New York State Clean Heat

Program Manual for

Central Hudson Gas & Electric Corporation,

National Grid,

New York State Electric & Gas Corporation,

Orange and Rockland Utilities, Inc., and

Rochester Gas and Electric Corporation

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Version History and Description of Revisions: NYS Clean Heat Program Manual[1]

Date Filed	Version	Topic	Description of Change	Section/ Page
12/16/24	12.1	Participating Contractor Requirements	Clarification on EPA 608 Technician Certification and other requirements	Sections 2, 3, 4, and 5
9/1/24	12	Eligible Technologies for Incentives	Category 4a renamed to Category 4a *Custom Heat Pump + Envelope*	Section 2
9/1/24	12	Eligible Technologies for Incentives	Addition of incentive Category 4b *Custom Full Load Multifamily Space Heating Applications*, with revisions in numerous sections to reflect this addition	Sections 2-5, 10
9/1/24	12	Eligible Technologies for Incentives	Addition of incentive Category 6a *Custom Centralized Multifamily Hot Water Heating Applications*, with revisions in numerous sections to reflect this addition	Sections 2-5, 10
9/1/24	12	Eligible Technologies for Incentives	Addition of incentive Category 10 *Custom Partial Load Space Heating Applications*, with revisions in numerous sections to reflect this addition	Sections 2-5, 10
9/1/24	12	Incentive Information in Tables	Removal of Incentive Structure column from Table 1 and moving of certain information to footnotes in Table 2	Section 2
9/1/24	12	Eligibility Criteria	Updating of Eligibility Criteria for Category 3 *GSHP: Full Load Heating*	Section 2
9/1/24	12	Eligibility Criteria	Added Ground Source Variable Refrigerant Flow Heat Pump ("GSVRF") as eligible technology in Category 3 *GSHP: Full Load Heating*, including Eligibility Criteria	Section 2
9/1/24	12	Eligibility	Update to eligibility criteria for Category 4 *Custom Full Load Space Heating Applications*, including General, Central ccASHP, MSHP,	Section 2

[1] This table reflects the changes made to Version 12 of this Program Manual, which has been published and made effective on September 1, 2024. For a complete record of changes from all versions see Appendix 3: Version History and Description of Revisions: Clean Heat Program Manual.

			Commercial Unitary Systems/ Large Commercial ASHPs, ASVRFs, GSHP, ccPTHPs, HRC and HPCs	
9/1/24	12	Eligibility	Update to eligibility criteria for Category 6 *Custom Centralized Hot Water Heating Applications*	Section 2
9/1/24	12	Incentives Categories	Removal of Category 9, which was discontinued 9/1/23, from Table 2, Table 3, and Table 4	Section 2
9/1/24	12	Incentive Caps	Updated incentive cap calculations	Section 2.1.3
9/1/24	12	Priority Electrification Area Kicker Incentives	Updates to information regarding Priority Electrification Area Kicker Incentives for National Grid Customers	Section 2.1.4
9/1/24	12	Incentives	Update regarding funding for projects that will not be completed until 2026-2030 period	Section 2.2
9/1/24	12	Coordination with NYSERDA Programs	Update regarding incentive availability from NYSERDA and Clean Heat programs	Section 2.3
9/1/24	12	Full Load Requirements	Update to full load requirements for Categories 2, 2a, and 2b	Section 3.5
9/1/24	12	Partial Load Systems	Updates regarding Partial Load Systems requirements	Section 3.3.3
9/1/24	12	Eligible Technologies	Revised language in list of eligible technologies and additional table	Section 3.4
9/1/24	12	Commercial Unitary/ Large Commercial ASHPs	Updates to requirements for certain system size parameters	Section 3.4.2.4
9/1/24	12	ASVRFs	Updates to ASVRF requirements	Section 3.4.2.5
9/1/24	12	GSHPs	Updates to GSHP requirements and information	Section 3.4.3
9/1/24	12	ERV/HRVs	Updates to ERV/HRV requirements and information	Section 3.4.5
9/1/24	12	HRCs and HPCs	Updates to HRC/HPC requirements and information	Section 3.4.3
9/1/24	12	Water-Source VRFs	Updates to efficiency requirements for WSVRFs under AHRI 1230 in Table 8	Section 3.4.3
9/1/24	12	Roles and Responsibilities	Table 13a added to outline roles and responsibilities of Designers, Installers, and Drillers	Section 4.1.1
9/1/24	12	Participating Contractor Requirements	Updated language regarding Participating Contractor requirements	Section 4.1.2

9/1/24	12	Requirements for Custom Installations	Updates to requirements for custom installations	Section 4.3.2
9/1/24	12	Contact Information	Updates to Utility and NYSERDA Contact Information	Section 4.3.2
9/1/24	12	Probationary Status	Clarifications to standards and requirements for contractors in Probationary status	Section 6.3
9/1/24	12	Load Calculation Guidance	New Appendix 1 added to provide more specific guidance on acceptable load calculations	Appendix 1
9/1/24	12	Load Calculation Inputs	Additional guidance added for common data-entry errors in manufacturer load calculation software	Appendix 2

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1. Introduction

What is the NYS 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 lower their energy costs and 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" or "Program") offers incentives 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[2] and the New York State Energy Research & Development Authority ("NYSERDA") (collectively, "Joint Efficiency Providers"[3]), is designed to provide customers, contractors, and other heat pump solution providers with a consistent experience and business environment throughout New York State.[4]

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 Program is the suite of incentives that support customer adoption of eligible heat pump technologies, both air source heat pump ("ASHP") and ground source heat pump ("GSHP") systems, through promotion and pricing discounts offered by contractors and other heat pump solution providers. 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.

The NYS Clean Heat Statewide Heat Pump Program Manual is a reference document that explains the NYS Clean Heat Program, its rules and requirements, and how to participate. This document is specifically for the following Electric Utilities: Central Hudson Gas & Electric Corporation ("Central Hudson"), 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 known as the "Designated Utilities."

For information about Con Edison's incentives and program, please reference the NYS Clean Heat Con Edison Heat Pump Program Manual.[5]

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[2] 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").

[3] 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.

[4] Version 11 of the NYS Clean Heat Program Manual was provided on March 1st, 2024. This revised version reflects many of the changes, as identified by the Joint Efficiency Providers and external stakeholders, deemed necessary to enhance the Program.

[5] Both Program Manuals can be found at: https://cleanheat.ny.gov/resources-for-applications/.

2. Program Summary

Heat pumps transfer heat from a source (or sink) such as outdoor air, the ground, or a mechanically heated or cooled fluid loop rather than producing it (e.g., via an electric resistance coil or by burning fossil fuels). In the heating season, heat is extracted from the heat source and supplied to the conditioned space. During the cooling season, heat is extracted from the conditioned space and rejected to the heat sink. Heat pump technology can provide customers with the following benefits:

- Less volatile annual energy bills, which is especially advantageous for customers with fixed, low, or moderate incomes and service-oriented institutions like nonprofits, schools, community centers, and houses of worship
- Greater comfort and health due to added air conditioning and improved indoor air quality delivered by emissions-free technology
- A long-term solution to heating and cooling needs that is easier to maintain than alternatives

The NYS Clean Heat Program funding has been designated by the New York State Public Service Commission through the Joint Efficiency Providers. Incentives are offered for Air-Source Heat Pumps ("ASHPs"), Air-to-Water Heat Pumps ("AWHPs"), and Ground-Source Heat Pumps ("GSHPs") for both space heating and cooling as well as for Heat Pump Water Heaters ("HPWHs") for water heating.

To apply for incentives under this Program, ASHP installers, ASHP designers, AWHP installers, GSHP installers, GSHP designers, and GSHP drillers ("Drillers") must first become "Participating Contractors" by submitting a Participating Contractor Application indicating the service territories in which they plan to perform work and a Contractor Participation Agreement[6] for each of those specified territories. Upon approval, the applicant will receive an approval notification from the Designated Utility and become eligible to apply for incentives in the Program.

Participating Contractors must adhere to the Eligibility and Requirements as defined in Sections 3 and 4.

Drillers must be approved through this process to become a "Participating Driller," but they are not eligible to submit for and receive incentives. Each GSHP installation must be completed by a Participating Driller. Contractors installing only HPWHs do not have to become Participating Contractors to submit an incentive application on behalf of a customer.

Project incentive amounts are paid directly to the Participating Contractor. The project incentive amount, less the optional Contractor Reward, is required to be passed along to the customer. Participating Contractors may request that the project incentive be paid to an alternate payee.

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 systems prior to or in conjunction 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 significantly help provide cost-effective heating with the installation of a cold-climate heat pump. Site owners can elect to receive incentives for a "Heat Pump + Envelope" project, as laid out in Category 4a (see Section 3: Eligibility and Requirements for more details). Site owners can also access additional

[6] Participating Contractor Applications and Contractor Participation Agreements are available at https://cleanheat.ny.gov/enroll-and-submit-heat-pump-applications/.

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 Statewide Heat Pump 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. Participating Contractors will be notified electronically of any program modification or change, and reference documents are publicly available on the NYS Clean Heat Resources for Applications webpage.[7]

Starting in May 2021, the Joint Management Committee 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 for Applications webpage[8] under the "Working Group Series" heading.

While the PC&IP webinars will serve as the primary avenue for stakeholder engagement, stakeholders are also welcome to reach out to the Program Administrators directly for specific issues as well. Program Administrator contact information is included in Section 9.

The NYS Clean Heat website includes other important information and resources under the following headings:

- Contractors Home Page
- Enroll and Submit Applications
- Resources for Applications
- Program Development, Approvals, and Processes
- Standards and Field Assessments
- NYS Energy Company Contacts
- List of Participating Contractors
- Additional Business Development Opportunities
- Stay Connected

2.1 Available Incentive Funding

Incentives are available on a first come, first served basis. Tables 1-4 in the following sections provide summary information regarding the incentive programs of the Designated Utilities. Additional detail is provided in these sections as well. Definitions for key terms are included in the NYS Clean Heat Program Glossary of Terms in Section 10.

- Table 1 provides the overall structure of the incentives, including identifying category

[7] See https://cleanheat.ny.gov/resources-for-applications/.
[8] Ibid.

description, target segments, eligible technology, incentive structure, and eligibility criteria
- Table 2 details the total incentive amount available by technology and installation type
- Table 3 shows the amount of the Participating Contractor Reward that the Participating Contractor may retain
- Table 4 shows additional incentives for National Grid customers in Priority Electrification Areas

The balance of the Total Incentive less the Participating Contractor Reward must be passed on or otherwise credited to the customer in its entirety. Incentives listed in Table 2, Table 3, and Table 4 are effective as of September 1, 2024.

Project incentive amounts are paid directly to the Participating Contractor. The project incentive amount, less the optional Contractor Reward, is required to be passed along to the customer. Participating Contractors and customers may jointly request that the project incentive be paid to an alternate payee by using the customer acknowledgment form.

All space heating incentives are for Full Load Heating Systems (as defined in Section 10) unless further noted. See Section 3.3 for details and examples.

The incentive categories offered by the NYS Clean Heat Program and outlined in the ensuing sections are as follows:[9]

- Category 2 *ccASHP: Full Load Heating*
- Category 2a *ccASHP: Full Load Heating with Integrated Controls*
- Category 2b *ccASHP: Full Load Heating with Decommissioning*
- Category 2e *Full Load Air-to-Water Heat Pump*
- Category 3 *GSHP: Full Load Heating*
- Category 4 *Custom Full Load Space Heating Applications*
- Category 4a *Custom Heat Pump + Envelope*
- Category 4b *Custom Full Load Multifamily Space Heating Applications*
- Category 5 *Residential Rated HPWH*
- Category 6 *Custom Centralized Hot Water Heating Applications*
- Category 6a *Custom Centralized Multifamily Hot Water Heating Applications*
- Category 7 *GSHP Desuperheater in Category 3 GSHP Systems*
- Category 8 *Water-to-Water Heat Pump ("WWHP") used to meet Domestic Hot Water ("DHW") Load in Category 3 GSHP Systems*
- Category 10 *Custom Partial Load Space Heating Applications*

[9] The Clean Heat Program formerly included Category 1 *ccASHP: Partial Load Heating*, but this incentive category has been discontinued.

2.1.1 Eligible Technologies and Eligibility Criteria

Table 1: Eligible Technologies and Eligibility Criteria

Eligible Technologies	*Eligibility Criteria*
Category 2 – ccASHP: Full Load Heating	
Minisplit Heat Pump ("MSHP"), Central ccASHP	• Each unit in system must be on the NEEP Product List • Total heat pump system heating capacity is <300,000 Btu/h for all building types except Multifamily • Multifamily (5 or more units) installing heat pumps should apply for Category 4, 4a, or 4b incentives • For central ASHPs installed with a back-up furnace in the same heating system, the back-up furnace must have capacity <225,000 Btu/h • Systems sized for >120% BHL may incur further review and require justification.
Category 2a – ccASHP: Full Load Heating with Integrated Controls	
Minisplit Heat Pump ("MSHP"), Central ccASHP with Integrated Controls	• Eligible projects include heat pumps that meet the full building load where the previously existing system is coupled with integrated controls • Category 2a is only available for retrofit projects of existing structures and is not available to new construction or gut rehab[10] • To be eligible for Category 2a incentives, 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 • Ancillary electric heating systems are not eligible for a Category 2a incentive
Category 2b – ccASHP: Full Load Heating with Decommissioning	
Minisplit Heat Pump ("MSHP"), Central ccASHP with Decommissioning	• Eligible projects include heat pumps that meet the full building heating load where the previously existing fossil fuel system is decommissioned • Retrofit projects are eligible; new construction and gut rehabs are not eligible • Category 2b will require submission of a decommissioning checklist, which can be found on the Contractor Resources website[11]

[10] Gut rehabilitation, or "gut rehab," is defined as a renovation that removes material down to structural load-bearing beams, as defined by the TRM v10, effective January 1, 2023.

[11] The Decommissioning Checklist can be found in the "Air Source Heat Pump" section under the "Prescriptive (Small Projects)" menu on the Resources for Applications page (https://cleanheat.ny.gov/resources-for-applications/)

Eligible Technologies	*Eligibility Criteria*
Category 2e – Full Load Air-to-Water Heat Pump	
Air-to-Water Heat Pump, for space conditioning	• Eligible heat pumps must be on the NYS Clean Heat AWHP Qualified Product List ("AWHP QPL")[12] • Eligible projects include heat pumps that meet 100% of building heating load (BHL) at design conditions. AWHPs that meet only part of the building load are acceptable if the remainder of the load is met by a separate ccASHP. • Retrofit projects, new construction, and gut rehabs are eligible • AWHPs can provide space heating alone or space heating and cooling. AWHPs can also serve domestic water heating loads, but may not be sized to more than 120% of the space heating load, or BHL.
Category 3 – GSHP: Full Load Heating	
GSHP - General	• Each heat pump in the system must meet or exceed the ENERGY STAR Geothermal heat pump specification • Console units and non-console heat pump appliances with less than 24,000 Btu/h rated full load cooling must meet or exceed the minimum efficiencies listed in Tables 6 and 7 • Total heat pump system heating capacity is <300,000 Btu/h • System consists only of individual appliance cooling capacity for open-loop and closed-loop GSHP installs <135,000 Btu/h and/or individual appliance cooling capacity for direct exchange GSHP installs ≤180,000 Btu/h • Ground loops must comply with applicable New York Department of Environmental Conservation ("NY DEC"), New York City ("NYC"), and International Ground-Source Heat Pump Association ("IGSHPA") standards • Systems sized for >120% BHL may incur further review and require justification • Projects must be sized to meet at least 100% of the load of the project scope at design conditions and serve at least 80% of the building's total square footage. See Section 3.3.2 for details. • For Water-to-Water Heat Pumps that meet both space heating and DHW loads, the WWHP size must not exceed 140% of BHL (space heating load); incentives will be capped at 120% of BHL.
Ground Source Variable Refrigerant Flow Heat Pump ("GSVRF")	• Must meet or exceed the minimum efficiencies listed in Table 8, regardless of total heating system size or individual appliance cooling capacity • GSVRF full load heating capacity is determined at 32°F entering water temperature and must be <300,000 Btu/h

[12] The NYS Clean Heat AWHP QPL was originally derived from that maintained by Efficiency Vermont. The NYS Clean Heat Program AWHP QPL is maintained by the NYS Clean Heat JMC. The Air to Water Heat Pump Eligibility and Qualified Products document can be found in the "Air Source Heat Pump" section under the "Prescriptive (Small Projects)" menu on the Resources for Applications page (https://cleanheat.ny.gov/resources-for-applications/).

Eligible Technologies	*Eligibility Criteria*
Category 4 – Custom Full Load Space Heating Applications	

General	• All non-Multifamily building types: total heat pump system heating capacity is >300,000 Btu/h or utilizes equipment from the following categories:
	  ○ Commercial unitary systems
	  ○ Air Source Variable Flow Refrigerant Heat Pump (ASVRF)
	  ○ Cold Climate Packaged Terminal Heat Pumps (ccPTHP)
	  ○ Energy Recovery Ventilator / Heat Recovery Ventilator (ERV/HRV)
	  ○ Single Package Vertical Heat Pumps (SPVHPs)
	  ○ Dedicated Outdoor Air System (HP-DOAS)
	  ○ Heat Recovery Chiller and Heat Pump Chiller
	• Multifamily buildings with over 100 dwelling units
	• Installed systems must satisfy the dominant HVAC load for the building, per applicable code. If the building has a higher BHL than BCL, the system must be sized to satisfy BHL. If the building has a higher BCL, the system must be sized to satisfy BCL.
	• Each project requires pre-approval, based on a review of projected MMBtu savings and an associated preliminary incentive amount ($/MMBtu)
	• Projects shall be for full-load heating systems, except for heat recovery chiller projects.

Central ccASHP	Equipment must be NEEP-listed
MSHP	Systems must be constituted only of NEEP-listed equipment

Commercial Unitary Systems/Large Commercial ASHPs	Systems must have the following characteristics:
	• Include individual heat pump appliances that are powered by three-phase electricity or have rated cooling capacities ≥65,000 Btu/h
	• Units must use multi-speed or variable speed compressors. Single speed systems are not eligible for incentives.
	
	System performance criteria:
	• Units between 65,000 and240,000 Btu/h cooling capacity
	  ○ Meet or exceed current ENERGY STAR Light Commercial HVAC Key Product Criteria for COP47
	  ○ Other efficiencies (COP17, EER, IEER) must exceed applicable code
	• Units with >240,000 Btu/h cooling capacity
	  ○ Efficiencies must exceed applicable code

Air Source Variable Refrigerant Flow Heat Pump	System performance criteria: • Units between 65,000 and 240,000 Btu/h cooling capacity must meet or exceed current ENERGY STAR requirements for VRF Criteria for Certified Cold Climate Light Commercial Heat Pumps.

