

# Expression of Interest in the Clean Heat For All Challenge

## A Packaged Heat Pump Solution

The purpose of this document is to collect and convey market demand for a new line of cold climate heat pump products to enable rapid, low-cost electrification of heating and cooling in existing buildings.

### Background

With states and localities adopting ambitious emissions reductions and timelines to address the climate crisis, the lack of an efficient and affordable electrification solution for heating in cold climates remains one of the primary hurdles, especially for tall residential buildings. Building owners and portfolio operators seeking to eliminate fossil fuels from their buildings, for example to comply with new legislation, have focused attention on air source heat pumps (ASHPs) given their demonstrated energy efficiency and reliability. Advances in heat pump technology over the past decade have produced cold climate heat pumps that operate at temperatures as low as -14°F while maintaining coefficients of performance above 1.

As multifamily buildings across the US consider converting to ASHPs for heating and cooling, many will hesitate to do so because of the high cost and major disruption to residents associated with installing variable refrigerant flow or split systems. The need to penetrate the exterior walls to run refrigerant pipes and condensate drains, the additional cost of soffits for the interior pipes runs, the exterior space required for outdoor units, and the requirement of 208 VAC (volts alternating current) operation instead of the more common 110 VAC are just a few of the many barriers to conversion.

Add to these the likely future shortage of capable Heating, Ventilation and Air Conditioning (HVAC) technicians and the potential for refrigerant leaks and their corresponding greenhouse gas emissions harm, and the problem becomes very challenging to address cost-effectively with currently available products.

While improved Packaged Terminal Heat Pump (PTHP) technology is promising for buildings with existing through-wall sleeves, many more buildings do not have this option and will face prohibitively high barriers to installing variable refrigerant flow or split heat pump systems.

A third option is needed to ensure that all buildings can afford a heat pump conversion. The proposed solution is a standalone, unitary Packaged Window Heat Pump (PWHP) that can be installed in occupied apartments with limited resident disruption. Such a product would not require extensive refrigerant piping, major electrical upgrades, or skilled labor. To accelerate the development of this new type of solution, the New York City Housing Authority (NYCHA), the New York Power Authority (NYPA) and the New York State Energy and Research Authority (NYSERDA) are challenging the HVAC industry to design, test and commercialize a new product that will meet the specifications below.

### Market Opportunity

**Initial Purchase Order:** Under an initial procurement, to be awarded in 2022, NYCHA, NYPA and NYSERDA will purchase 24,000 units that meet the specifications below. These units will be installed at six NYCHA developments to serve as the primary heating system for approximately 7,900 apartments. Looking ahead, NYCHA estimates a need for approximately 156,000 units over the next 5-10 years in its efforts to meet New York City and State mandated emissions targets.

**A Broader National Market:** Beyond NYCHA, New York City and New York State offer large markets in both low- to moderate-income and market-rate housing with several million multifamily units, as well as potentially in commercial

buildings. The solution specified below will also be applicable to buildings located in several climate zones that cover the Northeast and most of the continental U.S.

## Solution Specifications

The specifications below are for a unitary PWHP solution that can meet the demand outlined in the Market Opportunity section above. Requirements for the envisioned PWHP solution are:

- Plug into a standard three-prong household wall socket (e.g., 115VAC, single phase, 60Hz socket on a 15amp fuse).
- Does not require a plumber or other skilled labor for installation.
- Provide adequate heating at the coldest anticipated outdoor air temperatures for buildings located in climate zones 4, 5 and 6 that cover the vast majority of the continental U.S.
- Installation does not require drilling through walls.
- Installation can be done by property management staff within a few hours.
- Can be installed through a standard apartment window opening with no degradation to the existing thermal envelope.
- A form factor that is aesthetically pleasing and is not cumbersome or intrusive in tenant spaces.
- Operate quietly enough to not disrupt tenants.

## Sign on Now

We are interested in a PWHP solution for multifamily buildings in our portfolio that meets criteria listed in the Solution Specifications section above.

Organization name: \_\_\_\_\_

Number of buildings in portfolio: \_\_\_\_\_

Number of dwelling units in portfolio: \_\_\_\_\_

Reason this is important to our organization: \_\_\_\_\_

Authorized signatory: \_\_\_\_\_

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

Name of signatory: \_\_\_\_\_

Title of signatory: \_\_\_\_\_

### Disclaimer

*By signing this Pledge, you grant the New York State Energy and Research Authority (NYSERDA), the New York Power Authority (NYP&A) and the New York City Housing Authority (NYCHA) permission to publicly share the information provided above for purposes including but not limited to sharing with manufacturers as well as other marketing efforts and social media posts.*