

# EmPower and Assisted Home Performance Heat Pump Pilot Study

# LMI Adder Pilot Study

- <500 single family homes
- Development of short-term statewide standard offer incentive structures and program guidelines
- Eligibility parameters will be developed to address:
  - Fuels displaced to help ensure maximum benefit to the household/building
  - Minimum standards for building shell performance consistent with Comfort Home
  - Minimize cost-shifting of heat to tenants
- Collection of data and market insights on heat pump installations, including DHW
- Need utility input on plan and learning objectives
- Need to work together on transition plan to apply learnings to the next phase

# Adders Pilot Study Learning Objectives

- Test drive rules and mechanics for an additional heat pump incentives for LMI customers
- Develop a deep understanding of early building profiles/characteristics that represent the largest opportunity
- Measure household specific affordability/energy burden impacts
- Spur market learning and contactor partnerships to install heat pumps in early phase LMI households
- Gather market data on need and cost for electric panel/service upgrades needed

# Program Basics

- Goal: To study the impact of Heat Pumps on the LMI Market and plan for the permanent integration of heat pumps into LMI by 2025.
- What type of equipment? Air Source Heat Pumps, Ground Source Heat Pumps, and Heat Pump Water Heaters.
- What contractors can participate? -Current contractors with active Participation Agreements in the EmPower or Assisted Home Performance Programs. If a contractor is not active in those programs, they can partner with a contractor who is.
- Who can install the heat pumps? – NYS Clean Heat Participating Contractors
- What customers can participate? -1-4-unit homes with resident paid utilities. Residents must qualify for EmPower or Assisted Home Performance. Can be rentals or owner occupied.
- What fuels can be replaced?- All **non-natural** gas homes will be eligible, including electric, oil, propane, and wood.
- Full load or displacement? - The heating system must be replaced with heat pumps that can cover 90-120% of the building load with the heat pump. No hybrid systems for this study. Existing system can remain in place.
- How many jobs can a contractor do?- The budget for the program is \$5 million and no contractor can use more than 20% of the funds.
- How will we know how much funding is left?- There will be a tracker on the Contractor Resource Page.

# Insulation Level Requirements

Minimum Levels of Insulation in household (must be verified with an energy audit)

Area	Required Insulation level
Walls	R-14
Attic	R-30 average
Attic Hatches	R-20
Pull Down Stairs	R-13
Rim Joists	R-14
Mobile Home Walls	R-6
Mobile Home Attic	R-24
Mobile Home Belly	R-21
Air tightness	5 ACH

# Heat Pump Requirements

These guidelines align with utility specifications.

1. Must cover 90% to 120% of building load.
2. ASHP- NEEP Cold Climate
3. GSHP- Each heat pump in the system must be ENERGY STAR certified and meet or exceed ENERGY STAR Tier 3 Geothermal Heat Pump Key Product Criteria.7
4. HPWH-  $\leq 55$  gallon-  $UEF > 2.0$ ,  $> 55$  gallon  $UEF \geq 2.2$ UEF

# Incentive Structure

**Proposed Adders-** Incentives will cover project up to 60,000 btu/heating

Description	Incentive type	EmPower	AHP
Upstate ASHP	\$/10,000 btu	\$3,000	\$1,500
Downstate ASHP	\$/10,000 btu	\$2,200	\$1,100
Upstate GSHP	\$/10,000 btu	\$3,800	\$3,800
Downstate GSHP	\$/10,000 btu	\$3,800	\$3,800
Upstate HPWH	\$/unit	Normal EmPower	\$975
Downstate HPWH	\$/unit	Normal EmPower	\$825
Panel Box Upgrade/ Distribution Improvements	≤ 100 Amps	Up to \$2,000	50% of Cost up to \$1000

Downstate counties: New York, Bronx, Kings, Queens, Richmond, Orange, Rockland, Westchester, Putnam, Sullivan, Dutchess, & Ulster

# Additional Incentives

- Panel Boxes- If a panel box is  $\leq 100$  Amps it can be replaced automatically through the program. If it is greater than 100 Amps than a NEC worksheet must be filled out showing a need for the larger service. The program will provide up to \$2,000 for EmPower eligible clients and up to \$1,000 for AHP clients. The contractor must also provide a photo of the panel box and an invoice for replacement to take advantage of the adder.
- Heating System Distribution Improvements can also be covered by the \$2,000/\$1,000 adder if needed for the proper functioning of the distribution system.
- If a heat pump contractor is having an AHP/EmPower contractor process their paperwork, the AHP/EmPower contractor may charge an \$500 subcontractor fee. The 5% AHP contractor incentive does not apply for this program.



