FILED VIA ePUC

November 5, 2021

Holly R. Anderson
Clerk of the Commission
112 State Street
Montpelier, VT 05620-2701

Re: Notice re Climate Action and Innovation, Heat Pump Water Heater Initiative

Dear Ms. Anderson

By this filing, Vermont Gas Systems, Inc. ("VGS" or the "Company") provides notice of a new pilot in our behind-the-meter services in connection with our Climate Action and Innovation programing.[1] On December 1, 2021, VGS will begin offering services designed to advance the adoption of Heat Pump Water Heaters ("HPWHs") as a thermal energy alternative for Vermonters, both pipeline and non-pipeline customers. This informational notice provides background on the Company's current "Behind-the-Meter" offerings, describes VGS's HPWH initiative, and explains how the program will advance VGS's decarbonization efforts and Vermont's energy goals.

Background: "Behind-the-Meter" Services

For many years, VGS has been offering installation and maintenance services for natural gas appliances. These services include specifically: (1) Equipment Installation, (2) Appliance Repair and Maintenance Service, (3) Service Plans, and (4) Equipment Rental Services (and Sales). VGS updates the Commission on these services through an annual compliance filing.[2]

(1) **Equipment Installation Services:** VGS offers equipment installation services for customers who have purchased natural gas appliances. When a customer uses VGS for this service, the customer is charged an hourly labor rate plus materials. The labor and material rates for installation and the other services described below are periodically reevaluated to ensure they are in line with the market. This service is available to any

[1] Section 5 of the Company's Alternative Regulation Plan provides that VGS shall pursue "projects, programs, and services that support Vermont's statewide energy goals by advancing promising technologies to facilitate efficient, lower carbon energy choices for its customers." *See* Exhibit VGS-JMP-5 filed May 21, 2021 in Case No. 19-3529-PET. Section 5(d) requires VGS to provide 30 days' advance notice to the Commission and the Department before commencing any spending on a project, program, or service under the Climate Action and Innovation Budget that exceeds $25,000. This heat pump water heater initiative does not trigger the reporting requirements in Section 5, but VGS submits this filing to keep the Commission and Department apprised of its major Climate Action and Innovation projects, programs, and services.

[2] Pursuant to the Commission's Order in Case No. 19-0513-TF, dated Oct. 23, 2019, VGS makes an annual compliance filing detailing all programs and services VGS offers that are not subject to a specific tariff and related pricing information.

existing or new VGS customer that has residential-sized equipment.

(2) **Appliance Repair and Maintenance Services:** VGS provides appliance repair and maintenance service of natural gas appliances for existing VGS customers. This can be either on an emergency basis (a heating system malfunction during cold weather) or a preventive maintenance basis (a heating system or water heating tune-up in advance of the heating season). This service is available to any customer using residential-sized equipment. Customers are charged a market-based hourly labor rate plus materials.

(3) **Service Plans:** VGS offers Service Plans to customers for certain residential-sized natural gas water heaters and heating systems, and currently has approximately 5,700 customers enrolled in a Service Plan. These Plans constitute a service contract between VGS and the customer for limited repair, including parts, of customer-owned heating appliances and/or tank-style water heaters. Customers may choose a plan with or without an annual preventive maintenance inspection and are charged a monthly rate for the plan. Service Plan rates are periodically reassessed.

(4) **Lease Program and Sales**: VGS offers an appliance lease program for water heaters and conversion burners,[3] for which customers are charged a monthly lease rate. Sales of equipment are not widespread and are currently limited to space heaters aimed primarily at the condominium market, but VGS continues to evaluate customer interest in additional product sales. Customers are charged cost plus 35% (plus applicable taxes) for any equipment sold by VGS.

For these services, VGS's costs and revenues are included in our Cost of Service ("COS") and have been subject to formal and informal discovery during past rate proceedings. These services are a profitable part of VGS's overall business, and the associated revenue reduces our COS and therefore reduces customers' rates. For example, in the most recent rate case for FY2022, VGS had approximately 7,000 rental water heaters and 1,600 rental conversion burners in service. In FY2022, rental revenues are expected to be approximately $2,256,000, offset by rental property depreciation expense of approximately $1,004,000 and rental repair labor of approximately $77,000.[4] The overall net revenue for the behind-the-meter services for FY2022 reduced the FY2022 COS by $1,175,000.

