National Fuel Gas Distribution Corporation

Proposal to Revise Partnership for Urban Revitalization in Western New York Program

March 13, 2024

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1 Introduction and Background

1.1 Partnership for Urban Revitalization in Western New York Mission

The Partnership for Urban Revitalization in Western New York ("PUR") is a program whose mission is to transform disadvantaged communities ("DACs") within National Fuel Gas Distribution Corporation's ("National Fuel" or "Company") service territory by facilitating the construction of affordable housing on vacant lots, renovation of abandoned and neglected homes, and improving neighboring homes by providing access to safe, reliable, resilient, and affordable energy while reducing overall energy usage and emissions.

1.2 PUR Proposal Objective

On December 14, 2023, the New York Public Service Commission ("PSC" or "Commission") issued an *Order Implementing Long-Term Natural Gas Plan With Modifications* in Case 22-G-0610 directing the Company to file a proposal explaining how it will revise the PUR to encourage electrification and remove any incentives for additional natural gas usage. The Company submits the following proposal to modernize the existing PUR program.

1.3 PUR Executive Summary

The focus of the current PUR program has been on new construction on vacant lots or unoccupied homes with no connected gas service for over a year that have been substantially rehabilitated, within low-income communities. The revised PUR program will continue the previous program's objectives of revitalizing residential households and neighborhoods with vacant lots or homes within DACs, as defined by NYSERDA. Additionally, in an effort to take a neighborhood approach and improve cost efficiency, the revised PUR program will also seek to install measures in existing neighboring homes that meet specific criteria. This focus will allow low-income households in DAC neighborhoods with limited resources to gain access to cost saving measures that will reduce greenhouse gas ("GHG") emissions while maintaining safety and reliability.

In its focus on these three types of properties / residential structures in DAC neighborhoods, the revised PUR program will seek to implement weatherization, electrification, and resiliency measures as outlined in the table below.

	Weatherization	Electrification	Resiliency
Vacant Lot/New Construction	Insulation	1. ccASHP (preferred) 2. Hybrid Heating System (if ccASHP not feasible)	Install standby generator
Substantially renovated/Gut rehab	Insulation	1. ccASHP (preferred) 2. Hybrid Heating System (if ccASHP not feasible)	Install standby generator
Existing occupied structure/customer	Insulation & air sealing	1. Hybrid Heating System	Install standby generator

The current housing stock in the Company's service territory consists largely of old and poorly insulated homes. As recently referenced by New York Senator[1], Sean M. Ryan, 60.1% of housing units in Buffalo were built before 1940. The Company's recent Long-Term Plan[2] identified similar residential housing demographic statistics with poorly constructed building envelopes with single-pane windows, poor or no insulation, and outdated electrical services throughout its entire service territory. Most of these homes are located in cities with large areas identified as DACs. These homes lack energy efficiency measures and conditions that modern homes are built with today, per current code. The Company believes that the most significant impact on GHG emission reductions while also avoiding the prohibitive cost and reliability risks of additional household electric load can be made by reducing energy usage through weatherization measures on homes that have little to no insulation or air sealing.

[1] https://www.nysenate.gov/newsroom/press-releases/2024/sean-m-ryan/city-good-neighborhoods-senator-sean-ryan-announces

[2] Refer to National Fuel Gas Distribution Corporation's Final Long-Term Plan, filed with the New York PSC in Case 22-G-0610.

A poor building envelope often leads to excessive usage and heating bills due to wasted energy that places financial burdens on the occupants. To address this, the Company's current PUR program provides financial incentives that cover high efficiency, reliable, and safe heating equipment installed by developers performing services within low-income neighborhoods. Additionally, the Company's proposal to modernize its PUR program will also target existing homes within DACs by offering financial incentives for home weatherization measures, installing energy efficient Hybrid Heating Systems ("HH Systems"), and natural gas back-up power generators. A HH System is defined as an electric air source heat pump ("ASHP"), cold climate ASHP ("ccASHP"), or mini-split heat pump ("Mini-Split") paired with a furnace or boiler heating system utilizing natural gas or a mixture of natural gas, renewable natural gas, or hydrogen to meet a customer's heating needs. Installed measurement instrumentation will allow the Company to capture data on emissions reduction, realized savings and improve the program in the future.

