national fuel

December 27, 2023

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
400 North Street
Harrisburg, Pennsylvania 17120

Re: National Fuel Gas Distribution Corporation
Delta Fund for Research and Development Projects Report

Dear Secretary Chiavetta;

Pursuant to R-00061493 Settlement paragraph 18 A.3, "Distribution will file with the Commission and serve upon other Parties on or before December 31 an annual report for the preceding twelve-month period ended September 30, setting forth revenues for the Delta Fund for research and development projects and expenditures for such projects. In addition, Distribution will describe in the annual report projects that have been funded". The enclosed report is submitted under this settlement agreement.

Very truly yours,

Robert D. Eck
General Manager
Energy Services Department

Encl.

Cc: Office of Special Assistants (E-Mail)
Office of Consumer Advocate (E-Mail)
Office of Small Business Advocate (E-Mail)

I. INTRODUCTION/BACKGROUND

The provisions of R-00061493 Settlement paragraph 18 A.3 were adopted on November 30, 2006, and effective January 1, 2007. Paragraph 18 A.3 states:

"3. The Joint Petitioners agree to $526,466 to fund the Delta research and development program pursuant to the Statement of Scott E. Swartzfager No. 14. The deferral treatment and review process outlined in R-00049656 will continue. The company will not expend these dollars on additional customer outreach for enhanced energy efficiency.

Distribution will be permitted to record a regulatory asset or liability for differences between the annual rate allowance and annual expenditures. However, Distribution will not be permitted to retroactively recover in a future proceeding any expenditures in excess of the annual rate allowance and any deferred balance from the previous year's Delta funding. Distribution will provide for review of research projects as described in its testimony. In order to implement this Settlement, the Joint Petitioners request that the Commission's Final Order in this proceeding include the following language to allow Distribution to qualify for deferred accounting under SFAS 71:

> "National Fuel Gas Distribution Corporation's accounting policies conform to the Statement of Financial Accounting Standards No. 71 'Accounting for the Effect of Certain Type of Regulations' which are in accordance with the accounting requirements and ratemaking practices of regulatory authorities. The application of these accounting policies allows the Company to defer expenses and income on the balance sheet as regulatory assets and liabilities when it is probable that those expenses and income will be allowed in the rate-setting process in a period different from the period in which they would have been reflected in the income statement by an unregulated Company.
>
> "Because research and development projects often require a commitment over multiple years and because the expenditures for such projects may not match on an annual basis revenue for funding of research and development projects, deferred accounting is appropriate and is approved. The regulatory deferral treatment sought for the Research and Development expenditures and rate relief requested in the case are in accordance with SFAS No. 71.
>
> "The Company will manage the costs of the Research and Development expenditures to match revenues deferred pursuant to this Order to eliminate any differences between deferred costs and deferred revenues at the end of a five-year period commencing on the day after the R-00049656 Order was entered."

Distribution will file with the Commission and serve upon other Parties on or before December 31 an annual report for the preceding twelve-month period ended September 30, setting

forth revenues for the Delta Fund for research and development projects and expenditures for such projects. In addition, Distribution will describe in the annual report projects that have been funded."

The provisions of R-00049656 Settlement paragraph 44 were adopted on March 23, 2005, and effective April 15, 2005. Paragraph 44 states:

"44. Distribution's proposal to fund the Delta research and development program pursuant to the Supplemental Statement of Ruth Friedrich-Alf No. 102 S2 is approved. Increased rates in this proceeding provide for recovery of $526,466 in Delta research funds. Distribution will be permitted to record a regulatory asset or liability for differences between the annual rate allowance and annual expenditures. However, Distribution will not be permitted to retroactively recover in a future proceeding any expenditures in excess of the annual rate allowance and any deferred balance from the previous year's Delta funding. Distribution will provide for review of research projects as described in its testimony. In order to implement this agreement, the Parties request that the Commission's Final Order in this proceeding include the following language to allow Distribution to qualify for deferred accounting under SFAS 71:

> 'National Fuel Gas Distribution Corporation's accounting policies conform to the Statement of Financial Accounting Standards No. 71 'Accounting for the Effect of Certain Type of Regulations' which are in accordance with the accounting requirements and ratemaking practices of regulatory authorities. The application of these accounting policies allows the Company to defer expenses and income on the balance sheet as regulatory assets and liabilities when it is probable that those expenses and income will be allowed in the rate-setting process in a period different from the period in which they would have been reflected in the income statement by an unregulated Company.
>
> 'Because research and development projects often require a commitment over multiple years and because the expenditures for such projects may not match on an annual basis revenue for funding of research and development projects, deferred accounting is appropriate and is approved. The regulatory deferral treatment sought for the Research and Development expenditures and rate relief requested in the case are in accordance with SFAS No. 71.
>
> 'The Company will manage the costs of the Research and Development expenditures to match revenues deferred pursuant to this Order to eliminate any differences between deferred costs and deferred revenues at the end of a five-year period commencing on the day after this Order is entered.'

Distribution will file with the Commission and serve upon other Parties on or before December 31 an annual report for the preceding twelve-month period ended September 30, setting forth

revenues for the Delta Fund for research and development projects and expenditures for such projects. In addition, Distribution will describe in the annual report projects that have been funded."

As presented in R-00049656 Statement No. 102 (page 15).

"On an annual basis coming off of September 30, a reconciliation of revenues and expenditures with a description of projects funded will be on file on or before December 31 with the Office of Trial Staff, Office of Consumer Advocate and the office of Small Business Advocate. At the fifth reconciliation, Distribution will file a five-year report."

As presented in R-00049656 Statement No. 102 S2 (page 7)

"Annual revenues …. will be deferred to offset the costs of the Research and Development expenditures (expenses) to both the Gas Technology Institute ("GTI") fund and local projects.

The Company will manage the cost of the Research and Development expenditures to match revenues deferred pursuant to this Order to eliminate any differences between deferred costs and deferred revenues at the end of a five-year period commencing on the day after this Order is entered."

It is under these guidelines and agreements that Distribution files the following report for the period ended September 30, 2023.

National Fuel Gas Distribution Corporation
Pennsylvania Division

II. Annual Filing of Delta Fund Revenues and Expenditures
For the period ended September 30, 2023

	Annual		Cumulative		
Year Ended	Expenditures	Revenues	Expenditures	Revenues	Balance
Sept. 2005	$92,300	$113,927	$92,300	$113,927	($21,627)
Sept. 2006	$376,800	$526,466	$469,100	$640,393	($171,293)
Sept. 2007	$596,800	$526,466	$1,065,900	$1,166,859	($100,959)
Sept. 2008	$526,493	$526,466	$1,592,393	$1,693,325	($100,932)
Sept. 2009	$376,368	$526,466	$1,968,761	$2,219,791	($251,030)
Sept. 2010	$455,911	$526,466	$2,424,672	$2,746,257	($321,585)
Sept. 2011	$721,800	$526,466	$3,146,472	$3,272,723	($126,251)
Sept. 2012	$280,300	$526,466	$3,426,772	$3,799,189	($372,417)
Sept. 2013	$626,800	$526,466	$4,053,572	$4,325,655	($272,083)
Sept. 2014	$278,891	$526,466	$4,332,463	$4,852,121	($519,658)
Sept. 2015	$276,800	$526,466	$4,609,263	$5,378,587	($769,325)
Sept. 2016	$458,404	$526,466	$5,067,667	$5,905,053	($837,386)
Sept. 2017	$500,530	$526,466	$5,568,197	$6,431,519	($863,322)
Sept. 2018	$362,547	$526,466	$5,930,744	$6,957,985	($1,027,241)
Sept. 2019	$445,438	$526,466	$6,376,182	$7,484,451	($1,108,269)
Sept. 2020	$452,883	$526,466	$6,829,065	$8,010,917	($1,181,852)
Sept. 2021	$468,422	$526,466	$7,297,487	$8,537,383	($1,239,896)
Sept. 2022	$865,588	$526,466	$8,163,075	$9,063,849	($900,774)
Sept. 2023	$517,264	$526,466	$8,680,339	$9,590,315	($909,976)

Note 1: Rates were effective April 15, 2005, therefore the report ended September 30, 2005, does not represent a 12 month period of revenue collection.

