Con Edison Energy Efficiency Program Guidelines

Building Electrification

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1. Introduction

This Building Electrification Technical Guideline serves as a comprehensive manual for participants in Con Edison's Energy Efficiency and Building Electrification (EE/BE) Programs seeking incentives for eligible heat pump equipment projects in the Multifamily, Small Business & Nonprofit (Small Biz), and Commercial & Industrial (C&I) sectors. The Technical Manual defines the requirements related to building electrification and electric heating and cooling systems including eligible equipment, design requirements, heat pump sizing guidelines, and instructions for using the appropriate Energy Savings Calculator(s). Projects must adhere to all applicable requirements to apply for Con Edison EE/BE incentives.

For Ground Source Heat Pump (GSHP) project guidance, reference the Con Edison Commercial & Multifamily GSHP Program Manual.[1]

2. Eligible Technologies

Eligible technologies are grouped into several major categories:

1. Air Source Heat Pumps for space heating
2. Heat Pump Water Heaters for domestic and service water heating applications
3. Energy Recovery Ventilators and Heat Recovery Ventilators
4. Heat Recovery Chillers and Heat Pump Chillers
5. Heat Pump Dedicated Outdoor Air Systems
6. Advanced controls paired with eligible heat pumps
7. Water Source Heat Pumps
8. Other Heat Pump Technology

Heat pump systems used for space heating must be designed for either heating-only operations or both heating and cooling operations. Cooling-only systems are not eligible for Building Electrification incentives. For cooling-only building electrification project, refer to the applicable Multifamily, Small Biz, or C&I Program Manuals for eligibility information.

For information for Technologies beyond those listed above may be eligible to apply for incentives subject to Con Edison approval.

Installed heat pump and associated components must be installed in accordance with manufacturer specifications and installation requirements, and in compliance with all applicable laws, regulations, codes, licensing, and permit requirements including, but not limited to, the United States Environmental Protection Agency (EPA), New York State Environmental Quality Review Act, the Statewide Uniform Fire Prevention and Building Code and State Energy Conservation Construction Code, the National Electric Code, Fire Codes, and all applicable state, city, town, or local ordinances and/or permit requirements. For each project, the most stringent requirements among federal, state, and city codes must be followed to ensure full compliance. Additionally, best practices cover all aspects of installation, including best practices for the appearance of the property upon project completion. Con Edison may verify adherence to these requirements and determine incentive eligibility based on its findings. Systems must be installed to pass all applicable requirements (i.e., decommissioning, field Inspections and oversight process). Refer to the relevant Program Manuals for inspection and oversight requirements for Multifamily, Small Biz, or C&I applications.

[1] https://www.coned.com/en/save-money/rebates-incentives-tax-credits/commercial-and-multifamily-geothermal

2.1. Air Source Heat Pumps for Space Heating

Air-Source Heat Pumps ("ASHP") must meet the criteria established in this technical guideline or the Con Edison Non-Low to Moderate Income Energy Efficiency and Building Electrification Implementation Plan[2]. Eligible ASHP equipment must be on the Northeast Energy Efficiency Partnership (NEEP) Product List or demonstrate performance that meets or exceeds code requirements. Installed heat pump systems must be capable of operating year-round.

2.1.1 Cold Climate ASHPs

ASHPs listed by NEEP as cold climate ASHPs ("ccASHPs") have cooling capacities less than 65,000 Btu/hr. and are not contained within the same cabinet as a furnace with rated capacity greater than 225,000 Btu/hr. This includes systems classified as central and multi-splits.

Individual heat pumps in the installed system must be listed by NEEP as ccASHPs, tested under Air-Conditioning, Heating, and Refrigeration Institute ("AHRI") test standard 210/240, powered by single-phase electricity, have cooling capacities <65,000 Btu/hr., and may not be installed in the same cabinet as a furnace with heating capacity ≥225,000 Btu/hr. ccASHPs not on NEEP must meet or exceed code requirements.

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

2.1.2 Air-to-Air Large Commercial Unitary Heat Pumps (single packaged or split system)

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 are eligible for Full Load Space Heating Applications or Phased Load Space Heating Applications.

Eligible Commercial Unitary Systems must have the following characteristics:

- Systems other than single phase with rated cooling capacity <65,000 Btu/hr. must consist of multi-stage (including dual-stage) or variable speed compressors.
- Systems that require auxiliary heating at design temperature must also meet criteria described in Phased Load Space Heating Applications.
- Systems must meet the criteria in the applicable table below:

Single phase, variable speed units with rated cooling capacity (Btu/hr.) <65,000 must be listed in the NEEP cold-climate heat pump directory (the NEEP specification requirements of which are shown below); and they must be variable speed or have three or more stages. Units of this size are rated using AHRI 210/240.

Table 1: Criteria for Single Phase, Variable Speed Unitary Heat Pumps <65,000 BTU/Hr.

Rated cooling capacity (Btu/hr.) <65,000	SEER2	HSPF2	COP@5°F
Single phase, variable speed	≥14.3	≥7.7	≥1.75

Three phase (either multi-stage or variable-speed) equipment with rated cooling capacity <65,000 BTU/HR must meet the specifications described in Table below. For three-phase equipment, Seasonal Energy Efficiency Ratio (SEER) and Heating Seasonal Performance Factor (HSPF) may be used for compliance instead of SEER2 and HSPF2 only for models that have not been rated with SEER2 and HSPF2. These requirements only need to exceed the stated values for ONE parameter in the applicable row; the others can be equal to or greater than the values shown. Units of this size are rated using AHRI 210/240.

[2] https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BD0980A98-0000-C523-BE20-6C7A30F3C3B9%7D

Table 2: Criteria for Three Phase Multi-Stage or Variable Speed Equipment with Rated Cooling Capacity < 65,000 BTU/Hr.

Rated cooling capacity (Btu/hr.) <65,000	SEER	HSPF	SEER2	HSPF2
Single package	>14	>8.0	>13.4	>6.7
Split	>14	>8.2	>14.3	>7.5

Systems with rated cooling capacity (Btu/hr.) ≥ 65,000 must be variable speed or have two or more stages. Additional requirements are shown in the Table below. Systems with rated cooling capacity between 65,000 and 240,000 BTU/hr. must meet or exceed both values in the applicable row. Systems ≥240,000 Btu/hr. must exceed one of the values in the applicable row and must meet or exceed the other value. Units of this size are rated using AHRI 340/360 (2023)

Table 3: Criteria for Multi-Stage or Variable Speed Equipment with Rated Cooling Capacity ≥ 65,000 BTU/hr.

Rated cooling capacity (Btu/hr.) [1]	Supplemental heat type	IEER	COP @ 47 °F
≥65,000 and <135,000	Electric resistance or none	≥14.1	≥3.5
≥135,000 and <240,000		≥13.5	≥3.4
≥240,000		>12.5[2]	>3.2[2]
≥65,000 and <135,000	All other types of heating	≥13.9	≥3.5
≥135,000 and <240,000		≥13.3	≥3.4
≥240,000		>12.3[2]	>3.2[2]

For 3-phase equipment, SEER and HSPF may be used for compliance instead of SEER2 and HSPF2 only for models that have not been rated with SEER2 and HSPF2.

[1] Single phase units must be listed in the NEEP cold-climate heat pump directory, or they must meet the requirements shown in the table; and they must be variable speed or have two or more stages.

[2] The requirements shown with footnote 2 only need to exceed the stated values for ONE parameter in the applicable row; the others can be equal or greater than the values shown.

2.1.3 Air Source Variable Refrigerant Flow Heat Pumps

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.

ASVRF systems must be rated under AHRI Standard 1230-2023 certificates when available to be considered for eligibility.

