



NYS Clean Heat Statewide Heat Pump Program

Participating Contractors
2021 Training Session #1 – *Residential Applications*

March 15, 2021

NYS Clean Heat Joint Management Committee



NYS Clean Heat



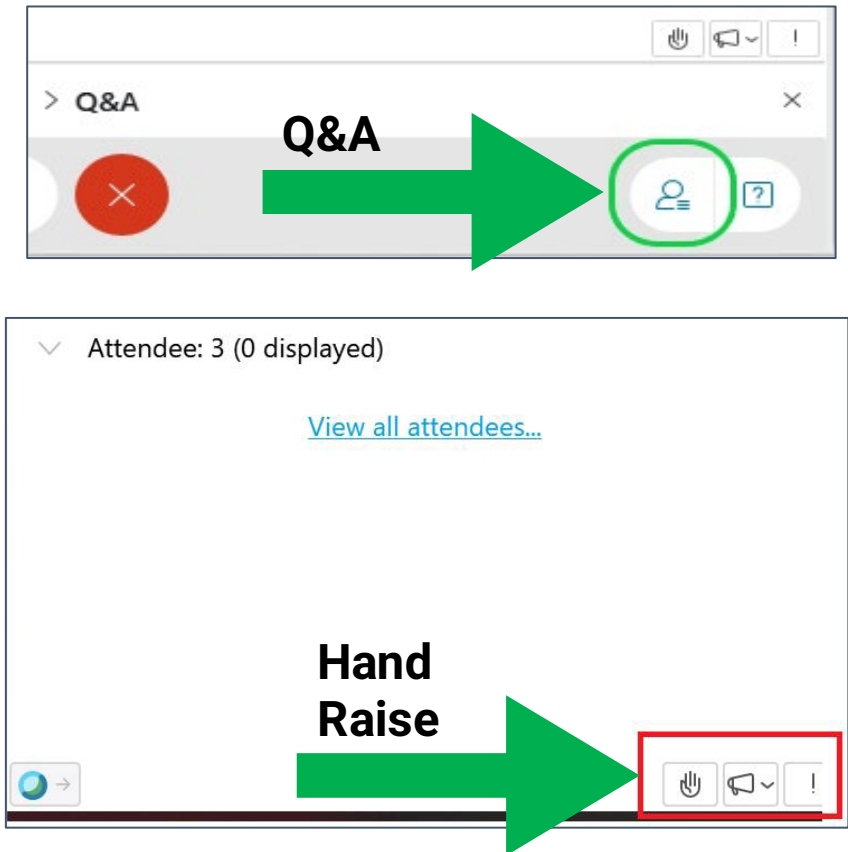
Agenda

- > Call-ins
- > Meeting procedures
- > Welcome & safety message
- > Goals for today
- > General overview of required fields
- > Zonal loads
- > Customer Acknowledgement form review
- > Q&A
- > Conclusion

Meeting procedures

Before beginning, a few reminders:

- > **All attendees will be muted**
 - > For questions or comments throughout, please use the Q&A function
 - > For the Open Discussion session, interested speakers can use the “Raise Hand” function. The meeting moderator will call on attendees and unmute individually
- > Video is encouraged when speaking
- > Slides will be shared after the meeting
- > If technical issues arise, please contact Karen Fusco at karen.fusco@nyserda.ny.gov





Welcome and safety message

Joint Management Committee (JMC) Co-Chairs:

- > **William Xia**, Program Manager, Con Edison
- > **Wendy MacPherson**, Program Manager, NYSERDA

> Other JMC Members:

- **Ray Cotto**: Central Hudson
- **Jennifer Cross**: National Grid
- **Elizabeth Arcangeli (Rhoda)**: NYSEG, RG&E
- **Mark Maloney**: Orange & Rockland

> Our implementation team speaking today:

- **Kenn Latal**: ICF
- **Matt Siano**: ICF
- **Ari Tatko**: RISE

Goals for today

- > **Review required NYSCH application fields for**
 - Category 1: ASHP Partial Load Heating
 - Category 2: ASHP Full Load Heating
 - Category 3: GSHP Full Load Heating
- > **Demo walk-through of**
 - National Grid application process
 - ICF Online Intake Tool (OIT) for:
 - Central Hudson, NYSEG/RG&E, Orange & Rockland
 - Con Edison residential applications
- > **Zonal load review**
- > **Customer Acknowledgement form review**

NYS Clean Heat Application Required Fields

HVAC Equipment	AHRI Number	Cooling System that is being Replaced	Manufacturer	Equipment Heating Capacity at Design Temp	Heating Load of the zone served by the equipment	Cooling Load of the zone served by the equipment	Outdoor Model Number	Indoor Model Number	System Type and Controls	Serial Number
Residential Mini-split HP	X	X	X	X	X	X	X	X	X	X
Residential Central Air-Source HP	X	X	X	X	X	X	X	X	X	X

HVAC Equipment	AHRI Number	Is Desuperheater installed?	Geothermal HP Product type	Model number	Manufacturer	Serial Number	Existing DHW System Fuel and Type **	Volume of Water Heater	GSHP COP (Full)	Product Type	Heating Capacity at Design temp	Heating Load of the zone served by this equipment	Cooling Load of the zone served by this equipment	Pumping Power	Pumping Control Strategy	Cooling System that is being replaced
Residential Ground – Source Heat Pump	X	X	X	X	X	X				X	X	X	X	X	X	X
Ground Source Heat Pump Demand DHW				X	X	X										

*If you cannot find the AHRI Number, please refer to the AHRI Directory: <https://www.ahridirectory.org/>

**Volume of Water Heater required if a Desuperheater is installed.

Please complete the entire application.

HOW TO APPLY

New qualifying equipment installed from 1/1/2021 to 12/31/2021 is eligible contingent upon availability of funds.
New equipment must be installed at a property with an active electric account and address listed on this application.

1. Verify that the equipment you will be purchasing meets minimum eligibility requirements listed on this application.
2. Purchase the qualified equipment and have a participating contractor install it.
3. Submit completed application, invoice, Manual J/S or Standard 183 for all commercial buildings or applicable code approved alternatives.

Email: NGridHeatPumpNY@RISEengineering.com
or by mail to: RISE Engineering
18 B Pelts Lane
Albany, NY 12205
For questions, call: 1-888-889-7207
Visit: Ngrid.com/ny-heatandcool

Make sure your invoice includes:

- | | | |
|------------------------------|--|-------------------------------------|
| • Equipment installed | • Equipment and installation costs | • "Paid in full" or "zero balance" |
| • Quantity installed | • Manufacturer | • Installation date and location |
| • Installer name and address | • Model number of indoor and outdoor equipment | • Incentive amount paid to customer |

CUSTOMER/ACCOUNT HOLDER INFORMATION — FORM MUST BE COMPLETED IN ITS ENTIRETY.

ELECTRIC ACCOUNT NUMBER AT INSTALLATION ADDRESS	INSTALLATION DATE	EQUIPMENT COST:	LABOR COST:
ACCOUNT HOLDER FIRST NAME	ACCOUNT HOLDER LAST NAME		
INSTALL ADDRESS	CITY	STATE	ZIP
EMAIL ADDRESS	PHONE		

CONTRACTOR INFORMATION — THIS INFORMATION MUST ALSO APPEAR ON THE CONTRACTOR INVOICE.