Billing for these services appears as a separate line item on a customer's monthly VGS bill. For leases, monthly lease payments continue during the term of the contract. Customers have the option at any time to buy out the contract by paying the remaining lease payments in full to

[3] Conversion burners are used when converting an existing oil-burning furnace or boiler to natural gas.

[4] Within the Annual Rate Adjustment Filing, revenues are categorized as "other revenue" and are included in the Annual Rate Adjustment Filing under Schedule 15 – Other Revenue. The revenue is offset by (1) rental repair labor which is included in Schedule 17 – Cost of Service – Sales and (2) rental property depreciation expense which is included as part of Schedule 8 – Cost of Service - Depreciation.

purchase the leased equipment.[5] For sales, the customer is charged the total purchase price plus applicable taxes on their VGS bill. And for service contracts, the monthly service charge is included on a customer's monthly bill. The customer can call or email VGS at any time to cancel a service contract.

An Initiative to Jump-Start Adoption of HPWH Technology

In this initiative, VGS seeks to expand its existing installation and equipment rental services to include HPWH for households within, or in close proximity to, our pipeline infrastructure. HPWHs provide customers an opportunity to balance their climate values with affordability by replacing their current fossil fuel water heaters or electric resistance water heaters. Heat Pump Water Heaters have been identified as a top-tier technology opportunity that can advance the decarbonization of residential buildings by replacing water heaters that depend on natural gas and other fossil fuels.[6]

This initiative will target a sector of Vermont's energy landscape that remains almost entirely dependent on fossil fuels. Most Vermonters currently rely on fossil fuels for domestic hot water heating and the adoption of HPWHs is not keeping pace with Vermont's climate goals. A key objective of VGS's HPWH initiative is to obtain more information about how Vermonters make decisions related to decarbonization and to identify how we might increase the adoption of HPWH. For our current customers, we want to understand how long-term decarbonization strategies like HPWH might advance even if customers face increased costs[7]. For non-pipeline customers close to VGS's infrastructure,[8] our initial HPWH program aims to obtain the same information about customers' decarbonization decisions, but we also recognize that the decision-making factors are likely different for these energy users from both a cost and emissions reduction standpoint. For Vermonters currently using propane, oil, or electric resistance for water heating, switching to a HPWH means immediate cost savings as well as greater emissions reduction (in the case of propane or oil) than for current VGS customers. We believe that the potential for HPWH adoption may be greater for non-pipeline customers and we seek to develop an understanding of how we can support the more widespread adoption of this carbon reduction technology—as both a way for customers to save money and a strategy to decarbonize.

---

[5] If a customer fails to make a lease payment, the customer is considered in default when payment lags past 30 days. If failure to pay results in early termination of the contract, VGS has the right to remove the leased equipment.

[6] *See* e.g., https://www.eanvt.org/longform/2021-ean-annual-progress-report-for-vermont-key-findings/.

[7] When comparing two tank-style water heaters there is near parity in energy costs. Efficiency Maine has constructed a simple, user-friendly tool for consumers to compare these types of equipment and it is representative of what VGS anticipates Vermont customers would experience: https://www.efficiencymaine.com/at-home/water-heating-cost-comparison/.

[8] VGS plans to offer HPWH services to Vermonters who are within 5 miles of our natural gas infrastructure. We believe this includes approximately 36,000 Vermont homes that are beyond the immediate reach of our pipeline system.

At scale, HPWHs provide a significant net benefit of carbon emissions reduction.[9] A typical gas tank water heater in a single-family home produces roughly 11 mtCO2e[10] over its lifetime. For oil and propane fueled water heaters, those CO2 numbers increase greatly. Beneficial electrification of thermal loads with highly efficient equipment is how Vermont will ultimately overcome our fossil fuel dependency. Accordingly, HPWHs are poised to be a key part of the strategy to help meet Vermont's near- and long-term Comprehensive Energy Plan goals and carbon emissions reduction targets under the Global Warming Solutions Act ("GWSA").

