system. Such inspections verify that the project is installed and operational, and meets the Scope of Work and complies will all program requirements.
- ***Quality Assurance & Quality Control (QAQC) Inspections***: QAQC inspections are completed on a sample of projects across all customer segments. Such inspections are intended to identify areas for improving overall program process. QAQC Inspections may be performed on projects which received Post-Installation Programmatic Inspections, or those that did not.

The Program performs field inspections according to the need of each customer segment. All non-residential projects may receive a Pre- and Post-Installation Programmatic Inspection. A random sample of residential projects will receive a Post-Installation Programmatic Inspection. All projects are subject to QAQC inspections at sampling rates determined by sector. Con Edison will conduct Post-Installation Programmatic and QAQC over a sample of midstream HPWH projects.

5.2 Residential Inspections

Inspections in the Residential customer segment include Post-Installation Programmatic Inspections and QAQC inspections. When a project is selected for a Programmatic Inspection, Con Edison will hold incentive payment until the inspection and any necessary follow-up actions are taken. Projects will be selected for inspection at the discretion of Con Edison.

5.2.1 Post-Installation Inspections: ASHP and GSHP Projects

Post-installation inspections for projects installing ASHP or GSHP measures will be subject to Con Edison's ASHP or GSHP Checklist depending on the installed measures. Inspections will verify

- Compliance with all aspects of the relevant checklist
- Project compliance will all program requirements

Any discrepancies found during a Post-Installation Inspection must be resolved by the Participating Contractor before the selected project can be approved for payment through the program. If projects are found to be in violation of the criteria outlined in the checklist, the responsible contractor will be subject to disciplinary actions. Findings from these inspections will also affect the Participating Contractor's standing in the program. See section 0 for details on the disciplinary process.

5.2.2 QAQC Inspections

In addition to Con Edison's Programmatic Post-Installation Inspections, some projects will be selected

for QAQC inspection. These QAQC inspections will occur after projects have been approved for payment.

5.2.3 Inspection Sampling Rates

Residential projects will be sampled for inspection. Across both ASHP and GSHP installations, Con Edison has sets targets of 10% of projects by Participating Contractor for Programmatic Post-Installation Inspections and 5% of projects for QAQC inspections. Con Edison may choose higher sampling rates based on contractors' status and standing or as a disciplinary measure.

5.3 Non-Residential Inspections

Inspections in the non-residential segments - Multifamily, SMB and C&I – will receive Pre-Installation Inspection, Post-Installation Programmatic Inspections and QAQC inspections. All non-residential projects in existing buildings will receive a Pre-Installation Inspection. New Construction and gut renovations may be required to provide other proof of on-site conditions, for example, with photographs, as prescribed by Con Edison. All non-residential projects will receive a Post-Installation Programmatic inspection. Con Edison will inspect a share for all non-residential projects for QAQC inspections, with rates to rise or fall depending on program performance at the discretion of Con Edison.

5.4 Disciplinary Process

It is important to the success of the Program that Participating Contractors meet all program requirements and the expectations of Con Edison's customers. Con Edison will document contractor performance through a combination of desk reviews, fields inspections and quality assurance and quality control activities. Participating Contractors who have complied with all Program rules will be considered Approved. Con Edison will inform Participating Contractors of deficiencies on a project and may specify corrective actions. Con Edison may take disciplinary action against any approved Participating Contractor who delivers inconsistent results, up to suspension or expulsion. The Program has established a disciplinary policy of increasing severity.

For example, when an Approved contractor fails multiple programmatic inspections within a rolling 6-month timeline, the disciplinary sequence may be:

1st Fail: Required coaching/reinforcement training
2nd Fail: Warning letter specifying potential consequences of a third fail
3rd Fail: Disciplinary escalation to be determined based on severity of identified issues

Potential 3rd Fail actions may include increased programmatic and QA/QC inspection rate (up to 100%), reduced prospective participating contractor allocations in the residential segment, suspension from submitting applications, or other actions up to and including program termination.

Disciplinary Escalation

Con Edison may establish a probationary or suspension period for an approved Participating Contractor as part of the increasing discipline outlined above. Con Edison will notify the Participating Contractor in writing of such action. Contractors under probation will still be allowed to submit new applications for Clean Heat incentives, but potentially subject to increased oversight or restrictions in the number of

new projects they can submit where any future violations would lead to suspension or expulsion. Contractors who are suspended are temporarily removed from the Program and will no longer be allowed to submit new applications for incentives. Both Probation and Suspension will impact future residential Contractor Allocations.

