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February 21, 2025

Oregon Public Utility Commission
Attn: Filing Center
P.O. Box 1088
Salem, OR 97308-1088

RE: Cascade Advice No. O25-02-01, Dual Fuel System Pilot

Cascade Natural Gas Corporation (Cascade or Company) submits the following revision to its Tariff P.U.C. OR No. 10, stated to become effective with service on and after **April 1, 2025**:

Twelfth Revision of Sheet No. iii
Original Sheet No. 810.1
Original Sheet No. 810.2
Original Sheet No. 810.3

The purpose of this filing is to introduce Schedule 810, Hybrid System Pilot (Pilot), which is a demonstration project limited to the 24 qualifying residential customers in Bend, Oregon. Qualifying customers' homes will have an existing and functioning natural gas forced air furnace that is not older than 10 years and an air conditioner. Participating customers will have their air conditioning unit removed and replaced with an efficient heat pump and advanced control technologies.

Cascade is developing the Pilot in partnership with GTI Energy, a technology development organization that works to scale impactful solutions that shape energy transitions. The Pilot will leverage GTI Energy's extensive research capabilities to identify hybrid system technologies and control strategies for the climate of the Bend, Oregon, region. Bend has been selected because the climate is representative of Cascade's Oregon service territory, and the City of Bend is a willing and engaged partner in this opportunity.

Cascade has engaged in robust outreach on this proposed Pilot. Meetings to share plans on the Pilot were held with Bend City Staff, Bend Chamber of Commerce, the Environmental Center, Economic Development for Central Oregon ("EDCO"), Local 290 Plumbers, Steamfitters and Heating, Ventilation, Air Conditioning ("HVAC") contractors, International Brotherhood of Electrical Workers, Oregon Public Utility Commission Staff, the Energy Trust of Oregon, and local electric utilities. The feedback on the proposed Pilot has been very positive. Both the City of Bend and the Bend Chamber of Commerce have provided letters of support that are included with this application. The main concern raised throughout the outreach process was whether the Pilot design and results would be transparent. It is Cascade's intent to share the project design and results with interested parties. The Company believes this Pilot

will provide another data point of valuable information as the region looks for effective pathways for decarbonization.

The Pilot will collect data during the 2025-2026 heating season on how three different configurations of hybrid systems and control technologies can be used to reduce greenhouse gas (GHG) emissions, overall natural gas throughput, and customer energy bills. The Pilot will also explore the potential for these systems to serve as a non-pipe alternative or demand side management (DSM) resource.

Hybrid systems, also known as dual fuel systems, combine a natural gas furnace with an electric heat pump and include control technology to switch between the units, traditionally based on a set outdoor temperature. Advanced control technologies have the potential to expand the way these systems can be used. This Pilot will investigate how the pairing of hybrid systems with advanced controls can maximize reductions in energy system-wide (gas and electric) GHG emissions and natural gas throughput, while measuring impacts on customer energy bills. The Pilot will also explore the potential to use these systems as a non-pipe alternative. If the Pilot shows that hybrid systems with advanced controls are a cost-effective way to secure the Pilot objectives, Cascade will work to develop programs based on the results.

Three different configurations of hybrid systems will be selected for deployment in this Pilot. The participating host sites will be split into three groups of eight sites. Cascade will strive to include a known low-income customer in each group; a known-low-income customer is defined as a customer who has had their income verified to receive service on the Company's Energy Discount Program. The billing and usage data compiled during the pilot from the income qualified household will be compared with the seven other participants' data to observe if outcomes for low-income household are different. A difference across the technology streams might warrant additional study.

The program will run from April 1, 2025, through December 31, 2026. GTI Energy will administer the program including training for local contractors, installation and commissioning of the technology, support of the large-scale field deployment, and implementation of a measurement and verification plan. GTI Energy will also collect qualitative data on contractors' and participating customers' satisfaction with the installation experience and the technology.

At the end of the Pilot, GTI Energy will provide a final report that will serve as a comprehensive summary and discussion of the project work. Both qualitative and quantitative measurements will be included to fully capture all Pilot activities and findings. The Pilot findings will determine if a larger program could be justified based on the cost effectiveness of both therm reductions and GHG emissions when compared with other decarbonization options. If the Pilot demonstrates that a hybrid system is able to reduce peak natural gas demand in amounts significant enough to offset pipeline upgrades and customer satisfaction is high enough then the Pilot may also pave the way for a future DSM program.