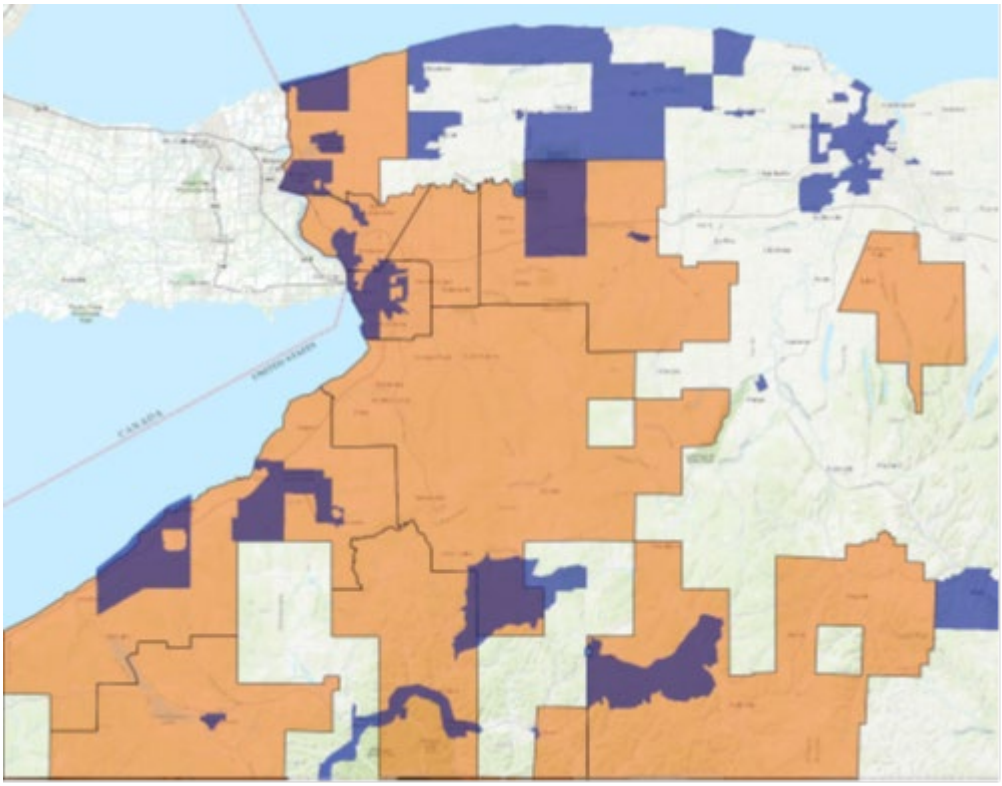
The Company plans to use a Program Administrator to implement the proposed PUR program. The Program Administrator's responsibility will include stakeholder outreach, managing project application and eligibility review process, performing pre and post construction site inspection, performing evaluation, measurement & verification ("EM&V") functions, and preparing project documentation and reporting.

1.4 National Fuel's Service Territory and DAC Communities

The revised PUR program will require the installation address to have natural gas service available, either through an existing service or a main line at the street, in the Company's Western New York service territory and the site must be in a DAC neighborhood. The criteria to identify DACs were finalized on March 27, 2023, and the New York State Energy Research and Development Authority ("NYSERDA") published a list of qualifying communities. As shown in Figure 1 below, several of these communities are located within the Company's service territory, many within metropolitan areas (illustrated in the darker purple overlap sections on the map). With the median household income for most of the Company's service territory,

including in the cities of Niagara Falls, Jamestown, and Buffalo, below that of the U.S. average, these communities are examples of locations in National Fuel's service territory that have been identified as "disadvantaged."

Figure 1. DACs (Blue) in National Fuel's Service Territory (Orange)



2 Program Details

2.1 Objectives

The proposed program objective leverages the successes of the current program by incentivizing DAC transformation with affordable solutions that reduce overall energy use, carbon emissions and customer utility energy bills while preserving customers' service reliability. The proposed program will expand the current program that targets new and substantially renovated homes to include nearby owner-occupied homes. Additionally, the revised program will reduce energy use by prioritizing weatherization and installing heat pump heating systems, both hybrid and standalone heat pumps. To address homeowners' concerns related to increased risk of electric heating equipment interruptions during winter power

outages, small back-up home generators will be installed at these homes to preserve high service reliability throughout DAC communities. [3]

To successfully achieve these objectives, the PUR program must be flexible to address variations in the DAC homes, customers' expectations, and changing market conditions. The program requires flexibility in the funding incentives offered to each project. The program's budget considers the potential variations in costs to weatherize the building shells and install hybrid heating systems and natural gas back-up generators. Individual project costs will likely vary and require less or more funding than estimated. The Company will capture and report on the variations. The Company will use these results to monitor and refine the program's effectiveness, such as implementing additional program components or technologies.