III. DESCRIPTION OF ACTUAL EXPENDITURES - PERIOD ENDED SEPTEMBER 2023

A. GTI Utilization Technology Development Program

$129,500 was submitted to Utilization Technology Development, NFP (UTD) for the April 1, 2023, through March 31, 2024, dues. $114,400 has been allocated to specific projects as listed below.

UTD Payments, Fees, Credits, Carryover

Payments to UTD	129,500.00
Administration Fees	-12,950.00
Carryover of Unallocated Funds from Prior Year	752.68
Funds Available for Allocation	117,302.68
Large Commercial and Industrial Customers	
2.16.A.4 Next Generation Infrared Burner - Phase 4: Hydrogen Focus	-2,220.00
2.20.A.3 Low Emission Efficient Burner for Ovens and Dryers - Field Demo - Phase 3	-1,850.00
2.20.E.2 Energy Source Options for Industrial and Large Commercial Gas Users - Phase 2	-816.22

2.20.E.3 Energy Source Options for Industrial and Large Commercial Gas Users - Phase 3	-4,440.00
2.21.B Energy Recovery from Brewing/Distilling Operations: Field Demo	-888.00
2.21.B.2 Energy Recovery from Brewing-Distilling Operations – Phase 2	-740.00
2.21.C.2 Zero Emission Processes with Carbon Recovery – Phase 2	-2,590.00
2.21.D.2 High-Efficiency Crop Drying Process – Phase 2: Prototype Design and Field Demo.	-408.11
2.22.B Ribbon Burner Performance with Hydrogen-Blended Gases	-2,336.55
2.22.D High Performance Adjustable Port Burner	-1,916.60
2.22.E Mitigating Methane Emissions from Large Commercial and Industrial End Use Eqpt.	-2,220.00
2.22.F Tecogen Hybrid Gas/Electric Chiller Laboratory Evaluation	-1,184.00
2.23.A Decarbonizing Large Commercial and Industrial Equipment with Hydrogen	-3,700.00
2.23.B Mobile Modular Resilient Gas-fired Power Generation	-555.00
2.23.C Controlled Mixing Burner for Process Heating	-3,330.00
2.23.D Flex Fuel Gas Nozzle and Burner for Boilers	-2,960.00
Food Preparation and Service Customers	
1.17.H.4 Residential Cooking Pollutants and IAQ - Phase 4	-395.16
1.17.H.5 Residential Cooking Pollutants and IAQ - Phase 5	-1,073.00
1.19.B.3 Gas Fired Warewasher - Phase 3	-1,292.78
1.20.K.2 Field Evaluation of Indoor Air Quality in Residential Kitchens - Phase 2	-544.64
1.21.G.3 Technical Support to Address Gas Foodservice Technologies - Phase 3	-1,850.00
1.21.H.2 CFS Burner Technology Carbon Reduction Including Hydrogen Blending – Phase 2	-1,438.93
1.21.H.3 CFS Burner Technology Carbon Reduction Including Hydrogen Blending - Phase 3	-1,850.00
1.23.K CFS Decarbonization Tool Development and Demonstration	-259.00
1.23.L Technical Assistance to Advance Gas Foodservice Equipment	-925.00
1.23.M Advanced Controls for Residential Kitchen Ventilation Systems	-1,480.00
1.23.N Next Generation Commercial and Residential Range Top Burner	-1,295.00
Residential and Light Commercial Customers	
1.16.H.4 EnergyPlus Models for Advanced Gas Heating Systems - Phase 4	-1,480.00
1.16.H.5 EnergyPlus Models for Advanced Gas Space Heating Systems and Combi Systems - Phase 5	-444.00
1.18.F.4 Mitigating Methane Emissions from ResCom End Use Equipment – Phase 4: H2 Impacts	-2,220.00
1.18.H.3 Economical High-Efficiency Res. Gas Abs. HP with Int. Cooling – Phase 3	-2,960.00
1.19.C.2 Integrated, Self-Powered, High-Efficiency System - Phase 2	-3,330.00
1.20.H.2 Hydrogen-Blended Gas in Residential/Commercial Combustion Equipment - Phase 2	-647.50
1.20.H.3 Hydrogen-Blended Gas in ResCom Comb. Eqpt. - Phase 3: Peripheral Appliances	-2,202.61
1.21.A.2 HeatAmp Adsorption Thermal Heat Pump – Phase 2	-986.79
1.21.B.3 Technical Support for ResCom Gas Equipment Testing, Perf. and Safety - Phase 3	-2,960.00
1.21.C.2 CleanO2 CarbinX Carbon Capture - Phase 2	-2,220.00
1.21.E.2 Gas Engine Heat Pump Modeling, Testing and Implementation - Phase 2	-592.00
1.21.I Ionic Liquid Absorption Heat Pump for Commercial Water Heating	-518.00
1.22.A Hydrogen Blending End-Use Performance and Safety Field Demonstration	-2,787.95
1.22.C Fuel-flexible Ultra-Low NOx Catalytic Burners for ResCom Appliances	-740.00
1.22.E Deep Energy Customized Affordable Retrofits of Bldg. Envelopes and Mechanicals	-2,220.00
1.22.E.2 Deep Energy Customized Affordable Retrofits of Bldg. Envelope and Mechanicals - Phase 2	-1,480.00
1.22.G Safe Use of Hydrogen in Buildings	-2,546.34