Pilot components are provided in Attachment A. This document is presented using the questions the Commission provides in Appendix A of Order No. 22-115, as guidance on information it needs for its review of pilot programs.

Program Costs

On the day of this filing, Cascade also files an application requesting authorization to defer Pilot costs incurred as part of the program, which will include the costs for GTI Energy to oversee the administration

of the Pilot, perform the data gathering and analysis that will be presented in the final report, as well as the installation and commissioning of the systems. The total Pilot costs are forecast to be $1,500,000. Cascade believes its proposed rate treatment of the pilot costs, which is put forth in its application for deferred accounting, would encourage a natural gas utility to actively participate in the installation of these systems for the benefit of all customers.

Pilot Review

At the end of the program term, Cascade will file GTI Energy's final program report. Based on the findings of the pilot, Cascade may seek to extend, broaden, or end the pilot or develop a permanent offering.

The Tariff index is revised to include proposed Schedule 810.

If you have any questions regarding this filing, please contact any of the following contacts:

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Sincerely,

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Attachments

INDEX

RATE SCHEDULES (continued)

RATE ADJUSTMENTS

OTHER CHARGES

OPTIONAL SERVICES

SCHEDULE 810
HYBRID SYSTEM PILOT

PURPOSE
This schedule defines the Hybrid System Pilot (Pilot) which seeks to collect data on how three different configurations of hybrid heating systems and control strategies can be used to reduce greenhouse gas emissions, lower overall natural gas throughput, minimize customer operating costs, and serve as a demand response mechanism.

AVAILABLE
Pilot participation is voluntary and will be available to 24 residential customers who meet the following criteria:

1) The customer must be receiving residential natural gas service in the city of Bend, Oregon, or Deschutes County, Oregon.
2) The customer's service premise, hereafter referred to as the host site, must be a single-family, detached home.
3) The host site must have an existing and functioning natural gas forced air furnace that is not more than 10 years old.
4) The host site must also have an air conditioning unit.
5) The host site must be able to accommodate the selected outdoor heat pump unit and have adequate space for equipment.
6) The host site must have a wireless internet network available.
7) The customer must affirm their intention to remain in their home for the duration of the 2025-2026 heating season.
8) Preference will be given to three income-qualified customers for pilot participation, defined as having been income verified to receive Schedule 36, Energy Discount Program services.

ENROLLMENT
Customers may apply to participate in the program by visiting the Cascade website and submitting an interest survey.

TERM
The pilot will commence on April 1, 2025, and end December 31, 2026.

PILOT STUDY GROUPS
The pilot will be comprised of three hybrid system technologies and advanced control systems. The 24 participants will be divided into three subgroups of Pilot participants and will utilize the various technology combinations to test the following research questions:

(continued)

SCHEDULE 810
DUAL FUEL SYSTEMS PILOT

PILOT STUDY GROUPS (continued)

1) How much can the various hybrid system combinations reduce therm usage while still balancing resiliency and reliability?
2) How can the electric and natural gas systems interact to provide the greatest benefit for system-wide energy decarbonization?
3) What are the impacts of hybrid systems on customer operating cost affordability and Cascade's upfront investment costs?
4) Can hybrid systems be used effectively for natural gas demand side management (non-pipe alternatives)?

PILOT EQUIPMENT

Participating customers will receive certified and warrantied hybrid systems. Cascade will leave the systems in place at the completion of the Pilot. The entire cost of purchasing and installing the hybrid systems will be included in the total Pilot cost. Customers will receive no bill for equipment or installation at the host sites. Customers will receive a no-cost invoice from the contractor that will carry a record of what was installed at the host site along with any manufacturer-provided warranty.

CASCADE'S RESPONSIBILITIES

Cascade's responsibilities are as follows:

1) Solicit and screen customers for the Pilot; and
2) Identify third-party heating, ventilation, and air conditioning (HVAC) contractors interested in installing hybrid systems for the Pilot.

GTI ENERGY'S RESPONSIBILITIES

GTI Energy's responsibilities include the following:

1) Complete a market assessment and laboratory evaluations to select the three hybrid system technologies for the Pilot;
2) Work with Cascade to screen the third-party HVAC contractors, onboard contractors for this Pilot, and coordinate the contractors' training with relevant manufacturer(s);
3) With feedback and engagement from selected manufacturer(s), develop host site selection criteria, screen customers and host sites, execute a field test agreement with each selected customer;
4) Oversee the installation and commissioning of the selected hybrid systems, including monitoring and data collection equipment;
5) Coordinate with installation contractors and manufacturer(s) to detect, diagnose, and resolve performance issues, and provide on-call support to participating customers;
6) Conduct surveys with participating customers to collect qualitative data; and
7) Compile a report detailing the finding of the pilot program by December 31, 2026.

