

# 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*



*Version 8*  
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# Version History and Description of Revisions: NYS 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 NYSEDA 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 definitions; clarification and flexibility on sizing systems cooling capacities.	Section 3

<b>Date Filed</b>	<b>Version</b>	<b>Topic</b>	<b>Description of Change</b>	<b>Section/ Page</b>
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 Heat Recovery Ventilators ("HRVs");	Sections 2-4

Date Filed	Version	Topic	Description of Change	Section/ Page
			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

<b>Date Filed</b>	<b>Version</b>	<b>Topic</b>	<b>Description of Change</b>	<b>Section/ Page</b>
3/1/22	6	Definitions and Glossary of Terms	Additional definition and clarification for key terms, including “gut rehab,” “decommissioning,” “integrated controls,” and “multifamily.”	Section 10 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	Section 2

Date Filed	Version	Topic	Description of Change	Section/ Page
			(PC&IP) webinars from monthly to 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

<b>Date Filed</b>	<b>Version</b>	<b>Topic</b>	<b>Description of Change</b>	<b>Section/ Page</b>
9/1/22	7	Infiltration Guidance	Addition of Section 3.2.6.2 Infiltration Guidance	Section 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: <a href="https://cleanheat.ny.gov/contractors/">https://cleanheat.ny.gov/contractors/</a>	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

<b>Date Filed</b>	<b>Version</b>	<b>Topic</b>	<b>Description of Change</b>	<b>Section/ Page</b>
1/11/23	8	Equipment Installation	Addition of clarifying guidelines regarding equipment installation requirements	Section 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



## Contents

Version History and Description of Revisions: NYS Clean Heat Program Manual .....	i
<b>1. Introduction</b> .....	1
What is the NYS Clean Heat Statewide Heat Pump Program? .....	1
<b>2. Program Summary</b> .....	2
2.1 Available Incentive Funding .....	3
2.2 Modifications to Incentives.....	20
2.3 Coordination with NYSERDA Programs.....	21
2.4 Green Jobs – Green New York Financing .....	21
<b>3. Eligibility and Requirements</b> .....	23
3.1 Site Eligibility .....	23
3.2 Eligible Technologies.....	23
3.2.1 System Sizing.....	24
3.2.2 Equipment Installation.....	28
3.2.3 Air-Source Heat Pumps .....	28
3.2.4 Ground Source Heat Pumps.....	32
3.2.5 Heat Pump Water Heaters and Ground Source Water-to-Water Heat Pumps .....	42
3.2.6 Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs).....	43
3.2.7 Envelope Measures (for Category 4A: Heat Pump + Envelope) .....	44
3.2.8 Additional Project Eligibility Criteria .....	46
3.3 Warranty Requirements .....	46
3.4 Operation and Maintenance Requirements .....	47
3.5 Savings Methodology for Categories 1, 2, 3, 5, 7 and 8.....	47
3.6 Engineering Savings Analysis Requirements for Custom Categories 4, 4a & 6 .....	48
3.6.1 Statewide Custom Clean Heat Program Savings Calculator .....	48
3.6.2 Energy Modeling .....	49
3.6.3 Establishing Baselines .....	50
3.7 Additional Requirements for New Construction and Gut Rehab.....	51
3.7.1 New Construction and Gut Rehab Eligibility .....	51
3.7.2 Energy Code Compliance .....	52
3.7.3 New Construction and Gut Rehab Energy Savings Analysis.....	52
3.8 Early Replacement Projects .....	52
3.8.1 Required Project Documentation .....	53
3.9 Special Circumstance .....	53
3.9.1 Age Rule .....	53

3.9.2 Energy Use Rule .....	54
3.9.3 Required Project Documentation .....	54
<b>4. Participating in the Program .....</b>	<b>55</b>
4.1 Prescriptive and Custom Heat Pump Project Installations .....	55
Step 1. Become a Participating Contractor .....	56
Participating Contractor Requirements .....	57
Step 2. Confirm Project Eligibility .....	59
Step 3. Submit Application Package.....	59
Step 4. Initial Technical Review.....	61
Step 5. Pre-Inspection .....	61
Step 6. Receive Project Pre-Approval .....	61
Step 7. Install Equipment .....	62
Step 8. Post-Inspection .....	62
Step 9. Final Technical Review .....	63
Step 10. Receive Incentive Payment.....	63
Step 11. Installation Assessment .....	63
4.2 Midstream Heat Pump Water Heater Unit Installations .....	64
Step 1: Become a Participating Distributor.....	64
Step 2. Confirm Project Eligibility .....	64
Step 3: Submit HPWH applications .....	64
Step 4. Receive Incentive Payment.....	64
Note: Installation Assessment .....	64
<b>5. Program Compliance and Field Assessments .....</b>	<b>65</b>
5.1 Compliance with Manufacturers' Installation Requirements, Laws and Codes .....	65
5.2 Execution of Work Requirements .....	65
5.3 Field Assessments Overview .....	65
5.3.2 Summary of Field Assessment Process .....	65
5.4 Field Assessments .....	66
5.5 Photo Assessment (ASHP & GSHP Categories 1, 2, 2a, 2b, and 3).....	67
5.6 Procedure for Handling Nonconformance and Corrective Action .....	68
5.7 Procedure for Contesting a Score .....	69
5.8 Contractor Feedback and Training .....	69
<b>6. Participation Status .....</b>	<b>70</b>
6.1 Provisional Status .....	70
6.2 Full Status .....	70

6.3 Probationary Status .....	71
6.4 Suspended Status.....	71
6.5 Terminated Status.....	72
6.6 Inactive Status.....	73
6.7 Status Review Process.....	73
<b>7. Recommended Program Guidelines .....</b>	<b>74</b>
<b>8. General Information.....</b>	<b>75</b>
8.1 Waiver .....	75
8.2 Logo Use Disclaimer .....	75
<b>9. Contact Information .....</b>	<b>76</b>
<b>10. NYS Clean Heat Program - Glossary of Terms .....</b>	<b>77</b>
<b>11. Appendix 2: Calculating Sizing Ratios in the New York State Clean Heat Program Guide .....</b>	<b>82</b>

# 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<sup>1</sup> and the New York State Energy Research & Development Authority (“NYSERDA”) (collectively, “Joint Efficiency Providers”<sup>2</sup>), is designed to provide customers, contractors, and other heat pump solution providers with a consistent experience and business environment throughout New York State.<sup>3</sup>

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 Program Statewide Heat Pump Program Manual is a reference document that explains the NYS Clean Heat Program, 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 Con Edison Program Manual.<sup>4</sup>

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<sup>1</sup> 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”).

<sup>2</sup> The New York Electric Utilities and NYSEDA are referred to as “Joint Efficiency Providers” for purposes of their partnership in the NYS Clean Heat Program.

<sup>3</sup> Version 6 of the NYS Clean Heat Program Manual was provided on March 1<sup>st</sup>, 2022. This revised version reflects many of the changes, as identified by the Joint Efficiency Providers and external stakeholders, deemed necessary to enhance the Program.

<sup>4</sup> Both Program Manuals can be found at: <https://cleanheat.ny.gov/contractor-resources/>.

## 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”) 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, 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 for each of those specified territories (available at <https://cleanheat.ny.gov/contractor-resources/>). Upon approval, the applicant will receive an approval notification from the Designated Utility and become eligible to apply for incentives in the Program.

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 system prior to, or in coordination with, installing a heat pump system. Common thermal efficiency upgrades include attic and wall insulation, air sealing, and duct sealing. These types of improvements can 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 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 webpage (<https://cleanheat.ny.gov/contractor-resources/>).

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](mailto:NYSCleanHeat@ceadvisors.com).

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

While the PC&IP webinars will serve as the primary avenue for 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](#).

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

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

## **2.1 Available Incentive Funding**

Incentives are available on a first come, first served basis. Tables 1-3, below, provide summary information regarding the incentive programs of the Designated Utilities. Additional detail is provided in following sections. 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 description, target segments, eligible technology, incentive structure, and eligibility criteria. Table 2 details the Total Incentive amount available

per technology and installation type. 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. Incentives listed in Table 2, Table 3, and Table 4 are effective as of September 1, 2022.

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.

**Table 1: Incentive Structure and Eligibility Criteria**

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
1	Cold Climate ASHP ("ccASHP"): Partial Load Heating	Minisplit Heat Pump ("MSHP"), Central ccASHP	\$/outdoor condenser unit	<ul style="list-style-type: none"> <li>Each unit in system must be on the Northeast Energy Efficiency Partnership ccASHP Product List ("NEEP Product List")</li> <li>Total heat pump system heating capacity is &lt;300,000 British Thermal Units per hour ("Btu/h")</li> <li>For central ASHPs installed with a back-up furnace in the same cabinet, the back-up furnace must have capacity &lt;225,000 Btu/h</li> <li>Total heat pump system heating capacity satisfies &lt;90% of the building's design heating load ("BHL")</li> </ul>
2	ccASHP: Full Load Heating	Minisplit Heat Pump ("MSHP"), Central ccASHP	<p>\$/10,000 Btu/h of maximum heating capacity at 5°F, as documented on the NEEP Product List</p> <p>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.</p>	<ul style="list-style-type: none"> <li>Each unit in system must be on the NEEP Product List</li> <li>Total heat pump system heating capacity is &lt;300,000 Btu/h.</li> <li>For central ASHPs installed with a back-up furnace in the same cabinet, the back-up furnace must have capacity &lt;225,000 Btu/h</li> <li>Total heat pump system heating capacity satisfies at least 90%<sup>5</sup> of the BHL. Systems sized for &gt;120% BHL may incur further review and require justification.</li> <li>In cases where there are four or fewer units choosing heat pumps in a Multifamily building, they shall be eligible to apply in Category 2 subject to the discretion of the utility.</li> </ul>

<sup>5</sup> Contractors are strongly encouraged to design heat pump systems in this Category that satisfy 100% of BHL



Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
2a	ccASHP: Full Load Heating	Minisplit Heat Pump ("MSHP"), Central ccASHP with Integrated Controls	<p>\$/10,000 Btu/h of maximum heating capacity at 5°F, as documented on the NEEP Product List</p> <p>Total Incentive to be limited to 120% of BHL - e.g., Total Incentive <math>\leq</math> (Maximum Heating Capacity * 1.2 / HP Sizing Ratio). See Equipment Sizing Requirements in Appendix 2 for additional details.</p>	<ul style="list-style-type: none"> <li>Eligible projects include heat pumps that meet the full building load where the previously existing system is coupled with integrated controls</li> <li>Category 2a is only available for retrofit projects of existing structures and is not available to new construction or gut rehab<sup>6</sup></li> <li>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</li> <li>Ancillary electric heating systems are not eligible for a Category 2a incentive</li> <li>In cases where there are four or fewer units choosing heat pumps in a Multifamily building, they shall be eligible to apply in Category 2a subject to the discretion of the utility.</li> </ul>
2b	ccASHP: Full Load Heating	Minisplit Heat Pump ("MSHP"), Central ccASHP with Decommissioning	<p>\$/10,000 Btu/h of maximum heating capacity at 5°F, as documented on the NEEP Product List</p> <p>Total Incentive to be limited to 120% of BHL - e.g., Total Incentive <math>\leq</math> (Maximum Heating Capacity * 1.2 / HP Sizing Ratio). See Equipment Sizing Requirements in Appendix 2 for additional details.</p>	<ul style="list-style-type: none"> <li>Eligible projects include heat pumps that meet the full building load where the previously existing fossil fuel system is decommissioned</li> <li>Category 2b will require submission of an additional attestation form and will only be available for retrofit projects</li> <li>To be eligible for a Category 2b incentive, the heat pump system installed must meet the full heating load of the building, as discussed in Section 3.2.2.1</li> <li>Category 2b incentives will only be available when decommissioning existing fossil fuel heating equipment</li> <li>In cases where there are four or fewer units choosing heat pumps in a Multifamily building, they shall be eligible to apply in Category 2b subject to the discretion of the utility.</li> </ul>

<sup>6</sup> Gut rehabilitation or "gut rehab" is any work that could be considered an "Alteration" per the Energy Conservation Construction Code of New York State (ECCCNYS), as defined in Sections C202 and R202 of the code and as covered in Sections C503 and R503, which make alterations subject to new construction code requirements

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
3	GSHP: Full Load Heating	GSHP	<p>\$/10,000 Btu/h of full load heating capacity as certified by AHRI</p> <p>Total Incentive to be limited to 120% of BHL - e.g., Total Incentive <math>\leq</math> (Full Load GLHP Rating OR Full Load GWHP Rating*1.2)/HP sizing ratio). See Equipment Sizing Requirements in Appendix 2 for additional details.</p>	<ul style="list-style-type: none"> <li>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 whose performance does not meet or exceed ENERGY STAR specifications must apply for incentives under Category 4.</li> <li>Total heat pump system heating capacity is &lt;300,000 Btu/h, except for systems installed in multifamily buildings, which all must apply through Category 4</li> <li>Ground source variable refrigerant flow heat pumps (“GSVRFs”) are eligible for incentives in Category 3 if the total heating capacity is &lt;300,000 Btu/h. GSVRF systems, regardless of total heating system size or individual appliance cooling capacity, must meet or exceed the minimum efficiencies listed in Table 6.</li> <li>System consists only of individual appliance cooling capacity for open-loop and closed-loop GSHP installs &lt;135,000 Btu/h and/or individual appliance cooling capacity for direct exchange GSHP installs <math>\leq</math>180,000 Btu/h</li> <li>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</li> <li>Total heat pump system heating capacity satisfies at least 90%<sup>7</sup> of the BHL. Systems sized for &gt;120% BHL may incur further review and require justification.</li> </ul>

<sup>7</sup> Contractors are strongly encouraged to design heat pump systems in this Category that satisfy 100% of BHL

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
4	Custom Space Heating Applications	General	\$/MMBtu of annual energy savings	<ul style="list-style-type: none"> <li>Total heat pump system heating capacity is &gt;300,000 Btu/h, except for systems installed in multifamily buildings, which all must apply through Category 4. In cases where fewer than five dwelling units of a multifamily building with five or more dwelling units apply for Clean Heat incentives, they may apply in Category 2, 2a or 2b.</li> <li>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.</li> <li>Requires confirmation of projected MMBtu savings to determine incentive amount</li> <li>Each project requires pre-approval, based on a review of projected MMBtu savings and an associated preliminary incentive amount (\$/MMBtu)</li> <li>Projects shall be for full-load heating systems</li> </ul> <p>Partial-load scenarios may be approved on a case-by-case basis to determine eligibility for Category 4 <i>Custom Space Heating Applications</i> incentives based on the following criteria:</p> <ul style="list-style-type: none"> <li>Fossil fuel (heating oil, natural gas, steam generated by fossil fuel, etc.) energy consumption must be reduced by the new electric technology or application. Air source electric technology must use staged, multi-speed or variable-speed heat pumps and must displace at least half of annual baseline heating consumption or alternative case fossil fuel consumption. Fuel savings cannot include fossil fuel system efficiency savings; in savings calculations, the fossil fuel baseline efficiency (including distribution) must equal the existing or upgraded (boiler) system efficiency.</li> </ul>

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
4 (Cont'd)	Custom Space Heating Applications		\$/MMBtu of annual energy savings	<ul style="list-style-type: none"> <li>The new electric technology or application:               <ol style="list-style-type: none"> <li>Must decrease the overall annual site energy consumption</li> <li>Shall meet or exceed applicable minimum efficiency specifications to meet applicable codes and standards</li> </ol> </li> </ul>
		Central ccASHP		<p>Eligible Central ccASHP systems must be constituted only of NEEP-listed equipment</p> <p>For central ASHPs installed with a back-up furnace in the same cabinet, the back-up furnace must have capacity &lt;225,000 Btu/h</p>
		MSHP		Eligible MSHP systems must be constituted only of NEEP-listed equipment
		Commercial Unitary Systems/Large Commercial ASHPs		<p>Eligible Commercial Unitary Systems must have the following characteristics:</p> <ul style="list-style-type: none"> <li>Include individual heat pump appliances that are powered by three-phase electricity or have rated cooling capacities <math>\geq 65,000</math> Btu/h</li> <li>Systems must consist of multi-speed or variable speed compressors. Single speed systems are not eligible for incentives.</li> </ul>

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
4 (Cont'd)	Custom Space Heating Applications	Air Source Variable Refrigerant Flow Heat Pump ("ASVRF")	\$/MMBtu of annual energy savings	<p>Eligible ASVRFs must have the following characteristics:</p> <ul style="list-style-type: none"> <li>ASVRF systems up to 240,000 Btu/h cooling capacity must meet or exceed current ENERGY STAR Light Commercial HVAC Key Product Criteria. For systems with capacities greater than those covered by ENERGY STAR, program eligibility will be determined based on whether proposed heat pump efficiencies meet or exceed local energy code.</li> </ul>
		GSHP		<p>GSHP systems must meet or exceed the ENERGY STAR Geothermal heat pump specification efficiency requirements and exhibit one or more of the following characteristics:</p> <ul style="list-style-type: none"> <li>Systems with individual heat pump appliances powered by three-phase electricity</li> <li>Systems with a total system heating capacity <math>\geq 300,000</math> Btu/h</li> <li>Systems that have individual appliance cooling capacity for closed-loop GSHP installs <math>\geq 135,000</math> Btu/h</li> <li>Systems that have an individual appliance cooling capacity for direct exchange GSHP installs <math>\geq 180,000</math> Btu/h</li> </ul> <p><u>Exceptions to the above eligibility criteria:</u></p> <ul style="list-style-type: none"> <li>GSHP systems with <math>&lt; 24,000</math> Btu/h rated full load cooling must meet or exceed the specifications in Table 5.</li> </ul>
		Ground Source Variable Refrigerant Flow Heat Pump ("GSVRF")		<p>GSVRF systems, regardless of total heating system size or individual appliance cooling capacity, must meet or exceed the minimum efficiencies listed in Table 6.</p>

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
4 (Cont'd)	Custom Space Heating Applications	Console Type GSHPs	\$/MMBtu of annual energy savings	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 4.
		Cold Climate Packaged Terminal Heat Pumps ("ccPTHPs")		Eligible ccPTHPs must meet the following criteria: each unit in system must be on the NEEP Product List.
		Single Package Vertical Heat Pumps ("SPVHPs")		<p>Eligible SPVHPs must meet the following criteria:</p> <ul style="list-style-type: none"> <li>• Manufacturer reported COP at 5°F must exceed 1.5 (at full operating capacity)</li> <li>• Compressor must be variable capacity (three or more distinct operating speeds, or continuously variable)</li> <li>• Manufacturer reported Heat Pump output at 5°F must be a minimum of 50% of rated heating capacity at 47°F</li> </ul>
		Energy Recovery Ventilator / Heat Recovery Ventilator ("ERV/HRV")		<p>Eligible ERV/HRVs must meet the following criteria:</p> <ul style="list-style-type: none"> <li>• Must not be required by federal, state, local or municipal codes or standards</li> <li>• Must be paired with an eligible heat pump system</li> </ul>

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
4a	HP + 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	\$/MMBtu of annual energy savings	<p>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.</p> <p>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:</p> <p>Tier 1:</p> <ul style="list-style-type: none"> <li>• <u>Existing</u>: 5-30% reduction in dominant load compared to baseline</li> <li>• <u>New Construction</u>: 1-5% reduction in dominant load compared to baseline</li> </ul> <p>Tier 2:</p> <ul style="list-style-type: none"> <li>• <u>Existing</u>: &gt;30% reduction in dominant load compared to baseline</li> <li>• <u>New Construction</u>: &gt;5% reduction in dominant load compared to baseline</li> </ul> <p>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 based on the tier qualified for. If a HP + Envelope upgrade also includes an eligible ERV/HRV, the ERV/HRV will also receive a Category 4a incentive.</p> <p><u>Eligible measures may include:</u>  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</p>

Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
5	HPWH (up to 120 gallons of tank capacity)	Air-to-Water HPWHs	\$/Equipment Unit	Air-to-Water HPWHs with tank capacities up to 120 gallons must meet or exceed ENERGY STAR Residential Water Heater specification
6	Custom Hot Water Heating Applications	Air-to-Water and Water-to-Water Heat Pumps for Dedicated DHW (total tank capacity >120 gallons)	\$/MMBtu of annual energy savings	<p>Dedicated DHW Water-to-Water heat pumps (WWHP) must meet or exceed ENERGY STAR Geothermal heating requirements.<sup>8</sup></p> <p>For dedicated DHW WWHP scenarios in which Custom project eligibility is not defined (according to the previous item) for domestic hot water heat pump applications and for all Air-to-Water systems, the following shall be used to determine eligibility for Category 6 <i>Custom Hot Water Heating Applications</i> incentives:</p> <ul style="list-style-type: none"> <li>• For HPWH systems with tanks &lt; 120 gallons piped in parallel, individual units must meet ENERGY STAR HPWH specifications<sup>9</sup></li> <li>• Fossil fuel (heating oil, natural gas, steam generated by fossil fuel, etc.) energy consumption must be reduced by the new electric technology or application</li> <li>• The new electric technology or application must: <ol style="list-style-type: none"> <li>1. Use staged, multi-speed or variable-speed heat pumps for air source systems</li> <li>2. Reduce existing fossil fuel or electric resistance annual consumption by at least 50%</li> <li>3. Not include fossil fuel system efficiency fuel savings; in savings calculations, the fossil fuel baseline efficiency (including distribution) must equal the existing or upgraded (boiler) system efficiency</li> <li>4. Decrease the overall annual site energy consumption</li> </ol> </li> </ul>