The market for HPWHs in Vermont, however, remains a nascent one, with customer adoption of HPWHs well behind the pace required to meet the ambitious milestones modeled in support of the State's goals. Energy Action Network's modelling estimates that 200,000 HPWHs will need to be installed by 2030 as part of a strategy to meet GWSA requirements. According to Efficiency Vermont, which processes and tracks both efficiency and Tier 3 HPWH rebates statewide for the electric distribution utilities, it is estimated that fewer than 13,000 HPWHs have been installed in Vermont to date. The total HPWHs installed over the past few years has been at a rate of approximately 1,800 per year. Looking at the next nine years (2022-2030), the pace for adoption needs to be a formidable 20,000 HPWH installed per year to meet the State's goals. More education, promotion, and access are required along with the need for more skilled contractors to install and service HPWHs. VGS's HPWH initiative will advance Vermont climate goals by (1) promoting the adoption of a top-tier carbon reduction technology that has not gained sufficient traction in the residential thermal heating market, (2) reducing customers' reliance on fossil fuels for water heating, and (3) adding strength to the Vermont clean energy trade labor market by leveraging and adapting our current field service expertise and capacities, to keep pace with the demand of Vermont's ambitious energy goals.

Moreover, this new HPWH equipment offering will complement existing programs by leveraging the efficiency rebates offered by Burlington Electric Department and Efficiency Vermont, and the Tier III rebates offered by electric distribution utilities (refer to the pricing section below for more detail). The overall objective of the HPWH initiative is to continue to provide Vermonters with choice while focusing on climate goals, affordability, reducing rate pressures, and increasing the availability of carbon reducing technology.

Technology, Implementation, and Market Assessment

Beginning this fall, VGS will launch our new HPWH equipment initiative through a lease and sales model, with the objective of (1) acquiring technical knowledge and experience, (2) developing a successful service delivery model, and (3) conducting a market solutions assessment. This will equip us with insight to further Vermont's efforts to promote HPWH adoption at scale, including learnings and training that will enable us to offer HPWHs to a

---

[9] For perspective, a conversion of 10,000 of our customers from a natural gas water heater to a HPWH would result in a carbon reduction roughly equivalent to removing approximately 20,000 passenger cars from the road for one year: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

[10] Metric tons of carbon dioxide equivalent or MTCO2e is a unit of measurement where the unit "CO2e" represents an amount of a GHG whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas.

broader audience. We also hope to foster broader statewide efforts around HPWHs by sharing insights with partners such as Efficiency Vermont, Burlington Electric Department, Green Mountain Power, and other electric distribution utilities, as well as HVAC service providers in Vermont.

VGS has approximately 30 service technicians along with decades of experience providing behind-the-meter energy services to customers, including installing and servicing water heaters. Through this equipment offering, we will strengthen our team's ability to provide new climate-forward technology options to customers and serve a critical purpose in expanding Vermont's clean energy workforce.

This initiative will enhance our ability to provide more clean energy options to all customers. For non-pipeline Vermonters it will offer significant economic and carbon reduction benefits. These customers will immediately benefit from lower monthly water-heating costs after switching to HPWH.[11] At the same time, these customers will reduce their carbon impact through the adoption of a HPWH if they are currently using oil, propane, or electric resistance for water heating. For our pipeline customers, HWPHs carry similar operational costs in the near-term to existing natural gas heaters, and therefore may not be perceived as substantial enough economic savings to spur the fuel switch. Accordingly, we aim to learn more about what would motivate these customers to switch to HWPHs from their existing water heaters.

VGS seeks to gain the following insight from this initiative:

Acquiring critical HPWH technical knowledge and experience, including:

- Physical space assessments for appropriateness of technology across a variety of residential environments
- Site-specific installation experience
- Maintenance and service best practices[12]
- Ensuring our HPWH technology choices would also seamlessly enable present and near-future economic benefits for consumers of Demand Response programs offered by distribution utilities and Efficiency Vermont

Developing a successful service delivery model, including:

- Testing various customer education and engagement strategies related to water heating choices, carbon emissions messaging, and costs such as in-person consultation, social media, bill inserts, and website tools

---

[11] Based on current (10/11/21) retail prices of oil and propane fuels (source: https://publicservice.vermont.gov/content/retail-prices-heating-fuels), and depending on existing technology in customers' homes, oil and propane customers can expect to save roughly between $90 and $350 annually on water heating costs by switching to an Energy Star Tier 4-rated HPWH (source: https://www.efficiencymaine.com/at-home/water-heating-cost-comparison/).