Eligible Technologies	***Eligibility Criteria***
("ASVRF")	• Units greater than 240,000 Btu/h cooling capacity must have efficiencies that exceed applicable energy code
GSHP	GSHP systems must meet or exceed the ENERGY STAR Geothermal heat pump specification efficiency requirements and exhibit any of the following characteristics: • Individual heat pump appliances powered by three-phase electricity • Individual appliance cooling capacity for closed-loop GSHP installs ≥135,000 Btu/h • Individual appliance cooling capacity for direct exchange GSHP installs ≥180,000 Btu/h Exceptions to the above eligibility criteria: • GSHP systems with <24,000 Btu/h rated full load cooling must meet or exceed the specifications in Table 7
GSVRF	GSVRF systems, regardless of total heating system size or individual appliance cooling capacity, must meet or exceed the minimum efficiencies listed in Table 8.
Console Type GSHPs	Console type GSHP systems, regardless of total heating system size or individual appliance cooling capacity, must meet or exceed the minimum efficiencies listed in Table 6.
Cold Climate Packaged Terminal Heat Pumps ("ccPTHPs")	Eligible ccPTHPs must meet the following criteria: • Each unit in system must be listed on, or meet or exceed the criteria of, the NEEP Product List
Single Package Vertical Heat Pumps ("SPVHPs")	Eligible SPVHPs must meet the following criteria: • Manufacturer-reported COP at 5°F must exceed 1.5 (at full operating capacity) • Compressor must be variable capacity (three or more distinct operating speeds, or continuously variable) • Manufacturer reported Heat Pump output at 5°F must be a minimum of 50% of rated heating capacity at 47°F
Energy Recovery Ventilator / Heat Recovery Ventilator ("ERV/HRV")	Eligible ERV/HRVs must meet the following criteria: • Exceed federal, state, or municipal efficiency codes or standards • Must be paired with an eligible heat pump system
Dedicated Outdoor Air System (HP-DOAS)	Eligible HP-DOAS must meet or exceed the minimum efficiency requirements set forth in ASHRAE Standard 90.1-2016 tables 6.8.1-15 and 6.8.1-16 under AHRI 920 as excerpted in Section 3.4.7.

Eligible Technologies	*Eligibility Criteria*
Heat Recovery Chiller and Heat Pump Chiller	Equipment must be used to satisfy space heating load. Equipment used for process heating is ineligible for Clean Heat incentives. Equipment must be electrically operated and meet or exceed the minimum efficiency requirements at operating conditions set forth in ASHRAE Standard 90.1-2022 under AHRI 550/590. For Ground Loop HPCs, capacities and efficiencies must be presented consistent with ISO 153256-1 in the following two scenarios: 1. Full load performance: 77/32°F EWT full speed compressor and pumping for cooling/heating 2. Part load performance: 68/41°F EWT part speed compressor and pumping for cooling/heating
Category 4a – Custom Heat Pump + Envelope	
See Category 4, plus Window Replacements, Window Film, Wall Insulation, Continuous Insulation, Window Walls, Curtain Walls, Exterior Façade, Air Leakage Sealing, Air Barrier Continuity, Roof Insulation	Eligible projects include any Category 4 heat pumps, installed at either an existing facility or new construction, that are coupled with a significant envelope upgrade. The envelope upgrade must produce a quantifiable impact on the heat pump sizing to be eligible for a packaged approach. Projects may qualify for one of two tiers of envelope upgrade improvements: Tier 1: • Existing: >5% reduction in dominant load compared to baseline • New Construction: >5% reduction in dominant load compared to baseline Tier 2: • Existing: >30% reduction in dominant load compared to baseline • New Construction: >10% reduction in dominant load compared to baseline When combined, the existing baseline will be used for calculating energy savings except for new construction projects, which should use a code baseline for savings analysis. The MMBtu savings from both the envelope measures and the heat pump measures will be paid out at the 4a rate. If a HP + Envelope upgrade also includes an eligible ERV/HRV, the ERV/HRV will also receive a Category 4a incentive. 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

Eligible Technologies	*Eligibility Criteria*
Category 4b – Custom Full Load Multifamily Space Heating Applications (5-100 dwelling units)	
Category 4 Space heating technologies	• Multifamily buildings with 5 to 100 dwelling units installing Category 4-eligible heat pumps and supporting equipment. Projects including envelope measures should apply to Category 4a. • Retrofit, gut rehab, and new construction are eligible. • Building must have year-round occupancy • Common-area-only projects are not eligible for Category 4b • Installed systems must satisfy the dominant HVAC load for the building, per applicable code. If the building has a higher BHL than BCL, the system must be sized to satisfy BHL. If the building has a higher BCL, the system must be sized to satisfy BCL. • Projects shall be for full-load heating systems. • Applicants will follow the Custom application process and requirements (see section 4.3).
Category 5 – Residential Rated HPWH	
Residential Rated HPWHs	HPWHs with a Uniform Energy Factor (UEF) rating. Must meet or exceed ENERGY STAR Residential Water Heater specification.[13]

[13] ENERGY STAR Water Heater Key Product Criteria: https://www.energystar.gov/products/water_heaters/residential_water_heaters_key_product_criteria

Eligible Technologies	*Eligibility Criteria*
Category 6 – Custom Centralized Hot Water Heating Applications	
Air-to-Water and Water-to-Water Heat Pumps for DHW	The following types of centralized systems are included: • Ground-coupled water-to-water heat pumps ("WWHP") used for DHW loads must meet or exceed ENERGY STAR Geothermal heating requirements for single phase units and applicable code for 3-phase units.[14] • Other air-to-water or water-to-water heat pump systems used for DHW must meet applicable ASHRAE 90.1-2022 requirements using AHRI 550/590. • Commercial HPWH (rated with COP_H) and residential HPWH (rated with UEF) must meet applicable ENERGY STAR requirements. Residential HPWH are eligible for Cat 6 only if they are parallel-piped as a central DHW system. • Heat Recovery Chillers and Heat Pump Chillers (see eligibility requirements in section 3.4.6) • Systems listed in NEEA Commercial/Multifamily HPWH Qualified Products List[15] In all cases: • 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 new electric technology or application must: 1. Reduce existing or baseline fossil fuel or electric resistance annual consumption by at least 50% 2. In savings calculations, the fossil fuel baseline efficiency (including distribution) must equal existing or upgraded (boiler) system efficiency, as applicable 3. Not increase the overall annual site energy consumption 4. Exceed applicable minimum efficiency specifications to meet applicable codes and standards
Category 6a – Custom Centralized Multifamily Hot Water Heating Applications	
Category 6 water heating technologies	• Multifamily buildings with 5 to 100 dwelling units installing Category 6-eligible heat pump water heating equipment and supporting equipment • Residential HPWH are eligible for Cat 6a only if they are parallel-piped as a central DHW system. • Retrofit, gut rehab, and new construction are eligible • Building must have year-round occupancy • Common-area-only projects are not eligible for Category 6a • A project is eligible to apply for incentives under Category 6a for domestic hot water in properties where hot water serves in-unit use only. Only full load heat pump installations are eligible for Category 6a incentives. • Applicants will follow the Custom application process and requirements (see section 4.3).

[14] ENERGY STAR Geothermal Heat Pumps Key Product Criteria: https://www.energystar.gov/products/heat_pumps_geothermal/key_product_criteria
[15] https://neea.org/img/documents/commercial-HPWH-qualified-products-list.pdf

Eligible Technologies	*Eligibility Criteria*
Category 7 – GSHP Desuperheater in Category 3 GSHP Systems	
Optional component to GSHP systems	Installed as integrated component in an eligible GSHP
Category 8 – Water-to-Water Heat Pump ("WWHP") used to meet DHW Load in Category 3 GSHP Systems	
WWHP added to ground loop to meet DHW load	WWHP can be integrated into an eligible GSHP system as a dedicated WWHP or combined with space heating, meeting or exceeding ENERGY STAR Geothermal specifications. Must meet 100% of water heating load
Category 10 – Custom Partial Load Space Heating Applications	
See Category 4	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. Eligibility for Category 10: • Category 4- and 4a-eligible projects that are not full-load heating systems • Projects must displace at least 50% of the existing on-site fossil fuel consumption annually or provide at least 4,000 MMBtu of annual savings. Heat recovery chiller projects are exempt from this requirement. • 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 project must not increase the overall annual site energy 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 • Technology must use staged, multi-speed or variable-speed heat pumps • Projects require pre-approval and will be reviewed on a case-by-case basis.

2.1.2 Incentive Structure and Amounts by Utility

Table 2: Incentives by Utility

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
2	*ccASHP: Full Load Heating*[16]	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F[17]	$500	$800	$800	$700
2a	*ccASHP: Full Load Heating with Integrated Controls* (inclusive of base incentive):	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F[17]	$700	$1,000	$1,000	$1,000
2b	*ccASHP: Full Load Heating with Decommissioning* (inclusive of base incentive):	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F[17]	$1,000	$1,200	$1,200	$1,400
2e	*Full Load Air-to-Water Heat Pump, for space conditioning*	$/10,000 Btu/h of heating capacity at the condition of 5°F ambient and 110°F leaving water temperature, or A5W110, as documented by the NYS Clean Heat AWHP QPL[17]	$500	$800	$800	$700
3	*GSHP: Full Load Heating*	$/10,000 Btu/h of full load heating capacity as certified by AHRI[18]	$2,000	$1,500	$1,500	$2,000
4	*Custom Full Load Space Heating Applications*	$/MMBtu of annual energy savings	$70	$70	$70	$70

[16] See Section 3.3.2 for full load heating definition

[17] For Categories 2, 2a, 2b, and 2e: Total Incentive to be limited to 120% of BHL - e.g., Total Incentive ≤ (Maximum Heating Capacity * 1.2 / HP Sizing Ratio). See Equipment Sizing Requirements in Appendix 2 for additional details.

[18] Total Incentive to be limited to 120% of BHL - e.g., Total Incentive ≤ (Full Load GLHP Rating OR Full Load GWHP Rating*1.2)/HP sizing ratio). See Equipment Sizing Requirements in Appendix 2 for additional details.

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
4a	*Custom Heat Pump + Envelope*[19]	$/MMBtu of annual energy savings	Tier 1: $70 Tier 2: $80	Tier 1: $70 Tier 2: $80	Tier 1: $70 Tier 2: $80	Tier 1: $70 Tier 2: $80
4b	*Custom Full Load Multifamily Space Heating Applications (5-100 dwelling units)*	$/Dwelling unit	$1,700	$1,800	$1,700	$1,800
5	*Residential Rated HPWH: Retail*	$/Equipment unit	$1,000	$700	$700	$1,000
	Residential Rated HPWH: Midstream	$/Equipment unit	$1,100	$800	$800	$1,100
6	*Custom Centralized Hot Water Heating Applications*	$/MMBtu of annual energy savings	$70	$70	$70	$70
6a	*Custom Centralized Multifamily Hot Water Heating Applications (5-100 dwelling units)*	$/Dwelling unit	$400	$400	$400	$400
7	*GSHP Desuperheater in Category 3 GSHP Systems*	$/Equipment unit	$150	$100	$100	$150
8	*WWHP used to meet DHW Load in Category 3 GSHP Systems*	$/Equipment unit	$1,000	$900	$900	$1,000
10	*Custom Partial Load Space Heating Applications*	$/MMBtu of annual energy savings	$70	$70	$70	$70

[19] Based on total project savings from the heat pump system plus any envelope measures. See Section 3.5 for more details.

Notes on Table 2

- Total heat pump incentive shall not exceed caps listed in Section 2.1.3
- Con Edison incentives are listed in the NYS Clean Heat Con Edison Heat Pump Program Manual
- Category 4b and 6a $/dwelling unit incentive rates are based on average MMBtu savings per dwelling unit for completed multifamily projects using current custom $/MMBtu incentive rates

Table 3: Participating Contractor Reward

Incentives listed in this table are included in the total incentives listed in Table 2. Con Edison contractor rewards are listed in the NYS Clean Heat Con Edison Heat Pump Program Manual.

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
2	*ccASHP: Full Load Heating*	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	$300/ project	$300/ project	$300/project	$500/project
2a	*ccASHP: Full Load Heating with Integrated Controls* (inclusive of base incentive)	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	$500/ project	$500/ project	$500/ project	$750/project
2b	*ccASHP: Full Load Heating w*ith Decommissioning (inclusive of base incentive)	$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	$500/ project	$500/ project	$500/ project	$1,000/project
2e	*Full Load Air-to-Water Heat Pump, for space conditioning* (inclusive of base incentive)	$/10,000 Btu/h of heating capacity at the condition of 5°F ambient and 110°F leaving water temperature, or A5W110, as documented by the AWHP QPL.	$300/ project	$300/ project	$300/ project	$500/project
3	*GSHP: Full Load Heating*	$/10,000 Btu/h of full load heating capacity as certified by AHRI	$500/ project	$500/ project	$500/ project	$500/project

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
4	*Custom Full Load Space Heating Applications*	$/MMBtu of annual energy savings	$500/ project	$500/ project	$500/ project	$500/project
4a	*Custom Heat Pump + Envelope*	$/MMBtu of annual energy savings	$500/ project	$500/ project	$500/ project	$500/project
4b	*Custom Full Load Multifamily Space Heating Applications (5-100 dwelling units)*	$/Dwelling unit	$500/ project	$500/ project	$500/project	$500/project
5	*Residential Rated HPWH: Retail*	$/unit	N/A	N/A	N/A	N/A
	Residential Rated HPWH: Midstream	$/unit	$50 contractor reward, $50 distributor reward	$50 contractor reward $50 distributor reward	$50 contractor reward $50 distributor reward	$50 contractor reward $50 distributor reward
6	*Custom Centralized Hot Water Heating Applications*	$/MMBtu of annual energy savings	N/A	N/A	N/A	N/A
6a	*Custom Centralized Multifamily Hot Water Heating Applications*	$/Dwelling unit	$500/ project	$500/ project	$500/project	$500/project
7	*GSHP Desuperheater in Category 3 GSHP Systems*	$/Equipment unit	N/A	N/A	N/A	N/A
8	*WWHP used to meet DHW Load in Category 3 GSHP Systems*	$/Equipment unit	N/A	N/A	N/A	N/A
10	*Custom Partial Load Space Heating Applications*	$/MMBtu of annual energy savings	$500/ project	$500/ project	$500/project	$500/project

2.1.3 Incentive Limitations and Caps

Effective September 1, 2023, the following limitations on Clean Heat incentives apply per project:[20]

- Incentives will be limited to up to 50% of project costs. Only material and labor costs associated with the incentive measure(s) will be considered. Other costs such as taxes, internal labor costs, shipping, administrative costs, or similar costs will not be included with total project cost when calculating incentive caps.
- Incentive Caps:
    - National Grid: $1 million
    - NYSEG: $700,000
    - RG&E: $700,000
    - Central Hudson: $700,000
    - O&R: $700,000
- For projects that request incentives above the utility-specific cap, the utility reserves the right to limit incentives or offer incentives at a custom rate.

Total incentives for Category 3 ground source projects are limited to $50,000 per project, including GSHP projects in Priority Electrification Areas.

Projects with sizing ratios 120-125% BHL will have incentives capped at 120% BHL and corresponding revisions to calculations and documents will be made as necessary. Projects submitted with sizing ratios over 125% will initially be deemed ineligible pending additional review.

[20] A Project is defined as 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. See Section 10.

2.1.4 Utility-Specific Modifications

Table 4: Priority Electrification Area Kicker Incentives for National Grid Customers

Additional kicker incentives are available for qualifying heat pumps installed within designated gas-constrained areas in select Upstate zip codes.[21] To be eligible for the National Grid kicker, a customer must be a National Grid electric and gas customer and must be replacing gas as the existing fuel. Only the categories listed below are eligible for the kicker incentives. Customers must decommission existing gas systems to receive the additional kicker incentives beginning 10/01/2024.

Category	Description	National Grid (Priority electrification areas)
2b	*ccASHP: Full Load Heating with Decommissioning*	Additional 25% of total incentive in select zip codes
2e	*Full Load AWHP: Full Load Heating*	Additional 25% of total incentive in select zip codes
3	*GSHP: Full Load Heating*	Additional 25% of total incentive in select zip codes
7	*GSHP Desuperheater in Category 3 GSHP Systems*	Additional 25% of total incentive in select zip codes
8	*WWHP used to meet DHW Load in Category 3 GSHP Systems*	Additional 25% of total incentive in select zip codes

2.2 Modifications to Incentives

The Designated Utilities reserve the right to change the incentive offerings (including but not limited to total incentive amount, Participating Contractor Reward, timing, recipient, incentive structure, and cap) at any time. The Designated Utilities reserve the right to further limit the number of incentives per Participating Contractor, site owner, site, or meter. The Designated Utilities shall make all reasonable efforts to notify the market three months prior to incentive changes and not make changes more frequently than twice per year.

Program changes will be reflected in the Program Manual. Changes will be e-mailed to Participating Contractors and posted on the Resources for Applications webpage.[22] The incentive amount for any project will be based on the incentive offering and program rules that are in effect at the time of installation. Participating Contractors are prohibited from cancelling submitted incentive applications and re-applying if the new incentive payment results in a higher amount. The Designated Utilities

[21] See additional information on National Grid's Electric Heating & Cooling Heat Pumps website, https://www.nationalgridus.com/Upstate-NY-Home/Energy-Saving-Programs/Electric-Heating-Cooling

[22] NYS Clean Heat Resources for Applications page, https://cleanheat.ny.gov/resources-for-applications/

reserve the right to structure incentive payments differently to accommodate unique situations.

The Commission has authorized Clean Heat program funding and budgets through December 31, 2025. To be eligible for incentives, custom projects must complete electrification and startup of all mechanical systems being incentivized by the date specified in the utility's Preliminary Incentive Offer Letter ("PIOL").[23] Future funding and budgets for the period 2026-2030 are currently under consideration by the Commission. For custom projects to be completed after 12/31/25, Participating Contractors are encouraged to share information with their account managers. Participating Contractors are encouraged to provide applications and associated project information for such projects; however, the utilities reserve the right to provide or not provide PIOLs. Prior to Commission decision on 2026-2030 funding and budgets, utilities may opt to provide PIOLs for such proposed custom projects.

2.3 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 independently from each respective program. However, NYS Clean Heat and NYSERDA incentives cannot be combined towards the cost of the same installed measure. Other program rules may apply.

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
- 100% of total heat pump project cost, for Low-to-Moderate Income ("LMI") participants. LMI participants are defined by the Statewide LMI Portfolio.[24]

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

Regarding NYS Clean Heat and EmPower+ as relates to the IRA Home Electrification Appliance Rebate ("HEAR") Program, coordination between NYS Clean Heat and EmPower+ is being reviewed. Customers continue to be able to access NYS Clean Heat. The review allows NYSERDA, the Department of Public Service ("DPS"), and the utilities to assess the plans for administering EmPower+/HEAR rebates to mitigate the potential for increased energy burden for lower-income customers, while also ensuring adequate plans are in place to manage NYS Clean Heat budgets. NYSERDA will work with DPS and utility companies on the design of future offerings funded through the IRA and will communicate with contractors and other interested parties as updates are available.

The Joint Efficiency Providers reserve the right to limit total combined funding for any project at any time.

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[23] See Section 4.3.3, Step 5 for more information about the PIOL process.

[24] See Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative ("NENY Proceeding"),* Statewide Low- to Moderate-Income Portfolio Implementation Plan (filed August 15, 2022), Section 2.6 Eligibility Thresholds, pp. 15-16. https://www.nyserda.ny.gov/All-Programs/Low-to-moderate-Income-Programs/LMI-Stakeholder-Resources-New-Efficiency-New-York

2.4 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"), a network that coordinates electronic payments.

Complete details of these residential financing options can be found on the NYSERDA Residential Financing Options webpage.[25]

The ability to provide access to GJGNY 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.

The Participating Contractor shall ensure that the GJGNY funds 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 homepage.[26] 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.

[25] NYSERDA Residential Financing Programs, https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Programs

[26] NYSERDA Become a Loan-offering Contractor, https://www.nyserda.ny.gov/All-Programs/Programs/Become-a-Contractor/Become-a-Loan-offering-Contractor

3. Eligibility and Requirements

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

3.1 General Eligibility

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

For projects installed at new construction sites, all components installed as part of an approved ASHP, GSHP and 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. The installation of used or refurbished equipment and components is not permitted under the program.