# Project Example

Incentives are based on 10,000 btu of heating.

For example: 2 ton heat pump (20,000 btu/hr heating) Upstate Air Source Heat Pump for a low income customer the incentive would be

\$3,000 per 10,000 Btu/hr x 20,000 Btu/hr= \$6,000

The home could also receive a \$2,000 panel box/ distribution improvement incentive and \$7,000 for building performance improvements.

EmPower Heat pump	\$6,000
EmPower Panel box	\$2,000
EmPower EE	\$7,000
Utility Incentive	\$2,000
<b>Total</b>	<b>\$17,000</b>

# Documentation Requirements

1. Customer Attestation
2. Contractor Attestation
3. Picture of Panel Box
4. Invoice for the heat pumps
5. Invoice for the Panel Box

## Certificate of Completion LMI Heat Pump Adder Study



EmPower New York     Assisted Home Performance with ENERGY STAR®

Customer Name: \_\_\_\_\_ Contractor Name: \_\_\_\_\_

EmPower ID#: \_\_\_\_\_ AHP ID: \_\_\_\_\_

Contractor: I, \_\_\_\_\_ attest that all measures completed by my company for EmPower New York/ Assisted Home Performance adhere to current standards defined by the Building Performance Institute (BPI) and the current EmPower New York/ Assisted Home Performance Program Guidelines. I further attest that for all Home Performance designated projects, I have conducted the appropriate Combustion Appliance Zone (CAZ) testing and left the home in a safe condition as per BPI Standards.

I attest that I have educated the customer on the use of their heat pumps and any effect they may have on their utility bills. The customer has signed the NYSERDA attestation and it will be completed in project completion paperwork.

I attest that this project adheres to the NY Clean Heat program Guidelines, that a Manual J has been performed for this home, and that I or the NYS Clean Heat contractor will be applying for a reimbursement from the NY Clean for a utility heat pump rebate.

I attest that my company is responsible for collecting the utility rebate for this project and I will not hold the customer responsible for the contractor's failure to collect these funds. I will also not place a lien on the customer's property for outstanding funds that were promised as a utility rebate.

Company Owner signature:

\_\_\_\_\_ Date: \_\_\_\_\_

# Upcoming EmPCalc Updates

- > Additional inputs being added to accommodate requested information
  - Update to ASHP tab
  - Add new GSHP tab
  - Subcontractor Fee
  - Dwelling's Existing Insulation Levels
    - Attic
    - Attic Hatches / Pull Down Stairs
    - Knee walls
    - Walls
    - Rim Joist
    - Mobile Homes (Attic, Walls, Belly)
  - Electrical Panel
- > Mandatory upgrade to latest EmPCalc version will be required

# EmPCalc: Air Source Heat Pump

- > ASHP Calculator tab
  - Tab will be updated to align with version in ASHP Proforma
- > Enter information on new and existing heating systems
- > EmPower
  - Appears as Heating Replacement
- > Express Contract
  - Appears as Heat Pump