1.22.P.2 Emerging Distributed Methane Pyrolysis Technologies - Phase 2	-1,739.00
1.23.B Blue Frontier RTU AC system with Integrated Fuel Cell - Laboratory Evaluation	-888.00
1.23.E Combustion Technology for Emerging Low Carbon Manufactured Gases	-1,369.00
1.23.F Integrating Hybrid Fuel-fired and Elec-driven ResCom HVAC with PV in Generac Nanogrid	-2,590.00
1.23.G Accelerated Life Testing of ResCom Equipment Components with H2-Blended Gases	-2,590.00
1.23.H Impacts of H2-Blended Gas on Venting, Condensation, and Weatherized Equipment	-1,850.00
1.23.I Inherently Safe ResCom Combustion Systems for Hydrogen-Blended Gases	-1,850.00
1.23.J Hydrogen Flame Visibility and Colorants	-2,590.00
Clean Transportation and Advanced Energy System Customers	
2.20.G.2 Smart CNG Station Field Demonstration - Phase 2	-730.38
2.21.F CNG/RNG Locomotive Field Demonstration	-4,810.00
2.21.I.3 Technical Support for Clean Transportation Testing, Performance, and Safety - Phase 3	-1,850.00
2.22.G Cost-Effective Pre-Cooling for High-Flow Hydrogen Vehicle Fueling	-4,070.00
2.22.H Heavy-duty Hydrogen Vehicle Development and Deployment	-2,590.00
2.23.E Adsorbed Natural Gas Vehicle Field Demonstration	-1,850.00
2.23.G Small-Scale Natural Gas SMR Technology Optimization with Carbon Capture	-740.00
Memberships/Other	
6. Veritas Gas Measurement and Verification Initiative	-5,550.00
1.23.P UTD Program Technology Transfer Communication	-1,850.00
Adjustments and Miscellaneous Refunds	
Board Designated Net Assets 2023	1,205.57
Refund - 1.11.M.5 Building America Whole House Retrofit Program (Phase 5)	72.97
Refund - 1.16.H.3 EnergyPlus Models and Market Analysis for Advanced Resid. Heating Sys - Phase 3	74.52
Refund - 2.12.M.3 Low NOx Ribbon Burner - Phase 3: Technology Transfer Activities	33.43
Refund - 2.14.F.2 Free Piston Linear Motor CNG Compressor - Phase 2	108.89
Funds Allocated to Projects	-114,399.56
Unallocated Funds	4,398.50

B. GTI Operations Technology Development Program

$184,500 was submitted to Operations Technology Development, NFP (OTD) for the 2023 membership fee. $154,367 has been allocated to specific projects as listed below.