CONTRACTOR COMPANY NAME	CONTACT NAME

GSHP DESIGNER INFORMATION — THIS INFORMATION MUST ALSO APPEAR ON THE CONTRACTOR INVOICE.

CONTRACTOR COMPANY NAME	CONTACT NAME

GSHP DRILLER INFORMATION — THIS INFORMATION MUST ALSO APPEAR ON THE CONTRACTOR INVOICE.

CONTRACTOR COMPANY NAME	CONTACT NAME

*Cost data is confidential and will be used for program evaluation in aggregate form that will not identify the contractor.

- > *Note:* National Grid only branded
- > Additional Fields in Project Information section collecting data on existing equipment and the building.
- > Additional equipment and sizing boxes available. Can add as many of those pages as needed when submitting application.

PROJECT INFORMATION

Existing Heating System Fuel (What did you replace or what are you avoiding?):

☐ Oil ☐ Propane ☐ Electric ☐ Natural Gas ☐ Wood ☐ Wood Pallets ☐ Other _____

Describe Existing Heating Type:

☐ Electric Resistance ☐ Furnace ☐ Boiler ☐ Packaged Heat Pump ☐ Split System Heat Pump ☐ Other _____

Will New Equipment Replace Existing System: ☐ Yes ☐ No New Construction: ☐ Yes ☐ No

Equipment Will Supplement Existing System? ☐ Yes ☐ No Home Occupancy: ☐ Year Round ☐ Seasonal/Vacation Home

Describe Existing Cooling Type: ☐ Split ☐ Packaged ☐ Room ☐ None

Status of Existing Equipment: ☐ Removed by contractor ☐ Left in place ☐ Decommissioned by contractor ☐ Not applicable (new construction)

Building Type: ☐ Single family detached ☐ Residential Attached (duplex, row, townhome or multifamily)

☐ Multifamily (5 or more apartments) ☐ Small Commercial

Number of floors per building (not including basement) _____ Year building built: _____

ASHP (for multiple equipment please use added table at the end of the application)

AHRI Reference Number:	Equipment Manufacturer:
ASHP Indoor Model Number:	ASHP Outdoor Model Number:
ASHP Outdoor Serial Number:	Supplemental Electric Heating Included: <input type="checkbox"/> Yes <input type="checkbox"/> No
SEER:	HSPF:
System Type and Controls (MSHP):	

GSHP

AHRI Reference Number:	Equipment Manufacturer:
GSHP Model Number:	GSHP Serial Number:
Heat Pump Loop Type (DX/Closed Loop/Open Loop):	Pumping Control (constant, staged, variable):
Pumping Power (watts/nominal rated ton):	GSHP COP (full load when installing a WW-EP):

GSHIP rated EERs (full and part):

Type of AHFI related data provided: (GLHP/GWHP)	System Type (water-to-water/water-to-air)
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HPWH

AHER Reference Number:	Equipment Manufacturer:	
HPWH Model Number:	HPWH Serial Number:	
Existing DHW Fuel Replaced: <input type="checkbox"/> Yes <input type="checkbox"/> No	Tank Volume (gallons):	Number of Occupants:

Sizing (for multiple equipment please use added table at the end of the application)

Equipment Heating Capacity @ Design F (Btu/h):	Equipment Heating Capacity @ 5F (Btu/h):
Building Heating Load @ Design F:	Building Cooling Load @ Design F:
What is calculated sizing ratio:	Total System Heating Capacity @ Design F:
Total System Cooling Capacity @ Design F:	Heating Load of Zone served by this equipment:
Cooling Load of Zone served by this equipment:	

National Grid Format & Fields

Sizing (for multiple equipment please use added table at the end of the application)	
Equipment Heating Capacity @ Design F (Btuh):	Equipment Heating Capacity @ 5F (Btuh):
Building Heating Load @ Design F:	Building Cooling Load @ Design F:
What is calculated sizing ratio:	Total System Heating Capacity @ Design F:
Total System Cooling Capacity @ Design F:	Heating Load of Zone served by this equipment:
Cooling Load of Zone served by this equipment:	

- > Equipment Heating Capacity @ Design F (Btuh) – If there is more than one heat pump in a system this is per heat pump
- > Equipment Heating Capacity @5F (Btuh) – This comes from NEEP (ASHP)
- > Building Heating Load @ Design F – This is a Manual J Heating Load
- > Building Cooling Load @ Design F – This is a Manual J Cooling Load
- > Calculated Sizing Ratio – Focus on the heating sizing ratio since it should be driving system capacities in a typical residence or small commercial building. On the cooling side concentrate on minimum capacities to the 115% guidance from the ACCA appendix.

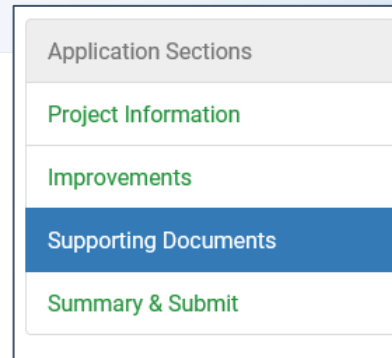
National Grid Format & Fields

Sizing (for multiple equipment please use added table at the end of the application)	
Equipment Heating Capacity @ Design F (Btuh):	Equipment Heating Capacity @ 5F (Btuh):
Building Heating Load @ Design F:	Building Cooling Load @ Design F:
What is calculated sizing ratio:	Total System Heating Capacity @ Design F:
Total System Cooling Capacity @ Design F:	Heating Load of Zone served by this equipment:
Cooling Load of Zone served by this equipment:	

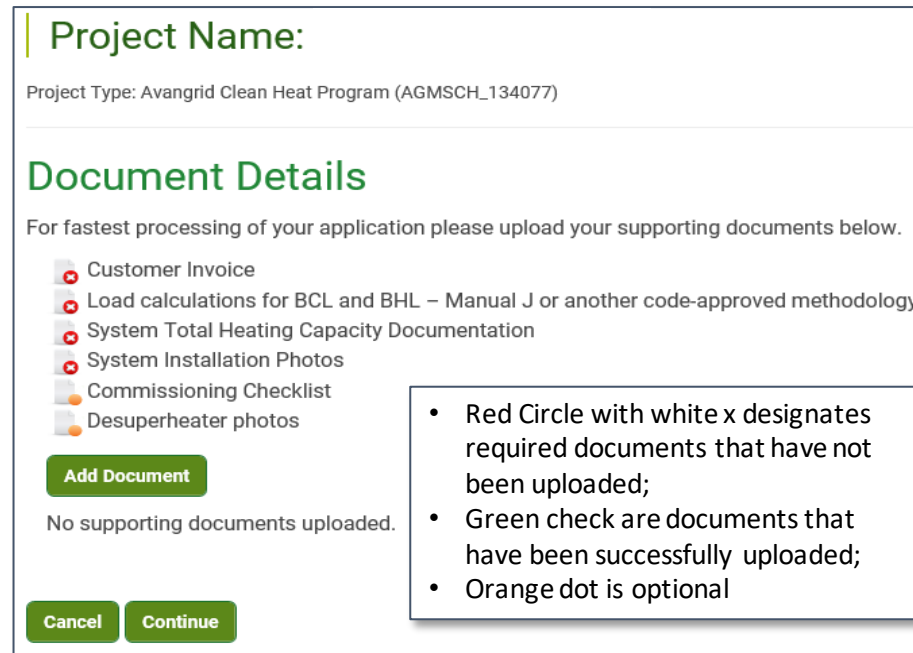
- > Total System Heating Capacity @ Design F – The total system heating capacity that is equal to the sum of the individual heating capacities at Design F, with the focus on maximum capacity at design temp.
- > Total System Cooling Capacity @ Design F – The total system cooling capacity is equal to the sum of individual cooling capacities at Design F, with the focus on minimum capacity at design temp.
- > Will show examples of where to find data and dive deeper into Zonal Loads in upcoming slides