KEY										NEW YORK STATE OF OPPORTUNITY   NYSEKDA				
Yellow Cells are Required Input			Values that "Override" default values			Light grey values used in calculations/diagnostics								
<b>Air Source Heat Pump</b>										<b>Customer Information</b>				
ASHP System	Building Heating Load (Manual J):		Btu/h	ASHP Application:		#DIV/0!			If more than 1, the Calculator for Multiple ASHP Units on this page must also be completed.					
	ASHP Type/Scenario:			#N/A	#N/A	No. of Outdoor Units:								
	ASHP Cooling Capacity at 95F:		Btu/h (all units)	#N/A	#N/A	Total Installed Cost:								
	ASHP Heating Capacity at 5F:		Btu/h (all units)	#N/A	#N/A									
	ASHP Rated HSPF:		Btu/wh (avg of all)	#N/A										
	ASHP Rated SEER:		Btu/wh (avg of all Weather Region):	#N/A	Heating Load:	#N/A	MMBtu/yr							
	TRM Scenario:	#N/A	TRM_HP_Sizing	#N/A	#N/A	#N/A	(TRM)	City, State:						
	Actual_HP_Sizing	#DIV/0!	BEFLH_h	#N/A	#N/A	#N/A			Zip:					
	Building Cooling Load			#N/A	Seasonal AVG HEATING COP (TRM Calcs)		#N/A	Avg COP						
	BCL (estimated)	#N/A	Btu/h	BEFLH_h	#N/A	#N/A	Cooling Load:	#N/A	MMBtu/yr	County:				
Building Vintage				Seasonal AVG COOLING Efficiency (TRM Calcs):		#N/A	Btu/Wh							
Base Case Fuel/System (choose one):				Electric Cost (\$/kWh):		#N/A	per kWh							
Htg Equipment Age:				Fuel Cost:		#N/A	#N/A							
Base Case factors & Seasonal Efficiency				#N/A	#N/A	#N/A	eff							
MEASURED Annual Fuel Use (for Space Heating ONLY)				Override:	#N/A	#N/A			<b>ASHP Installer/Contractor Information</b>					
Base Case Cooling Efficiency (avg EER)				Base Case AC:		Avg EER:	#N/A	Btu/Wh	Name:					
Heating Elect (kWh/yr)				Cooling Elect (kWh/yr)		Annual Heating Cost		Annual Cooling Cost		Total Annual Cost				
Base Case			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Energy (MMBtu/yr)			
ASHP System			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
Savings			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A				
Total Incentive			0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!				
Customer Incentive (equals total incentive less Contractor incentive)														
Customer/Contractor Contributions, Tax Incentives, and Replacement Costs:										\$0.00				
Post-Incentive Costs:														
Simple Payback Based on Total Costs									#N/A	years				
Simple Payback After Rebate									#VALUE!	years				
Expected ASHP System Life										15	years			
										<b>Calculator for Multiple ASHP Units</b>				
										Htg Capacity at 5F (Btu/h)	HSPF (Btu/Wh)	Ctg Capacity at 95F (Btu/h)	SEER (Btu/Wh)	
										ASHP Unit 1				
										ASHP Unit 2				
										ASHP Unit 3				
										ASHP Unit 4				
										ASHP Unit 5				
										Total/ Weighted A	-	0.0	-	0.0
											0	0.00	0	0.00
										v2020.5 8-18-2020				

# EmPCalc: Ground Source Heat Pump

- > GSHP Calculator tab
  - New tab will be added
  - Aligned with GSHP Proforma
- > Enter information on new and existing heating systems
- > EmPower
  - Appears as Heating Replacement
- > Express Contract
  - Appears as Heat Pump

KEY

Yellow Cells are Required Input

Values that "Override" default values

Light grey values used in calculations/diagnostics



Ground Source Heat Pump										
GSHP System	Building Heating Load (Manual J):		Btu/h	Sys Type:		DHW Option:				
	AHRI/ISO 13256-1 Rated Data			GSHP Unit Type:						
				#N/A		Btu/h		Total Installed Cost:		
				Heating Sizing Fraction:		#DIV/0!				
				#N/A			Heating Load:	#N/A	MMBtu/yr (TRM)	
	Weather Region:		#N/A							
	Pumping Control		BEFLH_h	#N/A	F_pump_h=	#N/A	#N/A	F_dist_h=	#N/A	
	Pumping Power				Seasonal AVG HEATING COP (TRM Calcs)		#N/A	Avg COP		
	Building Cooling Load									
	BCL (Manual J)		Btu/h	BEFLH_c	#N/A	F_pump_c=	#N/A	#N/A	Cooling Load:	#N/A
								MMBtu/yr		
				Seasonal AVG COOLING EFFICIENCY (TRM Calcs):		#N/A		Btu/Wh		
				Electric Cost (\$/kWh):		#N/A		per kWh		
Building Vintage			(sets BEFLH)	0 -						
Base Case System	Base Case Fuel System (choose one):			Fuel Cost:		#N/A		#N/A		
	Htg Equipment Age:		(sets baseline equipment efficiency)			#N/A		#N/A		
	Base Case factors & Seasonal Efficiency			#N/A	#N/A	#N/A		eff		
	MEASURED Annual Fuel Use (for Space Heating ONLY)		Override:		#N/A					
	Base Case Cooling Efficiency (avg EER)		Base Case AC:		Avg EER:		#N/A		Btu/Wh	
		Space Heating Elect (kWh/yr)		Cooling Elect (kWh/yr)		#N/A		Annual Space Heating Cost		
						#N/A		Annual Cooling Cost		
						#N/A		Annual DHW Cost		
						#N/A		Total Annual Cost		
						#N/A		Fuel Energy Content (MMBtu/yr)		
Base Case		#N/A		#N/A		#N/A		#N/A		
GSHP System		#N/A		#N/A		#N/A		#N/A		
Savings		#N/A		#N/A		#N/A		#N/A		
Space Conditioning Incentive			0	#N/A		per 10 MMBtu/h		#N/A		
Domestic Hot Water Incentive:								\$0		
Total Incentive								#N/A		
Customer Incentive (equals total incentive less Contractor Incentive)								n/a		
Customer/Contractor Contributions, Tax Incentives, and Replacement Costs:								\$0.00		
Post-Incentive Costs:										
Simple Payback Based on Total Costs								#N/A	years	
Simple Payback After Rebate								#VALUE!	years	
Expected GSHP System Life									25 years	