<sup>8</sup> [Geothermal Heat Pumps Key Product Criteria | ENERGY STAR](#)

<sup>9</sup> [Water Heater Key Product Criteria | ENERGY STAR](#)



Category Number	Description	Eligible Technologies	Incentive Structure	Eligibility Criteria
				5. Meet or exceed applicable minimum efficiency specifications to meet applicable codes and standards
7	GSHP Desuperheater	Optional component to GSHP systems	\$/Equipment Unit	Installed as integrated component in an eligible GSHP
8	Dedicated Domestic Hot Water ("DHW") Water-to-Water Heat Pump ("WWHP")	Dedicated DHW WWHP ( $\leq 120$ gallons) added to ground loop	\$/Equipment Unit	Can be integrated into an eligible GSHP or installed as a separate WWHP meeting or exceeding ENERGY STAR Geothermal specifications Must meet 100% of water heating load
9	Simultaneous Installation of Space Heating & Domestic Water Heating	HPWH plus others	Additional (\$) bonus incentive	Category 2 ccASHP <u>or</u> Category 3 GSHP: Full Load Heating project that opts to include a HPWH meeting the criteria, in Category 5, <u>or</u> DHW WWHP in Category 8, respectively

**Table 2: Incentives by Utility**

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
<b>1</b>	<i>ccASHP: Partial Load Heating<sup>10</sup></i>	\$/outdoor condenser unit	\$200	\$500	\$500	\$200
<b>2</b>	<i>ccASHP: Full Load Heating<sup>11</sup></i>	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$500	\$1,000	\$1,000	\$700
<b>2a</b>	<i>ccASHP: Full Load Heating with integrated controls (inclusive of base incentive):</i>	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$700	\$1,200	\$1,200	<u>Residential projects only (1-4 family):</u> \$1,200
<b>2b</b>	<i>ccASHP: Full Load Heating with decommissioning (inclusive of base incentive):</i>	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$1,000	\$1,400	\$1,400	<u>Residential projects only (1-4 family):</u> \$1,800
<b>3</b>	<i>GSHP: Full Load Heating</i>	\$/10,000 Btu/h of full load heating capacity as certified by AHRI	\$2,000	\$1,500	\$1,500	\$2,000
<b>4</b>	<i>Custom Space Heating Applications</i>	\$/MMBtu of annual energy savings	\$80	\$80	\$80	\$80

<sup>10</sup> See [Section 3.2.1](#) for partial load heating definition

<sup>11</sup> See [Section 3.2.1](#) for full load heating definition

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
<b>4a</b>	<i>Heat Pump + Envelope<sup>12</sup></i>	\$/MMBtu of annual energy savings	Tier 1: \$80  Tier 2: \$100	Tier 1: \$80  Tier 2: \$100	Tier 1: \$80  Tier 2: \$100	Tier 1: \$80  Tier 2: \$160
<b>5</b>	<i>HPWH: Retail (up to 120 gal of tank capacity)</i>	\$/Equipment unit	\$1,000	\$700	\$700	\$1,000
	<i>HPWH: Midstream (up to 120 gal of tank capacity)</i>	\$/Equipment unit	\$1,100	\$800	\$800	\$1,100
<b>6</b>	<i>Custom Hot Water Heating Applications</i>	\$/MMBtu of annual energy savings	\$80	\$80	\$80	\$80
<b>7</b>	<i>GSHP Desuperheater</i>	\$/Equipment unit	\$150	\$100	\$100	\$150
<b>8</b>	<i>Dedicated DHW WWHP</i>	\$/Equipment unit	\$1,000	\$900	\$900	\$1,000
<b>9</b>	<i>Simultaneous Installation of Space Heating &amp; Domestic Water Heating</i>	Additional bonus per combination installation	\$250	\$250	\$250	\$250

<sup>12</sup> Based on total project savings from the heat pump system plus any envelope measures. See [Section 3.2.6](#) for more details.

**Notes on Table 2**

- Total heat pump incentive shall not exceed caps listed in [Section 2.2](#) Modifications to Incentives.
- Con Edison incentives are listed in the Con Edison Program Manual.

**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 Con Edison Program Manual.

Category	Description	Incentive	Central Hudson	National Grid	NYSEG/ RG&E	Orange & Rockland
1	<i>ccASHP: Partial Load Heating</i>	\$/outdoor condenser unit	\$100/ outdoor unit	\$100/ outdoor unit	\$100/ outdoor unit	\$100/outdoor unit
2	<i>ccASHP: Full Load Heating</i>	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$300/ Project	\$500/ project	\$500/ project	\$500/project
2a	<i>ccASHP: Full Load Heating with Integrated Controls</i> (inclusive of base incentive):	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$500/ project	\$500/ project	\$500/ project	<u>Residential projects only (1-4 family):</u> \$750/project
2b	<i>ccASHP: Full Load Heating with decommissioning</i> (inclusive of base incentive):	\$/10,000 Btu/h of maximum heating capacity at NEEP 5°F	\$500/ project	\$500/ project	\$500/ project	<u>Residential projects only (1-4 family):</u> \$1,000/project
3	<i>GSHP: Full Load Heating</i>	\$/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	<i>Custom Space Heating Applications</i>	\$/MMBtu of annual energy savings	\$500/project	\$500/project	\$500/project	\$500/project
4a	<i>Heat Pump + Envelope</i>	\$/MMBtu of annual energy savings	\$500/project	\$500/project	\$500/project	\$500/project
5	<i>HPWH: Retail (up to 120 gal of tank capacity)</i>	\$/unit	N/A	N/A	N/A	N/A
	<i>HPWH: Midstream (up to 120 gal of tank capacity)</i>	\$/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	<i>Custom Hot Water Heating Applications</i>	\$/MMBtu of annual energy savings	N/A	N/A	N/A	N/A
7	<i>GSHP Desuperheater</i>	\$/Equipment unit	N/A	N/A	N/A	N/A
8	<i>DHW WWHP</i>	\$/Equipment unit	N/A	N/A	N/A	N/A
9	<i>Simultaneous Installation of Space Heating &amp; Domestic Water Heating</i>	Additional bonus per combination installation	\$250/project	\$250/project	\$250/project	\$250/project

#### Table 4: Priority Electrification Area Kicker Incentives

Additional kicker incentives are available for qualifying heat pumps installed within designated gas-constrained areas in select Upstate zip codes.<sup>13</sup> To be eligible for the National Grid kicker, a customer must be a National Grid electric and gas customer and replacing gas as the existing fuel.

Category	Description	National Grid (Priority electrification areas)
2	<i>ccASHP: Full Load Heating</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
2a	<i>ccASHP: Full Load Heating with Integrated Controls</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
2b	<i>ccASHP: Full Load Heating with Decommissioning</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
3	<i>GSHP: Full Load Heating</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
4	<i>Custom Space Heating Applications</i>	N/A
4a	<i>Heat Pump + Envelope</i>	N/A
5	<i>HPWH: (up to 120 gal of tank capacity)</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
6	<i>Custom Hot Water Heating Applications</i>	N/A
7	<i>GSHP Desuperheater</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
8	<i>DHW WWHP</i>	Additional 25% of total incentive in select zip codes <sup>13</sup>
9	<i>Simultaneous Installation of Space Heating &amp; Domestic Water Heating</i>	N/A

## 2.2 Modifications to Incentives

Effective September 1, 2022, the following incentive limitations apply:

- For all projects, incentives will be limited to up to 70% of project costs.
- For projects that request incentives above \$1 million, the utility reserves the right to limit incentives to \$1 million or offer incentives at a custom rate.
- Total incentives for ground source residential projects are limited to \$50,000 per project. This limitation includes GSHP projects in Priority Electrification Areas.

<sup>13</sup> See additional information at National Grid's Electric Heating & Cooling Heat Pumps website, <https://www.nationalgridus.com/Upstate-NY-Home/Energy-Saving-Programs/Electric-Heating-Cooling>

For projects with a signed customer commitment that would receive lower incentives due to changes in this Program Manual rather than under incentives in effect previously, the Designated Utilities will honor the previous incentives. To be eligible for such treatment, participating contractors must submit signed contracts and additional supporting documentation as required, within two weeks of publication of the Program Manual.

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 <https://cleanheat.ny.gov/contractors/>. 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 reserve the right to structure incentive payments differently to accommodate unique situations.

## **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 from each – provided that each program supports achievement of distinct outcomes.

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

- 70% of total heat pump project cost, for market rate participants
- 100% of total heat pump project cost, for Low-to-Moderate Income (LMI) participants as defined by the Statewide LMI Portfolio.<sup>14</sup>

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

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

## **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

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<sup>14</sup> See, Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative*, 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>



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.

NYSERDA also administers Companion Loans, which are funded by the New York Green Bank, a division of NYSERDA. The Companion Loan will be available to Customers that have fully utilized the GJGNY Loan for their energy efficiency or renewable energy system project and need additional loan funding to pay for remaining project costs. Companion Loans are an unsecured loan modeled after the SEL (repaid by statement billing/check or ACH payment). The Companion Loan is not eligible for OBR.

Complete details of these residential financing options can be found on the NYSERDA Residential Financing Options [webpage](#).<sup>15</sup>

The ability to provide access to GJGNY and Companion Loans through the GJGNY Residential Financing Program is reserved exclusively for Participating Contractors, including the NYS Clean Heat Program Participating Contractors. At no time may a non-participating subcontractor of a Participating Contractor represent itself as having the ability to access GJGNY or Companion Loans.

The Participating Contractor shall ensure that the GJGNY and Companion Loans are utilized only for the installation of those eligible measures and accessories identified in the supporting documentation submitted to, and satisfactorily approved by, the GJGNY Residential Financing Program.

The participation enrollment requirements, roles, and responsibilities of a Participating Contractor offering a GJGNY Loan can be found in the Green Jobs – Green New York Residential Program Manual, hereby incorporated in this Program Manual by reference and located on NYSERDA’s Become a Loan-offering Contractor [homepage](#).<sup>16</sup> 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.

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<sup>15</sup> NYSERDA Residential Financing Programs, <https://www.nyserda.ny.gov/All-Programs/Residential-Financing-Programs>

<sup>16</sup> 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 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.