OIT Format & Required Fields

- > When submitting your NYS Clean Heat project, it is mandatory that all applicable documents listed in the 'Supporting Documents' section of the project are successfully uploaded.
- > Failure to upload these documents will lead to your project not being processed.
- > Option documents include:
 - > Desuperheater Photos
 - > Commissioning Checklist



A vertical menu titled 'Application Sections' with five items: 'Project Information', 'Improvements', 'Supporting Documents' (highlighted in blue), and 'Summary & Submit'.



Project Name:
Project Type: Avangrid Clean Heat Program (AGMSCH_134077)

Document Details
For fastest processing of your application please upload your supporting documents below.

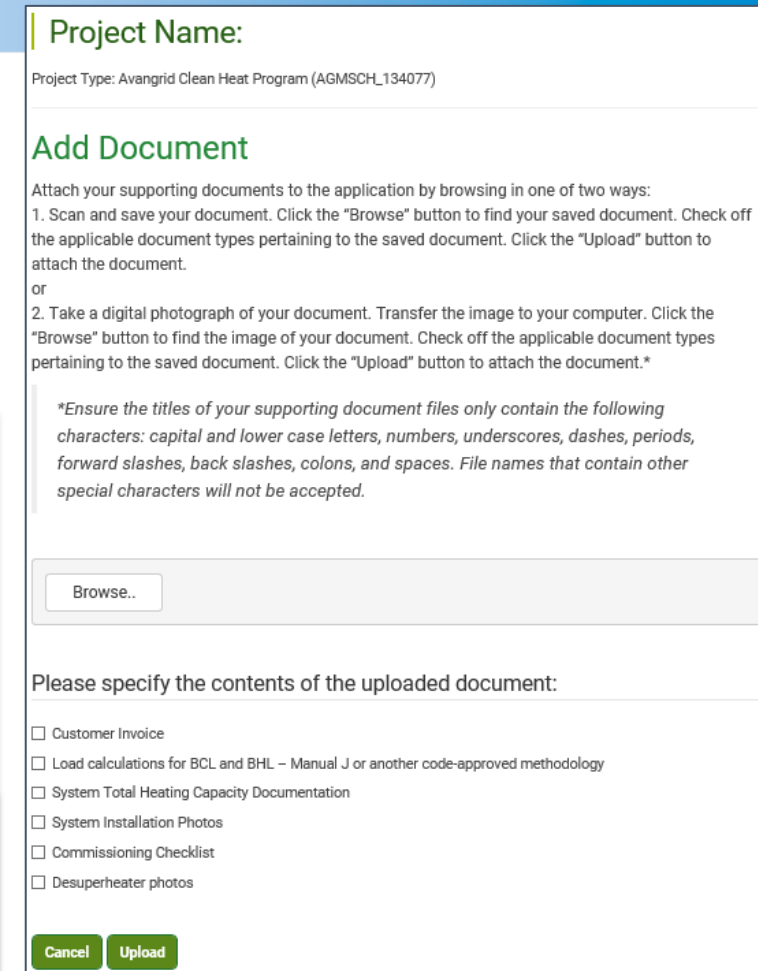
- ☐ Customer Invoice
- ☐ Load calculations for BCL and BHL – Manual J or another code-approved methodology
- ☐ System Total Heating Capacity Documentation
- ☐ System Installation Photos
- ☐ Commissioning Checklist
- ☐ Desuperheater photos

Add Document

No supporting documents uploaded.

Cancel Continue

- Red Circle with white x designates required documents that have not been uploaded;
- Green check are documents that have been successfully uploaded;
- Orange dot is optional



Project Name:
Project Type: Avangrid Clean Heat Program (AGMSCH_134077)

Add Document
Attach your supporting documents to the application by browsing in one of two ways:
1. Scan and save your document. Click the "Browse" button to find your saved document. Check off the applicable document types pertaining to the saved document. Click the "Upload" button to attach the document.
or
2. Take a digital photograph of your document. Transfer the image to your computer. Click the "Browse" button to find the image of your document. Check off the applicable document types pertaining to the saved document. Click the "Upload" button to attach the document.*

**Ensure the titles of your supporting document files only contain the following characters: capital and lower case letters, numbers, underscores, dashes, periods, forward slashes, back slashes, colons, and spaces. File names that contain other special characters will not be accepted.*

Browse..

Please specify the contents of the uploaded document:

- ☐ Customer Invoice
- ☐ Load calculations for BCL and BHL – Manual J or another code-approved methodology
- ☐ System Total Heating Capacity Documentation
- ☐ System Installation Photos
- ☐ Commissioning Checklist
- ☐ Desuperheater photos

Cancel Upload

Application – New Fields

> Building type changes

- Added more building single and multifamily attached selections
- Added selection for 5+ units in multi-family building

House Information

Home Occupancy: ☐ Year-round
☐ Seasonal/Vacation Home

Building Type:

Is this a multifamily building with 5 or more apartments?: ☐ Yes
☐ No

New Construction Project (includes gut renovation)?: ☐ Yes
☐ No

Building Type:

Building with 5 or more apartments?:

Project (includes gut renovation)?:

Effective future dates):

Select Pre-1979):

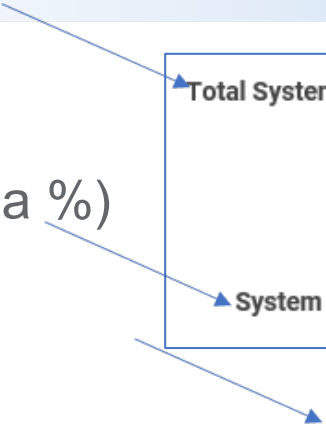
Select a Value

- Residential: Single Family Detached (1-3 floors)
- Residential: Single Family Detached (4+ floors)
- Residential: Attached Duplex, Row or Townhome, or Multifamily (1-3 floors)
- Residential: Attached Duplex, Row or Townhome, or Multifamily (4+ floors)
- Assembly
- Auto Repair
- Big Box Retail
- Fast Food Restaurant
- Full Service Restaurant
- Grocery
- Light Industrial
- Motel
- Primary School
- Religious Worship
- Small Office
- Small Retail
- Warehouse
- Other