Any notification will outline the deficiencies that have been found, the duration of Probation or Suspension, and any corrective actions that the participating contractor must take end the Probationary or Suspended status. In addition to requiring corrective actions for specific items, Con Edison reserves the right to increase inspections, and, for contractors participating in the residential segment, limit or curtail monthly contractor allocations.

If a participating contractor does not meet the corrective actions outlined in their notification of probation or suspension, they will be subject to program expulsion. If a participating contractor receives a second Probationary period in any twelve-month period, or if they are found to engage in misconduct, they will be subject to immediate expulsion. The Participating Contractor will be notified, in writing, of their expulsion. The notification shall state the deficiencies found in their performance, the reason for expulsion, and potential steps (if any) the participating contractor could take in order to be reinstated. Reinstatement is not guaranteed and is subject to the discretion of the Program.

If the participating contractor is placed under a disciplinary status within another Con Edison program, they may automatically be placed on probation/suspension in the Program, until the issue in the other program is resolved. The Program will make the determination based on the reason for probation.

Participating contractors that are found to be suspended or expelled from the NYS Clean Heat Programs run by other Joint Efficiency Providers will, at a minimum, receive a warning letter indicating Con Edison's awareness and that any new non-conformances with program rules can result in suspension or expulsion from Con Edison's program.

Con Edison will track, share, and review participating contractor performance across customer segments (C&I, SMB, MF, and residential). Warning letters, suspensions, and expulsions will apply across all customer segments.

Program expulsion is defined as the permanent removal of the Participating Contractor from the Program. All the privileges of Program participation will be revoked including but not limited to the use of all marketing materials associated with the Program and the ability to apply for incentives.

As of the publication of this Program Manual, there are residential Clean Heat projects with outstanding non-conformances from the Statewide Clean Heat Quality Service Provider (QSP) Field Assessment process. As part of Relaunch activities, in January 2023, Con Edison will indicate to each contractor a targeted list of non-conformance that must be resolved within 30 days of such communication. Failure to resolve these outstanding non-conformances may impact contractors' ability to submit projects or their next monthly allocations beginning no later than Q2 2023.

5.5 Disciplinary Exceptions

Con Edison reserves the right to move to immediately suspend or terminate Participating Contractors for any of the following:

- Any aspect of fraud or the intent to commit fraud in any aspect of the program

- Misrepresenting the program rules and requirements to customers
- Failure to resolve non-conformances within the 30-day window described above
- Repeated failure to engage Con Edison, Con Edison's contractors including Implementation Contractors, or customers in a timely manner
- Abusing or threatening abuse towards Con Edison or any of its employees or contractors
- Repeated failures to submit accurate program documentation
- Failing to schedule Programmatic or QAQC inspections in a timely manner
- For the residential segment, submitting a bad faith allocation request that significantly diverges from a contractor's capabilities or performance in the program

6. Contact Information

Residential: info@conedisonresidential.com
SMB: ConEd-SMBProgram@willdan.com
Multifamily: cleanheatmultifamily@coned.com
C&I: cleanheatcommercial@coned.com
HPWH: Jacob Lent; heat-ne@energy-solution.com; 1-617-440-5468
Clean Heat Financing: ConEd@CleanHeatFinancing.com

7. Glossary

This glossary provides definitions of key terms used in the NYS Clean Heat Program for Con Edison Program Manual (the Program Manual) and the NYS Clean Heat Implementation Plan. Capitalized terms used as defined terms and not defined in this glossary shall be as defined in the main body of the Program Manual or shall be as in common use between the parties.

Air-Conditioning, Heating, and Refrigeration Institute (AHRI): A trade association representing manufacturers of heating, ventilation, air-conditioning, refrigeration, and water heating equipment. AHRI provides the database of equipment performance specifications, which is used in the Program to determine the incentive amount.

Air Source Heat Pump (ASHP): An HVAC system that provides space heating using electricity through vapor-compression refrigeration cycle. An ASHP extracts heat from outdoor air and transfers the extracted heat into the conditioned spaces via various means. ASHPs are also used to provide space cooling by reversing the cycle to extract heat from a building and transfer the heat to the outside air.