### 3.2 Eligible Technologies

Eligible measures are grouped into several major categories:

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

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")

The Clean Heat Program provides incentives under twelve categories reflecting applicable technology type, system size, and incentive structure. The incentive categories are as follows:

- Category 1 *ccASHP: Partial Load Heating*
- Category 2 *ccASHP: Full Load Heating*
- Category 2a *ccASHP: Full Load Heating with Integrated Controls*
- Category 2b *ccASHP: Full Load Heating with Decommissioning*
- Category 3 *GSHP: Full Load Heating*

- Category 4 *Custom Space Heating Applications*
- Category 4a *Heat Pump + Envelope*
- Category 5 *HPWH (up to 120 gallons of tank capacity)*
- Category 6 *Custom Hot Water Heating Applications*
- Category 7 *GSHP Desuperheater*
- Category 8 *Dedicated Domestic Hot Water (“DHW”) Water-to-Water Heat Pump (“WWHP”)*
- Category 9 *Simultaneous Installation of Space Heating & Domestic Water Heating*

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.

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.

### 3.2.1 System Sizing

The use of ASHPs in cold climates is growing rapidly, but system sizing and selection practices have not always kept up with the wide range of applications that are now available. System performance, comfort, and energy efficiency can be significantly impacted by poor sizing and system selection. The ASHP and connected ductwork must be properly sized for the application to meet the building heat load requirements, ensure occupant comfort and satisfaction, and optimize system performance and energy savings. Participating Contractors must review and use the *NEEP Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates*<sup>17</sup> to assist in sizing and selecting ccASHP equipment.

To be eligible for incentives, all heat pump systems must be sized in compliance with applicable state and municipal code.<sup>18</sup> Residential heating and cooling equipment and appliances shall be sized in

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<sup>17</sup> [NEEP Guide To Sizing & Selecting Air-Source Heat Pumps in Cold Climates:](https://neep.org/sites/default/files/Sizing%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf)

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

<sup>18</sup> ECCCNY 2016, Section R403.7 and 2016 New York City Energy Conservation Code (NYCECC), Section R403.7. ECCCNY 2016 and 2016 NYCECC require that systems serving multiple dwelling units, where commercial code is applicable, follow Sections C403 and C404 of the respective codes. In general, heat pumps installed in dwellings where residential code is applicable are required to be sized per ACCA Manual S. The intent is to match the equipment capacity closely to the load calculations of ACCA Manual J. In addition to program requirements regarding sizing heat pumps relative to the heating load, Manual S sets a maximum low-speed heat pump cooling capacity (which corresponds to minimum capacity on NEEP Cold Climate Heat

accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.<sup>19</sup> Applicable exceptions shall apply.<sup>20</sup>

Participating Contractors are also encouraged to use additional design manuals as applicable to the system, including ACCA<sup>21</sup> Manual D: Duct Design,<sup>22</sup> ACCA Manual T: Air Distribution,<sup>23</sup> and ACCA Manual B: Test, Adjust and Balance.<sup>24</sup>

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. A grace period of three months following the effective date allows additional time for compliance with the existing Participating Contractor training requirement. Available trainings are posted on the Clean Heat Connect trainings calendar (located at <https://cleanheatconnect.ny.gov/calendar/sizing-and-design-calendar/>) and updated regularly.

Equipment installed in commercial buildings must be sized in accordance with heating and cooling load calculations following ANSI<sup>25</sup>/ASHRAE<sup>26</sup>/ACCA Standard 183-2007 (RA2017) or other code-approved equivalent computational procedure.<sup>27</sup> 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.<sup>28</sup>

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Pump List information sheets) of 115% of the total Manual J cooling load for multi-speed or variable-speed heat pumps. As an alternate, if the sensible heat ratio (SHR) is  $\geq 95\%$ , the maximum low-speed cooling capacity may be 15,000 Btu/h greater than the total Manual J cooling load for multi-speed or variable-speed heat pumps. For a single-speed water-to-water heat pump utilizing a buffer tank, the limit of 115% applies only to indoor coils that provide cooling from the buffer tank. The NYS Clean Heat Program considers the above cooling capacity limits to be best-practice targets, not absolute program rules. Contractors must make a good faith effort to select equipment whose combined low-speed cooling capacity is within the above guidelines.

<sup>19</sup> 2020 Residential Code of NYS, Chapter 14, Section M1401.3 Equipment and appliance sizing

<sup>20</sup> The Joint Efficiency Providers coordinated with NY Department of State ("DOS") and others to provide an efficient path for activity under the NYS Clean Heat Program providing for the ability to confirm the eligibility of additional heat pump installations. This coordination resulted in a DOS-issued Technical Bulletin ([TB-7005-ECCNYS](#)) clarifying the process of approving alternate methodologies for the calculation of heating and cooling loads and the sizing of residential heating and cooling equipment. One such alternative sizing methodology resource, Alternate Methodology to Demonstrate Energy Code Compliance: Heat Pump Sized to Meet Heating Design Load can be found under the Resources page of <https://cleanheat.ny.gov/contractor-resources/>.

<sup>21</sup> Air Conditioning Contractors of America

<sup>22</sup> ACCA Manual D: Duct Design: Method used to determine the overall duct layout including the individual duct sizes.

<sup>23</sup> ACCA Manual T: Air Distribution: Method used to determine how to distribute airflow.

<sup>24</sup> 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.

<sup>25</sup> American National Standards Institute

<sup>26</sup> American Society of Heating, Refrigerating, and Air-Conditioning Engineers

<sup>27</sup> ECCCNY 2016, Section C403.1.1 Calculation of heating and cooling loads

<sup>28</sup> ECCCNY 2016, Section C403.3.1. The intent of this section is to provide some flexibility in design for

All heat pump systems, except for those qualifying for Category 1 *ccASHP: Partial Load Heating*, shall be designed and sized for full load heating. Category 4 *Custom Space Heating Applications* and Category 6 *Custom Hot Water Heating Applications* projects may also be considered for partial load heating, provided that justification is given with the project application.

Under the NYS Clean Heat Program, a full load heat pump system is defined as a system installed as a building's primary heating source, with a total system heating capacity that satisfies at least 90% of the BHL at design conditions, in accordance with applicable code, and can distribute heat adequately across all occupied spaces in the project scope. All heat pump systems for projects in categories that require decommissioning (e.g., Category 2b) must be sized to meet 100% of the load over the project scope at design conditions. If the building has a higher BHL than BCL, the total system heating capacity must satisfy at least 90% of the BHL, which is consistent with the requirement to satisfy BHL under relevant municipal or state code. 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 90% of the heating load for the building, it qualifies as a full load heating system.
- *Full Load Heating Example 2:* the heat pump system is an independent heating system that satisfies 100% of the heating load of served 3 floors of a 10-floor commercial building. The remaining 7 floors will be heated using the existing boilers. In this case, the program will consider the 3 floors in the scope of the project. Since the heat pumps satisfy more than 90% of the heating load for the areas they serve, they qualify as full load heating systems. The participating contractor has submitted justification for completing three of ten floors.
- *Full Load Heating Example 3:* the heat pump system is a GSHP that serves 100% of the load in 90% of a residential house with the remaining 10% fulfilled by ASHP. The project will be eligible for full-load Category 3 incentives for the GSHP portion and Category 2 incentives for the ASHP portion.

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 <90% of the BHL at design conditions.

If a proposed Category 4 *Custom Space Heating Applications* or Category 6 *Custom Hot Water Heating Applications* project is a partial-load heating system, the project application must include an explanation as to:

- Why additional electrification above and beyond the proposed design is not feasible at the time of installation

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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.

- How a verifiable and reliable control strategy will be employed to ensure that the heat pump is being prioritized for heating.

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

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

- NEEP Cold Climate Air Source Heat Pump List product information sheet, if equipment is NEEP-listed.<sup>29</sup> For NEEP-listed equipment, the heating capacity shall be based on the equipment's NEEP certificate maximum heating capacity values, while the cooling capacity shall be based on the equipment's NEEP certificate minimum cooling capacity values. Project applications shall include the NEEP specification sheet with the corresponding version number of the NEEP equipment requirements, as applicable at the time of installation.
- AHRI certificate, where the product is not NEEP-listed
- Manufacturer engineering documentation, where the product is not NEEP-listed
- Manufacturer-developed software that is capable of assigning equipment capacity at entered design heating and cooling temperature, in accordance with ACCA Manual S, Standard 183, or other code-approved equivalent computational procedure

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

Refer to [Appendix 2](#) for more information on how to calculate heating and cooling sizing ratios.

Calculation of the BHL shall be at the 99% dry bulb heating design temperature for the most relevant ASHRAE (2021) location. Calculation of the BCL shall be at the 1% dry bulb cooling design temperature for the same ASHRAE location. Design temperature requirements in this Program Manual may be superseded by the local Authority Having Jurisdiction (AHJ). In such cases, contractors must provide documentation citing the applicable local requirement. Refer to Table 5 below for ASHRAE (2021) dry bulb heating and cooling design temperatures for various locations across New York State.

**Table 5: Dry Bulb Design Temperatures**

City Name	<b>2021 ASHRAE</b>	
	<b>99% Heating Dry Bulb (deg F)</b>	<b>1% Cooling Dry Bulb (deg F)</b>
Albany	4.3	86.3
Binghamton	3.9	82.3

<sup>29</sup> Information on performance of qualifying NEEP Cold Climate ASHPs is available at: <https://ashp.neep.org/#/>.

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.

### 3.2.2 Equipment Installation

To be eligible for Program incentives, Participating Contractors and their agents must install systems and system components in accordance with manufacturer specifications and installation requirements, and in compliance with all applicable laws, regulations, codes, licensing, and permit requirements including, but not limited to, the New York State Environmental Quality Review Act, the Statewide Uniform Fire Prevention and Building Code and State Energy Conservation Construction Code, the National Electric Code, Fire Codes and all applicable state, city, town, or local ordinances and/or permit requirements. Participating Contractors and their agents must also follow best practices for all aspects of installation, including the appearance of the property upon project completion. 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. The appropriate corresponding snow line can be determined using the NYS Clean Heat Prescriptive Categories Incentive Calculator and Statewide Custom Clean Heat Calculator found on the NYS Clean Heat Resources webpage. Systems must be installed to pass all requirements of the Program Compliance and Field Assessments process detailed in Section 5, and its associated Inspection checklists.

### 3.2.3 Air-Source Heat Pumps

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

compressor, can change the direction of the refrigerant flow for cooling as well as for defrosting the outside coils in winter.

Under the NYS Clean Heat Program, to be eligible for a program incentive, ASHP systems must either be listed on the NEEP Product List<sup>30</sup> 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) Commercial Unitary (i.e., Large Commercial) ASHPs (Split or Single Package)
- (4) Air Source Variable Refrigerant Flow (“ASVRF”)
- (5) Packaged Terminal Heat Pumps (“ccPTHP”)
- (6) Single Package Vertical Heat Pumps (“ccSPVHP”)

The 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/contractor-resources/>.