Customer Information	
Name:	
Address:	
City, State:	
Zip:	
County:	
Electric Utility:	
Gas Utility:	

GSHP Installer/Contractor Information	
Name:	
Address:	
City, State, Zip:	

Calculator for Domestic Hot Water Option			
No of People		T_man	#N/A
Gal/day:		F_dhw	#N/A
Q <sub>GSHP,DHW</sub> =	#N/A	MMBtu	F_hmode = #N/A
COP <sub>GSHP,DHW</sub> =	0.58	kWh <sub>GSHP,DHW</sub> =	#N/A
DHW Type			
# Units		at AHRI/ISO 132156-2 heating conditions (32F source, 105F load)	
DHW Base Fuel		Baseline UEF	0.580
		#N/A	#N/A
		#N/A	#N/A
Displaced Fuel=		#N/A	#N/A

# EmPCalc: Heat Pump Water Heater

- > Use existing DHW Tank tab
- > Enter information on new and existing heating systems
- > EmPower
  - Appears as Water Heater Replacement
- > Express Contract
  - Appears as Heat Pump Water Heater

**DHW Tank**

Customer Name: [Redacted]  
EmPower Project ID: 0  
Express Contract Project ID: 0  
Number in Household: [Dropdown]

**Replacement/Conversion**

Existing Type: [Dropdown]  
Existing Fuel: [Dropdown]

Cost: [Text]  
Existing Tank Volume (gallons): [Text]  
Existing UEF: #N/A  
DHW Location: [Dropdown]

Replacement Type: [Dropdown]  
Replacement Tank Volume (gallons): [Text]  
Replacement Fuel: [Dropdown]  
Replacement Pipe R-value: [Text]  
Replacement Heating Capacity (BTUh): [Text]  
Replacement Recovery Efficiency: [Text]  
Replacement Make: [Text]  
Replacement Model #: [Text]  
Replacement UEF: [Text]  
Water Temp (deg F): [Text]

Targeted Measure

Life of Measure	kWh Reduced	Savings in Therms	Annual \$ Savings	Simple Payback	SIR
#VALUE!	0	0.00	#N/A	#N/A	#N/A

# Project Submission: EmPower Approval

## > Existing Requirements

- EmPCalc
- Signed Homeowner's Agreement
- Combustion Appliance Form
- House Diagram
- Signed Appliance Exchange Agreement
- Photos

## > Additional Documents

- Signed Contractor Attestation Form
- Signed Customer Attestation Form
- Subcontractor Invoice (if one used)
- Electrical Panel Verification (photo/NEC Form)

# Project Submission: Express Contract Approval Submission

- > Workscope HPXML stage
  - Indicate if there is any additional project funding
    - *Is the homeowner receiving any third part grants or rebates, including EmPower funding, tax credits, or avoided replacement costs?*
  - Indicate if a Subcontractor is being used
  - If yes, input Subcontractor's name
- > Additional Rebate and Grants stage
  - Answer all questions on rebates, EmPower, grants and tax credits
    - Include amounts and name
  - Indicate if any avoided replacement costs should be accounted for
    - If yes, brief summary of avoided replacement costs
    - Total amount of replacement costs
- > Workscope Screening and Approval stage
  - Include the following supporting documentation
    - Signed Customer Attestation Form
    - Signed Contractor Attestation Form
    - Electrical Panel Verification (photo/NEC Form)



# Project Submission: Express Contract Completion Submission

## > Final Project Documents stage

- Upload the following documentation
  - Existing Documentation
    - Signed Contract
    - Signed Customer Information Form
    - Signed ESR
    - Post Installation Health & Safety Test Results
    - Subcontractor Invoice (if one used)
  - New Documentation
    - Signed Contractor Attestation Form
    - Signed Customer Attestation Form
    - Electrical Panel Verification (photo/NEC Form)