☐ 1979-2006

Application – New Fields

- > Total project costs
- > System Cost for Equipment (as a %)




▶ Total System Heating Capacity at design temp:

Total Project Costs: \$

▶ System Cost for Equipment (as a %): %


- > Replaced “All Others” with “Wood” and “Coal”
- > Status of Existing Equipment



Primary House Heating Fuel Type

Heating fuel of system replaced (or baseline for new construction):

- ☐ Electric
- ☐ Gas
- ☐ Oil
- ☐ Propane
- ☐ Wood
- ☐ Coal



Status of Existing Equipment :

- ☐ Removed by Contractor
- ☐ Decommissioned by Contractor
- ☐ Left in place
- ☐ Not applicable (new construction)

Project Information

- **Building Heating Load (BHL):**
 - The heating load of the house from manual J. (Also known as Total Heat Loss, no commas)
- **Total System Heating Capacity at design temp:**
 - Combined total of outdoor unit heating capacity at design temp. (no commas)
- **Building Cooling Load (BCL)**
 - The cooling load of the whole building from the Manual J (sensible + latent heat gain)
- **Total System Cooling Capacity at design temp:**
 - Combined total MIN @ 95° cooling capacity from NEEP.

Additional Information

System Designer:

Ground Source Heat Pump Driller:

Building Load (Partial or Full)? :

- ☐ Partial
☐ Full

Supplemental Electric Heating Included?:

Building Cooling Load (BCL) At Design Temp:

Total System Cooling Capacity at design temp:

Building Heating Load (BHL) At Design Temp:

Total System Heating Capacity at design temp:

Describe the cooling system replaced?:

Total Project Costs :

System Cost for Equipment (as a %):

Status of Existing Equipment :

- ☐ Removed by Contractor
☐ Decommissioned by Contractor
☐ Left in place
☐ Not applicable (new construction)



Improvements – Air Source HP

Notes for Cold Climate Air Source HP:

- **System Type and Controls**
 - This will be “Separate Controls” unless the control for the system being entered also controls other heating systems in the building (Furnace, HP etc.)
- **Number of Units:** Please always enter “1”, add each condenser or “system” as its own unique “improvement”.
- **AHRI Reference Number:**
 - Found at top of the NEEP sheet. Double-check!
- **Equipment Heating Capacity at Design Temp:**
 - Btu/h of heating this heat pump configuration supplies at the Manual J design temperature (no commas)
 - Must use either manufacturer performance data, NEEP data or the BTU Estimator tool with said data (slides 15/16)

Home Create Applications Documents Help Administration

Application Sections

- Project Information
- Improvements**
- Supporting Documents
- Summary & Submit

Project Name: Jane Doe
Project Type: Central Hudson Midstream (CH_137380)

Add HVAC

Select Equipment Type:

Equipment Type: Cold Climate Air Source HP

System Type and Controls: Select a Value

Manufacturer:

Number of Units:

AHRI Reference Number:

Equipment Heating Capacity (BTU) at Design Temp:

Heating Load of the zone served by this equipment:

Cooling Load of the zone served by this equipment:

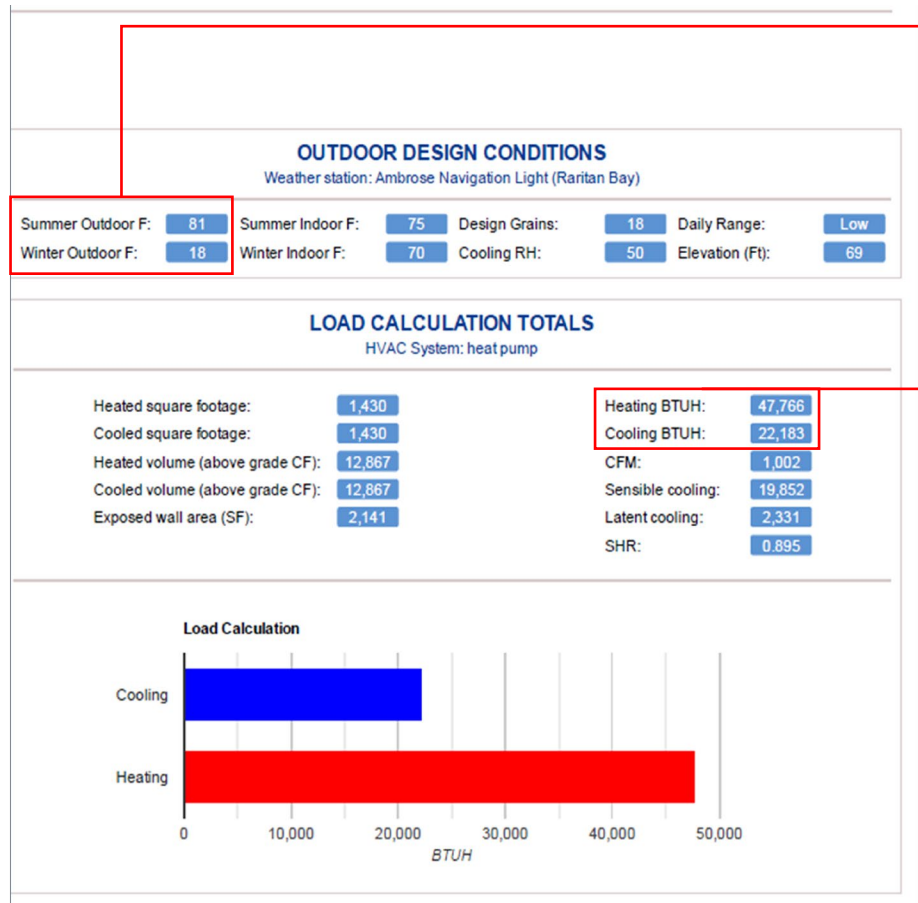
Outdoor Model:

Outdoor Serial Number:

Indoor Model:

Cancel Continue

Manual J Reference Points: All Categories



- Outdoor Design Temperatures for the Manual J will be based on ACCA criteria that covers each utility territory in NYS.
 - Must be “most reasonable” selection, based on acceptable configurations provided. Example:
 - These temperatures will affect system capacity.
- The resulting whole-house (or building) Heating and Cooling loads will determine the selection of the equipment, to satisfy either Partial or Full load as desired.
- It is important that the Heating Ratio does not exceed .90% for Partial Heating Load projects (category1) and the Heating Ratio falls within .90% and 1.2% for Full Load Heating (Category 2)
- Equally important is the Cooling Ratio does not exceed 1.15% for both Category 1 & 2
- If the values presented are not followed, the project will not pass eligibility for a rebate.

ACCA Cities for Central Hudson

Kingston: 2/88 Albany Co AP: 3/86
POK: 6/89 Albany CO: 1/88
Newburgh: 9/86

Determining Heating Capacity at Design Temperature for Category 1 & 2 - Method 1 (Interpolate)

Estimating BTU/h at Manual J temp with manufacturer's data

■ Model: AOU36RLXFZH

NOTE: Values mentioned in the table are calculated based on the maximum capacity.