- ASVRF systems between 65,000 and 240,000 Btu/hr. cooling capacity must meet or exceed current requirements under ENERGY STAR Criteria for Certified Cold Climate Light Commercial Heat Pumps.
- For systems with capacities greater than those covered by ENERGY STAR, heat pump efficiencies (e.g., IEER and Coefficient of performance ("COP")) must meet and exceed local energy code for at least one of the code-listed parameters.

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

ASVRF systems must comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE") Standard 15-2022, as referenced NYC Mechanical Code 2022, Ch. 11, 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. Systems must be installed to meet all requirements of the Con Edison quality control Program and its associated field inspection checklists.

2.1.4 Cold Climate Packaged Terminal Heat Pumps

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

PTHP are tested under AHRI standard 310/380. To be eligible for the incentives, each unit in the system must be listed on, or meet or exceed the criteria of, the NEEP Product List, i.e., be a ccPTHP (see also, NEEP Cold Climate PTHP Specification[3]).

2.1.5 Single Package Vertical Heat Pumps

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

Single package vertical heat pumps are tested under AHRI standard 390. To be eligible SPVHP must meet or exceed the criteria listed in the NEEP Cold Climate SPVHP Specification[4].

2.1.6 Air-to-Water Heat Pumps

Air-to-water heat pumps ("AWHPs") are a type of ASHP that distributes heat in the form of hot water for hydronic heating systems. AWHPs can be installed to meet some or all the domestic water heating load. Recognizing that mixed heat pump arrangements may be beneficial, the AWHP equipment can be sized and selected to meet only a portion of the building load if the remainder of the full load is served by an ASHP or a GSHP. The combined unit sizes still must not exceed 120% of the Building Heating Load ("BHL"). Projects which combine an AWHP with another heat pump type are eligible for only one Program incentive.

The rating standard for air-to-water heat pump equipment is AHRI 550/590. To be eligible for an incentive the AWHP equipment must be on the New York Clean Heat qualified product list (AWHP QPL) or a list from ENERGY STAR or NEEP, which are in development. For any manufacturer that wishes to have their product considered for addition to the NYS Clean Heat AWHP QPL, please email nyscleanheat@ceadvisors.com.

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

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

2. 2. Heat Pump Water Heaters ("HPWHs")

In addition to space heating, Con Edison's Energy Efficiency Programs 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, applicants are required to report the existing water heating fuel that is being replaced; for new construction, the replaced unit will be determined on a case-by-case basis, based on contemporary construction practice in the area.

As with space conditioning, heat pump water heaters can be air-source or ground-source technology and must be sized according to manufacturers' recommendations. Please refer to the Con Edison Commercial & Multifamily GSHP Program Manual for GSHP project guidance.

Incentives for HPWH are available through Con Edison's Multifamily Program. To be eligible for a prescriptive incentive, HPWH must possess a Uniform Energy Factor (UEF) rating, have a current rating less than or equal to 24 amps and a voltage less than or equal to 250 volts, and meet or exceed the current ENERGY STAR Residential Water Heater requirements. Air Source HPWH that do not have a UEF rating are eligible for incentives calculated based on $/MMBtu of annual energy savings, which are available for program incentives under the Custom Hot Water Heating Applications

2.2.1 Air-to-Water Heat Pump Water Heaters

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 having a UEF rating are eligible for Midstream incentives. Larger systems and custom applications are eligible for Hot Water Heating incentives.

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

2. 3. Energy Recovery Ventilators (ERVs) and Heat Recovery Ventilators (HRVs)

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

For the purposes of this technology, 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 ERV/HRVs that have efficiencies which meet or exceed federal, state, or municipal codes or standards paired with an eligible heat pump system are eligible for incentives. The incentive rate shall be the same as that given to the eligible heat pump system.

2. 4. Heat Recovery Chillers (HRCs) and Heat Pump Chillers (HPCs)

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

To be eligible for incentives, HRC/HPCs must be electrically operated and meet or exceed the minimum efficiency requirements at operating conditions set forth in ASHRAE Standard 90.1-2022 under AHRI 550/590. Heat recovery chillers and heat pump chillers are exempt from minimum annual heating consumption displacement thresholds for phased projects.

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

Con Edison reserves the right to decline to offer incentives for HRCs/HPCs which are primarily used for cooling and do not meet the spirit of Building Electrification.

2. 5. Heat Pump Dedicated Outdoor Air Systems (HP-DOAS)

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

HP-DOAS are eligible to receive incentives in Full Load Custom and Phased projects. HP-DOAS may also be installed as a replacement to a fossil fuel or electric resistance DOAS serving only ventilation loads. For projects with ventilation-only loads, equipment sizing for the DOAS system will be based solely on ventilation requirements. To be eligible for incentives, HP-DOAS must meet or exceed the minimum efficiency requirements set forth in Addendum cv to ASHRAE Standard 90.1-2022 tables 6.8.1-13 and 6.8.1-14 using AHRI 920-2022.

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

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

2. 6. Advanced Controls Paired With Eligible Heat Pumps

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

Only controls that are paired with an eligible heat pump system can receive incentives under the Program. Eligible controls will be incentivized at the same rate as the corresponding heat pump it is controlling.

2. 7. Water Source Heat Pumps (WSHP)

Water source heat pumps ("WSHP") projects where the source of energy is heat recovery from other building systems (such as condenser water loop) are eligible. WSHP projects where the source of energy is heat transfer from a water loop maintained by a fossil fuel system (i.e. boiler or district steam) will be reviewed on a case-by-case basis and must exceed a minimum annual fossil fuel savings threshold as indicated by the individual program requirements.

2. 8. Other Heat Pump Technology

For projects with Heat Pump Technology eligibility that 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 not be increased by the new electric technology or application.
- For projects with a decommissioning requirement, existing heating systems must be decommissioned.
- The new electric technology or application:
  - Must not increase the overall annual site energy consumption
  - Shall exceed applicable minimum efficiency specifications to meet applicable codes and standards

Please contact your account manager or energy advisor to determine heat pump eligibility for other Heat Pump Technology.

3. Heat Pump System Sizing and Design Requirements

3. 1. System Sizing

System performance, comfort, and energy efficiency can be significantly impacted by sizing and equipment selection. Heat pump equipment and any connected ductwork (if applicable) must be properly sized to meet the building heating load requirements, deliver occupant comfort and satisfaction, and optimize system performance and energy savings. All heat pump systems must be sized in compliance with applicable state and municipal code. Contractors are strongly encouraged to review and use the (NEEP) Guide to Sizing and Selecting Air-Source Heat Pumps in Cold Climates or to assist in sizing and selecting cold-climate Air-Source Heat Pump (ccASHP) equipment where applicable.

Contractors are also encouraged to use additional design manuals as applicable to the system, including ACCA Manual D: Duct Design, ACCA Manual T: Air Distribution, and ACCA Manual B: Test, Adjust and Balance. In cases where a building has a higher Building Cooling Load ("BCL") than BHL, the system must be sized to satisfy full BCL as required by relevant municipal or state code.

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

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 the dominant load with the capacity for the other function as small as possible, within available equipment options. oversizing for cooling is only permissible when the BCL is dominant and the system is designed to meet it, OR when a single system is being used for both heating and cooling and its capacity is dictated by the dominant BHL, leading to inherent cooling oversizing that must still meet a minimum cooling code or efficiency threshold.

The Program reserves the right to request additional justification or documentation regarding heat pump system sizing when the equipment capacity is sized above the dominant load. A system sizing justification letter is required in the following cases:

1. Heating is the dominant load and equipment heating capacity is greater than 120% BHL.
2. Cooling is the dominant load and equipment cooling capacity is greater than 115% BCL.