[12] VGS will also leverage and learn from others, such as Efficiency Vermont, BED, CVOEO, and GMP, who have extensive experience in electric water heating space, including HPWHs.

- Understanding customer education requirements on HPWH-specific operation, basic troubleshooting, and user-enabled controls and monitoring features
- Understanding customer support needs and the efficiency of remote troubleshooting through internal staff or on-line resources

Conducting a market solutions assessment, including:

- Data collection and analysis of estimated versus actual energy, carbon, and financial metrics related to HPWH
- Testing business models that increase options to consumers and effectively mitigate rate pressure
- Consumer message testing to help shape our offering and provide effective and clear information that increases engagement with VGS as a solutions provider

Climate Action & Innovation Budget

The Climate Action and Innovation Budget spending for this initiative is approximately $20,000 for the period of the pilot.[13] The cost to launch this initiative is minimal, as VGS already has a business model offering equipment rental, sales, and service as discussed above. The spending will support the design and collection of both qualitative and quantitative data on technology performance, customer experience, installation process, and customer support resources through the end of fiscal year 2022. This data collection will be done through electronic means, when available, and conducted primarily through surveying. Funds spent will be focused on gathering data to ensure education, messaging, and customer experience are effective, to best serve our current and future customers. Data collected will provide a better understanding of how to promote greater adoption of HPWHs.

Description	**Amount**
Contractor(s) to conduct customer engagement/experience surveys (qualitative & quantitative), customer education and on-site assessments, where applicable. This will include the work to create the surveys, analyze the data, and present that analysis to VGS, estimated at approximately 20 hours per month at ~$75/hour.	$20,000

Pricing

Pricing for HPWH equipment installation and leases will be consistent with VGS's other behind-the-meter offerings and priced the same for pipeline and non-pipeline customers. We expect that revenue from HPWH services will offset rate pressure for all customers similar to our current behind-the-meter installation and leasing and as described in the background section above.

[13] The pilot period will include the twelve months beginning December 1, 2021 but contracted data collection and analysis will take place within the fiscal year. Then, the program will continue during our internal assessment.

We intend to charge customers for HPWH equipment and leases as described below:

	Equipment Installation	Water Heater Leases
Price charged to customers	Hourly labor rate plus materials, including materials mark-up (35% plus applicable sales tax). There is a one-hour minimum charge and the bill includes travel time to the address.	The customer is charged a monthly lease fee, which is the same amount over the life of the lease agreement.
How VGS determined appropriate charge	Labor rates are assessed periodically to ensure rates are in-line with the market and recover VGS's costs, including direct and indirect. Material costs are charged at VGS cost plus a mark-up (35% plus applicable sales tax).[14]	Lease rates are periodically reassessed to ensure VGS's costs are recovered, including direct, indirect, and cost of capital. Revised lease rates apply prospectively to new leases.

VGS will process the Efficiency Vermont and Tier 3 rebate directly with Efficiency Vermont, or distribution utilities, on behalf of the customer. For HPWH sales, the rebate will be subtracted from the sales invoice to reduce the sales price for the installed equipment. For leases, the rebate will be subtracted from the amount charged to customers, thus lowering the monthly payment. The current rebate for a qualifying HPWH is $600, and an additional $200 rebate is available to income-qualifying households.

Current Billing Rates for Equipment Installation, Appliance Repair, and Maintenance

Time of Service		First Hour		Each subsequent 15 minutes	
Days	**Hours**	**1-person crew**	**2-person crew**	**1-person crew**	**2-person crew**
Mon-Fri	8:00 a.m. – 4:30 p.m.	$124	$212	$31.00	$53.00
Mon-Fri	4:30 p.m. – 8:00 a.m.	$176	$272	$44.00	$68.00
Saturday	Midnight to Midnight	$176	$272	$44.00	$68.00
Sunday and Holidays	Midnight to Midnight	$224	$312	$56.00	$78.00

[14] The 35% mark-up to be utilized for the sale of HPWHs is in line with the current mark-up on the sale of other water heating and space heating equipment, and reflects the current state of the market. VGS will continue to assess this markup and report on any changes to pricing in our annual compliance filing in Case No. 19-0513-TF.