Payments to OTD, Fees, Carryover

Payments to OTD	184,500.00
Administration Fees	-14,391.00
Carryover of Unallocated Funds from Prior Year	90,387.07
Funds Available for Allocation	260,496.07

Allocations to Projects

(1), (2) and (4) Historic Projects	
1.14.g.2 Refund Evaluation of Residential Methane Detectors-Phase 2	85.62
1.14.g.8 RMD/NGD Consumer Behavior Study Update	-2,214.00
2.14.a Refund Composite Repair Wrap for Polyethylene (PE) Systems	940.64
4.12.c.2 Refund Demonstration of Above Ground Pipe and Coating Assessment Tool, Phase 2	4.71
(5) Construction/ Infrastructure Techniques	
5.07.p (GTI) GNSS (GPS) Consortium	-5,535.00
5.11.m.2 Refund Mobile GIS with Tracking and Traceability Pilot Projects	1,845.00
5.15.a Refund Cybersecurity Collaborative	19.38
5.17.h Refund Investigation of Drilling Mud Permeation in PE Pipe	1,240.89
5.17.p Field Test NeverWet and Other Nano-Tech Coatings to Reduce Aboveground Corrosion	-526.93
5.18.b Refund Advanced Cross-Bore Detection Using Visual and Sensing Technologies	3,690.00
5.18.f Refund Compact Gas Meters	93.28
5.19.g Refund Design Day/Gas Modeling Workshop	372.21
5.21.e.2 Development and Evaluation of the CoSMiC Eye Satellite Based Pipeline Monitoring System Phase 2 -Pipeline Right-of-Way Monitoring for Class Location Designation	-7,380.00
5.21.t Effect of hydrogen blended natural gas on the performance of gas meters and diaphragm type service regulators- Phase 1	-3,354.58
5.22.d Evaluation of Micro-Thermal Gas Metering Technology	-758.30
5.22.e Tracking/Reporting Aggregated Methane Emission Reductions	-618.08
5.22.g Pressure Monitoring and Alert Device for the Replacement of Token Reliefs	-2,897.39
5.22.i Gas Engineer Training Program Development	-3,256.06
5.22.m Hydrogen Blend Measuring Devices	-212.91
5.22.n Remotely Deployed Double Balloon Stopper – Design Refinement	-1,338.73
5.22.p Hydrogen Blending Program -	-760.88
5.22.q NPT-F Threaded and Other Alternative Joint Connections for Meter Sets	-760.14
5.22.r Hydrogen Leak Tape Evaluation	-764.20
5.22.s H2 Steel Compatibility	-1,160.14
5.22.t Market Study of 100% H2 Compatible Distribution Equipment	-484.87
5.22.v Update to ASTM F2897	-346.49
5.23.g Plastic Gas Pipe Damage Assessment due to high pressure water jets and cross bores	-1,845.00
5.23.j Material Inspection and Testing Training Program	-1,845.00
5.23.n Developing Acceptance Criteria for Mechanical Tapping Tee Anomalies – Phase 1	-2,952.00
5.23.v Evaluation of Viega MegaPress Fittings	-1,845.00
(6) Memberships/Other	
6.08.a (GTI) Carbon Management Information Center	-11,070.00
6.11.a PRCI Membership	-1,845.00
6.14.a Quality Audit Program	-7,380.00