This letter is subject to the Program's approval and shall include:

1. Explanation for the system oversizing from the contractor or project design engineer.
2. Any applicable information that supports the need for system oversizing.
3. Examples: sizing calculations, specifications or technical data sheets (cutsheets), etc.

The Program may request mechanical drawings either upon request or as required by certain programs. For a complete list of documentation requirements, please refer to the relevant Multifamily, Small Biz, or C&I Program Manuals.

3. 2. System Sizing Definitions

Please see the definitions below for sizing the following Heat Pump applications: full load (for space or water heating), phased load (for space or water heating), and Domestic Hot Water (DHW) heating. For cooling-only building electrification project, refer to the applicable Multifamily, Small Biz, or C&I Program Manuals.

3.2.1 Full-Load Heating

Full-load space or water heating, projects must be designed and sized to meet at least 100% of the BHL at design conditions.

3.2.2 Phased Load heating

Phased building electrification projects that do not meet 100% of the building's heating load, either space or water, are eligible for incentives. Custom projects that do not electrify an entire building will be treated as Phased if they meet the following two conditions:

1. Include new equipment that uses electricity and one or more of the following sources of heat: geothermal heat exchanger, air-source heat pump, or recovered waste heat.
2. Permanently reduce fossil fuel or district steam use for space, water, or process heating.

Projects may permanently reduce fossil fuel or district steam use, together "legacy systems," either by disabling or disconnecting the heating equipment or system, or through the application of controls. A sample listing of project types that do not electrify all of a building's heating needs but which the Company considers Phased and Strategic is below:

1. Projects that electrify a specific area (e.g., floor, wing).
2. Projects that electrify a specific system (e.g., space heating, DHW or ventilation only).
3. Heat recovery systems.
4. Buildings with hydronic internal distribution systems for space heating that electrify a central legacy heating plant in stages. As a result, there will likely be heat pumps working to heat the hydronic loop alongside legacy fossil equipment.
5. Ground-source heat pump projects that connect separate spaces to a shared borefield in stages.
6. Projects that electrify less than 100% of a building's domestic hot water heating load with a central plant.

Generally, buildings with hydronic distribution systems that exclusively heat their water loop with fossil or steam boilers without the addition of new heat pump equipment will not be eligible for building electrification incentives.

Projects in buildings which fully electrify their space or water use, but maintain backup fossil systems to comply with requirements for resilience or reliability, as in the case for hospitals or other critical facilities, re eligible for incentives.

3.2.3 DHW Projects

To qualify for full load incentives, DHW projects must be designed and sized to meet 100% of the DHW load within the project scope under design conditions. DHW projects that meet the Phased criteria outlined in 3.2.2, including using a central plant, are eligible for Phased incentives.

3. 3 Load Calculation

- For commercial spaces & buildings, BHL & BCL shall be calculated following ANSI/ASHRAE/ACCA Standard 183-2007(RA2020)74. ACCA Manual N 5th ed.75, or other code-approved equivalent computational procedure, and the Contractor must submit a load calculation report.
- Calculation of the building's design heating load shall be at the 99% dry bulb heating design temperature for the most relevant ASHRAE 2017 location.
- Calculation of the building's design cooling load shall be at the 1% dry bulb cooling design temperature for the most relevant ASHRAE 2017 location.
- Software files detailing the project's load calculation analysis may be requested by the Program team at their discretion.
- Every load calculation report must have a completed and signed copy of the ASHRAE 183 Compliance form.
- The heat pump designer responsible for sizing the system must be the one performing and approving the load calculation. When a project files a building permit for onsite work, the permit and the load calculation report must be provided to the responsible registered Professional Engineers (P.E.) and Registered Architects (R.A.).

- Technical requirements:

  A. Load calculation method: a procedure used to calculate the cooling or heating load of a zone or building. Load calculation methods that comply with ANSI/ASHRAE/ACCA Standard 183-2007 include, but are not limited to:
     1. the cooling load temperature difference/cooling load factor (CLTD/CLF) family of methods,
     2. total equivalent temperature difference/time averaging (TETD/TA) methods,
     3. transfer function methods (TFMs),
     4. radiant time series (RTS) methods, and
     5. heat balance (HB) methods.

  B. Load calculation analysis must be zone-by-zone or room-by-room type; block load calculations will not be accepted.
     1. for additional load calculation guidelines please reference Appendix 2 – NYS Clean Heat Statewide Heat Pump Program Load Calculation Guidance

3. 4 Decommissioning Requirements

For decommissioning projects, the existing heating system must be completely removed, disabled, or disconnected, and proper documentation is required using the appropriate checklist. Refer to the relevant Multifamily, Small Biz, or C&I Program Manuals to determine decommissioning requirements or exemptions based on application type. Contractors are required to provide time- and date-stamped photographs in accordance with the application type, adhering to the instructions outlined in the Con Edison Non-Residential Decommissioning Checklist[5]. For more information on decommissioning guidance, please reference Appendix 3: Building Electrification Non-Residential Decommissioning Photo Guide.

[5] https://cleanheat.ny.gov/resources-for-applications/

4.Engineering Savings Analysis Requirements

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

1. Statewide Custom Building Electrification Program Savings Calculator
2. Statewide Heat Recovery Chiller Calculator
3. Domestic Hot Water Savings Calculator
4. Engineering Modeling
5. Temperature Bin Method
6. Alternative savings calculation method
    a. If applicable, the latest version of the Technical Resource Manual ("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.
- Energy modeling for entire buildings should be conducted using approved simulation software, as specified in the relevant Program Manuals for Multifamily, Small Biz, or C&I applications. The approved list of modeling software is based on current computational capabilities and familiarity of each respective program.

4. 1. Custom Building Electrification Program Savings Calculators

The Custom-Building Electrification Program Savings Calculator is an Excel-based tool for Program applicants that calculates energy savings and incentives for various types of heat pump technologies. The Custom-Building Electrification Program Savings Calculator user guides contain an updated list of technologies for which the Calculator calculates savings and incentives.

Currently the following Savings Calculators [6] are available for use for specific electrification measures, as listed below:

- Statewide Custom Building Electrification Program Savings Calculator – ASHPs, GSHPs, WSHPs, Building Envelope, ERV
- Domestic Hot Water Savings Calculator – Air Source HP and Ground Source HP DHW
- Statewide Heat Recovery Chiller Calculator– Simultaneous Heating and Cooling HRC, Air Source HPC

The Custom Building Electrification Program Savings Calculators should be used as the default method to calculate energy savings for the custom-building electrification projects.

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

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

For projects where there is no existing cooling system prior to the installation of the heat pump system, the contractor should enter the capacity of a single unit of the proposed heat pump system as the equipment baseline.

[6] https://cleanheat.ny.gov/resources-for-applications/

4. 2. Energy Modeling

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

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

If there are several EEMs of the same type, for example several HVAC EEMs, the order in which they are modeled relative to each other is not prescribed to allow flexibility in supporting the specific project circumstances and may be determined based on communications with the customer.

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.

4. 3. Establishing Baselines

Establishing the baseline equipment type or efficiency is necessary for calculating energy savings for any project, especially for a custom project. This section defines the types of baselines used by the Program and the general requirements for each baseline type. Baselines will depend on the facility's type and vintage and scope of work. In all cases, the energy savings baseline is the more stringent of the NYS TRM baseline or the prevailing building/energy code (e.g., NYC ECC 2020) applicable to the installation type.