2.2 Program Strategy

The proposed PUR program's three strategies that will consider energy reliability, resiliency, and affordability, GHG emissions reduction, and customer choice:

1. Energy efficiency - building envelope / weatherization
2. Building electrification – hybrid gas-electric or standalone air source heat pump
3. Energy resiliency – back-up natural gas generator.

The first strategy of the PUR program proposal will require residences receiving incentives under the program to improve the building envelope to facilitate full or partial electrification of the heating system and will remove incentives for additional natural gas usage. The PUR program will distinguish between weatherization for new construction/substantially renovated buildings and existing occupied buildings. The weatherization incentives will be for insulation and air sealing measures. New construction or substantial renovation of existing buildings must meet the new construction requirements of the 2020 Energy Conservation Construction Code for New York State (2020 ECCCNYS). The program's incentives will encourage weatherization

[3] Reliability and deliverability of the natural gas system will be evaluated when determining the appropriate installation measures for each project.

measures that exceed current code requirements. Existing occupied buildings can receive incentives to implement weatherization enhancements above the structure's existing levels, while attempting to achieve applicable codes. While the current code will not always be met for an occupied home, improvements will still be expected to lower energy use and GHG emissions.

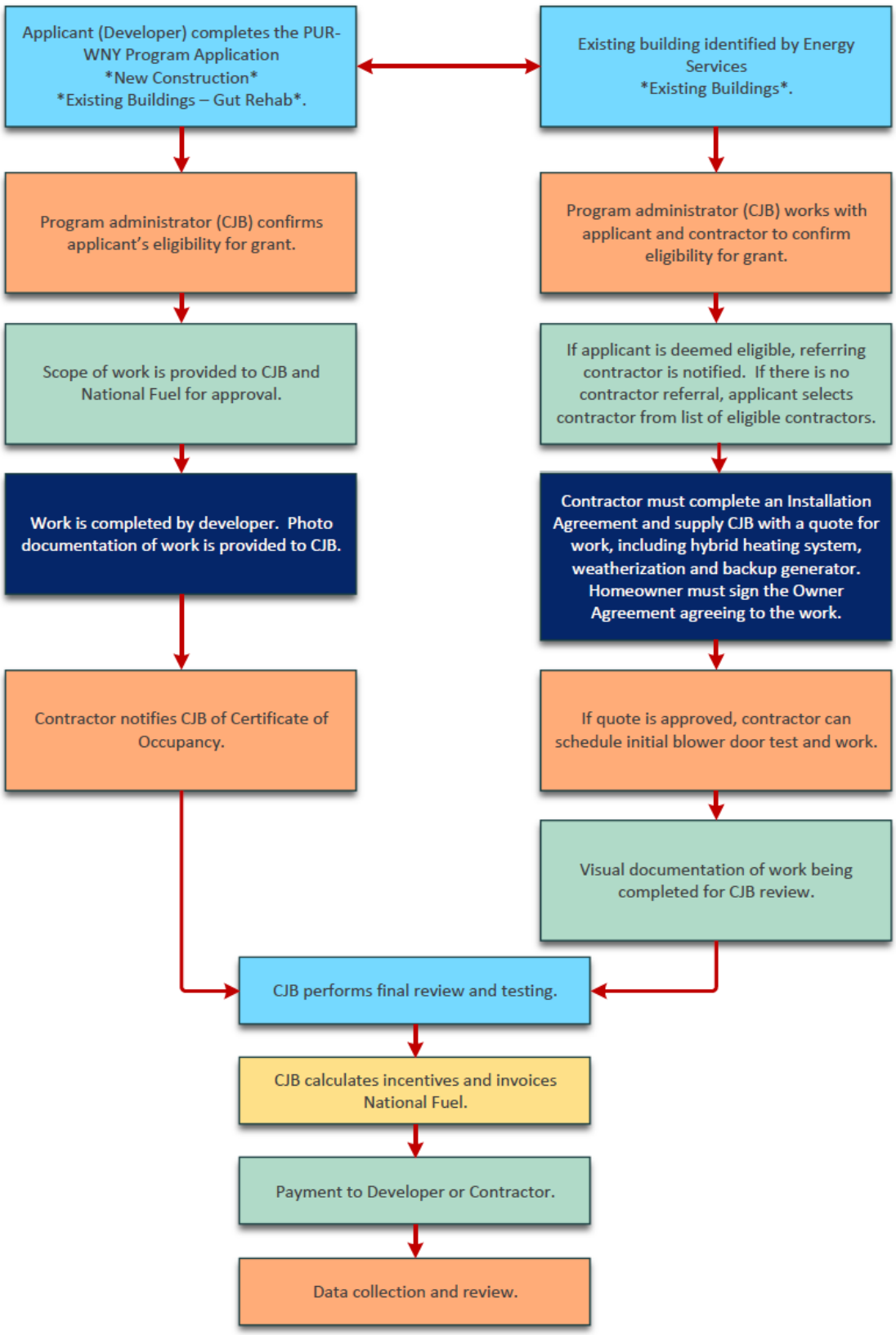
The second strategy of the PUR program will prioritize the installation of a HH System for occupied homes with existing gas service and standalone ccASHP or Mini-Split system for a new or substantially renovated home. Prior to installation of a standalone electric heating system, the installation contractor will perform a technical and economic evaluation that considers the safety and reliability of the electric distribution system serving the building/neighborhood, the ability of the electric grid to accommodate new electric load, and the relative cost of full electrification. If it is determined that full electrification is not feasible and cannot be accommodated, places undue reliability or safety risk on the customer, and/or is deemed to be economically prohibitive, the Company may elect to proceed with the installation of a HH System, as defined above.[4] HH Systems use an ASHP, ccASHP, or Mini-Split as a primary heating system to meet the customer's heat load with a furnace or boiler operating as the secondary or supplemental heating system. The secondary heating system is used to meet the demand when temperatures fall below a pre-determined set point or respond to electrical outage to ensure customer heating system reliability. The temperature set point preference is established by each individual customer working with the installer. As a default for determining the operation of these systems, National Fuel assumes that for outdoor temperatures at or above 65°F, heating is not required. For outdoor temperatures below 65°F, the ASHP, ccASHP, or Mini-Split acts as the primary heating source, operating until outdoor temperatures fall below the set point, when the secondary/supplemental heating system begins operations. When the outdoor temperature returns to a level exceeding the pre-determined set point, the secondary/supplemental heating system ceases operations and the ASHP, ccASHP, or Mini-Split returns to typical operation. This