● Heating capacity in kBTU/h

TC: Total Capacity (kBTU/h), IP: Input Power (kW)

Indoor unit connection capacity	Outdoor temperature		Indoor temperature									
			45°F DB		55°F DB		65°F DB		75°F DB		85°F DB	
	°DB	°WB	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
30	-15	-17	25.3	3.48	22.7	3.33	22.1	3.60	21.8	3.67	21.3	3.74
	-5	-7	28.4	3.65	25.8	3.72	25.1	3.80	24.3	3.88	23.7	3.95
	5	3	38.2	5.08	37.3	5.14	36.4	5.29	35.5	5.37	34.6	5.50
	14	12	45.8	5.01	38.6	5.12	38.6	5.22	37.7	5.32	36.7	5.43
	23	19	42.9	4.76	41.9	4.86	40.8	4.96	39.8	5.06	38.8	5.16
	32	28	44.1	4.87	43.1	4.88	42.0	4.76	41.0	4.85	39.9	4.95
	41	37	44.1	5.94	43.1	4.83	42.0	4.76	41.0	4.78	39.9	4.28
	47	43	44.1	5.21	43.1	5.28	42.0	5.35	41.0	5.41	39.9	5.48
	53	47	44.1	5.20	43.1	5.27	42.0	5.34	41.0	5.40	39.9	5.47
	59	50	44.1	5.18	43.1	5.25	42.0	5.31	41.0	5.36	39.9	5.45
	68	58	44.1	5.06	43.1	5.11	42.0	5.19	41.0	5.24	39.9	5.30
	75	65	44.1	5.05	43.1	5.01	42.0	5.07	41.0	5.13	39.9	5.19
	-15	-17	25.3	3.48	22.7	3.33	22.1	3.60	21.8	3.67	21.3	3.74
	-5	-7	28.4	3.65	25.8	3.72	25.1	3.80	24.3	3.88	23.7	3.95
	5	3	38.2	5.08	37.3	5.14	36.4	5.29	35.5	5.37	34.6	5.50
	14	12	40.8	5.01	38.6	5.12	38.6	5.22	37.7	5.32	36.7	5.43
	23	19	42.9	4.76	41.9	4.86	40.8	4.96	39.8	5.06	38.8	5.16
	32	28	44.1	4.87	43.1	4.88	42.0	4.76	41.0	4.85	39.9	4.95
	41	37	44.1	5.94	43.1	4.83	42.0	4.76	41.0	4.78	39.9	4.28
	47	43	44.1	5.21	43.1	5.28	42.0	5.35	41.0	5.41	39.9	5.48
	53	47	44.1	5.20	43.1	5.27	42.0	5.34	41.0	5.40	39.9	5.47
	59	50	44.1	5.18	43.1	5.25	42.0	5.31	41.0	5.36	39.9	5.45
	68	58	44.1	5.06	43.1	5.11	42.0	5.19	41.0	5.24	39.9	5.30
	75	65	44.1	5.05	43.1	5.01	42.0	5.07	41.0	5.13	39.9	5.19
	-15	-17	25.3	3.48	22.7	3.33	22.1	3.60	21.8	3.67	21.3	3.74
	-5	-7	28.4	3.65	25.8	3.72	25.1	3.80	24.3	3.88	23.7	3.95
	5	3	38.2	5.08	37.3	5.14	36.4	5.29	35.5	5.37	34.6	5.50
	14	12	40.8	5.01	38.6	5.12	38.6	5.22	37.7	5.32	36.7	5.43
	23	19	42.9	4.76	41.9	4.86	40.8	4.96	39.8	5.06	38.8	5.16
	32	28	44.1	4.87	43.1	4.88	42.0	4.76	41.0	4.85	39.9	4.95
	41	37	44.1	5.94	43.1	4.83	42.0	4.76	41.0	4.78	39.9	4.28
	47	43	44.1	5.21	43.1	5.28	42.0	5.35	41.0	5.41	39.9	5.48
	53	47	44.1	5.20	43.1	5.27	42.0	5.34	41.0	5.40	39.9	5.47
	59	50	44.1	5.18	43.1	5.25	42.0	5.31	41.0	5.36	39.9	5.45
	68	58	44.1	5.06	43.1	5.11	42.0	5.19	41.0	5.24	39.9	5.30
	75	65	44.1	5.05	43.1	5.01	42.0	5.07	41.0	5.13	39.9	5.19
	-15	-17	25.3	3.48	22.7	3.33	22.1	3.60	21.8	3.67	21.3	3.74
	-5	-7	28.4	3.65	25.8	3.72	25.1	3.79	24.3	3.87	23.7	3.94
	5	3	38.2	5.07	37.3	5.14	36.4	5.28	35.5	5.36	34.6	5.49
	14	12	40.8	5.01	38.6	5.11	38.6	5.21	37.7	5.31	36.7	5.42
	23	19	42.9	4.76	41.9	4.86	40.8	4.96	39.8	5.06	38.8	5.16
	32	28	44.1	4.87	43.1	4.88	42.0	4.76	41.0	4.85	39.9	4.94
	41	37	44.1	5.93	43.1	4.82	42.0	4.75	41.0	4.84	39.9	4.94

Equipment BTU (DBTU) Estimator for HEATING
Type in the green cells

ACCA Cities for Central Hudson
Newburgh: 9/86 Kingston: 2/88
POK: 6/89 Albany CO: 1/88

notes: Example for Fujitsu model AOU36RLXFZH in Kingston

If no temp-specific data exists for a model's BTUs Heating @ Design Temp,
Use best data from manufacturer, NEEP, or AHRI


	Degree	Max BTUs
Nearest COLDER data =	-5	25,100
(Man J) Design Temp ** =	2	33,010
Nearest WARMER data =	5	36,400

** If Design Temp is BELOW available data,
manufacturer data for the unit at design temp must be provided.

Questions? Jeff.Luoma@icf.com or Matthew.Siano@icf.com

Kingston at 2 degrees

Estimating BTU/h at Manual J temp with NEEP data



FUJITSU
INFINITE COMFORT

FUJITSU Halcyon Multi-room Mini-Split Systems
Singlezone Non-ducted Wall Placement
AHRI Cert #: 204740070
Outdoor Unit #: AOU15LZAS1
Indoor Unit #: ASUG15LZAS1

Maximum Heating Capacity (Btu/hr) @5°F: 21,000
Rated Heating Capacity (Btu/hr) @47°F: 18,000
Rated Cooling Capacity (Btu/hr) @95°F: 14,500