4.3.1 Baseline Equipment Types

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

4.3.1.1 Existing Facilities

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

4.3.1.1 New Construction and Gut Rehab

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

4.3.2 Baseline Efficiencies for Building Electrification Projects

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

1. Projects classified as Special Circumstance Replacements in accordance with the TRM requirements – i.e. Early Replacement or Extended Life. For Special Circumstance Replacements, the existing equipment efficiency shall be used for the baseline condition in accordance with the TRM two-step analysis method.
2. Projects involving new construction or gut rehab whose design demonstrates compliance with Section 406 of the latest ECCCNYS or the New York City Energy Conservation Code ("NYCECC") by providing more efficient HVAC performance shall set the baseline system efficiencies to exceed the minimum code efficiency requirements by 10%.
3. Low to Moderate Income projects should use the existing equipment type and efficiency as the baseline condition

4. 4. Additional Requirements for New Construction and Gut Rehab

4.4.1 New Construction and Gut Rehab Eligibility

All projects must comply with all applicable minimum code requirements, as stipulated by federal, state, and local codes. For GSHP and heat pump water heater projects, new construction projects are eligible to receive building electrification incentives. For all other building electrification projects, existing buildings, including those undertaking a gut renovation are eligible to receive building electrification incentives.

Reference the Multifamily, Small Biz, C&I, and GSHP Program Manuals for additional eligibility requirements for electrification projects.

4.4.2 Energy Code Compliance

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

- **Prescriptive**: Each discrete component complies with specific requirements
- **Component Performance Alternative**: Prescriptive approach that allows trade-offs between some components (some can be below code if others are above
- **Total Building Performance**: Using an energy model, show the entire building's compliance with code. With this method, performance trade-offs are allowed, meaning that some components in the proposed design may be less efficient than the minimally code-compliant like component in the baseline. In these instances, a trade-off must be made to "make up" for a component that does not comply with code. For example, a building owner might choose to install a more energy efficient heat pump system to "make up" for putting in more window area than allowed by the code

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

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

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

4.4.3 New Construction and Gut Rehab Energy Savings Analysis

New construction and gut rehab projects that follow a prescriptive approach, preparing a COMcheck or Tabular analysis, to demonstrate compliance with energy code may opt to submit an energy analysis using Excel calculations, i.e., the statewide calculator, or a whole building energy model. The modeling methodology is discussed in Section 4.4.2.

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

4. 5. Early Replacement Projects

Projects may qualify for early replacement if they meet the criteria summarized below as defined in the TRM. For full details, refer to Appendix M in the latest version of the TRM for guidelines for early replacement conditions.

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

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

4.5.1 Required Project Documentation

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

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

4. 6. Special Circumstance

There are two criteria for existing cooling and/or heating equipment to be eligible for special circumstance replacement. 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

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 custom categories.

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

4.6.1 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.

4.6.2 Energy Use Rule

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

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

4.6.3 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 each Energy Efficiency 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 are not affected by early replacement/extended life (ER/EL).

5. Glossary

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

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

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

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

Btu/hr.: 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/hr.). 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 Heating Load (BHL): Building heat loss in British Thermal Units per hour (Btu/hr.). 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.

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

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).

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

Decommissioning: Existing fossil fuel space heating or domestic hot water (DHW) heating appliance that is retired, disconnected, or removed in a manner that complies with all applicable federal, state, and municipality laws, regulations, and codes and is installed in conjunction with an eligible heat pump system.

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

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

Full Load Heating System: A system installed that satisfies at least 100% of total system heating load at design conditions. For locations where the total system cooling load is greater than the heating load, the heat pump system cooling capacity shall be as small as possible to satisfy the cooling load, while minimizing oversizing for the heating function to the extent possible.

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

Gut Rehabilitation ("Rehab"): A renovation that removes material down to structural load-bearing beam (as defined by the TRM, v12).

Heat Pump System: One or more electric heat pump appliances installed in a building to provide 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 Chiller (HPC): A chiller operating in a mode where a heat sink or source is outside of the building (i.e., well field, air, or chilled water loop as source of hot or cold water for the building). Unit provides either heating or cooling but not both at the same time.

Heat 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/hr.), 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 Chiller (HRC): A chiller operating in a mode where heat is moved between hot water and chilled water loops within the thermal envelope in buildings requiring simultaneous cooling and heating. Unit provides heating and cooling at the same time.

Heat Pump Chiller/ Heat Recovery Chiller (HPC+HRC): A chiller that will operate in both heat pump and heat recovery modes for a project.

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.

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.

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

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

Multifamily: A residential building with five or more units.

Phased Load Heating System: Projects that do not achieve full BE are treated as Phased if they add new electric heat equipment and permanently reduce fossil fuel or district steam heating.

Participating Contractor: To become a Participating Contractor (contractor), an entity must submit a Participating Contractor Application and a Contractor Participation Agreement Upon approval, the applicant will receive an approval notification from Con Edison and become eligible to apply for incentives in the Program. Contractors installing only HPWH do not have to be a Contractor to submit an incentive application on behalf of a customer.

Participating Distributor: HPWH distributor that is eligible to offer and receive incentives. To become a Participating Distributor, an entity must submit a HPWH Distributor Participation Agreement to Con Edison. 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.

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

Supplemental Heat: Supplemental heat refers to heating sources that are installed separate from the heat pump, such as legacy fossil fuel-fired systems, but work in tandem with the heat pump to meet the building's heating load.[90]

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

Appendix 1: Calculating Sizing Ratios

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

*AHRI Test Method: 210/240*$Heating\ Sizing\ Ratio = \frac{Max\ Heating\ Capacity\ at\ Design\ Temperature, F}{Calculated\ Heating\ Load}$

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

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

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

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

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

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

$$x = 40{,}291.67$$

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

Figure 1: NEEP Certification ccASHP

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

Information Tables

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

Performance Specs

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

Heating/Cooling Capacity Graph

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

AHRI Test Method: 340/360

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

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

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

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

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

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

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

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

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

Figure 2: AHRI Large Unitary Heat Pump

AHRI CERTIFIED®
www.ahridirectory.org

Certificate of Product Ratings

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

Brand Name : DAIKIN

Model Number : DPS010AHHE2**-4*

AHRI Type : HSP-A

Refrigerant Type : R-410A

Hertz : 60

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

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

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

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

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

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

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

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

IEER/IEER at 230v : 18.0/18.0

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

Full Load Indoor Coil Air Quantity (scfm) : 3850

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

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

3. Air Source Variable Refrigerant Flow

AHRI Test Method: 1230

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

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

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

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

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

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

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

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

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

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

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

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

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

Example:

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

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

Figure 3: Geothermal AHRI Certificate

Certificate of Product Ratings

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

Old AHRI Reference Number :

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

Model Number : 8VSHPGE12**

Brand Name : ICE AIR LLC

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

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

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www.ahridirectory.org

GLHP (Ground -Loop Heat Pumps)

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

If equipment is being installed in non-standard temperatures, option B should be followed to calculate sizing ratio. The 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.