The installed heat pump system must serve as the primary heating source to satisfy design heating loads in the conditioned space covered by the system.

Projects replacing existing full load heat pump systems shall not be eligible for incentives. Projects that add heating load to existing partial-load cold climate air source heat pump systems are eligible for incentives.

Heat pump projects are eligible for incentives regardless of the heating fuel (e.g., fuel oil, natural gas, propane, biomass, or electricity) they replace, in the case of retrofits, or decline to include, in the case of new construction. The Clean Heat program goal is to advance the adoption of efficient electric heat pump systems for space and water heating, displacing fossil fuel heating equipment. Customers who receive utility gas space heating equipment incentives on the same project as the heat pump installation will not be eligible for Clean Heat incentives.

Participating Contractors must adhere to all applicable laws, regulations, codes, licensing, certification, and permit requirements pertaining to the scope of work. For example, where U.S. Environmental Protection Agency (EPA) Clean Air Act Section 608 Technician Certification of the type applicable to the equipment being installed or serviced, including attaching or detaching hoses and gauges to and from an appliance to measure pressure, is required as prescribed by federal law. Technicians who maintain, service, repair, or dispose of equipment that could release ozone-depleting refrigerants into the atmosphere must be certified.

For reference, EPA has developed the following 4 types of certifications.

1. For servicing small appliances (Type I).
2. For servicing or disposing of high- or very high-pressure appliances, except small appliances and MVACs (Type II).
3. For servicing or disposing of low-pressure appliances (Type III).
4. For servicing all types of equipment (Universal)."

In general, Type II or Universal certification is required for residential AC/HP equipment and Type III or Universal is required for commercial AC/HP units. Some refrigerants are exempt from Section

608 requirements. It is the Contractor's responsibility to maintain the appropriate level of certification for the type of equipment being serviced or installed and should reference the law directly to ensure full compliance. Additional information can be found here: https://www.epa.gov/section608/section-608-technician-certification-0

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

3.2 Site Eligibility

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

Program incentives are available for systems installed in existing buildings and new construction. Incentive structures are described in terms of their applicability to various building types, which are:

- Residential (one to four units)
- Multifamily (five or more units)
- Small commercial businesses (small commercial)
- Large commercial and industrial buildings ("C&I")

3.3 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 heat pump and connected ductwork (if applicable) 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 *Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates*[27] to assist in sizing and selecting ccASHP equipment.

3.3.1 Program Requirements for System Sizing

To be eligible for incentives, all heat pump systems must be sized in compliance with applicable state and municipal code.[28]

Residential heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with

[27] NEEP Guide to Sizing & Selecting Air-Source Heat Pumps in Cold Climates: https://neep.org/sites/default/files/Sizing %26 Selecting ASHPs In Cold Climates.pdf

[28] 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.

ACCA Manual J or other approved heating and cooling calculation methodologies.[29] Applicable exceptions shall apply.[30]

Participating Contractors are also encouraged to use additional design manuals as applicable to the system, including ACCA[31] Manual D: Duct Design,[32] ACCA Manual T: Air Distribution,[33] and ACCA Manual B: Test, Adjust and Balance.[34.]

All ASHP installers seeking to become program Participating Contractors must provide documentation that they have completed a manufacturer-sponsored Cold Climate 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. Available trainings are posted on the Clean Heat Connect trainings calendar[35] and updated regularly.

Equipment installed in commercial buildings must be sized in accordance with heating and cooling load calculations following ANSI[36]/ASHRAE[37]/ACCA Standard 183-2007 (RA2017) or other code-approved equivalent computational procedure.[38] 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.[39]

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

3.3.2 Full Load Requirement and Examples

All heat pump systems shall be designed and sized for full load heating, unless otherwise noted.

Under the NYS Clean Heat Program, a full load heat pump system is defined as a system installed as a

[29] 2020 Residential Code of NYS, Chapter 14, Section M1401.3 Equipment and appliance sizing
[30] One 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/resources-for-applications/.
[31] Air Conditioning Contractors of America
[32] ACCA Manual D: Duct Design: Method used to determine the overall duct layout including the individual duct sizes.
[33] ACCA Manual T: Air Distribution: Method used to determine how to distribute airflow.
[34] 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.
[35] Clean Heat Connect trainings calendar, https://cleanheatconnect.ny.gov/calendar/
[36] American National Standards Institute
[37] American Society of Heating, Refrigerating, and Air-Conditioning Engineers
[38] ECCCNYS 2016, Section C403.1.1 Calculation of heating and cooling loads
[39] 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.

building's primary heating source, with a total system heating capacity that satisfies at least 100% of the BHL at design conditions, in accordance with applicable code, and can distribute heat adequately across all occupied spaces in the project scope. Projects in Category 2, 2a, 2b and GSHP projects must be sized to meet at least 100% of the load over the project scope at design conditions and serve at least 80% of the building's total square footage. Projects serving 80-100% of the building's total square footage are intended for configurations that include living space that is occupied only occasionally, such as garages, basements, in-law suites, etc. If the building has a higher BCL than BHL, the system must be sized to satisfy full building cooling load (BCL), as required by relevant municipal or state code.

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 100% of the heating load for the building, it qualifies as a full load heating system.
- *Full Load Heating Example 2 (applicable to Category 4 projects):* 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 to be within the scope of the project. Since the heat pumps satisfy at least 100% 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 for the GSHP portion.

3.3.3 Partial Load Systems for Custom Incentive Categories

Category 10 *Custom Partial Load Space Heating Applications* and Category 6 *Custom Centralized Hot Water Heating Applications* projects may be considered for incentives. A partial load heating system is defined as 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. A partial load system has a total system heating capacity that satisfies <100% of the BHL at design conditions.

If a proposed Category 10 *Custom Partial Load Space Heating Applications* or Category 6 *Custom Centralized Hot Water Heating Applications* project is a partial-load heating system, the project application must ensure that:

- Fossil fuel (heating oil, natural gas, steam generated by fossil fuel, etc.) energy consumption must be reduced by the new electric technology or application.
- 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.
- Project must displace at least 50% of the existing on-site fossil fuel consumption, or contributes at least 4,000 MMBtu of savings annually. This requirement does not apply to Heat Recovery

Chillers.

- The new electric technology or application must not increase the overall annual site energy consumption and must exceed applicable minimum efficiency specifications to meet applicable codes and standards.
- Technology must use staged, multi-speed or variable-speed heat pumps

Additional application documentation will be required, as specified in section 4.3.2.

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

3.3.4 Documentation of Sizing

Documentation must be provided with all applications to show equipment sizing is in accordance with Program rules, described in Section 3.3.1. Required documentation is described in Section 4.2 Prescriptive Heat Pump Project Installations and Section 4.3 Custom Heat Pump Project Installations.

3.3.5 Oversized Systems

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. Oversized systems whose incentives are calculated based on equipment heating capacity, namely Categories 2 and 3, will have their incentives capped according to Table 1.

3.3.6 Design Temperatures

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 5 below for examples of ASHRAE (2021) dry bulb heating and cooling design temperatures for various locations across New York State. The applicable location may be found in the Program's Design Temperature Lookup Tool[40] by entering the project zip code.

Table 5: Dry Bulb Design Temperatures

City Name	2021 ASHRAE	
	99% Heating Dry Bulb (deg F)	1% Cooling Dry Bulb (deg F)

[40] As available for download on the Resources for Applications webpage, under the Prescriptive (Small Projects) and Custom (Large Projects) sections. https://cleanheat.ny.gov/resources-for-applications/.

Albany	4.3	86.3
Binghamton	3.9	82.3
Buffalo	6.8	83.9
Central Long Island	16.5	86.4
Elmira	4.1	86.5
Fort Drum	-4.9	83.8
Glens Falls	-2.1	84.6
Islip	15.7	85.9
Jamestown	4.5	81.1
Massena	-7.6	84.6
Monticello	4.7	83.5
Niagara Falls	6.5	85.4
Poughkeepsie	8.04	88.4
Rochester	6.6	86.0
Saranac Lake	-12.6	81.0
Syracuse	4.1	86.4
Utica	0.8	84.4
Watertown	-5.4	83.3
Westhampton	11.9	84.2
White Plains	12.9	86.4

Load calculations performed may use dry bulb temperatures that differ from those in Table 5, but in those cases, must be within five degrees (+/-) of the applicable values in Table 5.

3.4 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 Central Ducted Heat Pumps
   c. Air-to-Water Heat Pumps
   d. Air-to-Air Large Commercial Unitary Heat Pumps (central ducted or split system)
   e. Air Source Variable Refrigerant Flow Heat Pumps
   f. Packaged Terminal Heat Pumps
   g. 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. Residential rated HPWHs with a UEF rating
   b. Ground Source Heat Pump Desuperheaters
   c. Water-to-Water Heat Pump added to Ground Loop

(4) Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs) paired with eligible heat pumps

(5) Building Envelope Upgrades paired with eligible heat pumps

(6) Heat Recovery and Heat Pump Chillers

(7) Heat Pump Dedicated Outdoor Air Systems (HP-DOAS)

Space Heating Eligibility by Technology and Category

Technology	Prescriptive Categories 2, 2a, 2b, 2e, 3	Custom Categories 4, 4a, 4b, 10
Air Source Heat Pumps for Space Heating Applications		
Cold Climate Air-to-Air Mini-Split Heat Pumps	Yes	Yes
Cold Climate Air-to-Air Central Ducted Heat Pumps	Yes	Yes
Air-to-Water Heat Pumps	Yes	Yes
Air-to-Air Large Commercial Unitary Heat Pumps (central ducted or split system)	No	Yes
Air Source Variable Refrigerant Flow Heat Pumps	No	Yes
Packaged Terminal Heat Pumps	No	Yes
Single Package Vertical Heat Pumps	No	Yes
Ground Source Heat Pumps		
Ground Source Heat Pumps	Yes	Yes
GS VRF	Yes	Yes
Heat Recovery Systems		
Heat Recovery Chillers	No	Yes
Heat Pump Chillers	No	Yes
Complementary Technologies Installed with Eligible Heat Pumps		
Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs)	No	Yes
Heat Pump Dedicated Outdoor Air Systems	No	Yes
Building Envelope	No	Yes

3.4.1 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 United States Environmental Protection Agency (EPA), 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. The applicable Designated Utility may verify adherence to these requirements and determine incentive eligibility based on its findings.

Outdoor units should be installed above the local snow line.[41] 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 for Applications webpage. Systems must be installed to pass all requirements of the Program Compliance and Field Assessments process detailed in Section 5, and its associated field assessment checklists.

3.4.2 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[42] 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 Statewide Heat Pump Program, including:

(1) Central ccASHPs that are identified on the NEEP Product List
(2) Ductless or partially ducted mini-split heat pumps 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) AWHPs
(4) Commercial Unitary (i.e., Large Commercial) ASHPs (Split or Single Package)
(5) Air Source Variable Refrigerant Flow ("ASVRF")
(6) Packaged Terminal Heat Pumps ("ccPTHP")
(7) Single Package Vertical Heat Pumps ("ccSPVHP")

The customer may either decide to keep their existing heating system in service to provide back-up or emergency heat, or to decommission it. The heat pump system that is installed must be capable of operating year-round. Decommissioning must be done legally, safely, and in compliance with applicable jurisdictional programs, codes, and requirements (e.g., federal, state, municipal, etc.). Decommissioning guidance and checklist may be found at https://cleanheat.ny.gov/resources-for-applications.

The Clean Heat program goal is to advance the adoption of efficient electric heat pump systems for space and water heating, displacing fossil fuel heating equipment. Customers who receive utility gas space heating equipment incentives on the same project as the heat pump installation will not be

[41] As referenced in https://neep.org/sites/default/files/resources/InstallingASHPinCold_edits.pdf
[42] The current specification and listed eligible units are available at https://neep.org/ASHP-Specification.

eligible for Clean Heat incentives.

3.4.2.1 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 heating system as a furnace with rated capacity greater than 225,000 Btu/h.[43] 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.

Central Cold Climate ASHPs may be eligible for incentives in Category 2 *ccASHP: Full Load Heating,* (including Category 2a *ccASHP: Full Load Heating with Integrated Controls,* Category 2b *ccASHP: Full Load Heating with Decommissioning*), Category 4 *Custom Full Load Space Heating Applications,* Category 4b *Custom Full Load Multifamily Space Heating Applications,* and Category 10 *Custom Partial Load Space Heating Applications.*

To be eligible for a Category 2, 2a, or 2b Full Load Heating incentive, the Central ccASHP system's total heating capacity must be <300,000 Btu/h. 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 may not be installed in the same heating system as a furnace with heating capacity ≥225,000 Btu/h.

To determine which incentive category the system is eligible for, the Participating Contractor shall size and select equipment for the system using the methodology provided in Section 3.3.

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

3.4.2.2 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 air handlers 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.

Cold Climate MSHPs may be eligible for Category 2 *ccASHP: Full Load Heating,* (including Category 2a *ccASHP: Full Load Heating with Integrated Controls,* Category 2b *ccASHP: Full Load Heating with Decommissioning*), Category 4 *Custom Full Load Space Heating Applications,* Category 4b *Custom Full Load Multifamily Space Heating Applications,* and Category 10 *Custom Partial Load Space Heating Applications.*

To be eligible for an incentive under Category 2 *ccASHP: Full Load Heating*, cold climate MSHP systems must have a total heating capacity of <300,000 Btu/h and consist only of individual heat pump

[43] 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.

appliances that are listed on the NEEP ccASHP Product List and tested under AHRI test standard 210/240.

To determine which incentive category the system is eligible for, the Participating Contractor shall size and select equipment for the system using the methodology provided in Section 3.3.

3.4.2.3 Air-to-Water Heat Pumps for Residential Space Conditioning

Air-to-Water Heat Pumps (AWHPs) are another type of air-source heat pump that provides heat in the form of hot water for hydronic heating in homes. AWHPs are appropriate in homes formerly heated by hot-water, fuel-fired boilers (or in New Construction). In most cases AWHPS cannot provide leaving water at the same temperature provided by boilers. Therefore, AWHPs can typically be applied when lower water temperatures are facilitated by 1) installing additional baseboards, heat emitters, or hydronic air handler units (AHUs), or 2) reducing the heating load in the home by implementing significant weatherization improvements. Many AWHPs are reversible and can also provide chilled water for space cooling, usually via an AHU, and supply domestic hot water.

To be eligible for an incentive under Category 2e, the AWHP equipment must be on the New York State Clean Heat AWHP QPL. To be on the QPL, the heating COP at 5°F ambient and 110°F leaving water temperature (A5W110) must be 1.7 or greater. Further, the rated cooling capacity (at A95W45) must be less than 72,000 Btu/h. Units larger than this size will be considered on a case-by-case basis.

The Participating Contractor shall size and select equipment for the system using the methodology provided in Section 3.3. Recognizing that mixed heat pump arrangements may be beneficial, the AWHP equipment can be sized and selected to meet only a portion of the building load if the remainder of the load is served by a ccASHP or a GSHP. The combined unit sizes still must not exceed 120% of the BHL.

Any manufacturer that wishes to have their product considered for addition to the NYS Clean Heat AWHP QPL should email the Clean Heat Program inbox at nyscleanheat@ceadvisors.com.

3.4.2.4 Commercial Unitary Systems/Large Commercial ASHPs

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.

Large commercial ASHPs may be eligible for Category 4 *Custom Full Load Space Heating Applications*.

Eligible Commercial Unitary Systems must have the following characteristics:

- Include individual heat pump appliances that are powered by three-phase electricity or have rated cooling capacities ≥65,000 Btu/h
- Systems must consist of multi-speed or variable speed compressors. Single speed systems are not eligible for incentives.
- Systems up to 240,000 Btu/h cooling capacity must meet or exceed current ENERGY STAR Light Commercial HVAC Key Product Criteria for COP47. Other efficiencies (COP17, EER, IEER) must exceed applicable code.
- Systems with individual heat pump appliance sizes greater than 240,000 Btu/h cooling capacity must have efficiencies that exceed applicable code. These systems are tested under AHRI Test Standard 340/360.

The Participating Contractor applying for incentives shall document that non-residential systems are sized according to the requirements of Section 3.3.

3.4.2.5 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.

ASVRF Systems may be eligible for Category 4 *Custom Full Load Space Heating Applications.*

- ASVRF systems must be rated under AHRI Standard 1230 to be considered for eligibility. ASVRF systems between 65,000 and 240,000 Btu/h cooling capacity must meet or exceed current requirements under ENERGY STAR Criteria for Certified Cold Climate Light Commercial Heat Pumps.[44]
- For systems with capacities greater than those covered by ENERGY STAR, heat pump efficiencies must exceed local energy code.

The contractor must provide documentation showing capacities at heating and cooling design conditions for the system as-designed (*not* AHRI ratings), using the same outdoor design temperatures that were used for calculating the building design loads.

The Participating Contractor applying for incentives shall document that non-residential systems are sized according to the requirements of Section 3.3.

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 Program Compliance and Field Assessments process detailed in Section 5, and its associated field assessment checklists.

3.4.2.6 Cold Climate Packaged Terminal Heat Pumps (ccPTHP)

A cold climate packaged terminal heat pump ("ccPTHP") 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 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.

[44] 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

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.

ccPTHP may be eligible for Category 4 *Custom Full Load Space Heating Applications.*

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.[45]

The Participating Contractor applying for incentives shall document that non-residential systems are sized according to the requirements of Section 3.3.

3.4.2.7 Single Package Vertical Heat Pumps

A single package vertical heat pump ("ccSPVHP") is 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.

ccSPVHP may be eligible for Category 4 *Custom Full Load Space Heating Applications.*

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.[46]

The Participating Contractor applying for incentives shall document that non-residential systems are sized according to the requirements of Section 3.3.

3.4.3 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 Statewide Heat Pump Program, including:

(1) Open-Loop GSHPs

[45] *See also* NEEP Cold Climate PTHP Specification: https://neep.org/sites/default/files/media-files/ccpthp_spvhp_specification_v1.pdf
[46] Ibid.

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

GSHPs may be eligible for Category 3 *GSHP: Full Load Heating* and Category 4 *Custom Full Load Space Heating Applications.*

For projects where more than one building shares a common borefield, consult your utility program representative to determine eligibility. Customers or projects participating in Utility Thermal Energy Network ("UTEN") projects are not eligible for incentives in the NYS Clean Heat Program.[47]

Prescriptive Full Load GSHP Incentive: To be eligible for the Category 3 *GSHP: Full Load Heating* incentive, the GSHP system:

- Must meet or exceed Geothermal ENERGY STAR specifications, which covers equipment powered by single-phase electricity[48]
- Must be sized to meet at least 100% of the load of the project scope at design conditions and serve at least 80% of the building's total square footage.
- 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
- Must have a total system heating capacity <300,000 Btu/h and consist only of individual appliance cooling capacity for open and closed-loop GSHP installs <135,000 Btu/h and/or individual appliance cooling capacity for direct exchange GSHP installs ≤180,000 Btu/h
- Projects may include electric resistance heating not to exceed 10% of BHL.