[4] This strategy will proceed until the prohibitions in New York Energy Law § 11-104 (6) are effective and a determination is made that they are applicable to the building being evaluated. In that case, a HH System will not be installed unless one of the exceptions identified in § 11-104 (7) is applicable.

system transition is not based on the use of a daily average. Rather, the system transition is based on real-time temperature readings obtained at the customer's location via an outdoor temperature sensor or an internet-based local weather service temperature reading.

The third strategy of the PUR program will require the installation of a standby backup generator, considering the extreme weather conditions experienced in National Fuel's service area. The DACs in National Fuel's service area experience long winters with some of the coldest temperatures in the state. These communities also frequently experience extreme winter weather events, accompanied by high winds, ice, and/or multiple feet of snow that often results in power outages for thousands of customers that can last multiple days. Based on these conditions, the proposed PUR program provides for the installation of a back-up system to ensure electricity is available to operate critical equipment and the residence will maintain safe levels of warmth during a prolonged outage. The standby generator must be a permanently installed natural gas-fired engine-generator wired to automatically transfer selected circuits (e.g., the furnace) to backup power in the event of an outage of the electric grid.

2.3 Delivery (Flowchart) Figure 2



2.4 Measures and Incentives

The proposed incentives for weatherization, the heating system, and the back-up natural gas generator provided below are estimates. The rebate amounts and saving potential may vary, based upon calculated estimates for a variety of home types. Actual numbers from the program's results will be used to improve future estimates.

For estimating HH System and ccASHPs incentives, based upon the past program results and estimates, the average cost of installation is assumed to be around $12,000 - $15,000. Natural gas standby generators are estimated to cost around $8,000-$10,000. The proposed program will provide full funding for installing these two measures.