### 3.2.3.1 Central Cold Climate ASHPs

Central Air Source Heat Pumps listed by NEEP as ccASHPs have cooling capacities less than 65,000 Btu/h and are not contained within the same cabinet as a furnace with rated capacity greater than 225,000 Btu/h.<sup>31</sup> 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 1 *ccASHP: Partial Load Heating*, Category 2 *ccASHP: Full Load Heating*, (including Category 2a *ccASHP: Full Load Heating with Integrated Controls*, Category 2b *ccASHP: Full Load Heating with Decommissioning*), and Category 4 *Custom Space Heating Applications*.

To be eligible for a Category 1 Partial or Category 2, 2a, or 2b Full Load Heating incentive, the Central ASHP 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 cabinet as a furnace with heating capacity ≥225,000 Btu/h.

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<sup>30</sup> The current specification and listed eligible units are available at <https://neep.org/ASHP-Specification>.

<sup>31</sup> 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=H TML#se10.3.430\\_12](https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=29d99fa0a367f0166b9cc8528ad29023&mc=true&n=pt10.3.430&r=PART&ty=H TML#se10.3.430_12).



Central ccASHP systems installed in multifamily new construction, gut rehab, and retrofit projects all must apply through Category 4, regardless of the overall capacity of the system being installed, except in cases where fewer than five dwelling units of a multifamily building with five or more dwelling units apply for Clean Heat incentives; in such cases, they may apply in Category 2, 2a or 2b.

To determine which incentive category the system is eligible for (Partial or Full Load Heating), the Participating Contractor shall size and select equipment for the system using the methodology provided in [Section 3.2.1](#).

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

### **3.2.3.2 Cold Climate Mini-Split Heat Pumps**

Cold climate MSHPs are ccASHPs that can circulate refrigerant between an outdoor unit containing a variable capacity compressor and one or more indoor air handlers ("indoor units"). Cold climate MSHPs are often referred to as "ductless mini-splits" because they are typically ductless but can also be installed with short duct runs that enable single 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 1 *ccASHP: Partial Load Heating*, Category 2 *ccASHP: Full Load Heating* (including Category 2a *ccASHP: Full Load Heating with Integrated Controls*, Category 2b *ccASHP: Full Load Heating with Decommissioning*), and Category 4 *Custom Space Heating Applications*.

To be eligible for an incentive under Category 1 *ccASHP: Partial Load Heating* and 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 appliances that are listed on the NEEP ccASHP Product List and tested under AHRI test standard 210/240.

Cold climate MSHP systems installed in multifamily new construction, gut rehab, and retrofit projects all must apply through Category 4, regardless of the overall capacity of the system being installed, except in cases where fewer than five dwelling units of a multifamily building with five or more dwelling units apply for Clean Heat incentives; in such cases, they may apply in Category 2, 2a, or 2b.

To determine which incentive category the system is eligible for (Partial or Full Load Heating), the Participating Contractor shall size and select equipment for the system using the methodology provided in [Section 3.2.1](#).

### **3.2.3.3 Commercial Unitary Systems/Large Commercial ASHPs**

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

- Include individual heat pump appliances that are powered by three-phase electricity or have rated cooling capacities  $\geq 65,000$  Btu/h, or
- Total system heating capacities  $\geq 300,000$  Btu/h

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

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

heating system.

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

The eligibility criteria for commercial ASHPs are equivalent to the ENERGY STAR® specification for Light Commercial HVAC, which covers heat pumps with cooling capacity ranging from 65,000 Btu/h up to 240,000 Btu/h.<sup>32</sup> Systems with individual heat pump appliance sizes of 240,000 Btu/h and above must have efficiencies that meet or exceed local energy code efficiency requirements. These systems are tested under AHRI Test Standard 340/360.

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

#### **3.2.3.4 Air Source Variable Refrigerant Flow Heat Pump Systems**

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

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

All ASVRF systems tested under AHRI standard 1230 are eligible. ASVRF systems up to 240,000 Btu/h cooling capacity must meet or exceed current ENERGY STAR® Light Commercial HVAC Key Product Criteria.<sup>33</sup> For systems with capacities greater than those covered by ENERGY STAR®, heat pump efficiencies must meet or exceed local energy code. The program will adopt a NEEP cold-climate ASVRF specification when it is issued.

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

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

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<sup>32</sup> ENERGY STAR Light Commercial HVAC specification:

[https://www.energystar.gov/products/heating\\_cooling/light\\_commercial\\_heating\\_cooling/light\\_commercial\\_hvac\\_key\\_product\\_criteria](https://www.energystar.gov/products/heating_cooling/light_commercial_heating_cooling/light_commercial_hvac_key_product_criteria).

<sup>33</sup> 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](https://www.energystar.gov/products/heating_cooling/light_commercial_heating_cooling/light_commercial_hvac_key_product_criteria)

### 3.2.3.5 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. 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 Space Heating Heat Pump 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 (see also, [NEEP Cold Climate PTHP Specification](#)).<sup>34</sup>

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

### 3.2.3.6 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 Space Heating Heat Pump 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](#).<sup>35</sup>

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

### 3.2.4 Ground Source Heat Pumps

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

GSHP systems also take advantage of the heat generated by the indoor compressor, particularly in cooling mode, by providing a desuperheater loop that pre-heats domestic hot water. GSHPs distribute

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<sup>34</sup> NEEP Cold Climate PTHP Specification: [https://neep.org/sites/default/files/media-files/ccpthp\\_spvhp\\_specification\\_v1.pdf](https://neep.org/sites/default/files/media-files/ccpthp_spvhp_specification_v1.pdf)

<sup>35</sup> Ibid.

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
- (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 Space Heating Applications*.

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<sup>36</sup>
- Must have a system heating capacity equivalent to at least 90% of BHL
- 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

ENERGY STAR® eligibility is based on the following test procedures to determine GSHP appliance Energy Efficiency Ratio (“EER”) and Coefficient of Performance (“COP”):

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

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

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<sup>36</sup> ENERGY STAR references:

[https://www.energystar.gov/products/heating\\_cooling/heat\\_pumps\\_geothermal/key\\_product\\_criteria](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/sites/default/files/specs//private/Geothermal_Heat_Pumps_Program_Requirements%20v3.1.pdf)  
<https://www.energystar.gov/productfinder/product/certified-geothermal-heat-pumps/results>

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

- $EER = (\text{full load EER} + \text{part load EER})/2$
- $COP = (\text{full load COP} + \text{part load COP})/2$

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 Space Heating Applications* incentives provided they meet or exceed the ENERGY STAR® Geothermal heat pump specification efficiency requirements 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  $\geq 300,000$  Btu/h
- Systems that have individual appliance cooling capacity for closed-loop GSHP installs  $\geq 135,000$  Btu/h
- Systems that have an individual appliance cooling capacity for direct exchange GSHP installs  $\geq 180,000$  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, may be eligible for Category 4 incentives if they meet or exceed the minimum efficiencies listed in Table 4 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, may be eligible for Category 4 incentives if they meet or exceed the minimum efficiencies listed in Table 5 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.
- Full-load GSHP systems installed in multifamily buildings as retrofits to existing heating systems, new construction, and gut rehab projects all must apply through Category 4, regardless of the overall capacity of the system being installed.

Program applications for any Category 4 *Custom 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 4. 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:

- $EER = (\text{full load EER} + \text{part load EER})/2$
- $COP = (\text{full load COP} + \text{part load COP})/2$

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 5. 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 6a. Efficiency requirements applicable to Ground Source Variable Refrigerant Flow heat pumps**

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

**Table 6b. Efficiency requirements applicable to Groundwater Source Variable Refrigerant Flow heat pumps tested under AHRI 1230 groundwater source configuration, however intended to be used in a ground source configuration.**

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

**Table 6c. 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	Min. EER at 86F EWT (with heat recovery)	Min. COP at 68F EWT	Testing Procedure
Water Source VRF multisplit system	<65,000	13.2 EER 17.6 IEER	13 EER 17.4 IEER	4.7	AHRI 1230
	> 65,000 < 135,000	13.2 EER 17.6 IEER	13 EER 17.4 IEER	4.7	AHRI 1230
	≥ 135,000 < 240,000	11.0 EER 15.4 IEER	10.8 EER 15.2 IEER	4.4	AHRI 1230
	≥ 240,000	11 EER 13.2 IEER	10.8 EER 15.2 IEER	4.3	AHRI 1230

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

The Participating Contractor applying for incentives shall document that GSHP systems are sized according to the requirements of [Section 3.2.1](#).

#### **General Well/Borehole/Loop Field Requirements**

- All projects must comply with New York State Department of Environmental Conservation (“DEC”) regulations for geothermal well drilling, which may be found at <https://www.dec.ny.gov/lands/61176.html>.
- For non-DX systems, only polyethylene piping is appropriate for underground loop field piping.
- For large scale systems, Participating Contractors must show rated walls and ceilings and specify firestopping of pipe penetrations.
- All well/bore fields must provide adequate well/bore spacing and thermal dispersion to accommodate the thermal load and thermal balance.
- For large GSHP systems, provide emergency eye washes on site during installation, as required



- by OSHA.
- Piping must be stored on site in a manner that prevents damage and the introduction of foreign matter. Piping shall be kept free from damage, debris, and foreign matter during installation.
- Grout and admixtures must be received and stored in a way that protects them from moisture and contamination.
- Manifolds installed underground or in a buried enclosure must have proper valves, pressure, and temperature ports.
- All equipment and system parts should be labeled per IGSHPA and ASHRAE guidelines.
- Performance tests must be verifiable. Temperatures, pressures, flow rates, control valve operation, controls, balancing reports, sequence of 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 at <https://igshpa.org/manuals> on the IGSHPA website.

Table 7 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<sup>37</sup> for large systems and field measurements for small systems.

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<sup>37</sup> 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 7: Maximum Allowable and Good Practice Pumping Power for Closed-Loop GSHP Systems in watts (W) per AHRI rated<sup>38</sup> full-load heating or cooling capacity of the installed system**

<b>GSHP System Size</b>	<b>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</b>	<b>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</b>
Individual GSHP units in residential and small commercial applications where each GSHP unit has its own dedicated loop pump	100	Less than 75
Large GSHP systems with multiple heat pump units served by centralized ground loop pumping	85	Less than 60

**Closed Loop Antifreeze Protection Requirements:** Propylene glycol (CAS No. 57-55-6), methanol (CAS No. 67-56-1) and ethanol (CAS No. 64-17-5) are the three presumptively acceptable antifreeze additives for use in the loop field. Use of any other 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).

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

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

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

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

**Horizontal-Loop Systems:** Horizontal loops must be installed below the frost line and have a surface

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<sup>38</sup> Reference the AHRI Ground-loop Heat Pump Application (GLHP) rating for Full-Load Heating Capacity and for Full-load Cooling Capacity.

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. System 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 at <https://www.dec.ny.gov/lands/61176.html> on the DEC website.