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

[47] UTEN projects are defined by the New York Department of Public Service in Case 22-M-0429, filing dated December 1, 2023.
[48] 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

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

Custom Incentive: GSHP systems may qualify for Category 4 *Custom Full Load Space Heating Applications* incentives provided they meet or exceed the ENERGY STAR Geothermal heat pump specification for single phase units and NYECC code minimums for 3-phase units and exhibit one or more of the following characteristics:

- Systems with individual heat pump appliances powered by three-phase electricity
- Systems with a total system heating capacity ≥300,000 Btu/h
- Systems that have individual appliance cooling capacity for closed-loop GSHP installs ≥135,000 Btu/h
- Systems that have an individual appliance cooling capacity for direct exchange GSHP installs ≥180,000 Btu/h

The following are *exceptions* to the above GSHP eligibility criteria:

- Console type GSHP systems, regardless of total heating system size or individual appliance cooling capacity, are eligible if they meet or exceed the minimum efficiencies listed in Table 6 below. These systems do not need to meet or exceed the ENERGY STAR Geothermal heat pump specification efficiency requirements.
- Non-console GSHP systems that have rated cooling capacities less than 24,000 Btu/h, regardless of total heating system size, are eligible if they meet or exceed the minimum efficiencies listed in Table 7 below. These systems do not need to meet or exceed the ENERGY STAR Geothermal heat pump specification efficiency requirements.
- GSVRF Systems are eligible for Category 3 or Category 4 incentives as described in Table 1. These systems do not need to meet or exceed the ENERGY STAR Geothermal heat pump specification efficiency requirements.

Program applications for any Category 4 *Custom Full Load Space Heating Applications* incentive for GSHPs with less than 10 tons of cooling capacity must include an AHRI rating certificate for each heat pump model to be installed. For units larger than 10 tons of cooling capacity, which are not rated by AHRI, manufacturer specification sheets must be submitted instead, provided the units have been tested in accordance with AHRI/ISO 13256-1, 13256-2, 550/590, or 870/871, as applicable.

GSHP console units—which are only eligible for the program if they are required due to sizing and/or space constraints—must have an AHRI-rated EER and an AHRI-rated COP of no less than the following:

Table 6. Efficiency Requirements Applicable to console units

System Type	EER	COP
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

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 of no less than the following:

Table 7. Efficiency requirements applicable to non-console units with AHRI-rated cooling capacities less than 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

Table 8. Efficiency requirements applicable to Water Source Variable Refrigerant Flow 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 (without heat recovery)		Min. EER at 86F EWT (with heat recovery)		Min. COP at 68F EWT	Testing Procedure
Water Source VRF Multisplit System	<65,000	12 EER	16 IEER	11.8 EER	15.8 IEER	4.3	AHRI 1230~~-2023~~
	> 65,000 < 135,000	12 EER	16 IEER	11.8 EER	15.8 IEER	4.3	AHRI 1230~~-20~~23
	≥ 135,000 < 240,000	10 EER	14 IEER	9.8 EER	13.8 IEER	4.0	AHRI 1230~~-2023~~
	≥ 240,000	10 EER	12 IEER	9.8 EER	11.8 IEER	3.9	AHRI 1230~~-2023~~

EER and COP calculations for such systems must be calculated using rated EER and COP.

The Participating Contractor applying for incentives shall document that GSHP systems are sized according to the requirements of Section 3.3.

General Well/Borehole/Loop Field Requirements

- All projects must comply with New York State Department of Environmental Conservation ("DEC") regulations for geothermal well drilling.[49]
- 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

[49] NYS DEC guidance for Geothermal Wells Deeper Than 500 Feet, https://www.dec.ny.gov/energy/1748.html, and NYS DEC Well Permitting Requirements, https://www.dec.ny.gov/energy/1783.html.

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 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 on the IGSHPA website.[50]

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 based on an ASHRAE GSHP Design Guide[51] for large systems and field measurements for small systems.

[50] International Ground Source Heat Pump Association, https://igshpa.org/manuals

[51] 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).

Table 9: Maximum Allowable and Good Practice Pumping Power for Closed-Loop GSHP Systems in watts (W) per AHRI rated[52] full-load heating or cooling capacity of the installed system

GSHP System Configuration	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
GSHP units in residential and small commercial applications where each GSHP unit has its own dedicated loop pump	100	Less than 75
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), ethylene glycol (CAS No107-21-1), methanol (CAS No. 67-56-1) and ethanol (CAS No. 64-17-5) are the four presumptively acceptable antifreeze additives for use in the loop field. Use of any other antifreezes 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).

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.

[52] Reference the AHRI Ground-loop Heat Pump Application (GLHP) rating for Full-Load Heating Capacity and for Full-load Cooling Capacity.

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 NYS DEC regulations for geothermal well drilling, which can be found on the DEC website.[53]

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

[53] NYS DEC guidance for Geothermal Wells Deeper Than 500 Feet, https://www.dec.ny.gov/energy/1748.html, and NYS DEC Well Permitting Requirements, https://www.dec.ny.gov/energy/1783.html.

Table 10: Maximum Allowable and Good Practice Pumping Power for Open-Loop GSHP Systems in watts (W) per AHRI rated[54] full-load heating or cooling capacity of the installed system

GSHP System Configuration	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
GSHP units in residential and small commercial applications where each GSHP unit has its own dedicated loop pump	140	Less than 105
GSHP systems with multiple heat pump units served by centralized ground loop pumping	120	Less than 90

DX System: Direct exchange 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 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)

[54] Reference the AHRI Ground-water Heat Pump Application (GWHP) rating for Full-Load Heating Capacity and for Full-load Cooling Capacity

    - 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.

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

In addition to space heating, the NYS Clean Heat Program 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.

3.4.4.1 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.

Dedicated air source HPWH may be eligible for Category 5 *Residential Rated HPWH* and Category 6 *Custom Centralized Hot Water Heating Applications.*

To be eligible for a program incentive, an air-to-water HPWH must meet or exceed ENERGY STAR water heater specifications.

A residential duty HPWH, defined as having a Uniform Energy Factor (UEF) rating,[55] shall receive incentives based on $/equipment unit under Category 5 *Residential Rated HPWH*. Units under this category must meet or exceed ENERGY STAR Residential Water Heater requirements.[56]

Centralized multifamily heat pumps serving hot water loads for 5-100 dwelling units shall receive incentives based on $/dwelling unit, under Category 6a *Custom Centralized Multifamily Hot Water Heating Applications*. Centralized commercial or multifamily heat pumps meeting service or domestic hot water loads for more than 100 dwelling units shall receive incentives based on $/MMBtu of annual energy savings, under Category 6 *Custom Centralized Hot Water Heating Applications*.

Systems shall be sized according to equipment manufacturer recommendations.

In addition to the equipment installation requirements described in Section 3.4.1, HPWHs must be installed in spaces that provide sufficient make-up air to support efficient heat pump operation, per manufacturer specifications.

3.4.4.2 Ground Source Desuperheaters and 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 either a separate water-to-water heat pump (WWHP) to the ground loop that is dedicated to meeting the DHW load, or sizing a WWHP to meet the DHW as well as space heating loads.

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.

Ground source Desuperheaters and DHW water-to-water heat pumps may be eligible for Category 6 *Custom Centralized Hot Water Heating Applications*, Category 7 *GSHP Desuperheater in Category 3 GSHP Systems,* and Category 8 *WWHP Used to Meet DHW Load in Category 3 GSHP Systems.*

Any desuperheater that is installed on a GSHP system shall be eligible for an incentive under Category 7 *GSHP Desuperheater in Category 3 GSHP Systems*.

A full-load DHW WWHP must meet or exceed ENERGY STAR Geothermal Heat Pump specification requirements[57] or the efficiency requirements listed in Section 3.4.3 for Non-ENERGY STAR Compliant Geothermal Heat Pumps to be eligible for incentives. Ground Source DHW WWHPs, are eligible for $/equipment unit incentives under Category 8 *WWHP Used to Meet DHW Load in Category 3 GSHP Systems*.

WWHPs that are not residentially rated shall receive incentives based on $/MMBtu of energy savings

[55] 10 CFR 430.2 – Definitions.
[56] See energystar.gov: energystar.gov/products/water_heaters/residential_water_heaters_key_product_criteria
[57] ENERGY STAR Program Requirements for Geothermal Heat Pumps: https://www.energystar.gov/sites/default/files/specs//private/Geothermal_Heat_Pumps_Program_Requirements

under Category 6 *Custom Centralized Hot Water Heating Applications*.

Systems shall be sized according to equipment manufacturer recommendations.

Ground Source HPWH loop requirements shall be the same as those for GSHP, as described above in Section 3.4.3.

Systems must be installed to pass all requirements of the Program Compliance and Field Assessments process detailed in Section 5, and its associated field assessment checklists.

3.4.5 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.

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 with efficiencies exceeding federal, state, or municipal codes or standards and that are paired with an eligible heat pump system are eligible for Category 4 *Custom Full Load Space Heating Applications* incentives under this Program. Installation of an ERV/HRV does not impact incentive category for the heat pump portion of the work. As an example, if an eligible ERV is installed with an eligible Category 2 heat pump, then the ERV will receive a Category 4 incentive while the heat pump will receive a Category 2 incentive.

Eligible ERV/HRVs must meet the following criteria:

1. Exceed federal, state, or municipal efficiency codes or standards
2. Must be paired with an eligible heat pump system in one of the following configurations:
    - Independent heat pumps are sized to meet space heating eligibility requirements of Category 4/4a, including the ventilation air (after accounting for the heat or energy recovery) for the zone(s) served by the ERV/HRV.
    - A dedicated heat pump in series with the ERV that is sized to meet space heating eligibility requirements of Category 4/4a, relative to the ERV/HRV ventilation load after accounting for the heat or energy recovery.
    - An ERV with dedicated electric resistance or fossil fuel heating source to provide conditioning of the ventilation air is not eligible

3.4.6 Heat Recovery and Heat Pump Chillers

Heat recovery chillers (“HRC”) and heat pump chillers (“HPC”) are systems that provide space and water heating (hot water) to a building by recovering heat from a low temperature source. Low temperature sources may include air, water, or waste heat sources. These systems can also provide chilled water for cooling. Unlike HPCs, HRCs can provide simultaneous heating and cooling but do not have to do so at all times.

HRCs/HPCs eligible to receive Clean Heat incentives in custom space and hot water categories (4, 4a, 4b and 6) are subject to the same incentive limitations as all other heat pump projects. To be eligible for Clean Heat incentives, HRC/HPCs must be electrically operated and meet or exceed the minimum efficiency requirements at operating conditions set forth in ASHRAE Standard 90.1-2022 under AHRI 550/590. HRCs are exempt from the requirement to displace at least 50% of the existing on-site fossil fuel consumption annually or to provide at least 4,000 MMBtu of annual savings. Equipment must be used to satisfy space heating load. Equipment used for process heating is ineligible for Clean Heat incentives.

If AHRI certificates containing heating performance under AHRI standard 550/590 are not available, data must be presented by the manufacturer's representative that satisfy ASHRAE 90.1-2022, Table 6.8.1-16 calculated with parameters consistent with AHRI standard 550/590 under heating and cooling operation appropriate for the project.

3.4.7 Heat Pump Dedicated Outdoor Air Systems (HP-DOAS)

Heat pump dedicated outdoor air units (HP-DOAS) dehumidify 100% outdoor air to a low dew point in the cooling season and heat 100% outdoor air during heating season and deliver this conditioned air to the building interior. HP-DOAS efficiency can be increased by energy recovery wheels or plates, which transfer energy between exhaust and intake air streams. HP-DOAS may have low temperature lockouts and/or electric coil or fossil backup heating systems at low outside temperature.

HP-DOAS are eligible to receive Clean Heat incentives in custom Categories 4, 4a, and 4b and are subject to the same incentive limitations and full load requirements as all other heat pump projects. To be eligible for Clean Heat incentives, HP-DOAS must meet or exceed the minimum efficiency requirements set forth in ASHRAE Standard 90.1-2016 tables 6.8.1-15 and 6.8.1-16 under AHRI 920.

Water source HP-DOAS coupled with fossil fuel boilers as a heat source are not eligible.

Since AHRI certificates with the above parameters generated under AHRI 920 may not be available, the applicant must provide documentation from the manufacturer’s representative demonstrating that the HP-DOAS meets the above criteria.

For HP-DOAS with energy recovery, the applicant must also provide documentation defining whether the energy recovery is required, or not required, by code per NYS ECC 2020 section C403.7.4 as well as summer and winter efficiency parameters for energy recovery.

3.5 Envelope Measures (for Category 4a: Custom 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. These shell 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, such as 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.

This Category applies to a Category 4 *Custom Full Load Space Heating Applications* project coupled with 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 3.5.1 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 Energy Conservation Construction Code of New York State ("ECCCNYS") as the baseline for savings analysis. Eligibility for Clean Heat incentives may be governed by compliance with applicable code. The MMBtu savings from both the envelope measures and the HP measures will be paid out at the 4a rate based on the tier qualified for. If an ERV/HRV is installed alongside an eligible heat pump plus envelope project, the ERV/HRV will also be incentivized at a 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

3.5.1 Eligibility Tiers for Category 4a: Custom Heat Pump + Envelope

Projects shall install envelope upgrades to reduce the dominant load – BHL (building heating load) or BCL (building cooling load) – by a specific percentage compared to the appropriate baseline. Please see the table below for details.

Table 11: Eligibility Tiers for Category 4a

Construction Type	Eligibility Criteria	Tier 1 Requirement	Tier 2 Requirement	Incentive Baseline
Existing Buildings	Exceed existing condition	5% - 30 %	>30%	Existing Condition
Existing Buildings – Gut Rehab	Applicable code (ECCCNYS or municipal)	>5%	>10%	Existing Condition
New Construction	Applicable code (ECCCNYS or municipal)	>5%	>10%	Applicable code (ECCCNYS or municipal)

3.5.2 Infiltration Guidance

Projects should adhere to guidelines for natural (unpressurized) air changes per hour (ACH_N) at heating design conditions.[58] 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 12: Infiltration Guidance

Infiltration Level by project type	Maximum Allowed ACH_N at Design Heating Load[59]	Maximum Cooling ACH_{max}
Typical new construction or gut rehabs Tight – Non-operating windows or best quality windows; sealed penetrations in envelope; vapor barrier	0.3	0.17
Existing building retrofit Average – Standard quality windows; major penetrations sealed; vapor barrier; glass less than 20% of wall area	0.7	0.4
Passive House certification	0.06	0.034

For Category 4a, infiltration ACH improvements for final savings can only be claimed if supported by documentation from blower door test data. In the case of typical new construction and gut rehabs, if blower door testing is not planned or feasible, then the same infiltration ACH must be used in both baseline and proposed loads and this ACH is not to exceed new construction maximum values above. An exception for Passive House projects, which may use retrofit or new construction ACH values above for the baseline and lower Passive House ACH value for proposed loads.

[58] 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 for Applications webpage: https://cleanheat.ny.gov/resources-for-applications/.

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

If the contractor is planning to do blower door tests upon completion, loads may use ACH, not exceeding retrofit maximum above (or value derived from blower door test data) for the baseline, and for proposed envelope ACH not exceeding the maximum for new construction for the purpose of calculating incentive for preapproval. In this case, the ACH derived from test out blower door data will be required to revise final loads, savings, and incentives.

3.6 Warranty Requirements

All ASHPs, including ASVRF, and AWHP

Category 2 *ccASHP: Full Load Heating,* Category 2e *Full Load AWHP,* Category 4 *Custom Full Load Space Heating Applications*

Each qualified residential and small commercial ASHP receiving an incentive under this program must include a minimum five (5) year manufacturer's warranty for parts including 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 Full Load 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 *Residential Rated HPWH*

Each residential rated HPWH system receiving an incentive under this program must include a minimum ten-year manufacturer's warranty for parts and tank.

Category 6 *Custom Centralized Hot Water Heating Applications*

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

3.7 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 Category 2, the Joint Efficiency Providers require that Participating Contractors provide site owners with the "Get the Most Out of Your Air Source Heat Pump" tip sheet which can be found on the NEEP website at https://neep.org/sites/default/files/GettingTheMostFromYourHeatPumpConsumerGuideFINAL.pdf.

The Joint Efficiency Providers strongly recommend 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/resources-for-applications/ under the Ground Source Heat Pump (GSHP) section in the Prescriptive (Small Projects) drop-down menu.

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

3.8 Savings Methodology for Categories 2, 3, 5, 7 and 8

The Designated Utilities shall rely on *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") and best practices to estimate energy savings for heat pump installations.[60] For multiple-unit configurations not covered by the TRM, or for larger or custom systems, the Participating Contractor will perform custom analyses to determine savings, consistent with the approaches outlined for custom measures in the TRM. Refer to Section 3.9 for more details concerning the requirements for the custom category engineering savings analysis.

Exception: Multifamily retrofits may be required to use the Statewide Custom Clean Heat Program Savings Calculator, depending on the number of units applying for incentives. See Table 1 for eligibility requirements.

[60] 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://dps.ny.gov/technical-resource-manual-trm

3.9 Engineering Savings Analysis Requirements for Custom Categories 4, 4a, 4b, 6 & 6a

Applications for custom categories may 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 Analysis

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 the respective Designated Utility for a complete list of their pre-approved software.

3.9.1 Statewide Clean Heat Program Custom Calculator

The Statewide Clean Heat Program Custom Calculator (Clean Heat Calculator) is an Excel-based tool that has been developed to assist Participating Contractors applying to the New York State Clean Heat Program with calculating energy savings and incentives for various types of heat pump technologies. Refer to the Statewide Clean Heat Program Custom Calculator User Guide[61] for 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 6) if one or more of the following statements is true:

- The project involves installing NEEP-listed cold climate central air source or mini-split units or ENERGY STAR compliant GSHPs at new construction and existing multifamily buildings.
- The project proposes to install a mix of the above heat pump technologies. For example, project scope includes installation of both NEEP-listed mini-splits and ASVRFs.

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

[61] This may be found at https://cleanheat.ny.gov/assets/pdf/StateWide%20Clean%20Heat%20Calculator_v3.0-User%20Guide_3.1.2024_Final.pdf. It can also be accessed through the Clean Heat Resources for Applications page (https://cleanheat.ny.gov/resources-for-applications/) under the “Custom (Large Projects)” drop-down.

3.9.2 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 ASHRAE Standard 90.1. 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:

- Base load measure(s) such as lighting, process loads, plug loads, etc.
- Envelope measure(s)
- Interactive measures(s) such as energy recovery ventilators or heat pump water heaters in conditioned space
- HVAC measure(s)

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 3.10 below.

For Category 6 custom DHW savings, guidance on hot water use and other parameters for energy calculations are provided on the Clean Heat Contractor Resources for Applications Page.[62]

3.9.2.1 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)

[62] This may be found at https://cleanheat.ny.gov/assets/pdf/category-6-energy-calculations-guidance-assumptions.pdf.

3.9.3 Establishing Baselines

Establishing the equipment or system baseline is a necessary step in calculating energy savings for any 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 type and vintage of the facility.

3.9.3.1 Baseline Equipment Types

Equipment baselines are defined as the type of equipment that would have been installed without the influence of the program. In other words, the savings baseline should represent customer choice in absence of the Program, not optimal behavior or policy goals.

3.9.3.1.1 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.
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. If the applicant selects a baseline that differs from the existing system, 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.

3.9.3.1.2 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. This default heating baseline may be overridden if natural gas service is not available, or access is not economical in the project's area.

3.9.3.2 Baseline Efficiencies (except Category 4a)[63]

Baseline system efficiencies for all categories except Category 4a shall be based on minimally code compliant equipment in accordance with the latest ECCCNYS prescriptive code values. There are three exceptions to this requirement:

1. Project qualifies as a Special Circumstance Replacement in accordance with the TRM[64] requirements – i.e. Early Replacement or Extended Life. For Special Circumstance Replacements (Section 3.12), 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 by providing more efficient HVAC performance shall set the baseline system efficiencies to exceed the minimum code efficiency requirements by 10%.