6.16.a Center for Methane Research	-9,225.00
(7) Methane Emissions/Detection and Gas Quality	
7.10.b.3 Refund Odor Fade and Odor Masking from H2 Blends	41.27
7.16.a.2 Refund Leak Repair Prioritization - Ph 2	2,82.43
7.16.a.3 Leak Repair Prioritization - Ph 3	-685.60
7.18.g Refund Impact of RNG on End Use Applications	68.79
7.18.h.2 Refund Gas Quality Resource Center (7.11.a and 7.18.h)	842.80
7.19.b.2 Advanced Leak Detection Technologies for Grading Leaks Phase 2	-1,422.13
7.20.a Develop Remote Sensing and Leak Detection Platform with Multiple Sensors	-2,212.52
7.20.b Refund Validation of Remote Sensing Leak Detection Technologies under Realistic Conditions	47.80
7.20.m Refund RMDs - Test Response to Natural Gas/Hydrogen Blends	1,230.00
7.22.e Refund Emissions Quantification and Reduction Strategies Report	883.76
7.22.f Refund Carbon Monoxide Sensor Interference from Hydrogen	432.56
7.22.h Veritas Gas Measurement and Verification Initiative	-5,535.00
7.22.j Evaluation of Current Advanced Mobile Leak Detection Systems	-283.76
7.22.k Optical Gas Imaging (OGI) and handheld laser methane detectors for large leak identification	-1,229.88
7.22.l Open Hydrogen Initiative	-36,900.00
7.22.n Predictive Corrosion-Rate Risk Model from Soil and Environmental Conditions	-1,111.80
7.23.g Investigate Feasibility of Pipeline Thermographic Internal Inspection for Leak Detection	-1,845.00
7.23.n Satellite Methane Detection for Distribution Applications	-1,845.00
7.23.q Workshops on Decarbonization Pathways that leverage the Natural Gas Infrastructure for non-utility stakeholders	-5,271.53
(8) Intelligent Utilities	
8.17.b.2 Refund Transmission Tracking and Traceability Marking Standard, Phase 2	268.05
8.19.c Refund Wearable Computing Technology	290.99
8.19.h.2 Refund	1,107.00
8.19.k Refund Augmented Reality (AR) O&M Procedures, Checklists and SME Contact	159.24
8.20.j Above Ground Service Tee Identification and 3D Mapping	-226.94
8.21.b.2 High-Accuracy Locating Technology - Phase 2 - On site pilots	-2,952.00
8.22.d Standardized Utility and Supplier Comanaged Inspection and Test Record Storage	-6,107.69
8.22.g Work Zone Intrusion Detection and Warning System	-492.98
8.22.i Pipe Bridge Inspection/Design using LiDAR drone-based inspection	-1,033.57
8.22.j Augmented Reality (AR) Technology to Enhance Field Operations	-1,845.00
8.23.b 3D monitoring of terrain over pipelines	-1,845.00
8.23.d SSR CORRECTION SERVICE FOR GNSS UTILITY MAPPING APPLICATIONS	-2,952.00
8.23.f Developing Routing Solution for Leak Survey	-1,845.00
8.23.g Commercial Implementation of Steel Pipe Traceability	-11,070.00
8.23.l Traceability Template for Assemblies	-5,535.00
(9) Risk and Decision Analysis/Model	
9.22.a Reserve Strain Capacity Determination- PHMSA cost share	-3,690.00

Adjustments and Miscellaneous Refunds	
Board Designated Net Assets 2022	7,212.21
G&A Refund	389.15
Funds Allocated to Projects	-154,366.69
Unallocated Funds	113,730.73

C. SUMMARY OF ACTUAL EXPENDITURES PERIOD ENDED 2023

Utilization Technology Development (UTD) Program - GTI	$ 129,500
Operations Technology Development Program (OTD) - GTI	$ 184,500
Emerging Technology Program (ETP) - GTI	$ 9,230
Low-Carbon Resources Initiative (LCRI) – GTI	$ 111,500
North American Gas Heat Pump Collaborative – RI LLC	$ 30,864
Natural Gas Vehicle (NGV) Technology Demo	$ 4,015
Hybrid Heating and Cold Climate Heat Pump- Demos	$ 43,705
Zero Net Energy (ZNE) Home Review	$ 3,950
Total Pennsylvania Delta Funds Program Expenditures	**$ 517,264**