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

Table 8 presents program requirements for the maximum allowable rated pumping power at design conditions (based on duty point), as well as good-practice guidance.

**Table 8: Maximum Allowable and Good Practice Pumping Power for Open-Loop GSHP Systems in watts (W) per AHRI rated<sup>39</sup> full-load heating or cooling capacity of the installed system**

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

<sup>39</sup> Reference the AHRI Ground-water Heat Pump Application (GWHP) rating for Full-Load Heating Capacity and for Full-load Cooling Capacity

**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 refrigerant must be R-410A unless otherwise approved by the Joint Efficiency Providers.
- The entire well depth interval for DX wells is grouted with thermally enhanced grout with hydraulic conductivity below  $1 \times 10^{-7}$  centimeters/second.
- A permanent placard must be attached to the heat pump unit, detailing the following:
  - loop field refrigerant content, type, and volume
  - loop location description
  - loop piping material
  - required maintenance schedule on loop field, refrigerant, and heat pump
  - planned decommissioning date and process, consistent with loop field useful life
- DX systems must also comply with ANSI/CSA/IGSHPA C448.8, “Installation of direct expansion heat pump systems.”
- DX GSHP systems must use only ACR B280 Copper Piping for Underground Loop Field.
- DX GSHP systems must conform to requirements of ASHRAE Standard 15-2019.

#### **Large GSHP System-Specific Requirements**

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

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

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

### 3.2.5 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.

#### 3.2.5.1 Air-to-Water Heat Pump Water Heater

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

Air-to-Water HPWH may be eligible for Category 5 *HPWH (up to 120 gallons of tank capacity)* and Category 6 *Custom 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 tank up to and including 120 gallons and a current rating  $\leq 24$  amps and voltage  $\leq 250$  volts,<sup>40</sup> shall receive incentives based on \$/equipment unit under Category 5 *HPWH (up to 120 gallons of tank capacity)*. Units under this category must meet or exceed [ENERGY STAR Residential Water Heater](#) requirements.<sup>41</sup>

Air Source HPWH with tank capacity larger than 120 gallons<sup>42</sup> shall receive incentives based on \$/MMBtu of annual energy savings, under Category 6 *Custom Hot Water Heating Applications*.

Systems shall be sized according to equipment manufacturer recommendations.

In addition to the equipment installation requirements described in Section 3.2.2, HPWHs must be installed in spaces that provide sufficient make-up air to support efficient heat pump operation, per manufacturer specifications.

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<sup>40</sup> 10 CFR 430.2 – Definitions.

<sup>41</sup> See energystar.gov:

[energystar.gov/products/water\\_heaters/residential\\_water\\_heaters/key\\_product\\_criteria](https://www.energystar.gov/products/water_heaters/residential_water_heaters/key_product_criteria)

<sup>42</sup> See energystar.gov:

[https://www.energystar.gov/products/water\\_heaters/commercial\\_water\\_heaters/key\\_product\\_criteria](https://www.energystar.gov/products/water_heaters/commercial_water_heaters/key_product_criteria)

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

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

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

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

Ground source Desuperheaters and dedicated DHW water to water heat pumps may be eligible for Category 6 *Custom Hot Water Heating Applications*, Category 7 *GSHP Desuperheater*, and Category 8 *Dedicated DHW WWHP*.

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

A full-load DHW WWHP must meet or exceed ENERGY STAR Geothermal Heat Pump specification requirements<sup>43</sup> or the efficiency requirements listed in [Section 3.2.3](#) for Non-ENERGY STAR Compliant Geothermal Heat Pumps to be eligible for incentives. Ground Source DHW WWHPs (up to 120-gallon tanks), are eligible for \$/equipment unit incentives under Category 8 *Dedicated DHW WWHP*.

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

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 3.2.3](#).

Systems must be installed to pass all requirements of the NYS Clean Heat quality control program and its associated Field Assessment checklists. More information on quality control is included in [Section 5](#).

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

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

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<sup>43</sup> ENERGY STAR Program Requirements for Geothermal Heat Pumps. Current link: [https://www.energystar.gov/sites/default/files/specs//private/Geothermal Heat Pumps Program Requirements](https://www.energystar.gov/sites/default/files/specs//private/Geothermal_Heat_Pumps_Program_Requirements)

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

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

The building envelope, which includes the walls, windows, roof, and foundation, forms the primary thermal barrier between the interior and exterior environments. The building envelope plays a key role in determining optimal comfort levels, ventilation, natural lighting, and energy needed for heating and cooling. 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 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 3.2.7.1](#) 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

### 3.2.7.1 Eligibility Tiers for Category 4A: Heat Pump + Envelope

Projects shall install envelope upgrades to reduce the dominant load: BHL building heating load or CHL cooling heating load by a specific % compared to the appropriate baseline. Please see the table below for details.

**Table 9: 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/local)	>5%	>10%	Existing Condition
New Construction	Applicable code (ECCCNYS or municipal/local)	>5%	>10%	Applicable code (ECCCNYS or municipal/local)

### 3.2.7.2 Infiltration Guidance

Projects should adhere to guidelines for natural (unpressurized) air changes per hour ( $ACH_N$ ) at heating design conditions.<sup>44</sup> 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 10: Infiltration Guidance**

Infiltration Level by project type	Maximum Allowed $ACH_N$ at Design Heating Load <sup>45</sup>
New construction or gut rehabs Tight – Non-operating windows or best quality windows; sealed penetrations in envelope; vapor barrier	0.3
Existing building retrofit Average – Standard quality windows; major penetrations sealed; vapor barrier; glass less than 20% of wall area	0.7

<sup>44</sup> Infiltration Guidance for Buildings at Design Conditions - For the NYS Clean Heat Program. Hugh Henderson, Bruce Harley. May 1, 2022. Accessible on the NYS Clean Heat Resources webpage: <https://cleanheat.ny.gov/contractor-resources/>.

<sup>45</sup> Listed maximum values cannot be exceeded unless written documentation justifying a higher value is provided and approved by the Program.



### 3.2.8 Additional Project Eligibility Criteria

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

- Fossil fuel (heating oil, natural gas, steam generated by fossil fuel, etc.) energy consumption must be reduced by the new electric technology or application. The air source electric technology must use staged, multi-speed or variable-speed heat pumps and must displace at least half of annual baseline heating consumption or alternative case fossil fuel consumption. Fuel savings cannot include fossil fuel system efficiency savings; in savings calculations, fossil fuel baseline efficiency (including distribution) must equal proposed (boiler) system efficiency.
- The new electric technology or application:
  - Must decrease the overall annual site energy consumption
  - Shall meet or exceed applicable minimum efficiency specifications to meet applicable codes and standards

## 3.3 Warranty Requirements

### All ASHPs, including ASVRF

Category 1 *ccASHP: Partial Load Heating*, Category 2 *ccASHP: Full Load Heating*, Category 4 *Custom 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 Space Heating Applications*

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

## **HPWH Systems**

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

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

### *Category 6 Custom Hot Water Heating Applications*

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

## **3.4 Operation and Maintenance Requirements**

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

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

For ccASHP and cold climate MSHP installations under incentive Categories 1 and 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 at [https://cleanheat.ny.gov/assets/pdf/CHC-ASHP-tips-fs-1-v1\\_acc.pdf](https://cleanheat.ny.gov/assets/pdf/CHC-ASHP-tips-fs-1-v1_acc.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/contractor-resources/> under the Ground Source Heat Pump (GSHP) drop-down menu.

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

## **3.5 Savings Methodology for Categories 1, 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.<sup>46</sup> For multiple-unit configurations not covered by the TRM, or for larger or custom

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<sup>46</sup> The New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs - Residential, Multi-Family, and Commercial/Industrial, known as the Technical Resource Manual (TRM), <https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECF52920A85257F1100671BDD>

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 3.6](#) for more details concerning the requirements for the custom category engineering savings analysis.

**Exception:** All multifamily retrofit Category 2 or 3 heat pump projects shall use the Statewide Custom Clean Heat Program Savings Calculator.

### 3.6 Engineering Savings Analysis Requirements for Custom Categories 4, 4a & 6

Each application shall in the custom categories 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.

#### 3.6.1 Statewide Custom Clean Heat Program Savings Calculator

The Statewide Custom Clean Heat Program Savings Calculator (Clean Heat Calculator) is an Excel-based tool that has been developed to assist Participating Contractors applying to the New York State Clean Heat Program with calculating energy savings and incentives for various types of heat pump technologies. Refer to the [Statewide Custom Clean Heat Program Savings Calculator user guide](#)<sup>47</sup> 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 are 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.

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<sup>47</sup> This may be found at <https://cleanheat.ny.gov/assets/pdf/Calculator-User-Guide.pdf>. Can also be found on the Clean Heat Resources page (<https://cleanheat.ny.gov/contractor-resources/>) under the “Air Source Heat Pump” and “Ground Source Heat Pump” drop downs.

- 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.

### **3.6.2 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:

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

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

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

If a project involves new construction or gut rehab, review additional new construction and gut rehab criteria in [Section 3.7](#) below.

#### **3.6.2.1 Modeling Submittals**

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

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

### 3.6.3 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.

#### 3.6.3.1 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.

##### 3.6.3.1.1 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.

##### 3.6.3.1.2 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.

#### 3.6.3.2 Baseline Efficiencies (except Category 4a)<sup>48</sup>

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<sup>49</sup> requirements – i.e. Early Replacement or Extended Life. For Special Circumstance Replacements ([Section 3.8](#)), the existing equipment efficiency shall be used for the baseline condition in accordance with the TRM two step analysis method.
2. Projects involving new construction or gut rehab whose design demonstrates compliance with Section 406 of the latest ECCCNYS by providing more efficient HVAC performance shall set the baseline system efficiencies to exceed the minimum code efficiency requirements by 10%.
3. LMI projects should use the existing equipment type and efficiency as the baseline condition.

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<sup>48</sup> 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>

<sup>49</sup> The New York State TRM can be found on the Department of Public Service website here:

<https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECF52920A85257F1100671BDD?OpenDocument>

### **3.6.3.3 Baseline Efficiencies - Category 4a**

Baseline system efficiencies for:

#### **3.6.3.3.1 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.

#### **3.6.3.3.2 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.

## **3.7 Additional Requirements for New Construction and Gut Rehab**

### **3.7.1 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 Space Heating Applications* incentive rate.

### 3.7.2 Energy Code Compliance

New construction and gut rehab projects must demonstrate minimum compliance with the 2020 applicable local Energy Code 2020, *e.g.*, ECCCNY, 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 ECCCNY 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.

### 3.7.3 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 3.6.2](#).

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

## 3.8 Early Replacement Projects

Projects may qualify for early replacement if they meet the criteria summarized below as defined in the Technical Resource Manual ("TRM").<sup>50</sup> 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:

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<sup>50</sup> New York Standard Approach for Estimated Energy Savings from Energy Efficiency Programs – Residential, Multi-Family, and Commercial/Industrial Measures, ("TRM") Version 10, effective January 1, 2023. See Appendices M & N.