[63] 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
[64] The New York State TRM can be found on the Department of Public Service website here:
https://dps.ny.gov/technical-resource-manual-trm

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

3.9.3.3 Baseline Efficiencies - Category 4a

Baseline system efficiencies for:

3.9.3.3.1 Existing Facilities and Gut Rehab - Category 4a

The energy savings from the packaged envelope upgrades and heat pump installations are based on the existing baseline. The thermal performance of the building envelope and HVAC system type and efficiency should reflect the current conditions found at the project. The participating contractor should provide a separate set of 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 cutsheets 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.

3.9.3.3.2 New Construction – Category 4a

The baseline for all eligible new construction projects in the program is code-compliant equipment in accordance with 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 Authority Having Jurisdiction ("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. This default heating baseline may be overridden if the applicant provides documentation indicating that new natural gas service is not available or access is not economical in the project's area.

3.10 Additional Requirements for New Construction and Gut Rehab

3.10.1 New Construction and Gut Rehab Eligibility

New construction and gut rehab projects installing heat pump technologies complying with New York State Clean Heat Program requirements are eligible to receive 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.

Eligibility for new construction and gut rehab projects using trade-offs will be determined on a case-by-case basis.

Please note: New construction and gut rehab Multifamily projects that elect to install Central ccASHPs, MSHPs, or GSHPs will be incentivized at the Category 4: *Custom Full Load Space Heating Applications* incentive rate.

3.10.2 Energy Code Compliance

New construction and gut rehab projects must demonstrate minimum compliance with the 2020 applicable local Energy Code 2020, *e.g.*, ECCCNYS, or local code 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 larger, 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 in accordance with 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.

3.10.3 New Construction and Gut Rehab Energy Savings Analysis

New construction and gut rehab projects that follow a prescriptive approach, preparing a COMcheck or Tabular (or similar) 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. Modeling methodology is discussed in Section 3.9.2.

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.

3.11 Early Replacement Projects

Projects may qualify for early replacement if they meet the criteria summarized below as defined in the TRM.[65] 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:

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

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).
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.

3.11.1 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:

1. 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
2. Age of the existing equipment
    - Supported by original invoice, bill of sale, construction permit, service log, or nameplate date

3.12 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

3.12.1 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.

3.12.2 Energy Use Rule

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.

3.12.3 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 the NYS Clean Heat 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, or 3 are not affected by early replacement/extended life (ER/EL).

4. Participating in the Program

4.1 Participating Contractor Requirement

In order to be eligible for incentives, projects must be installed by a Clean Heat Participating Contractor, unless otherwise approved by the Utility.

Customers who would like to have a heat pump system installed in their home or property can learn more about the different technologies and look for an approved Participating Contractor by visiting https://cleanheat.ny.gov/.

To participate in this Program, ASHP installers, ASHP designers, AWHP installers, GSHP installers, GSHP designers, and GSHP drillers[66] must first become Participating Contractors in the NYS Clean Heat Participating Contractor Network.

Parties that are interested in becoming Participating Contractors, but that may require additional support in meeting the requirements, are encouraged to take advantage of the resources and trainings offered through NYSERDA's Clean Heat Connect network: https://cleanheatconnect.ny.gov/

Notes:

- Participating Drillers
    - Each GSHP loop field installation must be completed by a Participating Driller
    - Participating Drillers are not eligible to apply for or receive incentives under this Program.
- Heat Pump Water Heaters
    - Contractors who only install HPWH do not need to become Participating Contractors.

4.1.1 Become a Participating Contractor

To become a Participating Contractor, installers, designers, and drillers must first complete and submit a NYS Clean Heat Participating Contractor Application via the NYS Clean Heat Contractor Management Portal.[67] Applicants will complete and submit a separate Contractor Participation Agreement for each Designated Utility applied for and all required supporting documentation.

Detailed enrollment instructions can be found on the "Enroll and Submit Heat Pump Applications" webpage.[68]

On the Participating Contractor Application, contractors must indicate:

- the utility service territory(ies) in which they plan to submit incentive applications.
- contractor type: ASHP Installer, ASHP Designer, AWHP Installer, GSHP Installer, GSHP Designer <300,000 Btu/h system heating capacity, GSHP Driller, GSHP Direct Exchange

[66] GSHP Drillers must also be approved by the Designated Utilities through this process to become Participating Drillers, but only participating installers and designers may submit incentive applications.
[67] NYS Clean Heat Contractor Management Portal: https://nystatewidecmp.customerapplication.com/
[68] Enroll and Submit Heat Pump Applications: https://cleanheat.ny.gov/enroll-submit-heat-pump-applications/

(DX) Contractor, or any combination of these. Contractors must be approved for each specific contractor type by the Designated Utilities.

Table 13a below outlines the general functions and responsibilities of each of the three primary categories of Participating Contractors that can enroll with the program:

Table 13a: Participating Contractor Roles and Responsibilities

Contractor Category	**Definition of Role**
Installer	• Contractors who are responsible for installation of heat pump equipment • Technicians who maintain, service, repair, or dispose of equipment that may contain refrigerant • Able to submit rebate applications for their completed projects • Responsible for meeting all program eligibility and QA/QC guidelines, and for submitting requested documentation directly to the program • Responsible for adhering to all applicable laws, regulations, codes, licensing, certification, and permit requirements pertaining to the scope of work
Designer	• Contractors who are part of a job team, assisting with design and product selection, but are not installing the chosen equipment • Heat Pump installation must be completed by a Participating Installer of the respective technology type to receive Clean Heat funds, unless otherwise approved by the Utility • Able to submit rebate applications on behalf of their customers • Responsible for ensuring all program eligibility and QA/QC guidelines are met by the installation team and collecting requested documentation/action from the installation contractor for submission directly to the program • Responsible for adhering to all applicable laws, regulations, codes, licensing, certification, and permit requirements pertaining to the scope of work • Particularly useful if only submitting Custom Clean Heat Rebates
Driller	• Contractors who drill wells for GSHP projects

	• Not able to submit rebate applications on behalf of customers - must work with a participating Installer or Designer on the job as responsible party for application submission • Must supply necessary drilling/well design documentation to participating Installer or Designer for rebate application • Responsible for adhering to all applicable laws, regulations, codes, licensing, certification, and permit requirements pertaining to the scope of work

4.1.2 Qualifications and Required Documents

Contractors must submit the following completed documents via the NYS Clean Heat Participating Contractor Portal:

- Participating Contractor Agreement
- NYS Participating Contractor Application
- IRS Form W-9
- Contractor License
- A certificate of insurance satisfying the requirements outlined in each of the Designated Utilities' Contractor Participation Agreement
- Sector-specific documentation as shown in Table 13b

Participating Contractors must adhere to all applicable laws, regulations, codes, licensing, certification, and permit requirements pertaining to the scope of work. For example, where EPA Section 608 Technician Certification[69] is required, the technician handling the refrigerant must adhere to the certification requirement that is appropriate for the size of the system being installed.

Table 13b: Participating Contractor Requirements

Contractor Type	Required Documentation
ASHP Installer	• ASHP Manufacturer-sponsored Installation Training Certificate (or comparable) • ASHP Manufacturer-sponsored Cold Climate Air Source Heat Pump Sizing and Design Training Certificate or comparable proof of training completion documentation[71] • Participating Contractors are required to review and use the *NEEP Guide to*

[69] Available at: https://www.epa.gov/section608/section-608-technician-certification-0
[71] A calendar of training options may be found at: https://cleanheatconnect.ny.gov/calendar/

	Sizing and Selecting Air-Source Heat Pumps in Cold Climates.[72] •
ASHP Designer	• An active NYS Professional Engineering license OR active NYS Registered Architect license • ASHP Manufacturer-sponsored Cold Climate Air Source Heat Pump Sizing and Design Training Certificate or comparable proof of training completion documentation[74] • Participating Contractors are required to review and use the *NEEP Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates.*[75]
AWHP Installer	• • AWHP Manufacturer-sponsored Installation Training Certificate (or comparable, including Heatspring's *Application of Air-to-Water Heat Pumps for Hydronic Heating and Cooling* course[77] or Heatspring's *Heat Pump System Design & Installation course*[78] • Attestation that the installer holds, or will hold, all necessary plumbing licenses for their installation locations •
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 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 (The NY Designated Utilities reserve the right to review the training curriculum provided.)
Weatherization Contractors	• Home Improvement License (where applicable)

[72] Available at: https://neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf

[74] A calendar of training options may be found at: https://cleanheatconnect.ny.gov/calendar/

[75] Ibid.

[77] Available at: https://www.heatspring.com/courses/application-of-air-to-water-heat-pumps-for-hydronic-heating-cooling.

[78] Available at: https://www.heatspring.com/courses/heat-pump-system-design-installation#instructors

Residential Contractor	• Contractor Verification Attestation Form

Additional Participation Qualifications:

Additional consideration will be given to applicants who also submit additional documentation verifying completion of training programs, including the following:

- Ground-loop designer
  - CGD
  - Geology or engineering degree (BS or higher)
  - Heat pump manufacturer/distributor training
- HVAC system designer
  - HVAC excellence residential heat load analyst
  - NYS licensed PE with a focus in mechanical engineering
  - Heat pump manufacturer/distributor training
- Heat pump/mechanical installer
  - North American Technician Excellence ("NATE") ground source heat pump loop installer
  - NYS licensed PE with a focus in mechanical engineering
  - Heat pump manufacturer/distributor training
- Distributions system installer
  - HVAC excellence duct and envelope testing
  - Plumbing license (hot water pipes)

The Designated Utilities will review all applications, agreements and supporting documentation and determine whether the contractor is accepted into the NYS Clean Heat Participating Contractor Network. Upon acceptance into the network, the Participating Contractor will receive approval notification emails and be eligible to apply for incentives in the program (except for Participating Drillers). Incentive applications can be found on each Designated Utility's website as well as the NYS Clean Heat Resources for Applications webpage.[81]

All Participating Contractors will be included on the list of NYS Clean Heat Program Participating Contractors, searchable by type of contractor as well as servicing utility and county.[82] Participating Contractors can offer residential financing to their customers: see Section 2.4 Green Jobs – Green New York Financing for additional details including links to enrollment instructions.

New Participating Contractors (except Participating Drillers) are initially granted Provisional status until the successful completion and field assessment of three projects. New participating drillers approved by the Designated Utilities are immediately granted Full status. If the contractor is not approved by the Designated Utilities, the opportunity to reapply is an option. A contractor can also opt out of the program at any time. More information on participation status be found in Section 6.

[81] NYS Clean Heat Resources webpage: https://cleanheat.ny.gov/resources-for-applications/
[82] NYS Clean Heat Program Participating Contractors: https://nyscleanheat-findacontractor.icfsightline.com/

4.1.3 Heat Pump Water Heater Contractors

Installing Category 5: *Residential Rated HPWH*

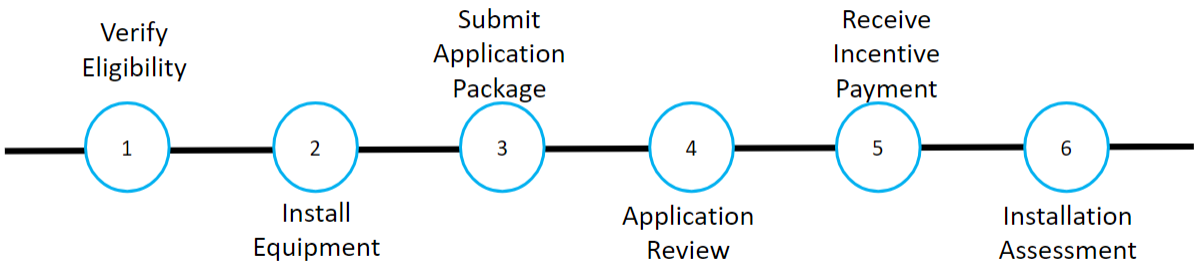
Contractors installing HPWHs are not required to submit a Participating Contractor Application or a Contractor Participation Agreement to be eligible to receive incentives under this program. Contractors installing a HPWH are required to be a NYS Licensed Contractor.

Site owners may install their own HPWH and apply for an incentive independently. All applicable codes and standards must be followed.

4.2 Prescriptive Heat Pump Project Installations

Projects submitted to the Clean Heat Program as prescriptive measures under Categories 2, 3, 5, 7, and 8 will follow the general process outlined below.

Incentive applications qualifying for prescriptive category incentives may be submitted up to 60 days after the heat pump system is commissioned.



Step 1. Confirm Project Eligibility

Prior to submission of an incentive application, the Participating Contractor or applicant shall confirm that the customer, site, proposed measures, and contractors qualify for the program as specified in the listed Eligibility Requirements (see Section 3).

Step 2. Install Equipment

The Participating Contractor must install qualifying equipment that adheres to the eligibility requirements specified in Section 3 and the Participating Contractor requirements specified in Section 4. If the Participating Contractor is unsure if the equipment selected is qualifying equipment, they should contact their account manager for guidance.

Step 3. Submit Application Package

To apply for an incentive, the Participating Contractor must submit the incentive application and associated documents to their respective Designated Utility via https://nyscleanheatrebates.com/.

Incentive applications for projects qualifying for prescriptive category incentives are due no later than 60 days after the eligible heat pump system is commissioned.

Documentation Requirements

All projects are required to submit the following documents **at minimum** as part of the application package:

- **Completed program application** –Participating Contractors shall receive log-in credentials for online incentive applications from each Designated Utility within whose service territory they work.
- **Customer Acknowledgment Form** – Includes customer information, incentive amount and customer signature indicating customer is aware of incentive amount.
- **System Design Heating Capacity Documentation –** A copy of either the NEEP performance data, a manufacturer's extended performance data sheet, the AHRI certificate, or the output from a manufacture's software platform that provides equipment performance and capacity at the design temperature, or with data points both above and below the design temperature, for the model numbers installed. See Appendix 2 for additional information.
- **Invoice for Installed Equipment** – Installation cost for measures. Labor and material costs shall be presented separately, and costs shall be limited to the equipment cost and labor cost. Other costs such as taxes, internal labor costs, shipping, administrative costs, or similar costs will not be included with total project cost when calculating incentive caps.
- **Load Calculations** – 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. Load calculations should be submitted in PDF format, unless otherwise requested. See Section 3.3 for additional details on load calculations.
- **Photo Submission –** For prescriptive incentive category projects, 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.
- **Prescriptive Calculator –** Installing contractors have the option of providing the Prescriptive Calculator[83] indicating various project attributes.
- **Decommissioning Checklist (when applicable)** – Provide completed Decommissioning Checklist indicating the correct decommissioning scenario that applies to the specific project. Decommissioning Checklist must include customer and contractor signatures.
- **Decommissioning Photos (when applicable)** – Provide before and after photos showing the legacy space heating system and demonstrating that decommissioning steps in the checklist were completed.

[83] The NYS Clean Heat Prescriptive Categories Incentive Calculator can be found on the Resources for Applications page (https://cleanheat.ny.gov/resources-for-applications/) under the Prescriptive (Small Projects) drop-down section.

Step 4. Application Review

The Designated Utilities will review the submitted project application documents to confirm completeness and accuracy of "Required Documents" in Step 3 above, equipment eligibility and proper sizing.

The Designated Utilities will not approve final incentive payments for projects with missing or inaccurate information. The Designated Utilities will consider the application incomplete and contact the applicant (Participating Contractor and/or customer) to request the missing and/or correct information. Participating Contractors will be given 45 days from the date that the Designated Utilities contact the applicant with the missing information request to complete their application. If the missing and/or incorrect application is not provided within the 45 days, the incomplete application will be moved to Inactive status. Participating Contractors may still reopen an inactive application after the 45 days by submitting the missing and/or corrected information without needing to resubmit the application entirely.

The Designated Utilities reserve the right to inspect the new condition of any site to confirm that all work was installed in accordance with the scope of work provided with the initial project application.

Once the project review is complete, if the project meets all program requirements and funding remains available, the incentive application will be approved.

Rejection or modification of an incentive application is at each Designated Utility's sole discretion for either of the following reasons:

- The Participating Contractor's past performance on the Joint Efficiency Providers' supported projects did not meet program requirements
- The quality of the incentive application or responsiveness of the Participating Contractor is insufficient as determined by the respective Designated Utility

Step 5. Receive Incentive Payment

The Designated Utilities will pay incentives to the applicant (Participating Contractor and/or customer) or to a third party, as designated in the completion paperwork. Each Participating Contractor may retain up to the Participating Contractor Reward amount shown in Table 3. The balance of the Total Incentive less the Participating Contractor Reward must be passed on or otherwise credited to the customer in its entirety, 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.

Step 6. Installation Assessment

Through participation in the program, Participating Contractors will be required to comply with a Field Assessment process for the purpose of ensuring quality installations. Please see Section 5 for more details. Additionally, Participating Contractors may be subject to utility-specific reviews and/or assessments for the purposes of verifying program measure implementation and acquisition.

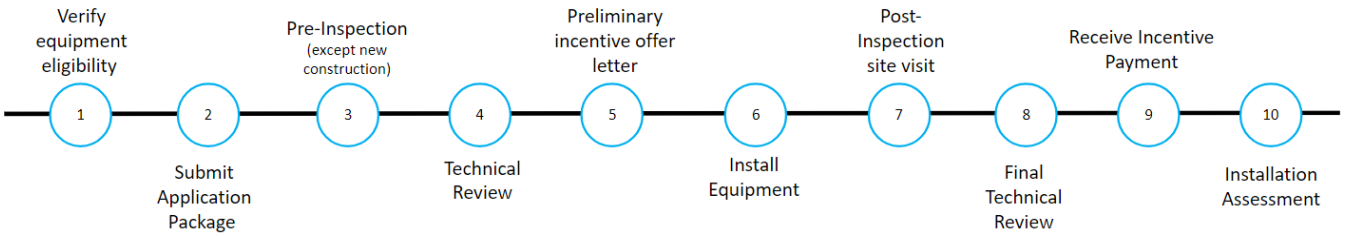
4.3 Custom Heat Pump Project Installations

Projects submitted to the Clean Heat Program as custom measures under Categories 4, 4a, 4b, 6, and 6a will follow the general process outlined below.

Multifamily and C&I customers seeking incentives under Category 4 *Custom Full Load Space Heating Applications,* Category 4b *Custom Full Load Multifamily Space Heating Applications (5-100 dwelling units),* Category 6 *Custom Centralized Hot Water Heating Applications,* and Category 6a *Custom Centralized Multifamily Hot Water Heating Applications (5-100 dwelling units),* may submit an incentive application to the Program directly. The direct applicant must work with a Participating Contractor in accordance with the program rules and requirements of the Program.

4.3.1 Application Timing

Applications qualifying for custom category incentives or projects that include a combination of prescriptive and custom incentive category measures **must** be submitted prior to installing the proposed energy conservation measures. In custom category cases where the scope consists of heat pumps being installed across multiple buildings owned by the same entity, a single custom application shall be submitted. In the case of Category 4 *Custom Full Load Space Heating Applications* for GSHP systems, incentive applications will not be accepted if construction of the loop field for such projects has begun before the Designated Utilities send the Participating Contractor and/or customer an approval notice.