(continued)

SCHEDULE 810
DUAL FUEL SYSTEMS PILOT

CUSTOMER RESPONSIBILITIES

A participating customer's responsibilities include the following:

1) Execute a field test agreement with GTI Energy;
2) Agree implicitly to remain a resident of their home and a Cascade customer through December 31, 2026;
3) Agree to indemnify Cascade from any claims related to the pilot equipment, including its installation, maintenance, efficiency, warranty, lifespan, and disposal;
4) Accept that their average monthly natural gas and/or electric bills may increase or decrease as a result of the Pilot;
5) Agree that GTI Energy may interact with the pilot equipment at any time with the intent of remotely adjusting the device settings in accordance with the project goals and regardless of the outcome, the customer agrees to continue to be financially responsible for their Cascade and electric accounts;
6) Adhere to the limitation that since the customer is receiving the heat pump at no costs, the customer may not apply to the Energy Trust of Oregon for a heat pump incentive for the heat pump installed for the pilot; and
7) Exclusively own the pilot equipment and its related warranties, and retain responsibility for all maintenance and replacement costs at the conclusion of the Pilot.

PILOT PROGRAM COSTS

Cascade will defer for future recovery all Pilot costs, forecast to be $1.5 million dollars.

ATTACHMENT A
Cascade's Schedule 810, Hybrid System Pilot Program

Cascade Natural Gas Corporation's (Cascade or Company) proposed Hybrid System Pilot (Pilot) seeks to collect data on how various configurations of hybrid space heating systems and control technologies can be used to reduce greenhouse gas (GHG) emissions, overall natural gas throughput, and customer energy bills. The Pilot will also explore the potential for these systems to serve as non-pipe alternatives or demand-side management (DSM) resources.

Hybrid systems, also known as dual fuel systems, combine a natural gas furnace with an electric heat pump. Traditionally, hybrid systems switch between a heat pump and a natural gas furnace based on a set ambient temperature. Coupling advanced control technologies with hybrid systems presents the opportunity to switch between heat sources for other outcomes. This Pilot will investigate how the pairing of hybrid systems with advanced controls can maximize reductions in energy system-wide (gas and electric) GHG emissions and natural gas throughput, while measuring impacts on customer energy bills. The Pilot will also explore the potential to use these systems as a non-pipe alternative. If the Pilot shows that hybrid systems with advanced controls are a cost-effective way to secure the Pilot objectives, Cascade will develop programs based on the results.

Cascade has had collaborative discussions with the City of Bend, Oregon, about opportunities to support the city's climate goals while continuing to maintain energy reliability and resiliency. As noted in the several letters of support included with this filing, the Bend community broadly supports this Pilot, which is why Cascade is recommending Bend, Oregon, as the Pilot site.

Cascade is also proposing rate treatment of the Pilot as detailed below under Item 8. If the Pilot demonstrates that hybrid systems with advanced controls are a cost-effective means to reducing GHGs and managing customers' energy burdens, then Cascade's cost recovery proposal will provide a unique way to encourage a natural gas utility to actively participate in the installation of hybrid systems.

1. The purpose of the research (including, if applicable, which legislative or Commission order it supports, and how it supports the implementation of the directives contained therein).

The purpose of the research resulting from the Pilot is to explore non-conventional means to reduce GHG emissions and overall throughput while remaining mindful of customer affordability and energy burden. The research will also determine whether the systems studied in the Pilot could be an effective non-pipe alternative, as reduced throughput should reduce the need for new or additional pipeline infrastructure.

The findings of this Pilot will support the Company's ability to reduce GHG emissions as required by the 2024 Climate Protection Program (CPP) codified in OAR Chapter 340- Division 273. The Pilot will also support the goals stated in the Oregon Climate Action Roadmap to 2030[1] as well as local

[1] Oregon Climate Action Committee, https://climate.oregon.gov/meeting-our-goals, accessed January 27, 2025.

climate goals of the City of Bend and Deschutes County. This Pilot will take place in Bend, Oregon, to support the city's goals of reducing community-wide fossil fuel use by 40 percent by 2030 and by 70 percent by 2050.[2]

The research will also support Cascade's ability to model reduced throughput and consequently, non-pipe alternatives, as required by the Public Utility Commission of Oregon (Commission) in Order No. 24-158, issued in Docket LC 83, the Docket for Cascade's most recent Integrated Resource Plan (IRP).