For the proposed new weatherization incentive, a total project cost of $10,000 - $15,000 is assumed for. The initial rebate incentive estimates are calculated from the assumption provided below and will be subject to future adjustment. Insulation and air-sealing proposed incentives, in the tables below, are based on estimates and will be used to compare contractor bids.

For new and substantially renovated home weatherization projects, the rebate incentive is based on change between minimum code requirement values and the program's targeted achieved values on a per square foot basis. This does not include a contractor incentive currently. See Table 1 below.

Table 1 Proposed Incentive for Weatherization of New and Substantially Renovated Homes

New and Substantially Renovated Homes			
	Code	**Achieved**	**Expected Rebate Amount ($/sq ft)**
Walls	R-13 (2x4 Cavity)	R - 15 (2x4 Cavity)	$ 0.36
	R-19 (2x6 Cavity)	R - 21 (2x6 Cavity)	$ 0.27
	R - 5 (Continuous)	R - 7.5 (Continuous)	$ 0.22
	R - 5 (Continuous)	R - 10 (Continuous)	$ 0.67
Attic/Ceiling	R - 49	R - 60	$ 0.39
Rim Joist Insulation	Same as Walls		

For existing homes weatherization, the rebate is based on change between a structure's existing R-value and the program's targeted achieved values on a per sq ft basis. Contractor costs are not added except for foam calculation. See Table 2 below.

Table 2 Proposed Incentive for Weatherization of Existing Homes

Existing Homes			
	Existing R-value	**Final R-value Achieved**	**Expected Rebate Amount**
Walls	No insulation	R - 13 Blown	$ 0.53
		R - 13 Foam	$ 2.50
	R -7	R - 13 - Foam	$ 2.50
Attic/Ceiling	No insulation	R - 30	$ 0.90
		R - 49	$ 1.54
		R - 60	$ 1.93
	R -11	R - 30	$ 0.56
		R - 49	$ 1.17
		R - 60	$ 1.38
	R - 19	R - 30	$ 0.36
		R - 49	$ 0.90
		R - 60	$ 1.17
	R- 38	R - 49	$ 0.36
		R - 60	$ 0.56

Floor Insulation	-	-	-
Rim Joist Insulation	Same as Walls		

For existing homes air-sealing, the rebate is based on % decrease. See Table 3 below.

Table 3 Proposed Incentive for Air-Sealing Existing Homes

Existing Homes		
	Incentive	**Expected Rebate Amount**
Air Leakage	$/100 CFM50	$100
******For existing homes infiltration rebates, will not be incentivized below 5 ACH@50Pa		

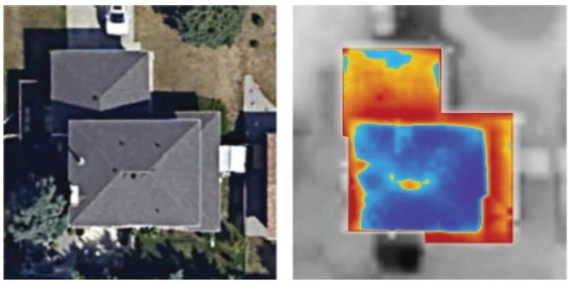
2.5 Target Market

The Company proposes the PUR program continue focusing on revitalizing residential households and neighborhoods with vacant lots, or unoccupied homes, as shown in Figure 3, where utility infrastructure is already in place, within a DAC, by utilizing the relationships established and new partnerships to be developed with local organizations, such as Habitat for Humanity, and small residential developers.

Figure 3. Example of Vacant Lots within a DAC

In addition to the vacant lots and vacant homes, the Company will evaluate high natural gas use homes with a heat rating of greater than 7 neighboring to the already completed PUR projects and any future projects. The heat rating scores were established using data captured during the Company's RD&D Pilot project with MyHEAT Thermal Imaging ("MyHEAT"). As shown in Figure 4, MyHEAT uses a proprietary process using mass-scale airborne thermal data that reveals energy loss data for individual residential buildings.

Figure 4. Example of an image using MyHEAT's proprietary process



The Company will also evaluate whether heating oil, propane, or other alternative carbon-based fuel customers reside within these neighboring homes.

2.6 Proposed Budget Assumptions

Total project cost is estimated to be between $30,000 - $40,000 per home as described above in Section 2.4. The cost for the measurement system is estimated to be $2,000 per home and electric upgrades are assumed to be $5,000 per home based upon past programs. The total cost for the Company's overall Administrative/EMV/Reporting responsibility is estimated to be $100,000.