4.3.2 Required Documents

Documentation Requirements – Custom Projects

All projects are required to submit the following documents **at minimum** as part of the application package:

- **Completed NYS Clean Heat Custom Program Application** – PDF application forms for each utility are posted on the NYS Clean Heat Resources for Applications webpage.[84]
- **Customer W9 and Incentive Recipient W9 (if applicable)**
- **Scope of work or proposal** – Description of project and inventory of equipment to be installed, such as a proposal, statement of work, or mechanical schedule. Please describe what will

[84] NYS Clean Heat Program Resources for Applications: https://cleanheat.ny.gov/resources-for-applications/

happen to the existing heating system and any backup or supplemental heating system(s) that will be serving the same area as the heat pump system.

- **Cost estimate for proposed work –** Including an itemization of labor and material costs.
- **Cutsheets for proposed equipment** – This should include specific model(s), AHRI certificate(s), and NEEP certificates(s), if applicable. If AHRI and/or NEEP certificate is not available, reviewer may request manufacturer performance calculations and/or documentation of capacities at design temperatures.
- **Load calculations** – Model output showing Building Heating and Cooling Loads and source documentation. Calculations must be 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 (for details see Section 3.3).
    - Block loads must be provided. Room-by-room models may be requested.
    - Provide both inputs to energy model and model output.
- **For Ground Source Heat Pumps** – Ground loop design report with avg, min, max entering water temperatures
- **For ERVs** – Whether or not the ERV/HRV is required by code. If not, provide a summary referencing section C403.7.4 of 2020 Energy Conservation Construction Code of New York State
- **For Domestic Hot Water** – Location to be installed
- **For Partial Load applications and/or applications with backup or supplemental heating systems**
    - Description of any existing or new heating system or system components serving the same space as the heat pump system. Documentation showing
    - Whether a supplemental heating system is required to accommodate the design heating load
    - Why additional electrification above and beyond the proposed design is not feasible (if applicable)
    - Description of the control strategy that will be employed to ensure that the heat pump system is prioritized for heating
- **For New Construction and Gut Rehab**: 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.
- **Savings analysis:** The Statewide Clean Heat Custom Calculator tools (available on the Clean Heat Resources for Applications webpage) should be used as the default method to calculate energy savings for the custom incentives.
    - If necessary, applicants may opt to calculate savings using a custom bin analysis or energy modeling approach. All calculations must be clear and transparent, utilizing standard engineering methodologies, including a listing of source values.
- **For Category 4a Projects:**

- Building Heating and Cooling Loads representing baseline condition, as required in Section 3.5.1, Table 11
- Documentation of proposed envelope measures, including architectural drawings and/or product submittals
- For gut rehabs and new construction, documentation that envelope meets code
- Blower door test data, if available, to support envelope improvement infiltration guidance in Section 3.5.2.

- **Additional information** – Reviewer may request (if not provided via application or other documents) the following information:
    - Description of existing heating and cooling systems, heating fuel, and building envelope
    - Building information including building square footage
    - Whether any other measures are being installed to contribute to additional heating or cooling relief, such as building envelope upgrades
    - Documentation of incentives received from NYSERDA (see Section 2.3 for additional information about coordination with NYSERDA programs on available incentives)

4.3.3 Application Process

Step 1. Verify Project Eligibility

Prior to submission of an incentive application, the Participating Contractor or applicant shall confirm that the customer, site, proposed measures, and contractors qualify for the program as specified in the listed Eligibility Requirements (see Section 3).

Step 2. Submit Application Package

To apply for an incentive, the applicant (Participating Contractor and/or customer) must submit the incentive application and required documents listed in Section 4.3.1 to their respective Designated Utility based on directions on the application. Additional utility-specific incentive application program requirements may apply. Contact the respective Designated Utility for all utility-specific program requirements.

Step 3. Pre-Inspection

The Designated Utilities will pre-inspect the existing condition of the project site. To be eligible for incentives, work may not begin until this pre-inspection has been completed and a Pre-Approval has been issued.

Exemptions for Late Project Submittals

The Designated Utilities understand that sometimes project contractors and owners are not aware of the Clean Heat Program Custom process flow and may submit projects too late to receive an Initial Technical Review and/or Pre-Inspection. The Designated Utility receiving the submittal may consider granting an exemption in such cases, if it determines that the Participating Contractor and customer are acting in good faith and were not aware of the process requirements. The Participating Contractor will

have 45 days to provide a full application with supporting documentation for an eligibility review, on a one-time basis. They may not request exemptions for any subsequent projects.

Step 4. Technical Review

This step applies to projects whose measures fall under custom incentive categories.

The Designated Utilities 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.

The Designated Utilities will not approve incentive applications with missing or inaccurate information. The Designated Utilities will contact the applicant (Participating Contractor and/or customer) and request the missing and/or correct information.

Step 5. Receive Preliminary Incentive Offer Letter

Once a custom project application has been reviewed and pre-inspection has been performed, the Designated Utility will issue a Preliminary Incentive Offer Letter (PIOL) to the Participating Contractor via email that provides incentive details, including the incentive amount, if the Designated Utilities determine that the project is eligible for a specific incentive amount per the Initial Technical Review and Pre-Inspection, or per information received in response to a one-time exemption.

The PIOL serves as an indication that installation of project measures may begin. The PIOL is also conditional on there being no material changes to the project. If there are any changes to the project scope of work (such as in the installed equipment) or the project technical analysis, the initial approval will be voided and the project will be re-evaluated for eligibility and incentive amount based on the new information received, the current custom calculator, and the current incentive structures.

The Preliminary Incentive Offer Letter is valid for a period of time as follows:

- Central Hudson: 18 months from the date of customer acknowledgement signature
- National Grid: 18 months from the date of customer acknowledgement signature
- NYSEG/RG&E: 18 months from the date of issuance
- Orange and Rockland: 12 months from the date of issuance

An applicant may request the utility's approval for an extension, and adjustments may be made on a case-by-case basis.

Step 6. Install Equipment

The Participating Contractor must install qualifying equipment that adheres to the eligibility requirements specified in Section 3. If the Participating Contractor is unsure if the equipment selected is qualifying equipment, they should contact their account manager for guidance.

In the event of unusual delays, the Participating Contractor may request an extension of time to complete the project by submitting an email to their respective Designated Utility listed in Section 9 explaining the reason for the delay. Extensions may be granted or denied at the Designated Utilities' discretion.

The project is considered complete when all incentivized measures are installed. At this time, the Participating Contractor, in cooperation with the system owner and/or site owner, will submit completion paperwork.

- **Final itemized invoices and receipts** documenting actual material and labor costs for the measure installation. Costs shall be limited to the equipment cost and labor cost. Other costs such as taxes, internal labor costs, shipping, administrative costs, or similar costs will not be included with total project cost when calculating incentive caps.
- **Revised load calculations** *if required*, e.g. if when revisions were made to the original load calculations or post-inspection indicates variance from the submitted model inputs (e.g., building size, insulation)

Step 7. Post-Inspection

The Designated Utilities reserve the right to inspect the new condition of any site to confirm that all work was installed in accordance with the scope of work provided with the initial project application.

Step 8. Final Technical Review

The Designated Utilities will review the completion paperwork and findings from the post-inspection, revising the energy savings calculations as necessary to reflect as-built conditions and as-installed costs, to determine the final project savings and incentive.

Once the project completion documents are submitted, if the paperwork meets all program requirements and funding remains available, the incentive application will be approved, and full payment will be sent to the applicant (Participating Contractor and/or customer).

Rejection or modification of an incentive application is at each Designated Utility's sole discretion for either of the following reasons:

- The Participating Contractor's past performance on the Joint Efficiency Providers' supported projects did not meet program requirements
- The quality of the incentive application or responsiveness of the Participating Contractor is insufficient as determined by the respective Designated Utility

Step 9. Receive Incentive Payment

The Designated Utilities will pay incentives to the applicant or to a third party, as designated in the Custom Application. The Participating Contractor may retain up to the Participating Contractor Reward amount shown in Table 3. The balance of the Total Incentive less the Participating Contractor Reward must be passed on or otherwise credited to the customer in its entirety, as documented in the site owner invoice or contract.

Applicants 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.

Step 10. Installation Assessment

Through participation in the program, Participating Contractors will be required to comply with a QA/QC process for the purpose of ensuring quality installations. Please see Section 5 for more details. Additionally, Participating Contractors may be subject to utility-specific reviews and/or assessments for the purposes of verifying program measure implementation and acquisition.

4.3.4 Incomplete Applications and Delays

The Designated Utilities will not issue a preliminary incentive offer letter or final payment for any project they determine to have missing or inaccurate information. The Designated Utilities will consider the application incomplete and contact the Participating Contractor and/or customer to request the missing and/or corrected information.

Participating Contractors will be given 45 days from the date that the Designated Utility issues the request for the missing and/or corrected information to complete their application. If the missing and/or corrected information is not provided within the 45 days, the incomplete application will be moved to Inactive status. Participating Contractors may still reopen an inactive application after the 45 days by submitting the missing and/or corrected information without needing to resubmit the application entirely.

4.4 Midstream Heat Pump Water Heater Unit Installations

Step 1: Become a Participating Distributor

Distributors who wish to participate in the Clean Heat HPWH midstream distributor incentive offering are required to submit a HPWH Distributor Participation Agreement to their Designated Utility partner.

Step 2. Confirm Project Eligibility

Prior to submission of an incentive application, the distributor shall confirm that the customer, site, and proposed HPWH measure qualify for the program, as specified in the listed Eligibility Requirements (see Section 3).

Step 3: Submit HPWH applications

At minimum, **all midstream HPWH Participating Distributors** are required to submit the following information as part of the application package:

- **Customer site information**
- **HPWH Installer Company Name**
- **Lists of Installed Equipment** – Specific model, AHRI certificate number, and serial number of units sold
- **Project Cost** – Installation cost for the HPWH. Labor and material costs shall be presented separately, and costs shall be limited to the equipment cost and labor cost. Other costs such as taxes, internal labor costs, shipping, administrative costs, or similar costs will not be included with total project cost when calculating incentive caps.

Following submission, all applicable Clean Heat and midstream add-on rewards for distributors and HPWH Installers will be processed.

Step 4. Receive Incentive Payment

The Designated Utilities will pay incentives to the Participating Distributor. Each Distributor may retain up to the Distributor Reward amount shown in Table 3. The balance of the Total Incentive less the Contractor Reward must be passed on or otherwise credited to the customer in its entirety, as documented in the site owner invoice or contract. The Distributor is responsible for passing the Contractor Reward and the incentive for the customer to the HPWH Installer. The HPWH installer is responsible for passing the incentive to the customer.

Note: Installation Assessment

Through participation in the program, Participating Distributors may be subject to utility-specific reviews and/or assessments for the purposes of verifying program measure implementation and acquisition. In such instances, the distributor will make a good faith effort to engage contractors installing eligible equipment about any issues regarding quality of installation, documentation, or customer concerns.

5. Program Compliance and Field Assessments

5.1 Compliance with Manufacturers' Installation Requirements, Laws and Codes

Under the NYS Clean Heat Program, all ASHPs, AWHPs, GSHPs, HPWHs, system components, and installations must comply with any and all manufacturer installation requirements and applicable laws, regulations, codes, licensing, and permit requirements, and must follow best practices for all aspects of installation, including appearance of the property.[85] These include the New York State Environmental Quality Review Act, the New York State Building Code or New York State Residential Code, New York State Plumbing Code, New York State Mechanical Code, New York State Energy Code, the National Electric Code, Fire Codes, EPA requirements, and all applicable state, city, town, or local ordinances or permit requirements. In the City of New York, all relevant New York City Codes and NYC Department of Environmental Protection requirements apply.

5.2 Execution of Work Requirements

All equipment and accessories must be installed in a competent and professional manner.

5.3 Field Assessment Overview

The Designated Utilities will maintain program integrity through the Field Assessment process, which consists of routine and systematic assessment activities to support quality installations and assure that Participating Contractors comply with program rules. The Joint Efficiency Providers developed and will maintain the NYS Clean Heat Quality Policies and Procedures document,[86] which describes protocols for the Field Assessment process and is implemented uniformly by the Designated Utilities and any representatives administering assessment activities on their behalf. These NYS Clean Heat Field Assessment activities will be supplemented by any utility-specific review or assessment of heat pumps that may be conducted for the purposes of program implementation and measure acquisition for any reason or at any time.

5.3.2 Summary of Field Assessment Process

The Field Assessment process has several components including establishment of program standards, comprehensive, technology-specific documentation requirements, and site assessments. Such approaches are unique to the heat pump technologies and include review of associated contractor credentials, project-specific calculation methods, approved construction permits, accuracy of provided application data, and site assessments to assure optimal heat pump system performance.

The Field Assessment process will employ sampling methods proportionate to the likely program risk associated with each application. Specifically, a site assessment will likely occur for every project until

[85] Aspects such as outdoor condenser location and appearance should be clearly communicated to customers and should comply with any local requirements such as those of homeowners' associations.

[86] The Clean Heat Quality Policies and Procedures document describes guidelines whereby Clean Heat projects are assessed, and outlines process for feedback and corrective action where applicable. https://cleanheat.ny.gov/assets/pdf/Quality-Policies-Procedures.pdf

the Participating Contractor has a proven successful track record under the incentive program, after which a sampling protocol will be followed. Projects contributing a disproportionate share of anticipated savings or employing novel solutions and custom savings estimate methods will receive increased scrutiny to identify opportunities for improvement as soon as possible. For larger-scale projects that pursue a custom incentive and require additional engineering review, the statewide assessment process (as applicable to the project and technology) will be supplemented with any utility-specific assessments and processes.

Field Assessments will be conducted by qualified independent third-party contractors having associated expertise and using the appropriate comprehensive checklists. The checklists include the criteria established for NYS Clean Heat and for each category of technology supported under the program. Checklists are available on the NYS Clean Heat Resources webpage under Standards and Field Assessments are for the following technologies:[87]

1. Air Source Heat Pumps
2. Air to Water Heat Pumps
3. Ground Source Heat Pumps
4. Heat Pump Water Heaters

The assessor does not inspect projects for purposes of code compliance or enforcement. Following a site assessment, the assessor will produce an Assessment Report that will document all evaluated criteria of the project and identify any nonconformances. If the assessor observes an unsafe condition associated with the installation, the contractor shall immediately inform the Designated Utility, consistent with their contractual obligations, and the utility will, in conformance with their own standard operating procedures, inform the appropriate authorities and/or conduct a lock-out disabling use of such equipment. Discrepancies identified through the Field Assessment process deemed not to endanger health and safety shall be remedied subject to program implementation rules.

5.4 Field Assessments

The purpose of Field Assessments is to provide the Designated Utility with an opportunity to verify that the heat pump system is installed according to all program requirements, and to assess the quality of workmanship of the heat pump installation.

The Designated Utility or its representative selects both in-progress and completed projects for Field Assessments following a rational sampling protocol with sampling rates primarily based on the Participating Contractor's current program status and whether the incentive application relates to an ASHP system, to an AWHP system, to a GSHP system, or to a HPWH. In the Field Assessment, a project is evaluated against a technology-specific checklist and assigned a score of 1-5. Full details on the Field Assessment process and scoring criteria are outlined in the Program's Quality Policies and Procedures document, available on the NYS Clean Heat Resources webpage.[88]

Field Assessments are scheduled at the site owner's convenience. A notice of the scheduled Field Assessment is sent to both the site owner and the Participating Contractor (if approved by the site owner) approximately one week in advance. Reasonable effort will be made to accommodate the

[87] NYS Clean Heat Program Resources for Applications https://cleanheat.ny.gov/resources-for-applications/
[88] Available at: https://cleanheat.ny.gov/assets/pdf/Quality-Policies-Procedures.pdf

schedule of the Participating Contractor, but the schedule of the system/site owner and efficient assessment scheduling take precedence.

Following the Field Assessment, the qualified third-party assessor produces a detailed report and determines whether the project fully complies with all program requirements and meets acceptable standards of workmanship. The report is made available to the installer after the assessment, following an internal review and scoring by the Designated Utility or its representative within 15 business days from the date of the assessment. If the site owner wishes to receive a copy of the report, they may request it from their contractor or can submit a request to their respective Designated Utility.

The Designated Utility or its representative may select any completed project at any point in the future for Field Assessments based on site or system owner's complaints, warranty-related issues or a review of the work done by a Participating Contractor under status review or program disciplinary action, or for any other cause at the sole discretion of the Designated Utility or its representative.

All Participating Contractors are encouraged to perform in-house quality control of each project.

ccASHP and AWHP (Category 2, as applicable)

For contractors in Provisional status, the Designated Utility or its representative will attempt to select up to 100% of each Participating Contractor's completed ccASHP projects, AWHPs projects, or combined ccASHP/HPWH projects for Field Assessment. Full status Participating Contractors are subject to up to a 7.5% rate of Field Assessment overall. For Categories 2a, 2b, and 2e, Full status Participating Contractors are subject to up to a 7.5%, 10%, and 7.5% rate of Field Assessment, respectively. Probationary and Suspended status Participating Contractors are subject to up to a 100% rate of Field Assessment on specific projects for cause.

GSHP Systems (Category 3)

All Participating Contractors that are in Provisional status will have up to 100% of projects selected for assessment. Based on the results of the assessments completed, the Designated Utilities may reclassify the Participating Contractor to Full, Probationary, Suspended, or Terminated status. Full status contractors and/or designers will be subject to up to a 30% assessment rate for 12 months, which will be lowered to 15% after 12 months. Probationary and Suspended status Participating Contractors are subject to a 30% rate of Field Assessment sampling overall and up to 100% Field Assessment sampling on specific projects for cause.

Residential Rated HPWH (Category 5)

All Category 5 Residential Rated HPWH systems are subject to Field Assessment at a rate of 7.5%.

Custom ASHP, GSHP and HPWH Systems (Categories 4, 4b, 6, 6a, 7 and 8, as applicable)

Projects in these categories may be subject to field assessment. These projects are also subject to pre-inspection as outlined in Section 4.

5.5 Photo Assessment (ASHP & GSHP Categories 2, 2a, 2b, 2e, and 3)

The Participating Contractor is required to take and retain construction photos of each project. The Designated Utility or its representative may request construction photos for the purpose of conducting a photo assessment at any time. Photo documentation shall focus on verifying compliance with program requirements and technical standards related to in-progress work such as loop field installation and must include clear indication of location and identification of units. Photo documentation scores are taken into consideration, along with Field Assessment scores, when evaluating performance.

The required documentation and photos must be submitted during the application process. Incomplete applications with missing documentation will not be accepted. Photos should be submitted in JPEG format or another format approved by the Designated Utility or its representative.

5.6 Procedure for Handling Nonconformance and Corrective Action

The Participating Contractor is solely responsible for ensuring compliance of the heat pump system installation with all applicable laws, regulations, rules, and standards, including requirements of the local AHJ. The contractor is responsible for correcting all nonconformances identified in the assessment activities to the satisfaction of the Joint Efficiency Provider. Contractors are required to submit proof demonstrating correction of all items identified. Contractors may also be put on Probationary status, suspended, or terminated from the program based on the results of Field Assessment activities or for otherwise violating program requirements.

The assessment report provided to the Participating Contractor will provide details of all evaluated elements of the project and list any nonconformances that were identified. The report will identify the overall score of the project for the purpose of maintaining good standing in the Participating Contractor Network and specific non-compliance issues that should be addressed.

Projects that have nonconformances related to health and safety (Critical) or system performance (Major) attributes automatically fail the assessment.