Btu/h: Unit of thermal power capacity that represents one British Thermal Unit (Btu) of energy transferred per hour.

Building Cooling Load (BCL): Building total sensible and latent heat gain in British Thermal Units per hour (Btu/h). For residential buildings, BCL shall be calculated using ACCA Manual J or another code-approved methodology. For commercial buildings, BHL shall be calculated following ANSI/ASHRAE/ACCA Standard 183-2007 (RA2017), or other code-approved equivalent computational procedure. Calculation of the building's design cooling load shall be at the 1% dry bulb cooling design temperature for the most relevant ASHRAE 2017 location.

Building Equivalent Full Load Hours (BEFLH): is used for the estimation of heating and cooling savings from heat pump systems, based on building type and location. It represents the equivalent full load operating hours for HVAC equipment based on 1% design temperature, TMY3 weather data, and the design heating load. The New York Technical Resource Manual employs the following vintage categories for determining BEFLH in residential buildings:[45]

- Built prior to 1940, uninsulated masonry buildings, referred to as "Pre-War uninsulated brick." This category is used only for full load heating hours for multifamily low-rise and high-rise buildings.
- Built prior to 1979, before the Energy Conservation Construction Code of New York State (ECCCNYS) went into effect. This vintage is referred to as "Old" in the Appendix G EFLH tables for single family detached buildings, and "Prior to 1979" in the EFLH tables for low-rise and high-rise multifamily buildings.
- Built from 1979 through 2006, with insulation conforming to the 1980s era building codes (1979 ECCCNYS). This vintage is referred to as "Average" in the Appendix G EFLH tables for single family detached buildings, and "From 1979 through 2006" in the EFLH tables for low-rise and high-rise multifamily buildings.

[45] New York State Standard Approach for Estimating Energy Savings from Energy Efficiency Programs, Appendix G, See NYS TRM V9.pdf (https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD)

- Built from 2007 through the present, new construction conforming to the 2007 ECCCNYS for residential buildings and the New York City Energy Conservation Code (if applicable). This vintage is referred to as "New" in the Appendix G EFLH tables for single family detached building, and "From 2007 through the present" in the EFLH tables for low-rise and high-rise multifamily buildings. Appendix G also provides EFLH tables for selected small and large commercial buildings; however, for these building types, EFLH values are the same across all building vintages.

Building Heating Load (BHL): Building heat loss in British Thermal Units per hour (Btu/h). For residential buildings, BHL shall be calculated using ACCA Manual J or another code-approved methodology. For commercial buildings, BHL shall be calculated following ANSI/ASHRAE/ACCA Standard 183-2007(RA2017), or other code-approved equivalent computational procedure. Calculation of the building's design heating load shall be at the 99% dry bulb heating design temperature for the most relevant ASHRAE 2017 location.

Central ASHP: An ASHP system that is typically sized to provide heating and cooling to the whole building through an air duct distribution system.

Coefficient of performance (COP): COP is the ratio of work or useful energy output of a system versus the work or energy input, measured in the same units. It is a measure of performance often used for electrically-powered heating and cooling equipment, with the higher the system COP corresponding to the more efficient operation.

Clean Heat Project ("Project"): The planning and quality installation of a heat pump system at a customer owned parcel of real property using common heat pump system components over a given scope at a given time. A single project may serve multiple electric accounts. A single parcel may have multiple projects subject to the discretion of the relevant Electric Utility.

Cold Climate ASHP defined as ccASHP: A heat pump product listed on the Northeast Energy Efficiency Partnership (NEEP) Cold Climate Air Source Heat Pump (ccASHP) Specification and Product List (NEEP Product List), which is designed to identify air-source heat pumps that are best suited to heat efficiently in cold climates (IECC climate zone 4 and higher). The current specification and listed eligible units are available at (https://neep.org/ASHP-Specification).

Commissioning Report: A report that shows the results of project start-up tests conducted to ensure the system is operating effectively.

Corrective Action: In the field assessment inspection process, action(s) that must be undertaken by a participant at the direction of NYSERDA or the Designated Utility to correct identified nonconformances (i.e., specific deviations or work that fails to meet the established quality standard).

Commercial Unitary (i.e., Large Commercial) ASHP: Large commercial heat pump systems that include individual heat pump appliances that are powered by three-phase electricity or have rated cooling capacities ≥65,000 Btu/h for the individual appliance.