Information Tables

Brand FUJITSU

Performance Specs

Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Heating	-6°F	70°F	Btu/h	3,100	-	18,600
			kW	0.38	-	2.74
			COP	2.39	-	1.99
Heating	5°F	70°F	Btu/h	4,000	-	21,000
			kW	0.62	-	2.75
			COP	2.93	-	2.24
Heating	17°F	70°F	Btu/h	5,200	-	21,500
			kW	0.82	-	2.59
			COP	3.63	3.25	2.43
Heating	47°F	70°F	Btu/h	3,100	18,000	23,900
			kW	0.15	1.15	2.19
			COP	6.06	4.59	3.2
Cooling	82°F	80°F	Btu/h	4,300	-	20,200
			kW	0.13	-	1.35
			COP	9.69	-	4.39
Cooling	95°F	80°F	Btu/h	3,100	14,500	18,400
			kW	0.15	1.04	1.56
			COP	6.06	4.09	3.46

Heating/Cooling Capacity Graph

Equipment BTU (DBTU) Estimator for HEATING
Type in the green cells

ACCA Cities for Central Hudson
Newburgh: 9/86 Kingston: 2/88
POK: 6/89 Albany CO: 1/88

notes: Example for Fujitsu model AOU12LZAS1 in Poughkeepsie

If no temp-specific data exists for a model's BTUs Heating @ Design Temp,
Use best data from manufacturer, NEEP, or AHRI


	Degree	Max BTUs
Nearest COLDER data =	5	21,000
(Man J) Design Temp ** =	6	21,042
Nearest WARMER data =	17	21,500

** If Design Temp is BELOW available data,
manufacturer data for the unit at design temp must be provided.

Questions? Jeff.Luoma@icf.com or Matthew.Siano@icf.com

- Using the BTU Estimator tool, combined with either the NEEP Cutsheet, or Manufacturer's Expanded Performance Data, we take the two nearest (colder and warmer) Design Temperature/Capacity configurations.
- We then enter the actual outdoor heating design temperature. Absent more accurate data, a linear loss is assumed.
- NEEP often does not have Design Temperature/Capacity configurations below 5°F, whereas Manuf. should.

Determining Heating Capacity at Design Temperature for Category 1 & 2 - Method 2 (Manufacturer calculated; or NEEP Direct)



Mitsubishi Electric M-Series H2i
Singlezone Non-ducted Wall Placement
AHRI Cert #: 201754298
Outdoor Unit #: MUZ-FH12NA
Indoor Unit #: MSZ-FH12NA
Maximum Heating Capacity (Btu/hr) @5°F: 13,600
Rated Heating Capacity (Btu/hr) @47°F: 13,600
Rated Cooling Capacity (Btu/hr) @95°F: 12,000

If two Max BTUs are the same, we assume the BTUs are the same for all temperatures in between.

Information Tables

Brand	Mitsubishi Electric
Series	M-Series H2i
Ducting Configuration	Singlezone Non-ducted Wall Placement
AHRI Certificate No.	201754298
Outdoor Unit #	MUZ-FH12NA
Indoor Unit Type	Mini-Splits
Indoor Unit #	MSZ-FH12NA
Furnace Unit #	
SEER	26.1

Performance Specs

Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Heating	5°F	70°F	Btu/h	1,450	-	13,600
			kW	0.15	-	1.8
			COP	2.83	-	2.21
Heating	17°F	70°F	Btu/h	2,100	8,000	13,600
			kW	0.2	0.72	1.9
			COP	3.08	3.26	2.1
Heating	47°F	70°F	Btu/h	3,700	13,600	21,000
			kW	0.28	0.95	2.3

The NEEP Maximum heating capacity can be used as the heating capacity at design temperature if:

- It does not change above/below the design temp.
- The Outdoor dry bulb temperature matches the design temperature of the Manual J

Indoor Units: 1 / 1 to 1
Capacity: 12 / 6 to 12 (100.0%)
* Connectable capacity is not actual capacity.
Total Pipe Length: 15.0 / 65.0 feet

Correction Factors
Temperature: 1.06 0.91
Piping Length: 1.00 1.00
Defrosting: - 1.00
User Derate: 1.00 1.00
Total Derate: 1.06 0.91
Additional Refrigerant: 0.0 lb
Total Refrigerant Amount: 2.6 lb

Conditions (°F)
Cooling
Indoor DB 80.0 Humidity 51.8% Indoor WB 67.0
Outdoor DB 89.0
Heating
Indoor DB 70.0 Humidity 14.3% Outdoor WB -0.7

MUZ-FH12NA

System 3

MSZ-FH12NA

1/4 / 3/8
15.0ft (0)

N/A / 3

12,781 BTU/h (10,274 BTU/h)
12,344 BTU/h

Est. Cooling Discharge Air Temp: 58.6
Est. Heating Discharge Air Temp: 95.2

Example is Mitsubishi Diamond System Builder – Design Temp is 2°F

Many Manufacturers have proprietary software that is able to calculate heating capacity at specific selectable design temperatures, as needed depending on the Manual J.

As you can see the capacity difference between 2°F (12,344 Btu/h) and 5° (13,600 Btu/h) is substantial and could impact project eligibility.

Category 3: Ground Source Heat Pump Specific OIT Fields (Improvements)

- Ground Source Heat Pumps require the **ENERGY STAR Unique ID**
This can be found at:
<https://www.energystar.gov/productfinder/product/certified-geothermal-heat-pumps/results>
- **Tank Volume** is required if a desuperheater was installed
- **Equipment Heating Capacity (BTU) at Design Temp:** This data will come from the AHRI Full Load Heating Capacity specific to the system type; or from more specific information obtained through software. We will accept either.

The screenshot shows a web application interface for adding HVAC equipment. The top navigation bar includes links for Home, Create, Applications, Documents, Help, and Administration. On the left, a sidebar titled 'Application Sections' lists 'Project Information', 'Improvements' (which is selected), 'Supporting Documents', and 'Summary & Submit'. The main content area displays 'Project Name: Jane Doe' and 'Project Type: Central Hudson Midstream (CH_137380)'. Below this, the 'Add HVAC' section contains several input fields: 'Select Equipment Type:' with a dropdown menu showing 'Ground Source Heat Pump'; 'Pumping Control Strategy:' with a 'Select a Value' dropdown; 'Number of Occupants:' with a 'Select a Value' dropdown; 'Energy Star Unique ID:' with a text input field; 'Manufacturer:' with a text input field; 'Model Number:' with a text input field; 'Serial Number:' with a text input field; 'Volume of water heater system tank in gallons (if desuperheater installed):' with a text input field; 'Pumping Power:' with a 'Select a Value' dropdown; 'Is desuperheater installed?:' with a 'Select a Value' dropdown; 'Geothermal HP Product Type:' with a 'Select a Value' dropdown; and 'Equipment Heating Capacity (BTU) at Design Temp:' with a text input field.

How to Calculate: Heating and Cooling Ratios All Categories

Now that you have determined your Building Heating/Cooling Loads and Heating/Cooling Capacities at Design Temperature, we can verify the project.