2. The research question.

The research question is: Can advanced control strategies for a hybrid system be used to shift a customer's demand between natural gas and electric in a manner that 1) reduces a customer's usage of natural gas, 2) reduces a customer's overall annual GHG emissions from energy consumption (considering emissions in both electricity and natural gas consumption), and 3) reduces a customer's energy burden. Additionally, the Pilot will seek to understand whether customers would allow remote control of a hybrid system to be used for a natural gas demand response program.

3. The overall pilot design strategy: What is the theory behind this strategy? The major design components should address the research question.

Cascade is developing the Pilot in partnership with GTI Energy, an 80-year-old nonprofit 501(c)(3), technology development organization that works to scale impactful solutions that shape energy transitions. GTI Energy has a long history of developing new end-use technologies. The Pilot will leverage GTI Energy's extensive, ongoing hybrid system research to identify hybrid system technologies and control strategies for the climate of the Bend, Oregon, region. Bend has been selected because the climate is representative of Cascade's Oregon service territory, and the City of Bend is a willing and engaged partner in this opportunity.

Three demonstration technology combinations will be selected through this process. Once demonstration technologies are selected, Cascade will identify and recruit 24 customers to participate in the pilot. Participating customers will then be divided into three categories – one for each of the selected technologies. Cascade will strive to include one known-low-income customer per category so any differences in usage or satisfaction between the known-low-income customers and the non-low-income customers may be measured.

The Pilot will also assume 1) each customer service premise (host sites) will have a single existing natural gas forced air furnace and central air conditioning; 2) the existing natural gas forced air furnaces may be left in place; and 3) a high efficiency electric air source heat pump will be installed along with advanced control technologies. There may be up to eight integrated systems that would require the replacement of the existing natural gas furnace should an integrated system be deemed a viable study pathway.

[2] City of Bend Energy Programs, https://www.bendoregon.gov/city-projects/sustainability/energy, accessed January 27, 2025.

The Pilot will be broken into the following four phases:

- The first phase will involve the selection of the technology combinations to be tested.
- The second phase will focus on recruitment, installation, and commissioning.
- The third phase will be the actual operation of the Pilot, including data collection and analysis and a qualitative evaluation.
- The fourth phase will develop the final report.

Each phase contains several tasks as explained below:

Phase 1 (Tasks 1 and 2)

Task 1 will include the development of a project charter and responsibility matrix between GTI Energy and Cascade. GTI Energy will manage the entire Pilot, including facilitating project management with applicable subcontractors or manufacturing partners.

In Task 2, GTI Energy will evaluate multiple technology packages to determine the best technologies and control strategies for the Bend, Oregon, region. The pilot will optimize key performance metrics such as reducing natural gas throughput, lowering GHG emissions, minimizing operating costs, and enhancing demand response. GTI Energy will perform a market assessment followed by a laboratory evaluation to determine three hybrid configurations for implementation in this Pilot.

Phase 2 (Tasks 3, 4 and 5)

In Task 3, local, qualified residential heating, ventilating, and air conditioning (HVAC) contractors will be recruited and trained to manage on-site technology installation and any necessary service calls. Cascade will recruit contractors for the project. Once interested contractors have been identified, GTI Energy will screen the contractors, conduct onboarding, and coordinate training with relevant manufacturer(s). Utilizing local contractors in this project will have the added benefit of creating a pool of contractors knowledgeable about hybrid systems should the Pilot later result in a full program.

Task 4 will include recruitment of host sites. Cascade will recruit host sites, and GTI Energy will screen interested host sites for optimal fit with the technologies selected in Task 3 and the Pilot design.

In Task 5, GTI Energy will lead the installation, commissioning and support of the large-scale field deployment of selected technologies and advanced control strategies in 24 residential host sites. The local installation contractor(s) will work closely with GTI Energy to address any issues during the demonstration. The project will install certified and warrantied systems with the intention of leaving the systems in place at the completion of the project. The entire cost of the systems will be included in the total Pilot cost. Host sites will receive no bill for equipment or installation. Host sites will receive a no-cost invoice from the contractor that will carry a record of what was installed at the home along with any manufacturer-provided warranty. Host sites will be responsible for all utility bills throughout the duration of the Pilot.