For maximum weatherization benefit, the proposed budget assumes that contractors will be incentivized to exceed the building code for insulation for new and existing homes. Since the work to meet code is already being performed, the incentive will be for the work above and beyond meeting applicable building codes. For existing occupied homes, since no work has been planned, the incentives will be higher since the contractor work will need to be added to the calculation. The incentives are also not based upon meeting code but will be based on the R-value Insulation level from the baseline and upon the amount of air-leakage decreased. For air-leakage, incentives will not be provided for bringing an occupied home below 5 air changes per hour or less since this would require 'whole-house' mechanical ventilation to be installed as well.

For the added reliability of back-up natural gas generators installed at all projects, all installation costs will be covered since no plans were considered by the owner in new and substantially renovated homes to include a generator.

2.7 PUR Proposed Budget

A breakdown of the proposed annual program budget is provided in Table 4.

Table 4. Proposed Budget for PUR

Budget Categories	Annual
Customer Incentives	$545,000
Administration/EM&V/Reporting	$100,000
Measurement Equipment	$30,000
Electrical Upgrades	$75,000
Total	**$750,000**

2.8 Natural Gas Savings

The following tables provide projected natural gas savings for the PUR program.

These projections show the potential cost savings associated with the reduced gas usage and corresponding reduction in GHG emissions. According to the New York State Technical Resource Manual ("TRM")[5], effective useful life ("EUL")[6] of Air Leakage Sealing[7] measures is 15 years and the EUL of Insulation – Opaque Shell[8] is 25 years. Based on these values and the table above, the range of projected lifetime gas savings are shown below.

For Air Leakage Sealing, values of 1,500 sq ft and 3,000 sq. ft. and 1, 1.5, and 2 stories were used. For Insulation – Opaque Shell, values between 500-1,000 sq ft of ceiling and between 500-1,000 sq ft of walls were assumed to be the ranges. Home ages and insulation increases were also varied to estimate for a wider variety of buildings. Values were calculated from the NY TRM.

[5] NY State Technical Resource Manual, "New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs" "https://dps.ny.gov/technical-resource-manual-trm"
[6] As defined in the New York State Technical Resource Manual Appendix P.
[7] As defined in the New York State Technical Resource Manual.
[8] As defined in the New York State Technical Resource Manual.

Table 5. Projected Annual Gas Savings per Home (mmBtu)

Program	Annual Gas Savings
Air Leakage Sealing	9.5 - 23.4
Insulation (before 2007)	1.65 - 82.46 Ceiling 1.02 – 25.32 Walls
Hybrid Heating Systems	22.5 – 42.6[9]
Total	34.6 –173.8

TRM Method for Calculating Annual Energy Savings for Air Leakage Sealing

$$\Delta MMBtu = units \times \left(\frac{\Delta CFM_{50}}{F_n \times F_h}\right) \times \frac{\left(\frac{\Delta therms}{CFM}\right)}{10}$$

TRM Method for Calculating Annual Fossil Fuel Energy Savings for Insulation

$$\Delta MMBtu = \frac{\left(\frac{1}{R_{baseline}} - \frac{1}{R_{baseline} + \Delta R}\right) \times A \times \left(1 - F_{fra\,\min g}\right) \times HDD \times 24 \times F_{FuelHeat}}{1{,}000{,}000 \times Eff_{FuelHeat}}$$

Table 6. Projected Lifetime Gas Savings per Home (mmBtu)

Program	Lifetime Gas Savings
Air Leakage Sealing*	142 - 351
Insulation (before 2007)*	41 – 2,061 Ceiling 26 - 633 Walls
Hybrid Heating Systems*	337.5 - 639
Total	546 – 3,684

[9] Range represents estimated savings for Hybrid Heating Systems with switchover Outside Air Temperatures between 30-40 degrees Fahrenheit.

*Estimated useful life is 15 years for air leakage sealing, 25 years for insulation, and 15 years for the HH System.

2.9 Emission Reductions

The following values will be used to project the annual CO2 equivalent emissions reductions.

Table 7. BTU and Emissions per unit

Energy Type	BTU per unit	Emissions rate per unit
Natural Gas	103,000 BTU/ccf	5.49 kg/ccf CO2e

$$mmBtu \times \frac{1\ ccf}{103{,}000\ Btu} x \frac{1{,}000{,}000\ Btu}{1\ mmBtu} \times \frac{5.49\ kg\ CO2e}{1\ ccf}$$

This section contains projections for CO2 emission reductions that are a direct result of the energy efficiency measures outlined in Tables (5&6). The following table breaks out the emission reductions due to gas savings.