Lease rates to take effect December 1, 2021:

Equipment Description	Monthly Rates*
50 Gallon HPWH	$38
65 Gallon HPWH	$45

*These rental rates were calculated using a $600 energy efficiency rebate.

Economic Analysis

By leveraging the same pricing model already utilized for the behind-the-meter equipment programs VGS currently conducts, VGS anticipates generating similar net revenue per unit. By way of example, if VGS assumes net revenue based upon the FY2022 cost of service ($1,175,000/8,600 total rentals) of $137 per unit and considers an increase in installations of 500 units to pipeline or non-pipeline customers, VGS estimates an increase in net revenue of $68,000[15], which would be included in future costs of service to reduce overall rates.

As the purpose of this initiative is, in part, to determine what adoption rate might be realistic or possible, it is difficult at this time to predict how many HPWHs may be installed during this initial pilot year as part of this initiative. However, as insight is gained through assessing the best way to promote greater adoption of this technology, VGS will have a clearer understanding of how many HPWHs can be installed each year, which will also depend on our field service team's capacity. For current VGS customers, providing HPWHs would be either replacement revenue for existing natural-gas water heater revenue, or would be new revenue for customers who do not currently rely on VGS equipment. For non-pipeline customers, HPWH revenue would be all new revenue. In any event, offering HPWHs will complement our existing behind-the-meter net revenue to continue to reduce the cost of service.

The Future of Heat Pump Water Heaters

The data and insights collected during this HPWH initiative will inform future offerings at VGS. Through this analysis, VGS will determine whether it is appropriate to continue and expand the initiative to more Vermonters and, if so, how to design it to achieve greater adoption of HPWHs. Our analysis will help us determine how various value propositions (e.g. carbon reductions vs cost savings) resonate across differing energy profiles (pipeline vs non-pipeline customers). Accordingly, VGS hopes to expand this offering through greater promotion to current and future customers, and in doing so increase availability of this carbon-reducing technology in the State.

[15] This example does not subtract customers who are already renting hot water heaters from VGS. Adoption of HPWHs by these customers would be revenue neutral but we are unable to estimate participation by such customers at this time.

Based upon the collection of quantitative and qualitative data, VGS anticipates a straightforward approach to assessment of success by measuring the following points and others that may become relevant during the process:

- What were the various motivations behind consumer choice of HPWH?
- Were there obstacles to adoption? If so, how can we overcome them in a reasonable manner?
- Did the customer experience savings on their energy bills and carbon reduction savings?
- What was the baseline customer thermal energy profile?
- Was the revenue collected from the leases and sales of HPWHs effective in being net revenue positive to support reducing the cost of service?
- Did the customer gain a better understanding of the benefits related to fuel switching and how they relate to affordability and climate?
- Is there an opportunity to continue to build the VGS workforce, in particular our field service team and sales team, to support the adoption of HPWHs?[16]

Conclusion

The State has ambitious climate goals and VGS looks forward to providing critical support for decarbonization through our behind-the-meter offerings to Vermonters. Acting as a catalyst to the market, VGS will jumpstart progress on the state energy plan and Global Warming Solutions Act obligations, and partner with others to move these goals forward. This initiative is another step to shift VGS's focus to supporting customers more broadly with the goal of equipping them with the tools and knowledge to decarbonize. If successful, this program will help mitigate rate pressure and maintain affordability, similar to the other behind-the-meter services VGS has been offering for years.

We are available to the Commission and the Department to answer any questions about this filing.

Respectfully submitted,

/s/ Jill Pfenning

Jill Pfenning
VP, Financial & Regulatory and General Counsel
Vermont Gas Systems, Inc.
jpfenning@vermontgas.com

[16] VGS will continue to provide this offering to customers during the assessment period and make modifications to the program based upon the assessment. VGS will provide updated information about our climate action metrics in accordance with our Alternative Regulation Plan and update the Commission on labor rates and charges for services not subject to a specific tariff during our annual compliance filing.