When the Designated Utility or its representative seeks specific corrective action, a corrective actions table will be provided within the assessment reports. The corrective actions must be either disputed within 15 days by contacting the Designated Utility or its representative, or remedied within 30 days. Sufficient evidence, such as photo documentation of remediation, must be provided to the Designated Utility or its representative documenting the completion of required actions. If Major or Critical nonconformances are not disputed or remedied within the stated timeframe, the Designated Utilities may adjust the Participating Contractor's status as described in Section 6.

Acknowledgment and plans for preventing future problems may be requested along with the report. While some nonconformances cannot be corrected post installation, others can be remedied through corrective action to the documentation, incentive applied to the project, or remediation of the installation or its components.

In the instance of past due or unacknowledged corrective action response forms, the Designated Utilities may send a Probationary Warning Notice detailing unacknowledged corrective actions and nonconformances at their discretion. Should these items remain unresolved after the specified timeframe, the Designated Utilities will adjust the Participating Contractor status as described in Section 6.

The Designated Utility or its representative may, at its discretion, conduct a field verification of the remediated installation. The Designated Utility has the right to provide a copy of the Assessment report, corrective actions table, or specific information from the Field Assessments directly to the site owner based on health, safety, and compliance concerns.

If the assessor observes an unsafe condition associated with the installation, the contractor shall immediately inform the Designated Utility, consistent with their contractual obligations, and the utility will, in conformance with their own standard operating procedures, inform the appropriate authorities and/or conduct a lock-out disabling use of such equipment.

The Designated Utility or its representative may communicate with any site owner on any matter relevant to a project. Such communications may be in reply to an inquiry from a site owner or at the Designated Utility's initiation.

The Designated Utilities expect Participating Contractors to avoid repeating nonconformances in future projects that were identified in a prior field assessment report. Acknowledgement and plans for preventing future problems may be requested along with the report.

5.7 Procedure for Contesting a Score

A Participating Contractor may contest the findings of a report by emailing supporting documents and information to the Designated Utility. The request must be submitted to the Designated Utility within 15 business days of receiving the report.

Upon review, if the utility agrees with the Participating Contractor, the nonconformance will be removed. The score may or may not change based on other nonconformances. If the Designated Utility agrees with the field assessment, the nonconformance will stand, and the score will remain the same.

5.8 Contractor Feedback and Training

Participating Contractor performance feedback strengthens the effects of learning and has significant, direct positive effects on performance.

Contractors will be evaluated and provided with performance feedback through the assessment report; the Joint Efficiency Providers will develop training and resources to recommend to Participating Contractors for continuous improvement. The Joint Efficiency Providers will also work with AHJ officials to offer training to increase familiarity with heat pump technologies and enhance the quality of code inspections for these new technologies.

6. Participation Status

Participating Contractors will be classified in one of the following status designations: Provisional, Full, Probationary, Suspended, or Terminated. Each designation will be subject to limitations or requirements associated with that status. The Joint Efficiency Providers reserve the right to modify the definition, limitations, and requirements of these designations. A Participating Contractor's progression into and/or through any status designation is determined at the sole discretion of the Joint Efficiency Providers. The designation or existence of a Participating Contractor in any status category does not relieve or modify the nature or scope of such Participating Contractor's responsibilities to fulfill any of its outstanding obligations under the program including, but not limited to, those obligations owing or relating to system or site owners.

6.1 Provisional Status

All new Participating Contractors are initially classified as Provisional and will remain as such until three successive field assessments with a passing score have been achieved. The Joint Efficiency Providers will conduct a formal evaluation for a change to Full status, which will be based upon the quality and consistency of work and full compliance with program rules, including current qualifications as previously described.

Special requirements for GSHP Participating Contractors:

- Provisional installers are strongly encouraged to attend at least the first three field assessments as it provides an opportunity to learn the field assessment process
- Provisional Participating Contractors will be recommended for relevant training

6.2 Full Status

At the Joint Efficiency Providers' discretion, Participating Contractors may be placed in Full status when they have:

- Met all program requirements for credentialing, experience, and installation quality
- Successfully completed the terms of the Provisional period, including three consecutive successful field assessment scores and an average score of at least 3.0
- Demonstrated quality services through past performance

Participating Drillers are automatically deemed to have Full status. All Full status contractors will be listed on the NYS Clean Heat Statewide Heat Pump Program Participating Contractor Network webpage and their status may be designated accordingly.

Full Participating Contractors must adhere to the following:

- Consistently deliver projects that routinely pass field assessments
- Meet program standards in terms of timely responses to Joint Efficiency Provider communications and corrective-action requests related to field assessments
- Take effective corrective actions to deficiencies in performance as identified by the Joint Efficiency Providers
- Maintain one of the credentialing standards referenced in Section 4. Failure to satisfy this program requirement and present appropriate documentation results in an automatic downgrade to Probationary status.

6.3 Probationary Status

Probationary status is reserved for Participating Contractors who have failed to consistently meet the requirements of the program. Probation is prescriptive in nature with both a specific list of requirements and a time frame for achieving results. Participating Contractors may be placed in Probationary status for any of the following reasons:

- Violation of program rules or ethical standards
- Failure to consistently deliver completed projects that pass the field assessment standard with a minimum score of 3.0
- Failure to take effective corrective actions on a Critical or Major deficiency or a repeated Minor deficiency in work quality or performance
- Three or more corrective action notices that have not been responded to or remain unresolved for more than 30 days
- A lapse in required credentials

Contractors may receive a formal warning letter outlining program findings related to a contractor's actions out of compliance with program rules or business ethics standards, and expectations by program administrators to prevent a contractor's entrance into Probation Status. Movement to Probation without warning may be done at the discretion of program administrators.

The Probationary period will not be less than 90 days. Projects completed by a Participating Contractor on Probationary status may receive enhanced oversight. During the Probationary period, the Participating Contractor can expect the following:

- Will not be listed on NYS Clean Heat Statewide Heat Pump Participating Contractor Network webpage
- May not continue to submit new incentive applications during the defined probation period, unless as part of the requested action plan
- Is subject to higher inspection levels as outlined in this manual
- Must remediate all issues related to probation, as directed by the Designated Utility
- Must submit an agreed-upon action plan in writing designed to ensure future violations are avoided
- Must demonstrate successful results through a specified number of completed projects
- May be mentored on the next installation at Program Administrator's request

Upon satisfactory completion of the action plan and all remediation and upon review of Probationary period assessment results, the Joint Efficiency Providers will determine in their sole discretion whether to return the Participating Contractor to Full status, continue the Probationary period, or suspend and/or terminate the Participating Contractor from the program.

6.4 Suspended Status

Participating Contractors who have failed to respond to prescriptive probation or commit more serious violations of program rules will be suspended. Participating Contractors may be suspended from the program in the following situations:

- Fail to adequately fulfill the terms of the Probationary period
- Are placed on probation for a second time within 12 months
- Are under investigation for (or the determination has been made to have been) engaging in

practices that put the public or program at risk
- Have outstanding and unresolved request(s) for return of incentive payment to Designated Utility due to failure to meet program requirements
- Have submitted any program application or incentive application documentation falsifying required items, including but not limited to permits, approvals, and site owner signatures
- Fail to consistently deliver completed projects that pass the field assessment standard
- Have a lapse in required credentials while on Probationary status

During a suspension, at the request of any Designated Utility, the Participating Contractor is restricted in the following ways:
- Will be removed from the NYS Clean Heat Resources webpage[89]
- Will not be allowed to submit new incentive applications to the program
- Must complete any work, with system and/or site owner's consent, that was in progress at the time of suspension
- Prohibited from being represented as a Participating Contractor except in the execution of remedial action
- Depending on the reasons for suspension, be directed by any Designated Utility to remediate issues related to the suspension, and may be required to submit to the program, in writing, an agreed- upon action plan that is designed to ensure future violations are avoided

At the Joint Efficiency Providers' sole discretion, Suspended Participating Contractors either progress to Probationary status upon satisfactory completion of the specified remedial activities or resolution of issues related to the suspension, or they are terminated from program participation. Regardless of program status, Participating Contractors will remain responsible for fulfilling any outstanding obligations to the program or site owner.

6.5 Terminated Status

Participating Contractors who fail to respond to prescriptive and disciplinary measures or have committed serious violations of program rules may be terminated from the program. Participating Contractors may be terminated from the program in the following situations:
- Have been on Suspended status for more than 30 days and unresponsive or failed to adequately fulfill the terms of suspension
- Have had credentials lapse while suspended
- Submit falsified documents or unauthorized signatures to the program
- Commit illegal actions while participating in the program
- Are convicted or have a principal who is convicted of a criminal charge that casts the program in negative light or calls the integrity or work of the Participating Contractor into question
- Are in gross violation of program standards
- Bill for measures that are not installed
- Fail to adhere to the Terms & Conditions contained within the signed Participation Agreements
- Request removal from the Program
- Fail to meet the terms of the Provisional period

Terminated Participating Contractors are prohibited from further participation. Site owners with incomplete projects will be notified of the Participating Contractor termination status. If appropriate, the Joint Efficiency Providers may notify the New York State Attorney General, the New York State

[89] Ibid.

Department of Labor, the Better Business Bureau, or others of their findings and decision to terminate the Participating Contractor.

The officers, directors, and owners of the terminated Participating Contractor are prohibited from holding positions of that nature with any other Participating Contractor. Regardless of program status, Participating Contractors will remain responsible for fulfilling any outstanding obligations to the program or site owner.

6.6 Inactive Status

A Participating Contractor may be declared inactive if they have not had an approved project in the program over a 6-month period of time. Contractor performance will be evaluated every 6 months. Contractors not on pace to meet minimum production requirements will be required to submit a work plan for meeting Programmatic production requirements. A Participating Contractor that fails to meet the production requirement 6 months after the execution of this Agreement and fails to provide a sufficient work plan will be placed in an inactive status. Inactive contractors will be removed from the Participating Contractor Find-a-Contractor Tool, [90] will no longer receive email notifications, and will not be eligible for incentives or financing options. Should they wish to participate in the future, they may reapply under the rules in place at that time.

6.7 Status Review Process

The status review process for administering Probationary, Suspended, or Terminated status is as follows:

- Designated Utility will provide written notice of at least 10 business days of its intention to act. The notice will outline the specifics for disciplinary action along with supporting documentation for the proposed action.
- During this period, the Participating Contractor will have an opportunity to dispute the program violation notification.
- If the Participating Contractor fails to respond to the Designated Utility prior to the end of the notice period, the stated disciplinary action will go into effect without further notice.
- The Designated Utility will promptly review any request for an appeal of the decision received before the end of the notice period.
- The Designated Utility will confirm, reverse, or place its action on hold based upon a review of all information received within 10 business days of receipt.
- Intended and final action letters will be sent via email and U.S. mail. The notice period commences on the date of the email from the Designated Utility.

The Joint Efficiency Providers reserve the right to shorten these notice periods or take immediate action in the event of an emergency, as determined by the Designated Utility.

When a Participating Contractor fails to consistently complete projects that pass Field Assessments or fails to respond to or remedy failed assessments, the Designated Utilities may review their status in the Program and take further action.

[90] https://nyscleanheat-findacontractor.icfsightline.com/

A Participating Contractor may be moved to Probationary or Suspended status, in which specific results and a timeline for demonstrating those results will be prescribed and monitored. The Participating Contractor may be terminated from the program at any time if determined necessary.

7. Recommended Program Guidelines

In addition, the following is a summary of optional, but strongly recommended, program guidelines and installation and design practices that the Joint Efficiency Providers encourage all Participating Contractor to follow:

- Participating Contractors who submit custom projects should wait to start installation until after the respective Designated Utility has reviewed the application and notified the Participating Contractor whether the incentive application has been approved or rejected.
- Participating Contractors should encourage site and system owners to work with their respective Designated Utility to assess and implement energy efficiency opportunities related to building envelope and HVAC distribution before or in coordination with installing a heat pump system.
- Test boreholes are recommended for GSHP projects with system capacities between 135,000 Btu/h and 300,000 Btu/h.
- The Designated Utilities strongly recommend that Category 4 *Custom Full Load Space Heating Applications* systems include a performance monitoring system.
- Installers, designers, and drillers seeking to become Participating Contractors should submit any additional training and certification documentation beyond the required documentation that would help bolster their credentials.
- The Designated Utilities recommend that, for projects that install heat pump systems to operate in combination with existing heating systems, the Participating Contractor install an integrated multi-stage control, in order to reduce backup heat from the existing system and emphasize heat pump operation. If an integrated multi-stage control is not available, the Participating Contractor should advise the site owner on the effective use of two thermostats to optimize heat pump system use.

8. General Information

8.1 Waiver

The purpose of these requirements is to ensure that electric heat pump systems installed under this Program are high-performing, high-quality installations that are used for space heating or hot water heating, which is critical to enabling market growth. However, the Designated Utilities encourage innovation in design and installation practices that improve performance and lower costs. If a Participating Contractor can substantiate that a deviation from a specific requirement will maintain or improve performance at a similar or lower cost, the Designated Utilities will consider granting a waiver to that specific requirement.

8.2 Logo Use Disclaimer

Participating Contractors are not permitted to use, reproduce, or otherwise publish any of the Designated Utilities' or NYSERDA's logos. Contractors are permitted and encouraged to use the "NYS Clean Heat" name.

There are very strict policies regarding use of the Designated Utilities' and NYSERDA's logos. There are very few companies that are eligible to use a version of the Designated Utilities' or NYSERDA's logo on their marketing materials or for any other purpose. For these purposes, please contact the Designated Utilities or NYSERDA directly at the contact information in Section 9.

9. Contact Information

NYS Clean Heat Contractor Resources Webpage: https://cleanheat.ny.gov/contractor-resources/

Submit questions by email to:

Central Hudson:
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Energy Efficiency Program Manager
85 Civic Center Plaza
Poughkeepsie, NY 12601
Telephone: (845) 486-5750
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Statewide Program-Related Inquiries:
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Statewide Participation- or Project-Related Inquiries:
nyscleanheat@icf.com
844-212-7823

10. NYS Clean Heat Program - Glossary of Terms

This glossary provides definitions of key terms used in the NYS Clean Heat Implementation Plan and Program Manual.

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 this 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.

Air to Water Heat Pump (AWHP): A type of air source heat pump that transfers extracted heat from outdoors into water which is used as the distribution medium for space heating, and in some cases space cooling (using a reverse cycle process) and domestic hot water.

Backup Heating System:[91] The backup heating system is a redundant system that provides heating in the event that the heat pump system is not operating. It is not intended to supplement the full load heat pump system.

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:[92]

- 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.

[91] This definition is still under review by the Utilities and NYSERDA.

[92] New York State Standard Approach for Estimating Energy Savings from Energy Efficiency Programs, Appendix G, See TRM v. 10 https://dps.ny.gov/technical-resource-manual-trm

- 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.
- 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.

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 parcel may have multiple projects subject to the discretion of the relevant Electric Utility.

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.

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).[93]

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.

[93] The current NEEP specification and listed eligible units are available at https://neep.org/heating-electrification/ccashp-specification-product-list

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

Decommissioning: Existing fossil fuel space heating or domestic hot water (DHW) heating appliance that is retired 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. 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 NYS Clean Heat Program are described in the NYS Clean Heat 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 for becoming 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/chapter/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 100% of total building heating load (BHL) 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 beams, as defined by the TRM v10, effective January 1, 2023.

Heat Pump Chiller (HPC) – chiller operating in mode where heat sink or source is outside of the building (i.e. well field, air or chilled water loop as source of hot or cold water for the building). Unit provides either heating or cooling but not both at the same time.

Heat Recovery Chiller (HRC) – chiller operating in mode where heat is moved between HW and CHW loops within the thermal envelope in buildings requiring simultaneous cooling and heating. Unit provides heating and cooling at the same time.

Heat Pump Chiller/ Heat Recovery Chiller (HPC+HRC) – chiller that will operate in both of the above modes for a project.

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 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 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 <100% 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 2, 3, 5, 7, and 8.

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.

Supplemental Heat: Supplemental heat refers to heating sources that are installed separate from the heat pump, such as legacy fossil fuel-fired systems, but work in tandem with the heat pump to meet the building's heating load.[94]

Total Heat Pump System Heating Capacity: The sum of all installed heat pump capacities at heating design temperature.

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.

[94] NENY Proceeding, DNV, "Technical Study of New York State Heat Pump Performance," (filed: August 15, 2024), p. xiii.

11. Appendix 1: Guidance for Acceptable Load Calculations

This Appendix provides guidance on how to perform heating and cooling load calculations for applications to the New York State Clean Heat Program. Load calculations are required for all applications for Clean Heat incentives and are subject to review by the Program Administrators. Participating Contractors who choose to perform load calculations that do not meet the criteria outlined in this document may be asked to provide written justification and their projects may be subject to additional review.

1) Methodology

a) Calculations shall be in accordance with ACCA Standard 183-2007 for commercial projects, ACCA Manual J for residential projects, or other approved calculation methods in accordance with the Clean Heat Program Manual.

b) Residential equipment sizing shall be based on manufacturers' extended performance tables in accordance with ACCA Manual S, not based on nominal size or AHRI ratings.

c) Each outdoor condensing unit should be sized for the dominant heating or cooling load of its corresponding zone. When multiple outdoor condenser units condition separate zones within a building, the individual zonal loads should be equal to the dominant heating or cooling load of that zone. When one outdoor condenser unit conditions multiple zones within a building (e.g., a VRF system), the block load of the entire conditioned space should be used (which may be smaller than the sum of the individual zone loads).

   i) Con Edison requires all Manual J submittals to follow a floor-by-floor load calculation methodology.

2) Temperatures

a) Outdoor design temperatures should be within ±5°F of the Clean Heat program default for the project's location, based on the Clean Heat Weather Station Reference (zip code lookup tool). In cases where the design professional chooses to use a different weather city or different ACCA reference, the design temperatures shall remain within 5°F of the site found in the CH weather station reference.

   i) Design temperature requirements may be superseded by manufacturer-specific requirements. In such cases, Clean Heat applicants must provide documentation citing the applicable manufacturer's requirement.

b) Indoor design temperatures for heating load calculations shall not exceed 72°F, and for cooling shall not be less than 75°F.

3) The following component loads should NOT be included in load calculations:

a) Humidification loads;

b) Hot water piping distribution losses;

c) Adiabatic surfaces (surfaces in which there is no heat transfer; i.e., party walls, within the building or between buildings, floors, or ceilings between conditioned floors);

d) Duct losses/gains, where indoor equipment is ductless or where ducts are located inside conditioned space;

e) Multiplicative or additive safety factors with no defined source.

4) Component load guidance

a) Ventilation loads shall be supported by mechanical schedules and account for heat recovery, so that they represent only the loads served by heat pumps.

b) Unless otherwise supported by blower door testing, heating and cooling infiltration shall be:

	Natural ACH heating	Natural ACH cooling
Retrofits	≤0.7	≤0.4
Typical new construction and gut rehab	≤0.3	≤0.17
Passive House	≤0.06	≤0.034

c) Clean Heat provides guidance on calculating design infiltration based on blower door testing. See http://cleanheat.ny.gov/assets/pdf/infiltration-guidance-for-buildings-at-design-conditions.pdf

d) Enclosure (envelope) component loads should use R values consistent with plans for new construction or gut rehab and existing conditions for retrofit.
   i) Category 4a baseline loads should be calculated based on the existing building for retrofit or gut rehab projects and the energy code minimum for new construction projects.
   ii) All documented energy-efficient features and specifications shall be accounted for when defining component loads.

e) Internal gains above normal levels (e.g., those from industrial process heat) shall be accounted for as offsetting design heating load.

f) Heating load calculations shall account for cold processes or equipment in the zone that absorb heat (for example, indoor unitary heat pump water heaters or some refrigerated cases).

g) Surface areas and geometry of exterior components (thermal envelope) and floor area used in loads must be consistent with architectural plans.