- Step 1: Sum up the Heating and Cooling Capacity at Design Temperature Btu/h's across all heat-pumps installed.
 - The sum will be your "Total System Heating/Cooling Capacity at Design Temperature"
 - Ex: 31,600 Btu/h heating and 6,140 Btu/h Cooling
- Step 2: Take those numbers and divide them by the respective Whole-Building Heating and Cooling Loads.
 - Ex: $31,600 / 29,798 \text{ BHL} = 1.06$ heating ratio
 - Ex: $6,140 / 12,301 \text{ BCL} = .499$ cooling ratio

Category 1 Partial-Load ASHP Projects must have a heating ratio below .90 or 90% of the BHL

Category 2 Full-Load ASHP and Category 3 GSHP must have a heating ratio between .90 and 1.20 or 90-120% of the BHL

Cooling ratios must be below 1.15 or 115% of the BCL for all ASHP projects. GSHP projects are exempt from this requirement.

Zonal Loads

- Only enter these next data if you have performed a room-by-room Manual J and the total of your heating/cooling loads equals the BHL/BCL totals. Otherwise, **leave blank**.
- **Heating Load of the zone served: ***
 - This entry will auto-calculate if left blank. (Of the building's total heating BTU needs, what portion is applicable to this unit?)
- **Cooling Load of the zone served: ***
 - This entry will auto-calculate if left blank. (Of the building's total cooling BTU needs, what portion is applicable to this unit?)
- **Indoor Model:**
 - Should match the indoor unit noted on the NEEP sheet, if there is one noted. *Abbreviate as needed*, as there is a 20-character limit. If the configuration differs from the NEEP sheet and is too long to enter, type "See Invoice".

The screenshot shows a web application interface for adding HVAC equipment. At the top, there is a navigation bar with links: Home, Create, Applications, Documents, Help, and Administration. Below this is a sidebar with 'Application Sections' including Project Information, Improvements (highlighted), Supporting Documents, and Summary & Submit. The main content area is titled 'Project Name: Jane Doe' with a subtitle 'Project Type: Central Hudson Midstream (CH_137380)'. The section 'Add HVAC' contains a form with the following fields: 'Select Equipment Type:' with a dropdown menu showing 'Cold Climate Mini-Split HP'; 'System Type and Controls:' with a dropdown menu showing 'Select a Value'; 'Manufacturer:' with a text input field; 'AHRI Reference Number:' with a text input field; 'Equipment Heating Capacity (BTU) at Design Temp:' with a text input field; 'Heating Load of the zone served by this equipment:' with a text input field; 'Cooling Load of the zone served by this equipment:' with a text input field; 'Outdoor Model:' with a text input field; 'Outdoor Serial Number:' with a text input field; and 'Indoor Model:' with a text input field. At the bottom right, there are two buttons: 'Cancel' and 'Continue'.

Home Create Applications Documents Help Administration

Application Sections

- Project Information
- Improvements
- Supporting Documents
- Summary & Submit

Project Name: Jane Doe
Project Type: Central Hudson Midstream (CH_137380)

Add HVAC

Select Equipment Type:

Equipment Type: Cold Climate Mini-Split HP

System Type and Controls: Select a Value

Manufacturer:

AHRI Reference Number:

Equipment Heating Capacity (BTU) at Design Temp:

Heating Load of the zone served by this equipment:

Cooling Load of the zone served by this equipment:

Outdoor Model:

Outdoor Serial Number:

Indoor Model:

Cancel Continue

Using the Zonal Load Calculator – Example 1

CENTRAL HUDSON Clean Heat calculator

Hover over red triangles in a cell for a description, like this one!

Fill in BHL, BCL, and tan cells. (Yellow cells autopopulate and are locked.)

Cust ID:					
Building Heating Load	Building Cooling Load	Total System Heating Capacity at Design Temperature	Total System Cooling Capacity at Design Temperature	Heating Ratio	Cooling Ratio
29798	12301	31600	6140	106.0%	49.9%
Man J loads:	Man J Temps:				
2	88	90% < 120% < 1.15			

DO NOT DISTRIBUTE OR ALTER IN ANY WAY

ACCA Cities for Central Hudson

Kingston: 2/88 Albany Co AP: 3/86
POK: 6/89 Albany CO: 1/88
Newburgh: 9/86

- Optional tool designed to help keep project verification; incentive estimates and application submission data in one place.
- Can also calculate zonal loads for your projects the same way that we automatically would.
- Ratios and Total Capacities (yellow cells) are automatically calculated for you, make sure these are green!

Heating Capacity @ 5°F (for rebate)	Outdoor Condenser	Model # or AHRI/NEEP #	Heating Capacity @ Design Temp	Cooling @ 95F (Min) from NEEP	Heating Load of Zone Served *	Cooling Load of Zone Served
18,500	UNIT 1	6937311	18,050	3,070	17021	6151
14,000	UNIT 2	6937309	13,550	3,070	12777	6151
	UNIT 3				0	0
	UNIT 4				0	0
	UNIT 5				0	0
	UNIT 6				0	0
	UNIT 7				0	0
	UNIT 8				0	0
	UNIT 9				0	0
	UNIT 10				0	0
	UNIT 11				0	0
\$5,200.00	Tot Incentive				29798	12301

First \$500 of Full Load projects goes to contractor.

IF contractor also installed HPWH, add \$1,000 to customer and \$250 to contractor for total rebate.

Outdoor Condenser BTU Estimators for Heating Capacity @ Design Temp

Use best data from manufacturer, NEEP, or AHRI below **

	Degree	Max BTUs
Nearest COLDER data =	-15	15,500
(Man J) Design Temp =	2	18,050
Nearest WARMER data =	5	18,500

-- Inferred DBTU for that model

	Degree	Max BTUs
Nearest COLDER data =	-15	11,000
(Man J) Design Temp =	2	13,550
Nearest WARMER data =	5	14,000

-- Inferred DBTU for that model

	Degree	Max BTUs
Nearest COLDER data =		
(Man J) Design Temp =		#DIV/0!
Nearest WARMER data =		

-- Inferred DBTU for that model

- Enter Load Calcs from Manual J in Red (heating) and Blue (cooling) Cells
- Enter Capacity information in associated Tan cells.
- Heating Capacity at Design Temperature was Interpolated using our tool for this application.
- Cooling @ 95F cells come from NEEP.

Customer Acknowledgement Form

- > Acknowledgement form required in Central Hudson, Con Edison, O&R, NYSEG and RG&E territories
 - Customer acknowledgement is built into PDF form for National Grid
 - Varied terms and conditions by utility
- > Provides written customer confirmation on:
 - Which measure was installed
 - What incentive amount the customer understands they will receive
 - How the customer wishes to receive the incentive – instant discount or check
 - Disposition of baseline heating system
 - What education and product information the customer received from the contractor

Customer Acknowledgement Form

New York State Clean Heat Program

New York State Completion Acknowledgment Form



Congratulations on your new Clean Heat system. Your new system is designed to provide your family or business with year-round comfort, while reducing the emission of greenhouse gases and other pollutants—leading to a cleaner and more economically secure future for all New Yorkers. Please take a few minutes to review and acknowledge the following information regarding your project:

Required Fields

- a. Customer Name: _____
- b. Customer Address: _____
- c. Customer Phone Number (with area code) : _____
- d. Customer NYSEG or RG&E Electric Account Number: _____
- e. Participating Contractor: _____
- f. Project Information:

Installed System Type	NYSEG or RG&E	Customer Rebate	Rebate Payment Option
Check all that apply: <ul style="list-style-type: none"><input type="checkbox"/> Partial Load Mini-Split Heat Pump System<input type="checkbox"/> Full Load Mini-Split or Central Air-Source Heat Pump System<input type="checkbox"/> Full Load Ground-Source Heat Pump System<input type="checkbox"/> Custom Air-, Ground-, or Water-Source HP System<input type="checkbox"/> Residential Heat Pump Water Heater (up to 120 gallons)<input type="checkbox"/> Commercial Heat Pump Water Heater (> 120 gallons)<input type="checkbox"/> Ground-source Heat Pump Desuperheater<input type="checkbox"/> Dedicated Water-to-Water Domestic Water Heater	<input type="checkbox"/> NYSEG <input type="checkbox"/> RG&E	\$ _____	<input type="checkbox"/> Instant Discount Provided by Contractor <input type="checkbox"/> Mail Customer a Check

Status of Existing Heating System

Check one:

- ☐ Removed by Contractor
- ☐ Decommissioned by Contractor¹
- ☐ Left in place
- ☐ Not applicable (New Construction or No Prior Existing System)

¹ Customer acknowledges applicable jurisdictional programs, codes, and requirements (e.g., federal, state, municipal) that govern decommissioning and disposal of heating systems. See, for example, *Amended Notice of Adoption rule, which amends and updates the Uniform code that applies to "Abandonment or removal of heating oil storage tanks."* March 25, 2020, NY Register (April 8, 2020), pp. 14-22, L.D. No. D05-14-20-00002-E. <https://www.dos.ny.gov/info/register/2020/040820.pdf>

Customer Education and Information

Check all that apply:

- ☐ Contractor has configured the NYS Clean Heat-eligible equipment installed in this project to be the primary heating source in all spaces into which it is installed.
- ☐ Contractor has educated the customer on the objective of the Clean Heat Program to minimize the use of heating fuels, and about how to operate and maintain the installed system as the primary heating system.
- ☐ Contractor has provided customer with printed product warranty, operation and maintenance, as well as Contractor contact information.

Customer Acknowledgment

I certify that all information above is correct to the best of my knowledge and that I have read and agree to all Terms and Conditions of this rebate. This rebate is for the benefit of New York electric customers of NYSEG or RG&E as shown in the Rebate Option above. Customers may not apply for or receive multiple rebates for the same measure from another gas or electric utility. NYSEG and RG&E reserve the right to conduct field inspections to verify installations. I acknowledge that NYSEG and RG&E, its company partners, New York agencies and authorities will use this information and my attestation to determine whether a rebate will be issued. I have read and agree to the terms and conditions for Customers participating in the Program included here.

Customer Terms and Conditions

NYSEG and RG&E reserve the right to conduct field inspections to verify installations. I acknowledge that NYSEG and RG&E, its company partners, New York agencies and authorities will use this information and my attestation to determine whether a rebate will be issued. The Customer hereby authorizes NYSEG and RG&E to release their energy use information to energy efficiency program administrators and/or designees, including the New York State Energy Research & Development Authority "NYSERDA", understands that such information will be kept confidential and used only for the purposes of Program evaluation, determining Program eligibility and energy savings during the duration of 1/1/2020–12/31/2025. The Customer agrees that NYSEG and RG&E may provide customer information including name, address, account number, energy consumption data and energy savings to a third-party contractor for program evaluation purposes. Such third-party contractor shall keep Customer information confidential. Customer information may also be provided to federal and state governmental and regulatory agencies.

The Customer agrees to provide NYSEG and RG&E (and its subcontractors) access to the premises for pre-installation, installation and follow-up visits. Customer agrees to authorize access to the residence in order to install the Heat Pump (including any pre- and post-installation visits). Advance notice will be given before installation or inspections. The Customer agrees to coordinate with its subcontractor for access to the premises. Such visit(s) will be at a time convenient to the Customer made with reasonable advance notice given to the Customer by NYSEG and RG&E. The Customer understands that the purpose of the follow-up visit(s) is to provide NYSEG and RG&E with an opportunity to review the operation of the Heat Pumps for quality control and Program evaluation purposes only. Such inspections or follow-up visits do not include any type of safety review. NYSEG and RG&E are under no obligation to (i) make follow-up visits, (ii) review the operation of the Heat Pump or (iii) make any suggestions of any kind to the Customer.

Customer Signature

Date

Customer Acknowledgement Form

Installed System Type	NYSEG or RG&E	Customer Rebate	Rebate Payment Option
Check all that apply: <input type="checkbox"/> Partial Load Mini-Split Heat Pump System <input type="checkbox"/> Full Load Mini-Split or Central Air-Source Heat Pump System <input type="checkbox"/> Full Load Ground-Source Heat Pump System <input type="checkbox"/> Custom Air-, Ground-, or Water-Source HP System <input type="checkbox"/> Residential Heat Pump Water Heater (up to 120 gallons) <input type="checkbox"/> Commercial Heat Pump Water Heater (> 120 gallons) <input type="checkbox"/> Ground-source Heat Pump Desuperheater <input type="checkbox"/> Dedicated Water-to-Water Domestic Water Heater	<input type="checkbox"/> NYSEG <input type="checkbox"/> RG&E	\$ _____	<input type="checkbox"/> Instant Discount Provided by Contractor <input type="checkbox"/> Mail Customer a Check

Status of Existing Heating System
Check one: <input type="checkbox"/> Removed by Contractor <input type="checkbox"/> Decommissioned by Contractor ¹ <input type="checkbox"/> Left in place <input type="checkbox"/> Not applicable (New Construction or No Prior Existing System)

Customer Education and Information
Check all that apply: <input type="checkbox"/> Contractor has configured the NYS Clean Heat-eligible equipment installed in this project to be the primary heating source in all spaces into which it is installed. <input type="checkbox"/> Contractor has educated the customer on the objective of the Clean Heat Program to minimize the use of heating fuels, and about how to operate and maintain the installed system as the primary heating system. <input type="checkbox"/> Contractor has provided customer with printed product warranty, operation and maintenance, as well as Contractor contact information.

Customer Acknowledgment

I certify that all information above is correct to the best of my knowledge and that I have read and agree to all Terms and Conditions of this rebate. This rebate is for the benefit of New York electric customers of NYSEG or RG&E as shown in the Rebate Option above. Customers may not apply for or receive multiple rebates for the same measure from another gas or electric utility. NYSEG and RG&E reserve the right to conduct field inspections to verify installations. I acknowledge that NYSEG and RG&E, its company partners, New York agencies and authorities will use this information and my attestation to determine whether a rebate will be issued. I have read and agree to the terms and conditions for Customers participating in the Program included here.



Q&A

- Interested speakers can use the “Raise Hand” function and be called upon by the moderator
- Speakers will be asked to identify themselves
- Written comments and questions can also be submitted through the WebEx Q&A feature
- Utility and/or NYSERDA reps will provide answers in real time, where possible
- Follow-ups will be shared after the meeting, where applicable
- *Please yield your time if your specific comment has already been addressed*



NYS Clean Heat

Thank you all for your joining!