Appendix 2: NYS Clean Heat Statewide Heat Pump Program Load Calculation Guidance

Guidance for Acceptable Load Calculations
Published: December 1, 2023, Revised July 15, 2025

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

1) Methodology
    a. Calculations shall be in accordance with ACCA Standard 183-2007 for commercial projects, ACCA Manual J, 8th Edition, for residential projects, or other approved calculation methods in accordance with the Clean Heat Program Manual.
    b. Residential equipment sizing shall be based on manufacturers' extended performance tables in accordance with ACCA Manual S, not based on nominal size or AHRI ratings.
    c. Each outdoor condensing unit or central system should be sized for the dominant heating or cooling load of its corresponding zone. When multiple central systems condition separate zones within a building, each system should be sized for the dominant heating or cooling load of its zone. Whenever one system or outdoor condenser unit conditions multiple zones within a building (e.g., a VRF system), the block load of the entire space conditioned by that system should be used (which may be smaller than the sum of the individual zone loads).
        i. To verify that the block load has been calculated correctly, the project submission should include a complete engineering load calculation report. This report must:
            1. Clearly identify the individual heating and cooling loads for each zone, detailing the inputs for envelope, solar gain, internal loads (lighting, occupants, plug loads), and ventilation consistent with this guidance document
            2. Demonstrate how the non-coincident timing of these zonal peaks was used to calculate the overall system block load.
            3. Confirm that the selected outdoor unit capacity is based on this calculated block load, not the sum of the individual zone peak loads.
        ii. Con Edison requires all Manual J submittals to follow a floor-by-floor load calculation methodology.
2) Temperatures
    a. Outdoor design temperatures should be within ±5 · F of the Clean Heat program default for the project's location, based on the Clean Heat Weather Station Reference (zip code lookup tool). In cases where the design professional chooses to use a different weather city or different ACCA reference, the design temperatures shall remain within 5 · F of the

values for 99% heating and 1% cooling, for the site as shown in the CH weather station reference.

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

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

3) The following component loads should NOT be included in load calculations:
   a. Humidification loads;
   b. Hot water piping distribution losses;
   c. Adiabatic surfaces (surfaces in which there is no heat transfer; i.e., party walls, within the building or between buildings, floors, or ceilings between conditioned floors);
   d. Duct losses/gains, where indoor equipment is ductless or where ducts are located inside conditioned space;
   e. Multiplicative or additive safety factors with no defined source.
4) Component load guidance
   a. Ventilation loads shall be supported by mechanical schedules. Calculations must account for heat recovery by subtracting the recovered energy from the total ventilation load. The final load calculation should only include the net load the heat pump is required to serve. For example, if the total ventilation heating load is 10,000 Btu/hr. and the ERV has a sensible effectiveness of 75%, the load calculation for the heat pump should only include the remaining 2,500 Btu/hr.
   b. Unless otherwise supported by project-specific blower door testing, heating and cooling infiltration shall be:

	Natural ACH Heating	Natural ACH Cooling
Retrofits	$\leqslant$ 0.7	$\leqslant$ 0.4
Typical New Construction and gut rehab	$\leqslant$ 0.3	$\leqslant$ 0.17
Passive House	$\leqslant$ 0.06	$\leqslant$ 0.034

   c. Clean Heat provides guidance on calculating design infiltration based on blower door testing. See Clean Heat Infiltration Guidance.
   d. Enclosure (envelope) component loads should use R values consistent with final architectural plans for new construction or gut rehab and verified existing conditions for retrofit.
      i. Category 4A baseline loads should be calculated based on the existing building for retrofit or gut rehab projects and the energy code minimum for new construction projects.
      ii. All documented energy-efficient features and specifications shall be accounted for when defining component loads.
      iii. For buildings where insulation levels of the envelope are not accessible for inspection, the following defaults can be used:

Vintage	IECC Climate Zone	Wall, Rim Joist	Ceiling	Basement Wall	Floor	Window U-Factor
Pre-war uninsulated masonry	N/A	4	4	4	4.5	See Window defaults in table below
Pre-war uninsulated wood frame	N/A	4.5	4	4.5	4.5	
Prior to 1979	N/A	4.8	11	4.5	4.5	
From 1979 through 2002	N/A	11	19	11	19	
NYS: 2002-2008 IECC (NYC Zone 4, 2002-2009)	4 and NYC	13	38	9	19	.45
	5	13	38	10	21	.40
	6	18	38	10	21	.35
NYS: 2008-2009 (NYC Zone 4, 2009-2011)	4 and NYC	15	38	10	19	.40
	5	21	38	10	30	.35
	6	21	49	10	30	.35
NYS: 2010-2015 (NYC Zone 4, 2011-2015)	4 and NYC	13	38	10	19	.35
	5	20	38	10	30	.35
	6	20	49	15	30	.35
NYS: 2016 through 2019	4	30	49	10	19	.35
	5	20	49	15	30	.32
	6	25	49	15	30	.32
NYC: 2016 though 2019	NYC	25	49	25	30	.32
NYS: 2020 through present	4	20	49	10	19	.32
	5	20	49	15	30	.30
	6	23	49	15	30	.30
NYC: 2020 through present	NYC	25	49	25	30	.27

Notes: the above values apply to low-rise residential buildings and commercial buildings through 2002 (shaded section). For commercial buildings after 2002, refer to the commercial building code at the time of construction. R-values shown represent minimum values for the whole assembly, including air films. Window U-factors are maximum. If any evidence of additional insulation exists, include that in the load calculations.

iv. For windows without known U-value and SHGC data, the following defaults may be used.

Window property defaults by vintage and window type

Vintage	Glazing	Frame	Storm	U-Factor BTU	SHGC
Older, poorly insulated	Single	Metal	No	1.2	0.75
	Single	Wood	No	0.71	0.64
Existing, Average insulation	Double	Metal	No	0.87	0.67
	Single	Wood/Vinyl	Yes	0.57	0.56
	Double		No		
	Double		Yes	0.44	0.51
New construction, replacement windows, ≥2005	Low e: double	Wood/Vinyl	No	0.47	0.31
	Low e: triple	Any	No	0.31	0.21

Note that window vintage may not match building vintage if windows were previously replaced. Use observed physical description of window glazing, frame type, and presence of storm panel to select the appropriate default.

e. Internal gains above normal levels (e.g., those from industrial process heat) shall be accounted for as offsetting design heating load.
f. Heating load calculations shall account for cold processes or equipment in the zone that absorb heat (for example, indoor unitary heat pump water heaters or some refrigerated cases).
g. Surface areas and geometry of exterior components (thermal envelope) and floor area used in loads must be consistent with architectural plans.

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

Appendix 3: Building Electrification Non-Residential Decommissioning Photo Guide

Con Edison Building Electrification Non-Residential Decommissioning Photo Guide

This photo guide for Consolidated Edison Company of New York, Inc. (Con Edison) provides best practices for Participating Contractors to ensure decommissioning standards and requirements are met for the Multifamily, Small Business & Nonprofit (Small Biz), and Commercial and Industrial (C&I) sectors. The examples provided in this photo guide reflect the requirements outlined in the Non-Residential Decommissioning Checklist, which can be found here.

Please note that all work should be completed in compliance with local, state, and national rules, regulations and building codes, which supersede any statements below. If a statement below conflicts with local, state, or national rules, regulations, or building codes, do not follow the statement. Instead, describe the variance in the notes field of the decommissioning checklist. Contractor assumes liability related to all decommissioning work, as outlined in the Participation Agreement(s) and/or Con Edison Program Manual.

If the specific decommissioning scope encountered is not reflected in decommissioning checklist and the best practices below do not provide additional help, please contact us at the contact information below.

Small Biz: Coned-smallbiz@willdan.com
Multifamily: Cleanheatmultifamily@coned.com
C&I: Cleanheatcommercial@coned.com
GSHP: Geothermal@coned.com

Thermostat Removal
Inspection Code – DE2

Purpose:
To ensure compliance with decommissioning standards for the removal or reassignment of thermostats during the transition to heat pump systems.

Applicability:
- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems
- ✅ Electric Resistance

Requirements from Decommissioning Checklist:
Remove thermostat(s) if it will not be used to control the new heat pump.

Inspection Protocol:
Inspectors verify that the contractor-completed Decommissioning Checklist matches on-site conditions.

- If the thermostat is not removed, confirm it is now servicing the new heat pump system.
- If not reused, the thermostat must be physically removed from the premises. Holes left in the wall from the removal should be permanently covered/sealed.