IV. PROJECTED EXPENDITURES - PERIOD ENDING SEPTEMBER 2024

Expenditures for National Fuel Gas Distribution Corporation's ("National Fuel") Pennsylvania Delta Funds RD&D Program are projected to be between $505,730 and $805,730 of which $526,466 is collected on an annual basis. The balance will be covered by unutilized funds from prior years. In 2024 the following planned charges are projected:

1. **Utilization Technology Development** (UTD) membership fees of approximately $129,500. Specific projects to be determined.

2. **Operations Technology Development** (OTD) membership fees of approximately $184,500. Specific projects to be determined.

3. **Emerging Technology Program** (ETP) membership fees of approximately $9,230.

4. **Low-Carbon Resources Initiative** (LCRI) membership fees of approximately $111,500.

    a. LCRI is an effort lead by the Electric Power Research Institute (EPRI) and the GTI Energy (GTI) to collaborate on addressing the need to accelerate development and demonstration of low carbon energy technologies.

5. **North American Gas Heat Collaborative** membership fees of approximately $25,000

    a. The North American Gas Heat Collaborative is membership-based collaborative to accelerate the commercialization and market acceptance of gas heat pumps in North America. The goal of this collaboration is to enhance market share of gas heat pump technologies and energy efficient gas technologies.

6. **Local Opportunity Projects** spending estimate of approximately $346,000 (see below). Funds not used for the development of qualified local technology projects in National Fuel territory may be allocated to the national GTI programs described above.

    1) $46,000 – Hybrid HVAC & Cold Climate Air Source Heat Pumps Demos
    2) $20,000 – Combined Heat and Power (CHP) Feasibility Assessments
    3) $250,000 – CHP Incentive Program
    4) $30,000 -- NGV Technology Demonstration

SUMMARY OF PROJECTED EXPENDITURES - PERIOD ENDED 2024

Utilization Technology Development Program - GTI	$ 129,500	Planned
Operations Technology Development Program - GTI	$ 184,500	Planned
Emerging Technology Program – GTI	$ 9,230	Planned
Low-Carbon Resources Initiative – GTI	$ 111,500	Planned
North American Gas Heat Pump Collaborative – RI LLC	$ 25,000	Planned
Hybrid Heating and Cold Climate ASHP Demos	$ 46,000	Planned
CHP Feasibility Assessments	$ 20,000	Potential
CHP Incentive Program	$ 250,000	Potential
NGV Technology Demos	$ 30,000	Potential
Total Pennsylvania Delta Funds Program Expenditures	**$ 505,730**	**Planned**
Total Pennsylvania Delta Funds Program Expenditures	**$ 300,000**	**Potential**
Total Pennsylvania Delta Funds Program Expenditures	**$ 805,730**	**Planned and Potential**

V. STATUS UPDATE OF LOCAL OPPORTUNITY PROJECTS – 2023

Funding of gas industry research through GTI, as an example, returns many benefits, including ensuring continued improvement and availability of energy-efficient, low emissions and cost-effective gas technologies, while leveraging the funding resources of gas utilities across North America. The Local Opportunity Projects portion of this program intends to identify projects for direct local support offering equal, or better, benefits than GTI. This is challenging, but National Fuel endeavors to identify and develop these opportunities. Funds available through this portion of the program, beyond the minimum commitments to GTI, may be used for qualified local projects. Funds not used locally are sent to GTI to be allocated to suitable projects, as shown in the previous supported project listings.

Summaries for Local Opportunity Projects active or completed in 2023 are provided below.

1. **Hybrid Heating Demonstrations.** National Fuel installed twelve (12) hybrid systems in its Pennsylvania service territory. National Fuel is investigating the operating costs and impact on greenhouse gas (GHG) emissions that contribute to climate change associated with utilizing an electric Air Source Heat Pump (ASHP) in combination with a high efficiency natural gas furnace for heating (and cooling), as compared to a traditional gas furnace only and central electric air conditioning.