Custom Incentive Categories: Incentive Categories 4, 4a and 6.

Decommissioning: Existing fossil fuel space heating or domestic hot water (DHW) heating appliance that is retired, disconnected, or removed in a manner that complies with all applicable federal, state, and municipality laws, regulations, and codes and is installed in conjunction with an eligible heat pump system. Residential decommissioning projects may include electric resistance heating not to exceed 10% of BHL. Decommissioning Guidance Checklist available at https://cleanheat.ny.gov/contractor-

resources/.

Designer: Individual or company that designs heat pump system. Requirements to be an eligible designer in the Program are described in Program Manual.

Desuperheater: An optional feature of a GSHP system that takes advantage of waste heat generated by the compressor and transfers the waste heat to a domestic hot water system.

Direct Exchange (DX) GSHP: Direct exchange GSHP systems circulate a refrigerant through a buried, closed-loop copper pipe.

Driller: Individual or entity that drills GSHP systems. Requirements to be an eligible driller in the NYS Clean Heat Program are described in this Program Manual.

Dwelling Unit: A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Source: 2020 Energy Conservation Code of NYS Section R202 https://up.codes/viewer/new_york/ny-energy-conservation-code-2020/Section/RE_2/re-definitions#R202

Energy Efficiency Ratio (EER): A measure of how efficiently a cooling system will operate when the outdoor temperature is 95 degrees Fahrenheit. It is calculated by dividing the rated cooling output at 95 degrees Fahrenheit by the watts used by the AC/HP system. A higher EER means the system is more efficient. It is an instantaneous measure of electrical efficiency, unlike SEER (Seasonal Energy Efficiency Rating), which is an averaged value of efficiency. This is a term applied to air conditioning equipment.

Energy Recovery Ventilator (ERV): ERVs reduce heating and cooling loads while maintaining required ventilation rates by facilitating sensible heat transfer between outgoing conditioned air and incoming outdoor air. ERVs employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of pre-conditioning outdoor air prior to supplying the conditioned air to the space, either directly or as part of an air-conditioning system. Unlike HRVs, ERVs do not transfer latent heat (moisture content) between supply and exhaust air streams.

Full Load Heating System: A system installed that satisfies at least 90% of total system heating load at design conditions. For locations where the total system cooling load is greater than the heating load, the heat pump system cooling capacity shall be as small as possible to satisfy the cooling load, while minimizing oversizing for the heating function to the extent possible.

Ground Source Heat Pump (GSHP) system: An HVAC system comprising one or more heat pumps, ground loops, interior distribution systems and terminal units that enables the air and/or water in buildings to be conditioned by exchanging thermal energy with the ground, ground water, or other natural body of water.

Gut Rehabilitation ("Rehab"): A renovation that removes material down to structural load-bearing beam (as defined by the TRM, v10, effective January 1, 2023.

Heat Pump System: One or more electric heat pump appliances installed in a building to provide partial or full load heating and cooling to the building's conditioned space. The heat pump appliances and associated components may be centrally or separately controlled. In a multifamily building in which a central heating plant serves more than one apartment, the heat pump system must be designed and installed to provide heating to all of the individual apartments and common areas otherwise served by the central heating plant.

Heat Pump System Heating Capacity: For buildings whose BHL exceeds BCL, the heat pump system heating capacity shall be as small as possible to satisfy BHL, while minimizing oversizing for the cooling

function to the extent possible with available equipment.

Heat Pump System Cooling Capacity: The sum of the cooling output of all heat pump appliances in the system, expressed in British Thermal Units per hour (Btu/h), at the cooling design temperature used for the building cooling load (BCL) calculation. For buildings whose BCL exceeds BHL, the heat pump system cooling capacity shall be as small as possible to satisfy BCL, while minimizing oversizing for the heating function to the extent possible with available equipment.

Heat Pump Water Heater (HPWH): HPWHs are water heater tanks that heat domestic hot water or process hot water through the use of an onboard air source heat pump that extracts heat from the air in the building surrounding the unit. They use a secondary electric resistance as a back-up to ensure that the water temperature meets the desired setpoint during times of high demand. Air source HPWH models come in two versions (integrated and split-system HPWH) and both versions are eligible for incentives under the program.