Phase 3 (Tasks 6 and 7)

Task 6 encompasses the actual operation of the Pilot with data collection and analysis. GTI Energy will implement a measurement and verification (M&V) plan which will include detailed instrumentation and monitoring protocols for 25 percent of the host sites comprised of two host sites from each of the three technology groups. The detailed monitoring will enable the team to characterize performance, efficiency, reliability, energy/emission savings, and end-user comfort in high resolution under a variety of control mechanisms, including the impact and potential of a demand response protocol. GTI Energy will collect the M&V data stream and develop and maintain dashboards for continuous monitoring and analysis. GTI Energy will install meters and perform energy usage analyses for the other 75 percent of the host sites to provide savings estimates and performance insights. The M&V plan will also define host site baselining procedures.

GTI Energy will review detailed M&V data throughout the data collection period to identify any system reliability, performance, or efficiency issues and/or data collection issues. GTI Energy will also set up alarms in the data collection software to alert the project personnel to issues based on pre-determined data thresholds and logical checks. This process will serve as project quality control and assurance for all sites. Root cause analysis will be performed to determine if the issue is related to installation or equipment. As necessary, other installations will be reviewed to ensure that identified issues are not widespread.

In Task 7, the Pilot will also collect qualitative data from host sites and installers. This series of surveys will collect feedback with the intention of capturing lessons learned that may support Cascade in planning for future programs. The qualitative evaluation will aim to understand the installation experience and the contractors' perceptions of the technology. It will also seek to understand the host site interaction and satisfaction with the technology.

Phase 4 (Task 8)

GTI Energy will develop a final report on the Pilot that will serve as a comprehensive summary and discussion of the project work. Both qualitative and quantitative measurements will be included to fully capture all Pilot activities and findings.

The final report will focus on answering the research question outlined in Item 2 above and will also include the following:

1. An assessment of the performance of the tested hybrid systems and comparisons to GTI Energy Virtual Test Home data.

2. The predicted energy and GHG savings over (1) modeled conventional gas furnaces and central air conditioning, and (2) the baseline performance, as derived by a combination of on-site measurements, utility bill data, and simulated baseline equipment.

3. An assessment of demand response control strategies across technology packages,

including load shifting potential for both electricity and natural gas.

4. System operating costs for the host sites.

5. A payback analysis to inform recommendations on utility investments.

6. A discussion of the equipment selected and recommendations for future considerations, building on feedback from questionnaires collected from installation contractors and host sites.

7. Consolidated findings from the qualitative evaluation, including comments on the installation contractors' experiences, and the host sites' feedback on system interaction and comfort.

4. The potential benefits to the ratepayer if the Pilot succeeds.

a. Portfolio consideration: A description of how this Pilot complements or adds to related utility activities and addresses a market gap/opportunity not currently addressed by current operations or ongoing research, and how overlap with existing work is minimized.

The proposed Pilot provides an opportunity to study a technology pairing that is not currently addressed by current operations and includes technology that is not currently deployed in field demonstrations in the Pacific Northwest. The idea of pairing an electric heat pump with a natural gas backup furnace is not new; however, the advanced control technologies that allow for switching between the units based on a variety of considerations, such as emissions reductions goals, rather than switching based on a set ambient temperature is new.

The pilot will be successful if it answers important questions around the intersection of therm savings versus resiliency and reliability; GHG emission reductions from an energy system-wide perspective; operating costs for the systems; and the possibility of use in demand side management. In particular, a successful pilot outcome will address the following topics:

1. Therm savings versus resiliency and reliability. An important and often least-cost decarbonization strategy can be reducing the natural gas usage of customers. Cascade believes it is important to balance usage reductions with the resiliency and reliability that the natural gas system provides. This study will provide important data on how much this type of system can reduce usage while still balancing resiliency and reliability.

2. Energy system-wide GHG emission reductions. Meaningful decarbonization will require an understanding of how the natural gas and electric systems can interact to provide the greatest benefit for energy system-wide decarbonization. This Pilot will provide necessary GHG emission reduction data.