2. **Cold Climate Air Source Heat Pump Demonstrations.** National Fuel installed two (2) cold climate air source heat pumps (ccASHP) in its Pennsylvania service territory. National Fuel is conducting a study to determine the monthly energy cost and usage changes, cold climate equipment performance and GHG emissions associated with utilizing a ccASHP as the sole energy source for the residences' heating and cooling needs.

3. **NGV Technology Demonstration.** National Fuel has purchased a total of four (4) Ford F-250 pickup trucks that have been modified to include Adsorbed Natural Gas (ANG) technology. ANG is a low-pressure technology that reduces tank pressure from 3,600 to 900 psi. The low-pressure enables private, daily fueling with the use of a small, low-cost fueling

device that can be installed wherever a natural gas line is available, thereby eliminating the lack and high cost of high pressure/fast-fill stations. The cost of the vehicle modification and the fueling device was shared with an Alternative Fuels Incentive Grant (AFIG) and National Fuel. There is one fueling device at Oil City Service Center and one at Erie Service Center. Two of these trucks are operating out of the Oil City Service Center and two additional trucks are operating out of the Erie Service Center. AFIG funding and Delta funds paid for two trucks and fueling devices. National Fuel's Operations group purchased the additional two trucks.

4. ZNE Home Review – National Fuel engaged with various local non-profit entities in the Erie area and completed multiple initial site studies to implement a ZNE home solution. A viable site was identified with one of the entities, but National Fuel was unable to reach an agreement with the non-profit on the implementation of the ZNE technologies. National Fuel conducted various other site studies to identify viable homes, but due to several factors, none of the facilities met the required criteria to qualify for the ZNE technologies.

VI. PROSPECTIVE LOCAL OPPORTUNITY PROJECTS – 2024

1. **Hybrid Heating Demonstrations.** National Fuel will continue to investigate the operating costs and impact on GHG emissions of the hybrid installations that contribute to climate change associated with utilizing an electric ASHP in combination with a high efficiency natural gas furnace for heating (and cooling), as compared to a traditional gas furnace only and central electric air conditioning.

2. **Cold Climate Air Source Heat Pump Demonstrations.** National Fuel will continue to conduct a study on the ccASHP installations to determine the monthly energy cost and usage changes, cold climate equipment performance and GHG emissions associated with utilizing a ccASHP as the sole energy source for the residences heating and cooling needs.

3. **CHP Feasibility Assessments.** In accordance with the PUC CHP Policy Statement and as an extension of previous initiatives in support of market development for CHP, National Fuel will continue to implement an active program to identify prospective candidates for siting of CHP technology. To assist in this initiative, National Fuel has developed a CHP questionnaire and distributed this questionnaire to its hardwood kiln drying facilities to help quickly assess if CHP technology is a good fit for their prospective sites. National Fuel will be using the gathered data to pursue preliminary studies to install CHP technology at any qualifying facilities.

4. **CHP Incentive Program.** In accordance with the PUC CHP Policy Statement, National Fuel is evaluating an incentive program to promote the implementation of CHP projects in its service territory. An industrial coating operation has been identified and a preliminary study is being completed for the potential installation of a 500 KW IC engine. Based upon the results of the preliminary study, National Fuel would partially fund the installation of the CHP system.

5. **NGV Technology Demonstration.** National Fuel is currently receiving quarterly reports on the operation of the four purchased ANG pick-up trucks. National Fuel will continue to review these reports to see how the ANG platform affects fuel savings and the reduction of GHG emissions. Additionally, National Fuel will continue to work alongside local transportation companies and participate in events to promote the ANG platform in public as well as private modes of transportation.

National Fuel intends to continue efforts to identify other beneficial Local Opportunity Projects for development which may provide direct benefit to its Pennsylvania consumers, businesses, and industries.