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.

### **3.8.1 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

## **3.9 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

### **3.9.1 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.

### **3.9.2 Energy Use Rule**

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

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

### **3.9.3 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

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/>.

### 4.1 Prescriptive and Custom Heat Pump Project Installations

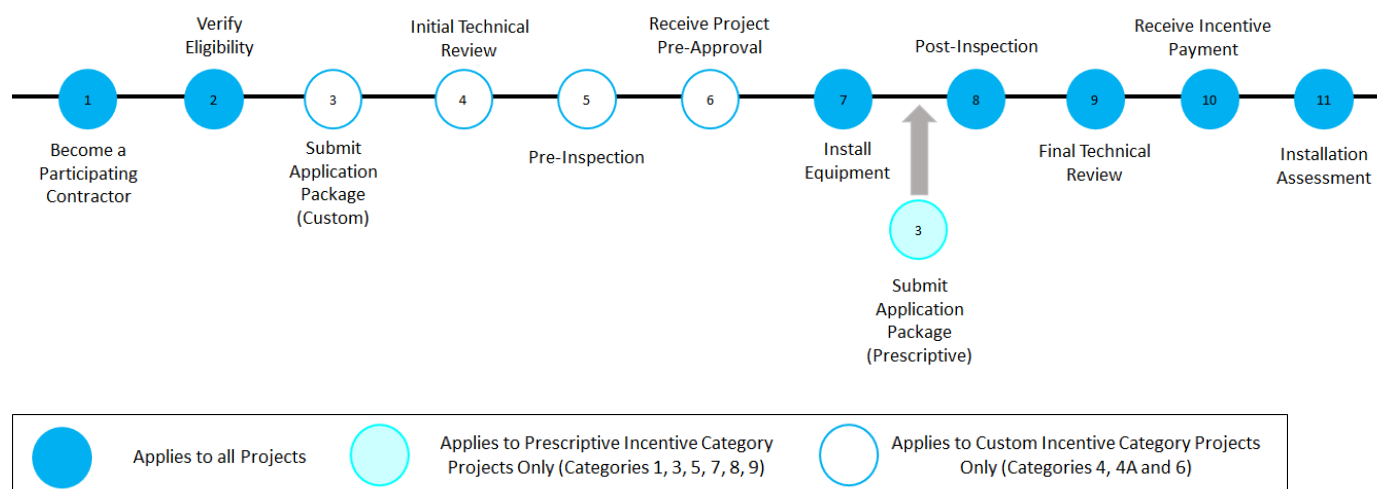
Projects submitted to the Clean Heat Program will follow the general process outlined below. Steps are dependent on whether project measures fall under prescriptive incentive categories or custom incentive categories:

Incentive Category Type	Category
Prescriptive	Categories 1, 2, 3, 5, 7, 8, and 9
Custom	Categories 4, 4a and 6

Incentive applications qualifying for prescriptive category incentives may be submitted within 60 days after the installation is complete.

Multifamily and C&I customers seeking incentives under Category 4 *Custom Space Heating Applications* and Category 6 *Custom Hot Water Heating Applications* may choose to be the applicant by submitting 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.

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 the case of Category 4 *Custom Space Heating Applications* GSHP systems, incentive applications will not be accepted if construction of the loop field for such project has begun before the Designated Utilities send the Participating Contractor and/or customer an approval notice.



## Step 1. Become a Participating Contractor

To participate in this Program, ASHP installers, ASHP designers, GSHP installers, GSHP designers, and GSHP drillers<sup>51</sup> must first become Participating Contractors in the NYS Clean Heat Participating Contractor Network.

Notes:

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

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](https://cleanheat.ny.gov/contractors/).<sup>52</sup> 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 at <https://cleanheat.ny.gov/contractors/>.

On the Participating Contractor Application, contractors must indicate the utility service territory(ies) in which they plan to submit incentive applications. They must also indicate contractor type: ASHP Installer, ASHP Designer, GSHP Installer, GSHP Designer <300,000 Btu/h system heating capacity, GSHP Designer ≥300,000 Btu/h system heating capacity, GSHP Driller, GSHP Direct Exchange (DX) Contractor, or any combination of the above. Contractors must be approved for each specific contractor type by the Designated Utilities.

To become a Participating Contractor, 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

For additional information on the NYS Clean Heat Program Contractor enrollment, visit <https://cleanheat.ny.gov/contractors/>.

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<sup>51</sup> 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.

<sup>52</sup> NYS Clean Heat Contractor Management Portal:

<https://nystatewidecmp.programprocessing.com/programapplication/?ft=822091043BBC4F09A7D5F7DB2C9CF255>.

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

### Participating Contractor Requirements

<b>Contractor Type</b>	<b>Required Documentation</b>
ASHP installer	<ul style="list-style-type: none"> <li>• A copy of the <a href="https://www.epa.gov/section608/section-608-technician-certification-0">U.S. Environmental Protection Agency Section 608 Technician Certification</a> that is appropriate for the size of the system being installed<sup>53</sup></li> <li>• ASHP Manufacturer-sponsored Installation Training Certificate (or comparable)</li> <li>• ASHP Manufacturer-sponsored <a href="https://www.neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf">Cold Climate Air Source Heat Pump Sizing and Design Training</a> Certificate or comparable proof of training completion documentation<sup>54</sup></li> <li>• Participating Contractors are required to review and use the <a href="https://www.neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf">NEEP Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates</a>.<sup>55</sup></li> </ul>
ASHP Designer	<ul style="list-style-type: none"> <li>• An active NYS Professional Engineering license OR active NYS Registered Architect license</li> <li>• Participating Contractors are required to review and use the <a href="https://www.neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf">NEEP Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates</a>.<sup>56</sup></li> </ul>
GSHP Contractor	<ul style="list-style-type: none"> <li>• A copy of a current (and in good standing) International Ground-Source Heat Pump Association (“IGSHPA”) accredited installer certificate</li> </ul>
GSHP Designer (Category 3)	<ul style="list-style-type: none"> <li>• 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</li> </ul>
GSHP Designer (Category 4)	<ul style="list-style-type: none"> <li>• A current CGD certificate from AEE/IGSHPA OR an active NYS Professional Engineering license OR active NYS Registered Architect license</li> <li>• Designers must have an active CGD certificate from AEE/IGSHPA to be promoted to Full status</li> </ul>
GSHP Driller (Vertical Loop Field)	<ul style="list-style-type: none"> <li>• Active registration (in good standing) and certification for open-loop geothermal well drilling by the NYS Department of Environmental Conservation OR</li> <li>• National Ground Water Association Certified Vertical Closed-Loop Driller (CVCLD) certificate</li> </ul>

<sup>53</sup> Available at: <https://www.epa.gov/section608/section-608-technician-certification-0>

<sup>54</sup> A calendar of training options may be found at:

<https://cleanheatconnect.ny.gov/calendar/>

<sup>55</sup> Available at:

<https://www.neep.org/sites/default/files/Sizing%20%26%20Selecting%20ASHPs%20In%20Cold%20Climates.pdf>

<sup>56</sup> Ibid.

GSHP Driller (Direct Exchange “DX”)	<ul style="list-style-type: none"> <li>• Training certificate from a DX Ground Source Heat Pump manufacturer (The NY Designated Utilities reserve the right to review the training curriculum provided.)</li> </ul>
Weatherization Contractors	<ul style="list-style-type: none"> <li>• Home Improvement License (where applicable)</li> </ul>
Residential Contractor	<ul style="list-style-type: none"> <li>• Contractor Verification Attestation Form</li> </ul>

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 webpage <https://cleanheat.ny.gov/contractor-resources/>.

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.<sup>57</sup> Participating Contractors can offer residential financing to their customers: see [Section 2.3](#) 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](#).

#### **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

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<sup>57</sup> NYS Clean Heat Program Participating Contractors: <https://nyscleanheat-findcontractor.icfwebservices.com/>

- Distributions system installer
  - HVAC excellence duct and envelope testing
  - Plumbing license (hot water pipes)

## **Heat Pump Water Heater Contractors**

### **Installing Category 5: HPWH (Tank capacity up to 120 gal)**

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.

### **Installing Category 6: HPWH (Tank capacity greater than 120 gal)**

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 have applicable licenses and comply with applicable codes and standards.

## **Step 2. 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 3. Submit Application Package**

To apply for an incentive, the applicant (Participating Contractor and/or customer) must submit the incentive application and associated documents to their respective Designated Utility based on directions on the application. Note that these are general requirements applying to all clean heat projects. Additional utility-specific incentive application program requirements may apply. Contact the respective Designated Utility for all utility-specific program requirements.

Beginning March 1, 2022, incentive applications for projects qualifying for prescriptive category incentives will be due no later than 60 days after the eligible heat pump system is commissioned.

## **Documentation Requirements – All Projects**

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 whose service territory they work within, as well as to get access to PDF applications for large or custom projects, as required by each Designated Utility. PDF application forms for large or custom projects shall also be posted

on the NYS Clean Heat Resources webpage for download by Participating Contractors or project owner Applicants.<sup>58</sup>

- **Cutsheets for Proposed Equipment** – Specific model(s), serial numbers, and product ratings being used in the project must be highlighted on the cutsheets.
- **Cost Estimate for Proposed Work** – Installation cost for the proposed 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. If the project is being submitted post construction, these costs shall be the actual itemized as-built costs, supported by invoices.
- **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.
- **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.

#### **Additional Documentation Requirements – Custom Incentive Category Projects**

- **NYS Custom Clean Heat Incentive Application**
- **Detailed Scope of Work** – A detailed scope of work that specifies all equipment related to the proposed measure, includes a description of the existing system operation (if applicable), and provides the following additional details:
  - Provides a description of existing heating and cooling systems and building envelope, or in the case of new construction and gut rehab, a counterfactual case that describes the equipment and building envelope that would have been installed but for the Clean Heat Project.
  - Describes the extent of work and indicates whether the scope involves new construction, gut rehab, or upgrades at an existing facility (retrofit or substantial renovation). Description should specify building type and the floors or building areas impacted by the project. Include whether any other measures are being installed to contribute to additional heating or cooling relief, such as building envelope upgrades (e.g., weatherization, sealing, insulation, etc.).
  - Specifies the type of heat pump technology being proposed for installation, quantity of new units, and proposed system application (e.g., domestic hot water heating,

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<sup>58</sup> NYS Clean Heat Program Contractor Resources: <https://cleanheat.ny.gov/contractor-resources/>

space heating and cooling). Specifies whether equipment is ducted or ductless.