3. Customer affordability. Customer energy burden is also an important criterion in determining what an eventual hybrid system program might look like. The Pilot will track operating costs as well as return on investment to allow Cascade to better understand the opportunities and challenges of a permanent program.

4. Demand side management opportunities. Through its 2023 IRP, Cascade has received feedback on the importance of exploring non-pipe alternatives. This Pilot will investigate the possibility of using the hybrid system for demand response for not only the electric system, which would be the more traditional application of demand response, but also for natural gas peaking events.

Cascade has been actively participating in the current Energy Trust of Oregon's (ETO) Dual Fuel Heat Pump pilot. The ETO pilot's focus is:

1. Determine the utility system costs and benefits of Hybrid HVAC system installations.
2. Determine the customer costs and benefits of Hybrid HVAC system installations.
3. Determine the costs and process considerations associated with installing Hybrid HVAC systems in low-income households.

Cascade's Pilot will be complementary to the ETO pilot and will seek to answer additional questions beyond those identified by ETO, such as the GHG emission reduction and demand response potential questions. In addition, it has been challenging to get Cascade customers to participate in the ETO pilot, because the ETO pilot is limited to homes that do not already have central air conditioning and is targeted toward low-income customers. The slightly different host site requirements for this Pilot may serve as a helpful data point to identifying barriers to participation in future hybrid system programs.

b. **In support of EO 20-04: Will there be any positive or negative impact in reducing GHG emissions as a direct result of this Pilot, or if applied to wider adoption?**

The Pilot will explore whether wider adoption of hybrid systems across Cascade's service territory could lead to a more cost-effective means for GHG emissions reductions than other available options. In addition, this Pilot will provide insight into whether controlling the timing of when the system uses natural gas, or electricity would result in greater economy-wide (both gas and electric system) GHG emission reductions.

c. **In support of EO 20-04: Will there be any positive or negative impact on any "vulnerable populations or impacted communities" as a direct result of this Pilot, or if applied to wider adoption?**

By including one known-low-income customer in each of the technology option categories, Cascade hopes to ascertain whether the usage reductions, GHG emissions reductions, cost impacts, demand response capabilities, or customer satisfaction ratings are different

between the non-low-income customer base and known-low-income customers. A difference across the technology streams might warrant additional study. Cascade also hopes to gain some insight from the ETO pilot by comparing the outcomes.

5. **Context: Prior research and relevant market research supporting this strategy. What are the major barriers that stand between this concept and wider adoption? What is the technical/conceptual viability of what is being tested, i.e. how market-ready is it? Has this been implemented elsewhere?**

The hybrid system is not a new concept. However, the use of advanced control technology has not been tested in the ways that Cascade is proposing, particularly for demand side management. The first phase of the Pilot includes a desk review of existing and ongoing research and demonstrations to identify the technology combinations to be tested in the Pilot. GTI Energy will also perform laboratory evaluations of the technologies considered to select the configurations that will be implemented in the Pilot.

Studying these systems in the Bend climate zone will provide useful information for Cascade on the therm saving and GHG emission reductions that could be expected as well as cost effectiveness of those reductions if a program were to be rolled out to all customers. The Pilot proposes to use local contractors which will provide helpful information to Cascade on the familiarity of contractors with the systems, the type and level of training that may be required for a future program, and the satisfaction of the installers with the systems. Finally, the proposed rate treatment for this Pilot will provide a framework for the discussion of opportunities for a natural gas utility to better support decarbonization.

6. **A research plan that includes:**
   a. **The learning objectives that will inform the research question(s) and how these objectives will be achieved.**

The research plan is outlined in response to Item 3 above. The research plan will answer the learning objectives outlined in response to Item 4 above which include:

1. How much can this type of system reduce therm usage while still balancing resiliency and reliability?
2. How can the electric and natural gas systems interact to provide the greatest benefit for energy system-wide decarbonization.
3. What are the impacts of hybrid systems on customer operating cost affordability and the upfront investment costs for the utility?
4. Can hybrid systems be used effectively for natural gas demand side management (non-pipe alternatives)?

   b. **Participation target: Who or what will this Pilot target?**

The Pilot will target 24 Cascade customers, including three known-low-income customers,

in the Bend, Oregon area. The Pilot will also involve local Bend area contractors.

c. **Potential scale: what is the ultimate potential?**

If successful, the Pilot will be used to develop programs to support decarbonization and non-pipe alternatives for customers across Cascade's Oregon service territory.

d. **Number of participants or test subjects: include statistical rationale for this number.**