Note: The infiltration guidance document, zip code weather station reference, and other helpful resources can be found at https://cleanheat.ny.gov/contractor-resources/ under the Air Source Heat Pump and Ground Source Heat Pump expanders.

12. **Appendix 2: 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 performance data sheet 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.

For using manufacturer software, ensure all software inputs are accurate to the specific heat pump application. The following bullets list common data-entry errors that result in inaccurate design capacity calculations:

i. Entering the wrong indoor unit model numbers, or quantity of connected indoor heads, particularly for multi-split applications
ii. Entering inaccurate line-lengths
iii. Entering inaccurate outdoor design temperatures. Design temperatures must match what is used, and allowed, in Manual J modeling.
iv. Entering inaccurate indoor setpoints. Setpoint temperatures shall not exceed 72°F for heating and shall not be less than 75°F for cooling.
v. Entering the outdoor humidity inaccurately – outdoor relative humidity should be 60% to 80%.
vi. Entering inaccurate refrigerant volumes

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

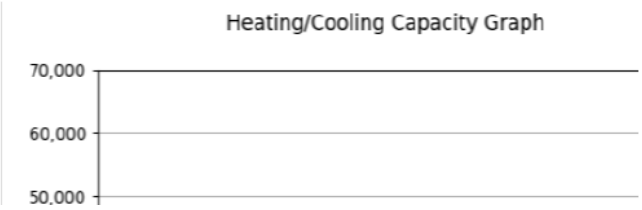


Figure 1: NEEP Certification ccASHP

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

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

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

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

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



AHRI CERTIFIED®
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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 2, 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.

12. Appendix 3: Version History and Description of Revisions: Clean Heat Program Manual

Date Filed	Version	Topic	Description of Change	Section/ Page
3/16/2020	1	N/A	N/A	N/A
4/30/2020	2	Revisions identified in 3/31/2020 New York Department of Public Service Letter Approving NYS Clean Heat Implementation Plan	Revision of terminology in accordance with industry use; additional detail on distributor incentives; clarification on eligibility requirements; inclusion of Glossary of Terms; consistency with NYS Clean Heat Implementation Plan.	Whole Document
5/29/2020	3	Revisions given additional Quality Assurance/ Quality Control (QA/QC) Materials	Program Manual updates to reflect development of additional materials related to QA/QC.	Section 5
7/1/2021	4	Transition Plans	Discussion of Transition Plans (from NYSERDA and/or Electric Utility-specific heat pump programs to NYS Clean Heat) has been removed since this transition is complete.	Whole document
7/1/2021	4	Criteria to determine eligibility	Additional clarity provided for scenarios in which project eligibility is not clearly defined; changes in eligibility to provide additional flexibility and options.	Sections 4, 5
7/1/2021	4	Field Assessments	QA/QC references changed to “Field Assessments”; edits made to align with the New York State Clean Heat Statewide Heat Pump Program Quality Policies and Procedures document; clarification of procedures for contractors to contest assessments scores.	Section 5
7/1/2021	4	System Sizing Requirements	Revisions including: allowing manufacturer equipment sizing software; additional direction regarding temperature information; information regarding alternative methods to comply with residential building codes; clarification of	Section 3

Date Filed	Version	Topic	Description of Change	Section/ Page
			definitions; clarification and flexibility on sizing systems cooling capacities.	
7/1/2021	4	Energy Modeling	Additional clarity and information for energy modeling; reference to provision of Excel tool to calculate energy savings and estimated incentives for specific eligible heat pump technologies, including a user manual for the tool.	Section 4
7/1/2021	4	Financing	Additional information regarding Green Jobs-Green New York Financing.	Section 2
7/1/2021	4	Incentives	Changes and clarifications to incentives, including: new category of Heat Pump + Envelope measures; changes to distributor incentives for certain utilities; total incentive cap for certain categories; new Customer Participation Acknowledgement form allowing additional payment option.	Sections 2-4
7/1/2021	4	Program Incentive Application Process	Clarifications and changes on program incentive application process.	Section 4
7/1/2021	4	Participating Contractor Eligibility	Clarifications/changes on certain requirements for Participating Contractors.	Section 4
10/1/21	5	Stakeholder Engagement	Additional detail on stakeholder engagement, including meetings with Participating Contractors and Industry Partners	Section 2
10/1/21	5	Incentives	Changes and clarifications to incentives, including re: inclusion of ground source variable refrigerant flow heat pumps (“GSVRFs”); eligibility requirements for integrated controls package incentive adder and decommissioning of existing system adder; change to incentive levels for certain utilities/categories; clarification of terminology in incentive tables; clarification on standards for eligibility of Air-Source Heat Pumps (“ASHPs”) and Air Source VRFs (“ASVRFs”); inclusion of Single Package Vertical Heat Pumps (“SPVHPs”); inclusion of Energy Recovery Ventilators (“ERVs”), and	Sections 2-4

Date Filed	Version	Topic	Description of Change	Section/ Page
			Heat Recovery Ventilators ("HRVs"); and clarification of AS and GSVRFs terms	
10/1/21	5	Eligible Technologies	Addition of: SPVHPs, Energy Recovery Ventilators ("ERVs"), and Heat Recovery Ventilators ("HRVs"), with associated program requirements	Section 3.2.2.6, 3.2.5, 3.6
10/1/21	5	Eligibility Criteria	Clarification of eligibility criteria for: Air Source VRFs ("ASVRFs"); Ground-Source Heat Pump ("GSHP") systems; Air-to-Water Heat Pump Water Heaters; Category 4A: Heat Pump + Envelope projects	Sections 3.2.2.4, 3.2.3, 3.2.4.1, 3.2.5
10/1/21	5	Warranty	Change to warranty criteria for Heat Pump Water Heater ("HPWH") Systems qualifying for Category 6 incentives	Section 3.3
10/1/21	5	Savings Calculator	Updates to Statewide Clean Heat Program Savings Calculator, including addition for GSVRFs	Section 3.6.1
10/1/21	5	Program Incentive Application Process	Additional detail on timing for submission of incentive applications	Section 4
10/1/21	5	Contractor requirements	Additional detail on requirements for HPWH Contractors	Section 4
10/1/21	5	Field Assessments	Additional guidance on photo assessments for prescriptive incentive applications.	Section 5.5
10/1/21	5	Contractor Participation Status	Additional detail regarding criteria for achieving Full Status.	Section 6.2
10/1/21	5	Glossary of Terms	Addition and revision of terms, including: ERVs, HRVs, and SPVHPs	Section 10
10/1/21	5	Sizing Calculations	Revisions to guidance in calculating sizing ratios.	Appendix 2
3/1/22	6	Incentives	Change in residential incentive amounts for Central Hudson, Con Edison, and Orange & Rockland Service Territories for Category 1, 2, 2a, and 2b; addition of 2b decommissioning adder in Central Hudson service territory; change in incentive amounts for Con Edison natural gas moratorium kicker; additional information regarding requirements for these incentives.	Section 2
3/1/22	6	Definitions and	Additional definition and clarification	Section 10

Date Filed	Version	Topic	Description of Change	Section/ Page
		Glossary of Terms	for key terms, including “gut rehab,” “decommissioning,” “integrated controls,” and “multifamily.”	and Whole Document
3/1/22	6	Financing	Additional information and revisions regarding Green Jobs – Green New York Financing Program.	Section 2.3
3/1/22	6	Eligible Technologies	Revisions regarding SPVHPs, VRFs, ERVs, HRVs, and Building Envelope Upgrades paired with eligible heat pumps. Additional detail regarding: year round heating system capability; requirement to meet 100% of building heating load for 2b incentive eligibility; heat distribution across all occupied spaces; updates regarding entering water temperature requirements for GSHPs.	Sections 3.2 and 2.1
3/1/22	6	Training	Additional information regarding ccASHP manufacturer sizing and design training requirements for Participating Contractors.	Section 3.2.1
3/1/22	6	Modifications to Incentives	Utility planning to notify market three months prior to incentive changes and not make changes more frequently than twice per year.	Section 2.2
3/1/22	6	Quality Control and Field Assessments	Clarification that systems must be installed to pass all requirements of the NYS Clean Heat quality control program and its associated Field Assessment checklists	Section 3.2
3/1/22	6	Timing Regarding Incentive Applications	Information and detail regarding: incentive applications for prescriptive category incentives due within 60 days after the installation is commissioned; 45-day period for Participating Contractors to provide missing application information.	Section 4
3/1/22	6	Program Compliance, Fields Assessments, and Participation Status	Additional information regarding Field Assessment checklists and scoring criteria, photo documentation, and Participating Contractor status.	Sections 5 and 6
3/1/22	6	Contact Information	Updates on Utility contact information	Section 9
9/1/22	7	Stakeholder Engagement	Change in timing of Participating Contractor and Industry Partner (PC&IP) webinars from monthly to	Section 2

Date Filed	Version	Topic	Description of Change	Section/ Page
			quarterly	
9/1/22	7	Incentives	Additional detail and updates regarding incentive categories, effective Sept. 1, 2022, including: update that all projects in Multifamily Buildings are eligible for incentives under Category 4, Custom; expanded applicability of Category 2a ccASHP Full Load Heating with Integrated Controls and Category 2b ccASHP Full Load Heating with Decommissioning, with inclusion in statewide incentive tables; GSVRF eligibility for incentives in Category 3; eligibility for Category 4 Custom Space Heating Applications; eligibility for Category 6 Custom Hot Water Heating Applications; addition of HPWH Midstream Incentive; updates to Participating Contractor Rewards; change to Priority Electrification Kicker Incentives (formerly Con Edison Natural Gas Constrained Kicker Incentives, now relevant for National Grid for certain zip codes)	Section 2
9/1/22	7	Incentive Limitations and Other Modifications	Identification of Program incentive limitations, effective Sept. 1, 2022, including 70% of project costs for all projects; provisions related to $1 million cap per project; total GSHP incentive limit of $50,000 per project. Also provision regarding changes in Program incentives for projects with signed customer commitment.	Section 2.2
9/1/22	7	Stacking of Clean Heat and NYSERDA Incentives	Provisions regarding stacked Clean Heat incentives with NYSERDA program incentives	Section 2.3
9/1/22	7	Design Temperature Requirements	Clarification of precedence of AHJ in determining design temperature requirements	Section 3.2.1
9/1/22	7	Project Eligibility	Clarification of eligibility, sizing, and installation requirements with the statewide implementation of Categories 2a and 2b	Section 3.2.2 and subsections
9/1/22	7	Infiltration Guidance	Addition of Section 3.2.6.2 Infiltration	Section

Date Filed	Version	Topic	Description of Change	Section/ Page
			Guidance	3.2.6.2
9/1/22	7	Project Eligibility	Additional specifications around air source electric technology and baseline heating consumption displacement	Section 3.2.7
9/1/22	7	Participating Contractor Requirements	Removal of language requiring Participating Contractors to submit a NYSERDA Participation Agreement	Section 4.1, Step 1
9/1/22	7	Midstream HPWH Incentive	Addition of Section 4.2 Midstream Heat Pump Water Heater Unit Installations, outlining steps involved in the Midstream HPWH incentive process	Section 4.2
9/1/22	7	Participating Distributors	Addition of "Participating Distributor" definition	Appendix 1
1/11/23	8	Applicable Utilities for this Program Manual	This Program Manual is applicable to the following utilities: Central Hudson Gas & Electric Corporation ("Central Hudson"), 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"). These are referred to as the "Designated Utilities." There is a separate Clean Heat Program Manual applicable to Con Edison.	Whole Document
1/11/23	8	Program Website	Update of links to reference the new location of Clean Heat contractor information and resources: https://cleanheat.ny.gov/contractors/	Whole Document
1/11/23	8	Like-for-Like Projects	Clarification of eligibility of projects replacing existing full-load heat pump systems	Section 3.2
1/11/23	8	System Sizing	Updated language regarding system sizing standards and requirements	Section 3.2.1
1/11/23	8	Contractor Sizing & Design Training	Updated requirements and additional resources for contractor Cold Climate Air Source Heat Pump Sizing and Design Training	Section 3.2.1
1/11/23	8	Full Load Projects	Clarification of load requirements for full load projects	Section 3.2.1
1/11/23	8	Equipment Installation	Addition of clarifying guidelines	Section

Date Filed	Version	Topic	Description of Change	Section/ Page
			regarding equipment installation requirements	3.2.2
1/11/23	8	GSHP Technology	Inclusion of additional GSHP technology as eligible	Section 3.2.4
1/11/23	8	Gut Rehab and New Construction	Update to eligibility criteria for Category 4A gut rehab and new construction projects	Section 3.2.7.1, Table 9
1/11/23	8	Early Replacement Projects	Addition of specific subsection addressing early replacement projects	Section 3.8, 3.9, and subsections
1/11/23	8	Participating Contractor Requirements	Simplification of detail regarding documentation and requirements to become a Participating Contractor	Section 4, Step 1
1/11/23	8	O&R PIOL	Clarification of valid length of incentives included in PIOLs issued by Orange & Rockland	Section 4, Step 7
1/11/23	8	Program Glossary	Addition and update of definitions for Clean Heat Project, Dwelling Unit, and Gut Rehabilitation	Section 10
3/1/23	9	Multifamily Projects	Clarification of language regarding multifamily projects	Table 1, Category 3 and 4
3/1/23	9	Decommissioning	Clarification of applicability of decommissioning incentives and required checklist documentation	Table 1, Category 2b
3/1/23	9	GSHP project incentives	Update of applicability of incentive limits for GSHP projects	Section 2.2
3/1/23	9	Full Load Heating	Clarification of incentive eligibility for projects that split between GS and AS technology	Section 3.2.1
3/1/23	9	Application Timeline	Update of prescriptive category incentive application timeline	Section 4.1
3/1/23	9	Late Project Submittals	Addition of exemption parameters for late project submittals	Section 4.1, Step 5
3/1/23	9	Project Pre-Approval	Additional information regarding the project pre-approval process	Section 4.1, Step 6
3/1/23	9	Project Installation Timeline	Updates to project installation timelines for Category 4, 4A, and 6	Section 4.1, Step 7
3/1/23	9	Gut Rehab	Update to definition of gut rehab	Footnote 6
9/1/23	10	Incentive Limitations and Other Modifications	Discontinuation of Categories 1 and 9, Incentive reduction for Categories 4, 4a, and 6 for Central Hudson, National Grid, NYSEG/RG&E, and O&R	Section 2
9/1/23	10	Incentive Limitations	Category 2 incentive reduction for National Grid and NYSEG/RG&E	Section 2

Date Filed	Version	Topic	Description of Change	Section/ Page
9/1/23	10	Incentive Limitations	Categories 2a and 2b incentive reduction for National Grid, NYSEG/RG&E, Orange & Rockland	Section 2
9/1/23	10	Incentive Caps	Clean Heat incentives on all projects for all utilities capped at 50% of project costs	Section 2.1.3
9/1/23	10	Incentive Caps for Custom Projects	Central Hudson, NYSEG/RG&E, and Orange & Rockland will adjust incentive caps for custom projects to the lesser of $700,000 or 50% of project cost	Section 2.1.3
9/1/23	10	System Sizing	Custom projects must displace at least 50% of existing on-site fossil fuel consumption or contribute at least 4,000 MMBtu of savings annually	Section 3.3.1
9/1/23	10	Eligibility	Customers who receive utility gas space heating equipment incentives on the same project as the heat pump installation will not be eligible for Clean Heat incentives	Section 3.3.3
9/1/23	10	ERV and HRV Eligibility	Only ERV/HRVs not required by code or with efficiencies that exceed code standards paired with an eligible heat pump are eligible for Category 4 incentives	Section 3.3.6
9/1/23	10	Eligible Technologies	Addition of heat recovery and heat pump chillers	Section 3.3.8
9/1/23	10	Eligible Technologies	Addition of heat pump dedicated outdoor air systems (HP-DOAS)	Section 3.3.9
9/1/23	10	Savings Analysis Requirements for Custom Categories	Addition of reference to DHW savings calculations on Clean Heat Contractor Resources Page	3.7.3
3/1/24	11	Eligible Technologies for Incentives	Addition of incentive Category 2e *Air-to-Water Heat Pump* (“AWHP"), with revisions in numerous sections to reflect this addition	Sections 2-5, 10
3/1/24	11	Eligible Technologies for Incentives	Removal of Category 1 *ccASHP: Partial Load Heating*	Sections 2-5, 10
3/1/24	11	Incentive Category Update	Category 5 renamed to Category 5 *Residential Rated HPWH*, and associated revisions to category details	Section 2-5
3/1/24	11	Incentive Category Update	Category 7 renamed to Category 7 *GSHP Desuperheater in Category 3 GSHP Systems*, and associated revisions to category details	Section 2-4

Date Filed	Version	Topic	Description of Change	Section/ Page
3/1/24	11	Incentive Category Update	Category 8 renamed to Category 8 *Water-to-Water Heat Pump ("WWHP") used to meet Domestic Hot Water ("DHW") load in Category 3 GSHP Systems*, and associated revisions to category details	Section 2-3
3/1/24	11	Eligibility – Full Load Heating	All space heating incentives are for Full Load Heating Systems, unless otherwise noted	Sections 2, 3.3
3/1/24	11	System Sizing	Category 3 *GSHP* projects must be sized to meet at least 100% of the load of the project scope at design conditions and serve at least 80% of the building's total square footage	Sections 2, 3.3.2
3/1/24	11	Eligibility	Update to eligibility criteria for Commercial Unitary Systems/Large Commercial ASHPs and Air Source Variable Refrigerant Flow Heat Pump ("ASVRF")	Section 2, 3.4.2
3/1/24	11	Eligibility	Update to eligibility criteria for Category 6 - *Custom Hot Water Heating Applications*	Sections 2-4
3/1/24	11	Eligibility	Note regarding funding for projects that will not be completed until 2026-2030 period	Section 2.2
3/1/24	11	Financing	Removal of reference to Companion Loans funded by New York Green Bank	Section 2.4
3/1/24	11	Section Reorganization and Clarification	Reorganization and clarification of Section 3 Eligibility and Requirements, including changes to subsection headers	Section 3
3/1/24	11	Design Temperature Tool	Reference added to new online tool to identify design temperature, available on Contractor Resources webpage	Section 3.3.6
3/1/24	11	Program Eligibility	Reference added that customers or projects participating in Utility Thermal Energy Network projects are not eligible for Program incentives	Section 3.4.3
3/1/24	11	Savings Analysis Requirements for Envelope Measures	Update regarding materials required for savings calculations for Category 4a *Heat Pump + Envelope*	Section 3.5
3/1/24	11	Savings Analysis Requirements for Custom Categories	Revised language regarding requirements related to detailed engineering analysis for custom categories	Section 3.9

Date Filed	Version	Topic	Description of Change	Section/ Page
3/1/24	11	Program Participation	Section 4 Participating in the Program has been restructured and revised for clarity and to provide updated information	Section 4
3/1/24	11	Program Compliance and Field Assessments	Section 5 Program Compliance and Field Assessments has minor edits to reflect Program updates (e.g., addition of Category 2e)	Section 4
3/1/24	11	Contractor Program Status	Revised requirements regarding contractor participation in the Program and Inactive Status	Section 6.6
3/1/24	11	Glossary	Glossary updates to reflect Program revisions	Section 10