Table 8. Projected Annual CO2 Emission Reductions by Energy Source (kgs C02)

Savings Source	Annual C02 Emission Reductions	
	Low	High
Natural Gas	1,846	9,262

2.10 Participation

Anticipated participation in the program is in Table 9 below. This is the average participation seen over the past years of the PUR program. The Company believes that the previous interest in the program will continue.

Table 9. Projected Program Participation

Program Year	2024	2025	2026
Number of Participants	10	15	15

2.11 Proposed Performance Metrics

The Company will submit an annual report on the PUR program each April, three months after the close of the calendar year. This report will provide information on activity for the previous year and progress towards three-year goals, including, but not limited to:

- First year and lifetime savings of weatherization measures.
    - Calculated using the TRM.
- HH System operations.
    - Operating hours
    - Setpoint temperatures
    - System Changeover
    - Changes in Occupant Parameters
    - Total energy costs
- Participation (developers or DAC residents).
- Total number of DAC participants for calendar year.
- Total dollar amount spent on initiatives for calendar year.
- Emissions reductions.
- Itemized spending across weatherization measures, hybrid heating systems and natural gas generator installations.

3 Implementation

3.1 PUR Program Staging

The Company anticipates that the PUR program will be ready to implement post plan approval. This will give the program a short year of activity in 2024, with the anticipation of full participation levels in 2025.

3.2 Administration

The PUR program will be managed by National Fuel. The Company will engage the services of a Program Administrator to fulfill all the roles required to implement the program. Table 10 below describes the primary roles in the management of the program.

Table 10. Overview of Administration Roles

Role	Description
Program Administrator	Primarily responsible for program planning and management. Supervises and manages all other roles.
Implementation Contractor	Directly responsible for main aspects of program delivery, including developer engagement, measure installation, incentive processing, program tracking, inspection, and reporting.
Evaluator	Performs independent program and portfolio evaluations that are used to verify program results and guide future plans.

3.3 Inspections

Inspections are to be completed by the Program Administrator.

Perform a Blower Door Test[10] before renovation and after (for existing occupied homes unless not feasible due to health or safety concerns).[11]

Before information that shall be obtained on the property includes:

- Blower Door Test (for existing occupied homes only)
- Number of Stories
- HVAC Type
- Insulation Baseline for Ceiling (with Pictures as applicable)
- Insulation Baseline for Walls (with Pictures as applicable)

[10] Home energy professionals use a blower door as a diagnostic tool to determine how much air is entering or escaping from your home. "https://www.energy.gov/energysaver/blower-door-tests"
[11] NYS TRM - AIR LEAKAGE SEALING "https://dps.ny.gov/technical-resource-manual-trm"

- Home Age
- Current Electric and Gas usage (as applicable)

After information that shall be obtained on the property includes

- Blower Door Test Delta
- New Insulation Baseline for Ceiling (with Pictures as applicable)
- New Insulation Baseline for Walls (with Pictures as applicable)
- TRM Calculation for Air Leakage Change
- TRM Calculation for Insulation Change
- Picture documentation of weatherization measures

3.4 Measurement System

National Fuel will require that its Program Administrator collect all relevant participant, application, measure, and contractor information. There are two types of data monitoring that the Company proposes. The first monitor will be via an Ecobee Smart Thermostat which provides data on how the homeowner uses the system from setpoints, change-over settings, schedule, etc. The electric usage can be captured via a remote electronic meter system because a heat pump's efficiency and capacity vary with outdoor air temperature and number of stages. Gas usage will be monitored via monthly metered data which will account for usage based on heating degree days. This is the most cost-effective solution for monitoring gas usage if there are no unusual gas loads at the location.

The costs for this type of monitoring are estimated to be between $2,000 per home monitored with a possible fixed fee for data maintenance, cloud data access, and end of life electrical metering removal. The Company will regularly review this data and aggregate cost, savings, and participation data to a centralized database controlled by the Company, the source for program management and reporting.

3.5 Evaluations

The Company will monitor the ongoing progress of the PUR program to provide the

highest possible service to developers and customers. The Company will closely track real time data, perform inspections of completed projects, and perform periodic evaluations for the program.