Heat Recovery Ventilator (HRV): HRVs reduce heating and cooling loads while maintaining required ventilation rates by facilitating both sensible (heat content) and latent (moisture content) heat transfer between outgoing conditioned air and incoming outdoor air. HRVs employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of pre-conditioning outdoor air prior to supplying the conditioned air to the space, either directly or as part of an air-conditioning system.

Incentive Category: Grouping in the NYS Clean Heat Program reflecting applicable technology type, system size, customer type, and incentive structure.

Installer: Individual or entity that installs a heat pump system. Requirements to be an eligible installer in the NYS Clean Heat Program are described in the NYS Clean Heat Designated Utilities Program Manual.

Integrated Controls (ICs): Coordinates the heating operation of heat pump (ducted and ductless) systems with ancillary heating systems such as fossil fuel boilers and furnaces. ICs prioritize operation of the heat pump system as the first stage of heat and rely on the ancillary system as backup or second stage of heat. Integrated Controls eligibility document available at https://cleanheat.ny.gov/contractor-resources/

International Ground-Source Heat Pump Association (IGSHPA): An association established to advance GSHP technology, which conduct geothermal research and installer training and accreditation.

Mini-Split Heat Pump (MSHP): A type of cold climate ASHP or ccASHP that can circulate refrigerant between an outdoor unit containing a variable capacity compressor and one or more indoor air handlers. MSHPs are often referred to as “ductless mini-splits” because they are typically ductless. These units can also be installed with short duct runs that enable single air handlers to serve more than one room at a time.

MMBtu of Annual Energy Savings: Estimation of first-year site energy savings, which accounts for both the decreased fuel and the change in electricity consumed at the site.

Multifamily: A residential building with five or more Dwelling Units.

Nonconformances: In the field assessment inspection process, specific deviations or work that fails to meet the quality standard established for program requirements, industry standards and quality requirements.

Partial Load Heating System: A partial load heating system is a primary, first stage, heat pump system installed alongside a supplemental, second stage, heating system for the purpose of providing heating. The supplemental heating system may be either the existing system or a new system. In this type of

system, the total heat pump system heating capacity satisfies <90% of the building's design heating load ("BHL") at design conditions.

Participating Contractor: ASHP and GSHP designer and installer that is eligible to apply for and receive incentives under the NYS Clean Heat Program. To become a Participating Contractor, an entity must submit a Participating Contractor Application and a Contractor Participation Agreement for each Electric Utility service territory where work will be performed (available at https://cleanheat.ny.gov/contractors/). Upon approval, the applicant will receive an approval notification from the Electric Utility and become eligible to apply for incentives in the Program. GSHP drillers must also be approved through this process to become a "Participating Driller," but are not eligible to submit for and receive incentives. Each GSHP installation must be completed by a Participating Driller. Contractors installing only HPWH do not have to be a Participating Contractor to submit an incentive application on behalf of a customer.

Participating Distributor: HPWH distributor that is eligible to offer and receive incentives under the NYS Clean Heat Program. To become a Participating Distributor, an entity must submit a HPWH Distributor Participation Agreement to their Utility Partner. Upon approval, the distributor will become eligible to apply for incentives in the Program.

Cold Climate Packaged Terminal Heat Pump (ccPTHP): A packaged terminal heat pump is a wall sleeve and a separate un-encased combination of heating and cooling assemblies specified by the builder and intended for mounting through the wall. It includes a prime source of refrigeration, separable outdoor louvers, forced ventilation, and heating availability by builder's choice of hot water, steam, or electricity. A PTHP utilizes reverse cycle refrigeration as its primary heat source and is equipped with supplementary heating via hot water, steam, or electric resistant heat. To be eligible for the Program, each unit in a PTHP system must be on the NEEP Product List, *i.e.*, be a ccPTHP.

Prescriptive Incentive Category: Incentive Categories 2a, 2b, 2c, 2d, 3, and 5.

PIOL: Preliminary Incentive Offer Letter

Single Package Vertical Heat Pump (SPVHP): A single package vertical heat pump is an air-cooled commercial package air conditioning and heating equipment that is factory-assembled as a single package, has components that are arranged vertically, and is intended for exterior mounting on, adjacent interior to, or through an outside wall. These units may be powered by a single-or 3-phase current and may contain 1 or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum or sleeves. SPVHPs utilizes reverse cycle refrigeration as its primary heat source and may be equipped with supplementary heating via hot water, steam, gas or electric resistant heat.