The Pilot will include 24 Cascade customers. The proposed number resulted from the following considerations:

1. GTI Energy will identify three different system configurations to be tested through this Pilot.
2. With expected variations in usage and trends from home to home, it is ideal to have multiple host sites per technology configuration and more than one fully instrumented M&V host site per configuration.
3. GTI Energy suggested eight homes per system, two of which will be fully instrumented with M&V, primarily through factoring in the cost.
4. The GTI Energy statistics team recommends prioritizing a higher number of sites rather than prioritizing the length of monitoring. For example, monitoring two homes over eight months is more valuable than monitoring one home over 16 months. The project is structured to be efficient with time and reaching as many homes as feasible with the Pilot at a reasonable cost.

e. **Evaluation strategy: A description of how the evaluation will be conducted. How will we know if it worked? The evaluation plan should answer whether or not the idea should be rolled out for broader adoption. Include what is necessary to measure results at the needed level of statistical certainty.**

GTI Energy will develop a final report on the Pilot that will serve as a comprehensive summary and discussion of the project work. Both qualitative and quantitative measurements will be included to fully capture all Pilot activities and findings.

Expected topics summarized in the final report include:

1. Assessment of the performance of the tested hybrid systems and comparisons to GTI Energy Virtual Test Home data.

2. Predicted energy and GHG savings over (1) modeled conventional gas furnaces and central air conditioning, and (2) the baseline performance, as derived by a combination of on-site measurements, utility bill data, and simulated baseline equipment.

3. Assessment of demand response control strategies across technology packages, including load shifting potential for both electricity and natural gas.

4. System operating costs for the host sites.

5. Payback analysis to inform recommendations on utility investments.

6. Discussion of the equipment selected and recommendations for future considerations, building on feedback from questionnaires collected from installation contractors and host sites.

7. Consolidated findings from the qualitative evaluation, including comments on the installation contractors' experiences, and the host sites' feedback on system interaction and comfort.

The Pilot will help to determine, based on the results above, if a larger program is justified. The justification would be based on cost effectiveness of both therm reductions and GHG emissions when compared with other options. If the Pilot demonstrates that a hybrid system is able to reduce peak natural gas demand in amounts significant enough to offset pipeline upgrades and customer satisfaction is high enough, they would enroll in a DSM program, it may also pave the way for a future DSM program. Finally, the Pilot will identify whether a rate treatment can be developed that would allow for natural gas utility investment, with an associated return, in this type of program on a service territory-wide basis.

7. Schedule: A timeline that shows when each component of the plan will be implemented. What is the timeframe? The duration of the Pilot must be limited, yet sufficient to answer the question. The schedule should include time for conducting the evaluation, final reporting, and any necessary activities to wind down the research.

The schedule below assumes a Pilot start date of April 1, 2025. The Pilot will run through December 31, 2026, when the final report will be issued. Because Cascade intends to leave the equipment installed at the host sites, there is no wind down activity. Table 1 below provides a detailed Pilot timeline:

Table 1 - Hybrid System Pilot Program Timeline

Project Schedule	2025			2026			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Task 1 - Project Management and Administration							
Task 2 – Technology Selection and Pilot Design							
Task 3 – Contractor Recruitment and Management							
Task 4 – Host Site Recruitment and Management							
Task 5 – Installation and Commissioning							
Task 6 – Data Collection and Analysis							
Task 7 – Qualitative Evaluation							
Task 8 – Final Report							

8. Budget: What will this cost? The budget should be sufficient to answer the question and limited in scope and costs to reduce risk to the ratepayer. Budget should include O&M expenses and revenues, broken down by FERC account, capital costs, number of FTE employees, and number of contractors.

The project is estimated to cost $1,500,000 on a time and materials basis. Of the total, approximately 71% of the Pilot cost will be for the installation and commissioning of the equipment. If Cascade's deferral application is approved, costs will be deferred as a regulatory asset in FERC 182.3 (Other Regulatory Assets) and will earn the Company's authorized rate of return. Cascade will contract with GTI Energy to administer the entire project.

Cascade is also proposing rate treatment in this Pilot that would encourage a natural gas utility to actively promote the installation of hybrid systems. Cascade proposes to defer the entire cost of the equipment, installation, and the cost for GTI Energy to administer this Pilot to a regulatory asset as outlined above. Cascade further proposes to move the regulatory asset to rate base in its next general rate case and amortize the balance through base rates over ten years.