- Provides design capacity, efficiencies, and proposed sequence of operations for new heat pump installation
- Specifies what percentage of the design heating/cooling load the new heat pumps are proposed to accommodate. See Required Equipment Sizing for details regarding equipment sizing.
- Specifies whether supplemental heating, via either an existing heating system or new heating system, is required to accommodate the design heating load. If a supplemental heating system is required, provide an explanation as to the following:
  - Why additional electrification above and beyond the proposed design is not feasible
  - How a verifiable and reliable control strategy will be employed to ensure that the heat pump system is prioritized for heating
- **For New Construction and Gut Rehab:** Specify which compliance pathway (i.e., Prescriptive or Performance Path) the design follows to demonstrate compliance with the applicable 2020 energy code and whether design trade-offs have been taken.
- **Savings Analysis:** All calculations must be clear and transparent, utilizing standard engineering methodologies, including a listing of source values.

#### **Step 4. Initial 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. Pre-Inspection**

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

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.

#### **Step 6. Receive Project Pre-Approval**

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

Once a project application has been reviewed and pre-inspection has been performed, the Designated



Utility will issue an approval notification to the Participating Contractor via email that provides incentive details, including the incentive amount. This approval serves as indication that installation of project measures may begin. The incentive offer expires in 30 days if not signed and returned to the respective Designated Utility within 30 days.

## Step 7. Install Equipment

Installation of project measures shall occur within the timelines listed in the following table.

Category	Existing Buildings*	New Construction and Gut Rehab*
1, 2, 3, 5, 7, 8, 9	12 months	24 months
4, 4A, 6	24 months	36 months

\*Note: Effective **January 1, 2023**, incentive offers for non-residential projects in Orange and Rockland service territory will be valid for 12 months after the issue of the PIOL. An applicant may request the utility's approval for an extension, and adjustments may be made on a case-by-case basis.

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.

Upon project completion, the Participating Contractor, in cooperation with the system owner and/or site owner, will submit completion paperwork. Paperwork should only be submitted after 100% of incentivized measures identified in this Program Manual are installed. The completion paperwork includes:

- 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.
- Approved Authority Having Jurisdiction (AHJ) Permit Submission, including EN-drawings and energy analysis (required only if permit filing was not submitted as part of initial review or if subsequent changes to the permit filing have occurred)
- Revised load calculations (required only when revisions were made to the original load calculations) eligible to receive incentives

## Step 8. 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 9. 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.

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.

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 10. 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. Multifamily and commercial and industrial (C&I) customers seeking incentives under Custom Categories 4, 4A, and 6 may choose to be the applicant by submitting an incentive application directly. As the applicant, the multifamily and C&I customers choosing this option must have the project installed by a participating contractor and will receive direct payment of the Total Incentive amount listed in Table 2 from the Program.

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 11. 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.

## **4.2 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, 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.<sup>59</sup> 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, 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 Assessments Overview

The Designated Utilities will maintain program integrity through the Field Assessment<sup>60</sup> 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 Assessment process and protocols as described in the document,<sup>61</sup> which 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

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<sup>59</sup> 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.

<sup>60</sup> According to the American Society for Quality (ASQ), QA and QC, while both considered aspects of quality management, are distinctly different from each other: QA provides confidence that quality requirements will be fulfilled, whereas QC focuses on fulfilling quality requirements. Retrieved May 28, 2020, from ASQ: <https://asq.org/quality-resources/quality-assurance-vs-control>.

<sup>61</sup> 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>

associated with each application. Specifically, a site assessment will likely occur for every project until 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 for the following technologies<sup>62</sup>:

1. Air Source Heat Pumps
2. Ground Source Heat Pumps
3. 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 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.<sup>63</sup>

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

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<sup>62</sup> NYS Clean Heat Program Contractor Resources <https://cleanheat.ny.gov/contractor-resources/>

<sup>63</sup> 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 (Categories 1 and 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 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 and 2b, Full status Participating Contractors are subject to up to a 7.5% and 10% 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 HPWH (Category 5)**

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

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

All projects in these categories will be subject to field assessment prior to payment of incentive. These projects are also subject to pre-inspection as outlined in [Section 4](#).

### **5.5 Photo Assessment (ASHP & GSHP Categories 1, 2, 2a, 2b, 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 and 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.

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
- 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

The Probationary period will not be less than 30 days and will not exceed 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:

- Continues to be listed on the NYS Clean Heat Resources webpage<sup>64</sup>
- May continue to submit new incentive applications, subject to restrictions based upon the reason for the Probationary status
- 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
- Must be mentored on the next installation

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) 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

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<sup>64</sup>NYS Clean Heat Program Contractor Resources: <https://cleanheat.ny.gov/contractor-resources/>

- 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<sup>65</sup>
- 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 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

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<sup>65</sup> Ibid.

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 24-month period of time. They will be removed from the NYS Clean Heat Resources webpage<sup>66</sup>, will no longer receive email notifications, and will not be eligible for incentives. 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.

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.

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<sup>66</sup> Ibid.

## 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 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:**

Ray Cotto  
Associate Energy Efficiency Program Manager  
85 Civic Center Plaza  
Poughkeepsie, NY 12601  
Telephone: (845) 486-5750  
Email: [RCotto@cenhud.com](mailto:RCotto@cenhud.com)

**Con Edison:**

Toby Hyde  
Program Manager, Clean Heat  
Telephone: (917) 565-6911  
Email: [hydet@coned.com](mailto:hydet@coned.com)

Daniel Krupa  
Sr. Specialist, Clean Heat  
Telephone: (212) 460-2831  
Email: [krupad@coned.com](mailto:krupad@coned.com)

**National Grid:**

Jennifer Cross  
Lead Program Manager  
1125 Broadway  
Albany, NY 12204  
Telephone: (518) 433-5034  
Email: [Jennifer.Cross@Nationalgrid.com](mailto:Jennifer.Cross@Nationalgrid.com)

Jim MacMartin  
Program Manager  
300 Erie Blvd. West  
Syracuse, NY 13202  
Telephone: (315) 427-0723  
Email: [James.Macmartin@nationalgrid.com](mailto:James.Macmartin@nationalgrid.com)

Julie Hawkins  
Lead Analyst  
300 Erie Blvd. West  
Syracuse, NY 13202  
Telephone: (315) 776-1006  
Email: [Julie.Hawkins@nationalgrid.com](mailto:Julie.Hawkins@nationalgrid.com)

**NYSEG/RG&E:**

Nicole Williams  
Program Manager, Conservation and Load Management  
18 Link Drive, Binghamton, NY 13905  
Telephone: (585) 484-6592  
Email: [Nicole.williams@nyseg.com](mailto:Nicole.williams@nyseg.com)

**NYSERDA**

William Xia  
Director, Multifamily Programs  
Telephone: 332-323-8368  
Email: [William.Xia@nyserda.ny.gov](mailto:William.Xia@nyserda.ny.gov)

**Orange & Rockland:**

Mark Maloney  
Program Administrator  
Telephone: (845) 577-2368  
Email: [maloneym@oru.com](mailto:maloneym@oru.com)

**Statewide Program-Related Inquiries:**  
[nyscleanheat@ceadvisors.com](mailto:nyscleanheat@ceadvisors.com)

**Statewide Participation- or Project-Related Inquiries:**  
[nyscleanheat@icf.com](mailto: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.

**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:<sup>67</sup>

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

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<sup>67</sup> New York State Standard Approach for Estimating Energy Savings from Energy Efficiency Programs, Appendix G, See [NYS TRM V9.pdf](https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD)  
(<https://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD>)



building, and “From 2007 through the present” in the EFLH tables for low-rise and high-rise multifamily buildings. Appendix G also provides EFLH tables for selected small and large commercial buildings; however, for these building types, EFLH values are the same across all building vintages.

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

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

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

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

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

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

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

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

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

**Decommissioning:** Existing fossil fuel space heating or domestic hot water (DHW) heating appliance that is retired 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 to be an eligible driller in the NYS Clean Heat Program are described in this Program Manual.

**Dwelling Unit:** A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Source: 2020 Energy Conservation Code of NYS Section R202 [https://up.codes/viewer/new\\_york/ny-energy-conservation-code-2020/chapter/RE\\_2/re-definitions#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 90% of total system heating load at design conditions. For locations where the total system cooling load is greater than the heating load, the heat pump system cooling capacity shall be as small as possible to satisfy the cooling load, while minimizing oversizing for the heating function to the extent possible.

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

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

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

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

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

heating function to the extent possible with available equipment.

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

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

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

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

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

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

**Mini-Split Heat Pump (MSHP):** A type of cold climate ASHP 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 <90% of the building’s design heating load (“BHL”) at design conditions.

**Participating Contractor:** ASHP and GSHP designer and installer that is eligible to apply for and receive incentives under the NYS Clean Heat Program. To become a Participating Contractor, an entity must submit a Participating Contractor Application and a Contractor Participation Agreement for each Electric Utility service territory where work will be performed (available at

<https://cleanheat.ny.gov/contractors/>). Upon approval, the applicant will receive an approval notification from the Electric Utility and become eligible to apply for incentives in the Program. GSHP drillers must also be approved through this process to become a “Participating Driller,” but are not eligible to submit for and receive incentives. Each GSHP installation must be completed by a Participating Driller. Contractors installing only HPWH do not have to be a Participating Contractor to submit an incentive application on behalf of a customer.

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

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

**Prescriptive Incentive Category:** Incentive Categories 1, 2, 3, 5, 7, 8, and 9.

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

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

# 11. 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

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

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

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

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

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

**Example using NEEP method:** Downstate location with heating design temperature at 12°F.

Heating Design Temperature: 12°F

Proposed Heat Pump Make: Fujitsu

Proposed Heat Pump Model: AOU36RLAVM

Maximum Heating Output at 5°F: 37,900 btu/h

Maximum Heating Output at 17°F: 42,000 btu/h

Heating Load at 12°F: 38,500 btu/h

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

$$x = 40,291.67$$

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



**FUJITSU J-Series**  
Multizone All Non-ducted  
AHRI Cert #: **8693480**  
Outdoor Unit #: **AOU36RLAVM**  
Indoor Unit #:

**INFINITE COMFORT**

- 🔥 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

Heating/Cooling Capacity Graph



Figure 1: NEEP Certification ccASHP

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

AHRI Test Method: 340/360

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

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

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

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

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

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

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



# 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 17F at 230v : 62000/62000

COP 17F/COP 17F at 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

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



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

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 GSVPFs 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

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

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

#### **Example:**

Make: Ice Air

Model: 8VSHPG12

Full Load Heating Capacity: 9,000 btu/h

Heating Load: 8,000 btu/h

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

# 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 : 8VSHPG12\*\*

Brand Name : ICE AIR LLC

Rated as follows in accordance with ANSI/AHRI/ASHRAE/ISO Standard 13256-1 Water-to-Air 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:				



*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.*