Variable Refrigerant Flow Heat Pump (VRF): VRF systems circulate refrigerant between a variable capacity compressor and multiple indoor air handlers, each capable of individual zone temperature control. VRF systems can be built with heat recovery and cooling capabilities that allow simultaneously heating to some zones and cooling to other zones. VRF systems may be air-source or ground-source type heat pumps.

Appendix 1: Calculating Sizing Ratios in the New York State Clean Heat Program Guide

1. Cold Climate Air Source Heat Pump / Mini-Splits (<65,000 btu/h cooling capacity)

AHRI Test Method: 210/240

$$Heating\ Sizing\ Ratio = \frac{Max\ Heating\ Capacity\ at\ Design\ Temperature, F}{Calculated\ Heating\ Load}$$

$$Cooling\ Sizing\ Ratio, when\ BCL > BHL = \frac{Max\ Cooling\ Capacity\ at\ Design\ Temperature, F}{Calculated\ Cooling\ Load}$$

$$Cooling\ Sizing\ Ratio, when\ BHL > BCL = \frac{Min\ Cooling\ Capacity\ at\ Design\ Temperature, F}{Calculated\ Cooling\ Load}$$

Maximum heating and cooling capacities at design temperatures may be obtained in the following ways:

a. Download the NEEP certificate for the appropriate make/model heat pump. Linearly interpolate (if necessary) between the known maximum heating capacities at 5 degrees and 17 degrees to obtain the maximum heating heat pump performance at the design temperature. For cooling, linearly interpolate (if necessary) between known maximum cooling capacities at 95 degrees and 82 degrees to obtain the maximum cooling performance at the design temperature. Note that if the BHL>BCL, the cooling size ratio may be calculated using minimum cooling capacity at the design temperature, by extrapolating between known minimum NEEP cooling capacities at 95 degrees and 82 degrees respectively.
b. Obtain manufacturer-specific performance and capacity data at the design temperature or use manufacturer software that provides equipment performance and capacity at the design temperature.

Example using NEEP method: Downstate location with heating design temperature at 12°F.
Heating Design Temperature: 12°F
Proposed Heat Pump Make: Fujitsu
Proposed Heat Pump Model: AOU36RLAVM
Maximum Heating Output at 5°F: 37,900 btu/h
Maximum Heating Output at 17°F: 42,000 btu/h
Heating Load at 12°F: 38,500 btu/h

$$\frac{42{,}000\ btu/h - 37{,}900\ btu/h}{17\ degree - 5\ degree} = \frac{42{,}000\ btu/h - x\ btu/h}{17\ degree - 12\ degree}$$

$$x = \ 40{,}291.67$$

$$Heating\ Sizing\ Ratio = \frac{40{,}291.67\ btu/h}{38{,}500\ btu/h} = 1.05$$

FUJITSU J-Series
Multizone All Non-ducted
AHRI Cert #: **8693480**
Outdoor Unit #: **AOU36RLAVM**
Indoor Unit #:
Maximum Heating Capacity (Btu/hr) @5°F: **37,900**
Rated Heating Capacity (Btu/hr) @47°F: **42,000**
Rated Cooling Capacity (Btu/hr) @95°F: **36,000**

Information Tables

Brand	FUJITSU
Series	J-Series
Ducting Configuration	Multizone All Non-ducted
AHRI Certificate No.	8693480
Outdoor Unit #	AOU36RLAVM
Indoor Unit Type	Non-Ducted Indoor Units
Indoor Unit #	
Furnace Unit #	
SEER	19
EER	13.3
HSPF Region IV	11.4
Energy Star	✓
Variable Capacity	✓
Turndown Ratio (Max 5°F/Min 47°F)	2.3
Capacity Maintenance (Max 5°F/Max 47°F)	90%
Capacity Maintenance (Rated 17°F/Rated 47°F)	61%
Capacity Maintenance (Max 5°F/Rated 47°F)	90%
Integration	
Connectivity	
Operational Diagnostics	
Refrigerant(s)	