Contractor Best Practices:
- Clearly document whether the thermostat is re-used or decommissioned.
- If re-used, provide evidence of its integration with the new heat pump.
- If removed, ensure no exposed wiring is left behind and the wall is patched appropriately.

Distribution System (Boiler-Specific Requirements)

Inspection Code – DE2

Purpose:

To ensure proper sealing of hydronic and steam distribution systems when a boiler is decommissioned as part of a heat pump conversion.

Applicability:

- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

Requirements from Decommissioning Checklist:

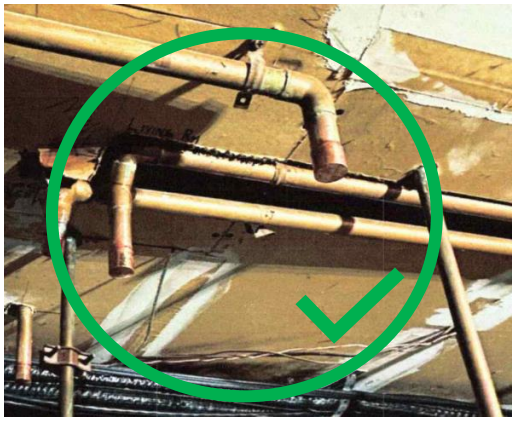
Seal hydronic or steam distribution piping according to the system type:

- Hydronic systems: Use metal soldered caps, threaded fittings, press fittings, or brazing.
- Steam systems: Use threaded fittings or a PVC cap with a metal clamp.

Inspection Protocol:

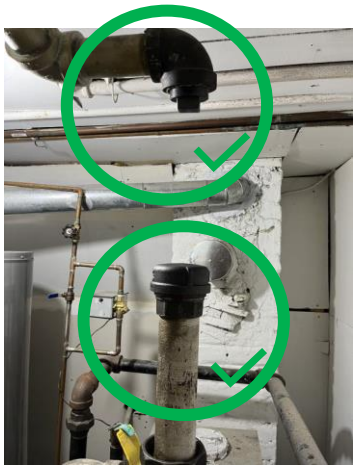
Inspectors must verify that the contractor-completed Decommissioning Checklist matches the on-site condition.

Inspect sealed piping for the correct materials and sealing method, per the requirements above.



Contractor Best Practices:

- Verify whether the decommissioned system is hydronic or steam prior to sealing.
- Use durable, mechanical sealing methods.
  Sealing with tape only is not an acceptable solution.



Distribution System (Furnace-Specific Requirements)

Inspection Code – DE2

Purpose:

To confirm that ductwork previously connected to a decommissioned furnace has been properly sealed, preventing unintended airflow or contamination.

Applicability:

- ✅ Furnace
- ✅ Gas Systems
- ✅ Oil Systems

Requirements from Decommissioning Checklist:

Seal all disconnected ductwork using rigid metal caps and fasteners.

Inspection Protocol:

Inspectors confirm that the contractor-completed Decommissioning Checklist aligns with observed field conditions.

Inspectors check that ductwork is disconnected from the decommissioned appliance and has been completely sealed using metal caps that are mechanically secured using rigid metal and fasteners.

Contractor Best Practices:

- Only use rigid metal caps — do not use foil tape, plastic covers, or temporary materials.
- Secure each cap with mechanical fasteners to prevent loosening.
- Ensure there are no gaps between the cap(s) and the duct(s).
- Take close-up photos of fasteners before applying any additional sealing tape (if used).
- Clearly indicate duct sealing completion on the Decommissioning Checklist.

Appliance Removal
Inspection Code – DE2

Purpose:
To ensure complete removal of legacy space heating equipment when converting to a heat pump system, reducing safety risks and preventing code violations.

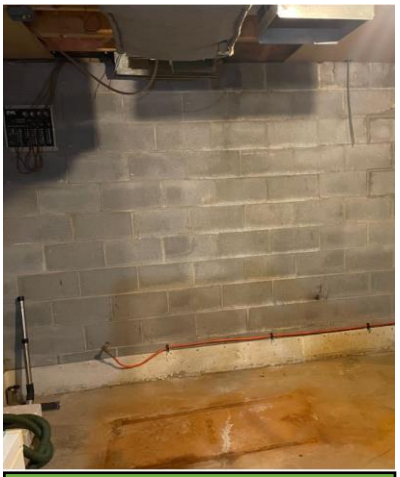
Applicability:
- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

Requirements from Decommissioning Checklist:
Completely remove the existing space heating appliance from the site.

Inspection Protocol:
Inspectors confirm the contractor-completed Decommissioning Checklist reflects the actual field conditions.
The previously used heating appliance must not be present anywhere on the premises.

Contractor Best Practices:
- Remove all components of the decommissioned heating appliance, including the casing, burner, and heat exchanger.
- Confirm removal before submitting the checklist — do not rely on scheduled removal or plans to remove.
- If an appliance must remain temporarily (e.g., waiting on disposal), clearly communicate that it's pending and do not check "complete" on the checklist.
- Take wide-angle and close-up photos of the location after removal to document absence of the equipment.

Before



After

Before

After

Fuel Storage, Fill Line Removal, and Waiver Documentation
Inspection Code – DE2

Purpose:
To guide contractors and building owners through the safe and compliant process of either removing or disabling oil and propane storage tanks and associated fill lines after converting to a heat pump system. This bulletin also outlines when and how to use the "Leaving Oil Tank on Premises When Switching to Heat Pumps" waiver form.

Applicability:
✅ Furnace
✅ Boiler
❌ Gas Systems
✅ Oil Systems

Key Recommendation from the Program
The New York State Clean Heat Program strongly recommends removing the oil tank to eliminate long-term safety risks and environmental hazards.

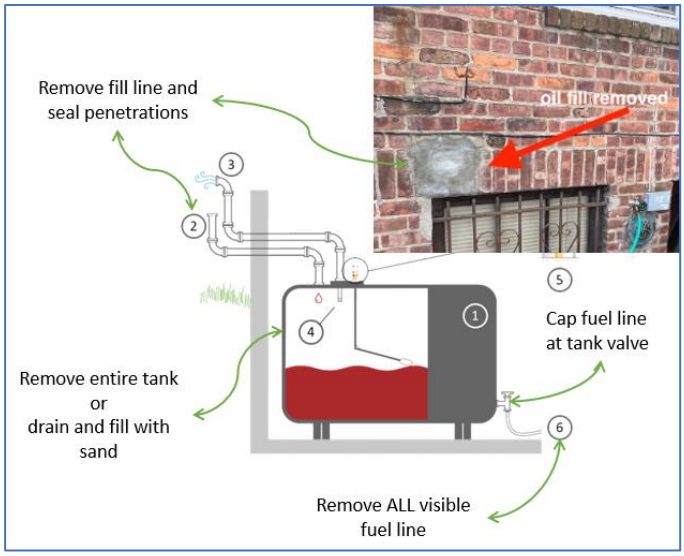
Risks of Keeping a Tank Disabled in Place:
- Deterioration over time may lead to leaks or structural failure.
- Potential pest infestation
- Fire hazard if not properly sealed
- Soil or groundwater contamination

Regulatory Requirements:
- NYC: Follow NYC Fire Code – tanks must be removed or properly disabled
- NYS (outside NYC):
  - After 90 days: tank must be emptied and capped, vent line maintained
  - After 1 year: must be removed or disabled in place

Checklist Requirements:
- Remove the tank and fill line, or disable them per code
- Seal wall penetrations where fill lines are removed
- Submit signed waiver if tank is left in place

Inspection Protocol:
- Confirm tank removal or disablement
- Verify fill line removal and sealed wall
- Ensure fuel lines are capped (see SF1)
- Collect and review waiver if tank remains

Contractor Best Practices:
- Engage a licensed tank removal or environmental specialist when required
- If disabling in place, drain, clean, and permanently disconnect it
- Always remove fill and vent lines if tank is removed
- Seal all penetrations to prevent water and pest entry
- Coordinate with SF1 fuel disconnection requirements



Disabled in Place: Burner Assembly, Control Module, and Circulation Pumps Inspection Code – DE2

Purpose:
To ensure the safe and complete decommissioning of internal components when a space heating appliance is left in place rather than removed.