9. **Decision points: Built-in milestones or dates where the Pilot is evaluated against project objectives to determine if the Pilot requires a change in scope or should end early.**

   Because of the relatively short duration of the Pilot, Cascade does not believe it would be prudent to end the Pilot early once the equipment is installed. Because the intent of the Pilot is to leave the equipment installed at the host sites, there is a possibility of extending the data collection and reporting of the Pilot if conditions warrant.

10. **Reporting requirements: The proposed cadence of utility reporting on progress and results. This may include GHG emissions reductions if applicable.**

    GTI Energy will provide a final report that will include GHG emissions reductions at the end of the Pilot, which will be in the fourth quarter of 2026. GTI Energy will also meet bi-weekly with Cascade and provide routine written progress updates.

February 7, 2025

Oregon Public Utility Commission
RE: Cascade Natural Gas, Bend OR Pilot Program

To Whom It May Concern:

On behalf of the Bend Chamber of Commerce, I am writing to express our support for Cascade Natural Gas Corporation's filing to operate a Residential Hybrid Space Heating pilot program in Bend, Oregon.

As a partner of the Bend Chamber, Cascade Natural Gas has been engaged in discussions with the Bend business community on ways to support state and local climate priorities while maintaining affordable, reliable energy services. A hybrid dual-fuel system has emerged as a priority option within Cascade's internal decarbonization planning work and is the subject of the proposed pilot program.

Cascade's hybrid system pilot, which will pair electric heat pumps with existing natural gas heating, will help the utility determine if this approach can be scaled to support demand response, increase efficiency, manage energy costs, and lower overall carbon impacts. One element of the proposal of particular interest to the Bend Chamber is the workforce development opportunity that exists within the pilot. Namely the job opportunities for local qualified residential HVAC contractors.

The Bend Chamber supports this opportunity to learn more about the potential for hybrid systems to increase energy efficiency, reduce GHG emissions and operating costs, and support demand response. We encourage the Oregon Public Utilities Commission to approve this pilot and look forward to learning more about the results of this effort and its potential to balance energy needs and environmental priorities within our community.

Sincerely,

Katy Brooks
President & CEO
Bend Chamber of Commerce

CITY OF BEND

February 3, 2025

Oregon Public Utility Commission
201 High St. SE #100
Salem, OR 97301

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To the Oregon Public Utility Commission,

We are submitting this letter to the Oregon Public Utility Commission (OPUC) in support of Cascade Natural Gas Corporation's filing to operate a Residential Hybrid Space Heating pilot program in Bend, Oregon. Cascade has been engaged in discussions with the City of Bend on ways to support state and local climate priorities, consistent with the company's efforts to understand and adapt offerings to serve the community's environmental goals.

As part of Cascade's internal decarbonization planning work, hybrid systems, or dual-fuel space heating, emerged as a priority alternative for decarbonization. Cascade's hybrid system pilot, which will pair electric heat pumps with existing natural gas heating, will help the utility determine if this approach can be scaled to support demand response, increase efficiency, manage energy costs, and lower overall carbon impacts.

The City of Bend welcomes the opportunity to learn more about the potential for hybrid systems to increase energy efficiency, reduce greenhouse gas emissions ad operating costs and support demand response, as we believe all solutions to reducing greenhouse gas emissions should be explored to achieve the City's climate action goals. We encourage the OPUC to approve this pilot and look forward to learning more about the results of this effort and its potential to serve as a non-pipe alternative for Cascade customers in Bend and across the state.

Sincerely,

Signed by:
Melanie Kebler
29B92C34DE84443...

Melanie Kebler, Mayor
City of Bend
mkebler@bendoregon.gov

Language Assistance Services & Accommodation Information for People with Disabilities
You can obtain this information in alternate formats such as Braille, electronic format, etc. Free language assistance services are also available. Please contact Cassie Lacy at clacy@bendoregon.gov or 541-323-8587. Relay Users Dial 7-1-1.

Servicios de asistencia lingüística e información sobre alojamiento para personas con discapacidad
Puede obtener esta información en formatos alternativos como Braille, formato electrónico, etc. También disponemos de servicios gratuitos de asistencia lingüística. Póngase en contacto con Cassie Lacy en clacy@bendoregon.gov o 541-323-8587. Los usuarios del servicio de retransmisión deben marcar el 7-1-1.