Performance Specs

Heating /Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Heating	-4°F	70°F	Btu/h	12,960	-	33,600
			kW	1.13	-	3.74
			COP	3.36	-	2.63
Heating	5°F	70°F	Btu/h	14,860	-	37,900
			kW	1.1	-	4.06
			COP	3.96	-	2.74
Heating	17°F	70°F	Btu/h	16,460	25,800	42,000
			kW	1.2	2.7	4.43
			COP	4.02	2.8	2.78
Heating	47°F	70°F	Btu/h	16,460	42,000	42,000
			kW	0.87	3.2	3.2
			COP	5.54	3.85	3.85
Cooling	82°F	80°F	Btu/h	18,190	-	36,000
			kW	0.95	-	2.37
			COP	5.61	-	4.45
Cooling	95°F	80°F	Btu/h	18,190	36,000	36,000
			kW	1.09	2.71	2.71
			COP	4.89	3.89	3.89

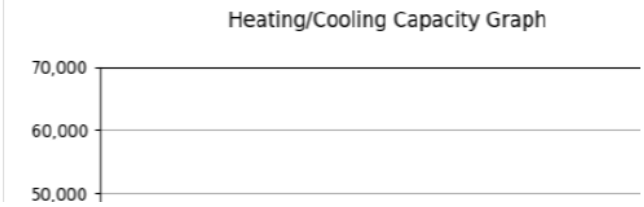


Figure 1: NEEP Certification ccASHP

2. Larger Unitary Heat Pumps (>65,000 btu/h)

AHRI Test Method: 340/360

$$Heating\ Sizing\ Ratio = \frac{Heating\ Capacity\ at\ Design\ Temperature}{Calculated\ Heating\ Load}$$

$$Cooling\ Sizing\ Ratio = \frac{Cooling\ Capacity\ at\ Design\ Temperature}{Calculated\ Cooling\ Load}$$

Heating and cooling capacities at design temperatures may be obtained in the following ways:

a. Download the AHRI certificate for the appropriate make/model heat pump. Extrapolate (if necessary) between the known certified rated heating capacities at 17 degrees and 47 degrees to obtain the heating heat pump performance at the design temperature. For cooling, use AHRI cooling capacity at 95 degrees directly as values cannot be extrapolated from the AHRI certified data.
b. Obtain manufacturer specific performance data at the design temperature.

Example using AHRI method: Downstate location with heating design temperature 15°F and cooling design temperature 87°F.
Heating Design Temperature: 12°F
Cooling Design Temperature: 87°F
Proposed Heat Pump Make: Daikin
Proposed Heat Pump Model: DPS010AHHE2
Rated Heating Output at 17°F: 62,000 btu/h
Rated Heating Output at 47°F: 105,000 btu/h
Rated Cooling Output at 95°F: 119,000 btu/h
Heating Load at 12°F: 56,000 btu/h
Cooling Load at 17°F: 118,000 btu/h

$$\frac{105{,}000\ btu/h - 62{,}000\ btu/h}{47\ degree - 17\ degree} = \frac{105{,}000\ btu/h - x\ btu/h}{47\ degree - 12\ degree}$$

$$x = \ 54{,}833\ btu/hr$$

$$Heating\ Sizing\ Ratio = \frac{54{,}833\ btu/h}{56{,}000\ btu/h} = 0.978$$

$$Cooling\ Sizing\ Ratio = \frac{119{,}000\ btu/h}{118{,}000\ btu/h} = 1.008$$

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Certificate of Product Ratings

AHRI Certified Reference Number : 5831165 Date : 03-31-2021 Model Status : Active

Brand Name : DAIKIN

Model Number : DPS010AHHE2**-4*

AHRI Type : HSP-A

Refrigerant Type : R-410A

Hertz : 60

Sold In? : USA, Canada, Outside USA and Canada

Rated as follows in accordance with the latest edition of AHRI 340/360 Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment and AHRI 365 and subject to rating accuracy by AHRI-sponsored, independent, third party testing:

Cooling Capacity 95F/Cooling Capacity 95F at 230v : 119000/119000

EER 95F/EER 95F at 230v : 11.70/11.70

Heating Capacity 47F/Heating Capacity 47F at 230v : 105000/105000

COP 47F/COP 47F at 230v : 3.42/3.42

Heating Capacity 17F/Heating Capacity 17Fat 230v : 62000/62000

COP 17F/COP 17Fat 230v : 2.38/2.38

IEER/IEER at 230v : 18.0/18.0

The following data is for reference only and is not certified by AHRI

Full Load Indoor Coil Air Quantity (scfm) : 3850

Figure 2: AHRI Large Unitary Heat Pump

Note that if interpolation/extrapolation of heating capacities using the AHRI method results in irregularities, reviewers shall request manufacturer specific performance data at the design temperature.