Applicability:

- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

Steam systems

Hydronic systems

1. Burner Assembly Removal

Checklist Requirement:
Remove the burner assembly, including the ignitor and all fuel piping inside the appliance.

Inspection Protocol:

- Confirm all burner components are removed.

Cure Notes:
"DE2_Burner assembly not removed. Submit photo showing that the whole burner assembly (including the ignitor and fuel piping) has been removed."

2. Control Module Removal

Checklist Requirement:
Remove ignition controls, pressure controls, aquastats and zone pump valves.

Inspection Protocol:

- Confirm all components are removed and appliance is non-operational.

3. Circulation Pumps and Valves Removal (Hydronic Only)

Checklist Requirement:
Remove circulation pumps and valves from hydronic systems.

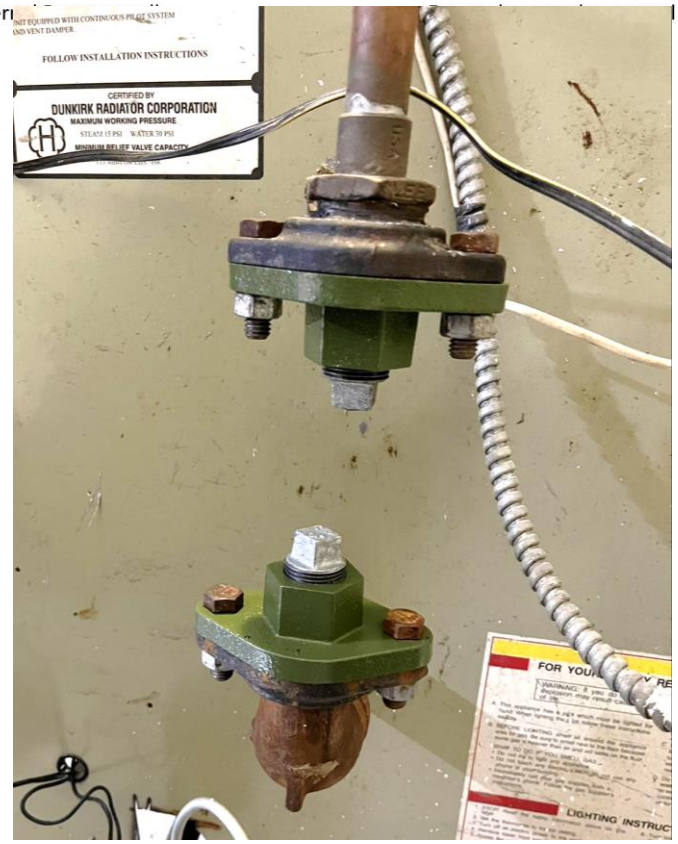
Inspection Protocol:

- Confirm pumps and valves are fully removed.

Cure Notes:
"DE2_Circulation pumps/valves not removed. Submit photo showing that the circulation pumps/valves are removed from the premises."

Best Practices:

- Remove all mechanical and fuel components
- Label appliance as disabled if remaining
- Photograph each step of component removal



Fuel Disconnection (Natural Gas Systems Only)

Inspection Code – SF2

Purpose:

Ensure safe disconnection and sealing of natural gas lines.

Applicability:

- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ❌ Oil Systems

Checklist Requirement:

- Disconnect and remove visible fuel line to appliance
- Cap with a press fitting or threaded fitting with sealant

Inspection Protocol:

- Verify full disconnection and appropriate sealing method

Best Practices:

- Cap close to main trunk
- No improvised solutions
- Coordinate with licensed gas professionals

Fuel Disconnection (Oil/Propane Systems Only)

Inspection Code – SF2

Purpose:

Ensure safe disconnection of oil/propane fuel lines.

Applicability:

- ✅ Furnace
- ✅ Boiler
- ❌ Gas Systems
- ✅ Oil Systems

Checklist Requirement:

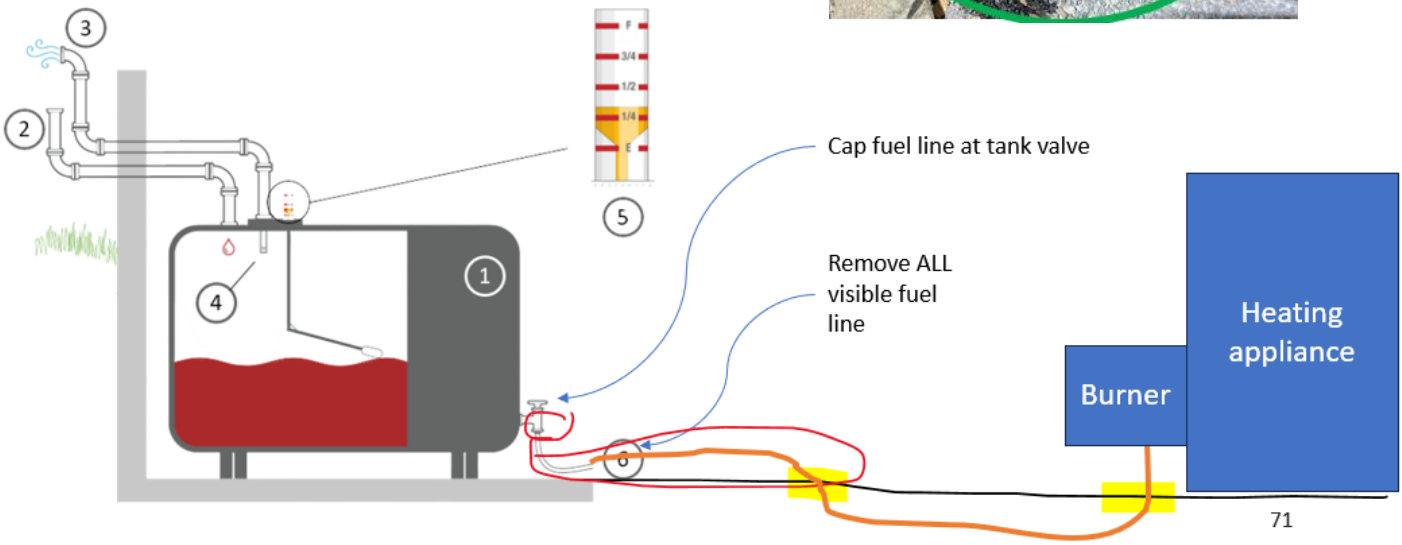
- Remove visible fuel lines and filter
- Cap at tank with threaded fitting

Inspection Protocol:

- Confirm full removal of all fuel lines and secure cap at tank

Best Practices:

- Use only threaded metal caps
- Coordinate with DE2 tank guidance



Fuel Disconnection (District Steam)

Inspection Code – SF2

Purpose:

Ensure safe disconnection from district system

Applicability:

❌ Furnace
✅ Boiler
❌ Gas Systems
❌ Oil Systems
✅ Heat exchanger
✅ District heating partial decommissioning

Checklist Requirement:

- Cut and cap at point of entry to boiler room

Inspection Protocol:

- Confirm presence of steel cap and removal of distribution in room

Best Practices:

- Cap with permanent, high temperature rated, steel cap
- Cap should be threaded and/or welded
- Follow proper notification protocol for distribution shutoff to safely disconnect reroute the steam serving the building before disconnection

Power Disconnection Inspection Code – SF3

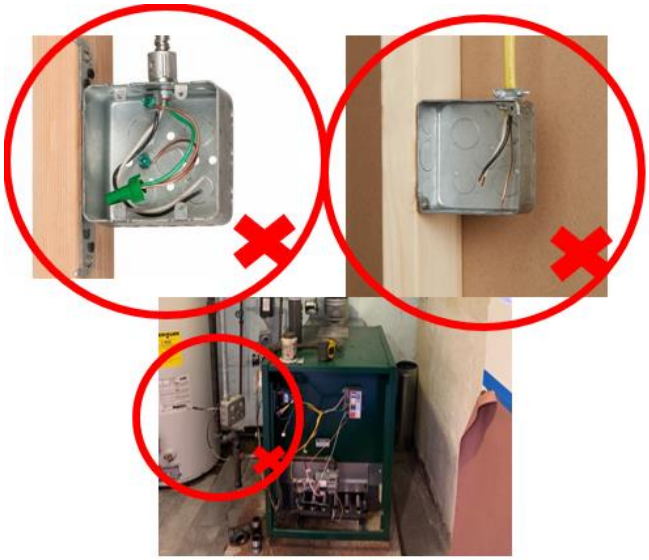
Purpose:
Ensure all power is disconnected from decommissioned appliances and wires are terminated properly.

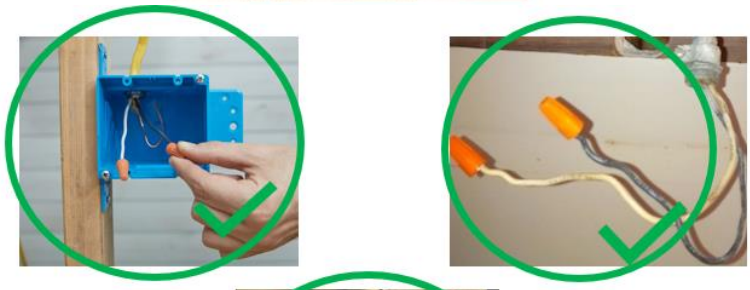
Applicability:
- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

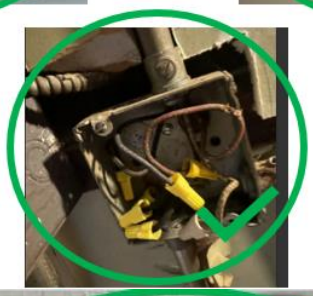
Checklist Requirement:
- Remove visible wiring
- Terminate wire ends in junction box or with wire nuts

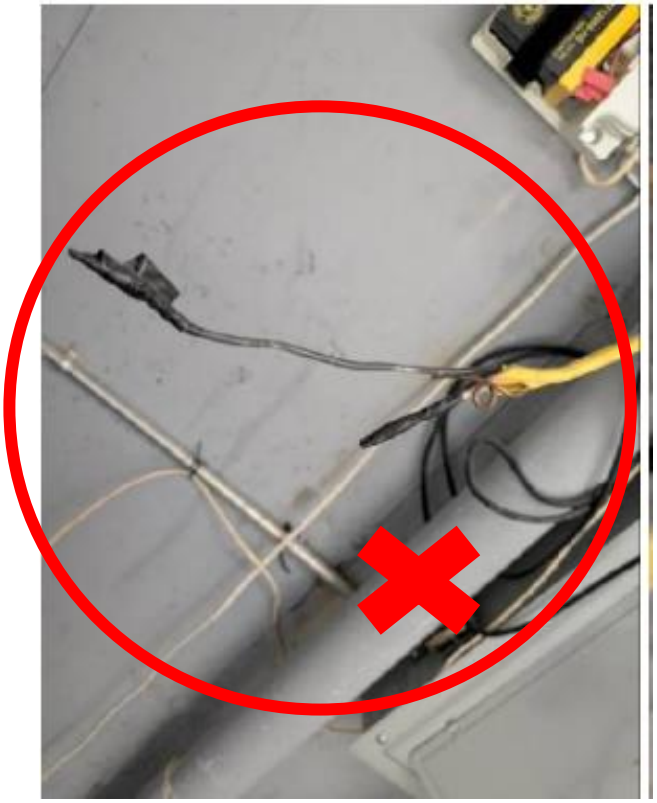
Inspection Protocol:
- Confirm power is not live and no loose/exposed wiring is present

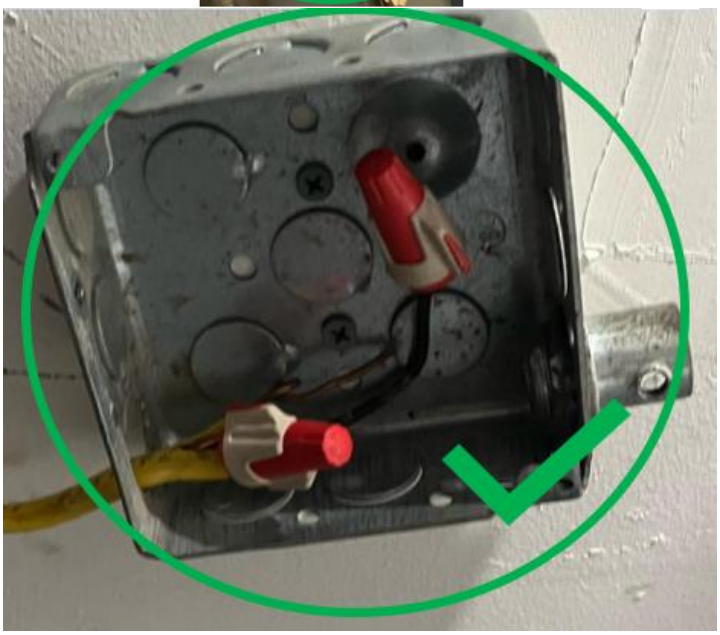
Best Practices:
- Use wire nuts
- Label and document any remaining circuits











Carbon Monoxide (CO) Detector Verification

Inspection Code – SF4

Purpose:

Ensure working CO detectors are present near remaining combustion appliances.

Applicability:

- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

Checklist Requirement:

- Detector must be:
  - Clearly labeled "CO"
  - Permanently mounted on wall or ceiling
  - Functional (indicator light or test sound)

Inspection Protocol:

- Verify presence, functionality, label, and mounting

Best Practices:

- Do not leave detectors on shelves
- Always mount and test

Exhaust Vent Sealing and Common Vent Adjustment

Inspection Code(s) – V1 & V2

Purpose:

Ensure vent openings are sealed after appliance removal and that remaining combustion appliances are properly vented.

Applicability:

- ✅ Furnace
- ✅ Boiler
- ✅ Gas Systems
- ✅ Oil Systems

V1 – Exhaust Vent Sealing

Checklist Requirement:

- Seal all unused vent openings with rigid metal caps and fasteners or patch openings if venting removed

Best Practices:

- No foil tape or temporary seals
- Confirm secure, weather-tight closure
- Use manufactured caps, crimped and fitted tightly

V2 – Common Vent Adjustment

Checklist Requirement:

- If DHW or another combustion appliance remains, adjust venting to:
  - Be pitched upward
  - Be supported and defect-free

Cure Notes:

"V2_Common exhaust venting is not modified appropriately. Submit photo showing correct pitch, support, and condition."

Best Practices:

- Use manufacturer instructions to size remaining vent
- Resize or reconnect as needed to avoid oversized orphaned vents
- Use appropriate reducers when connecting two different-sized vent piping.