If product is not AHRI rated, manufacturer performance-specific data may be used. For non-AHRI rated equipment, performance data should be provided at the same rated conditions as the applicable AHRI test method for the purposes of determining eligibility.

3. Air Source Variable Refrigerant Flow

AHRI Test Method: 1230

$$Heating\ Sizing\ Ratio = \frac{Heating\ Capacity\ at\ Design\ Temperature}{Calculated\ Heating\ Load}$$

$$Cooling\ Sizing\ Ratio = \frac{Cooling\ Capacity\ at\ Design\ Temperature}{Calculated\ Cooling\ Load}$$

Heating and cooling capacities at design temperatures may be obtained in the following ways:

a. Download the AHRI certificate for the appropriate make/model heat pump. Extrapolate (if necessary) between the known certified rated heating capacities at 17 degrees and 47 degrees to obtain the heating heat pump performance at the design temperature. For cooling, use AHRI cooling capacity at 95 degrees directly as values cannot be extrapolated from the AHRI certified data.
b. Obtain manufacturer specific performance data at the design temperature

Note that if interpolation/extrapolation of heating capacities using the AHRI method results in irregularities, reviewers shall request manufacturer specific performance data at the design temperature.

Relevant example showing AHRI method is provided in Appendix 1, Section 2 Above.

If product is not AHRI rated, manufacturer performance specific data may be used. For non-AHRI rated equipment, performance data should be provided at the same rated conditions as the applicable AHRI test method for the purposes of determining eligibility.

4. Geothermal Heat Pumps (including GSVRFs and console type units)

Heating and cooling capacities at design temperatures may be obtained in the following ways:

a. Downloading the AHRI certificate for the appropriate make/model heat pump and pulling the certified full load heating and cooling capacities directly from certificates to calculate sizing ratio. Note that if BHL>BCL, the cooling sizing ratio may be calculated using AHRI ground source part load capacity.
b. Obtain manufacturer specific performance data at the design temperature.

Test Method: ANSI/AHRI/ASHRAE/ISO Standard 13256-1

$$Heating\ Sizing\ Ratio = \frac{Full\ Load\ Heating\ Capacity\ at\ Design\ Temperature}{Calculated\ Heating\ Load}$$

$$Cooling\ Sizing\ Ratio = \frac{Full\ Load\ Cooling\ Capacity\ at\ Design\ Temperature}{Calculated\ Cooling\ Load}$$

Example:
Make: Ice Air
Model: 8VSHPGE12
Full Load Heating Capacity: 9,000 btu/h
Heating Load: 8,000 btu/h

$$Heating\ Sizing\ Ratio = \frac{9{,}000\ btu/h}{8{,}000\ btu/h} = 1.125$$

Certificate of Product Ratings

AHRI Certified Reference Number : 205746251 Date : 11-19-2020 Model Status: Active

Old AHRI Reference Number :

Product : Water-to-Air and Brine-to-Air

Model Number : 8VSHPGE12**

Brand Name : ICE AIR LLC

Rated as follows in accordance with ANSI/AHRI/ASHARE/ISO Standard 13256-1 Water-toAir and Brine-To-Air Heat Pumps and subject to verification of rating accuracy by AHRI-sponsored, independent third party testing:

	Full Load	Part Load1	Part Load2	Part Load3
Air Flow Rate - Cooling:	500			
Air Flow Rate - Heating:				

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GLHP (Ground -Loop Heat Pumps)

Cooling Capacity (Btuh)	13800/13800
Cooling EER Rating (Btuh/Watt)	20.10/30.10
Cooling Fluid Flow Rate (gpm)	3.00
Heating Capacity (Btuh)	9000/9000
Heating COP (watt/watt)	3.70/3.70
Heating Fluid Flow Rate (gpm)	3.00

Figure 4: Geothermal AHRI Certificate

If equipment is being installed in non-standard temperatures, option B should be followed to calculate sizing ratio. The participating contractor will be required to submit manufacturer performance data at the specific design conditions. The AHRI method will apply in most circumstances.

If product is not AHRI rated, manufacturer performance-specific data may be used. For non-AHRI rated equipment, performance data should be provided at the same rated conditions as the applicable AHRI test method for the purposes of determining eligibility.