

Oregon Citizens' Utility Board

610 SW Broadway, Suite 400
Portland, OR 97205

(503) 227-1984
www.oregoncub.org

October 5, 2023

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

**RE: LC 83 In the Matter of CASCADE NATURAL GAS CORPORATION'S, 2023
Integrated Resource Plan; Oregon Citizens' Utility Board's Opening Comments**

The Oregon Citizens' Utility Board (CUB) appreciates the opportunity to comment on Cascade Natural Gas Corporation's (Cascade or the Company) 2023 Integrated Resource Plan (IRP). This IRP comes amid a period of considerable policy and regulatory change, which has far-reaching implications for Cascade's future operations. Cascade's IRP— with its twenty-year planning horizon— is therefore an important document with which to assess the reasonableness of both the Company's near-term action items and long-term plans to comply with applicable policy mandates in a least cost, least risk manner.

CUB will focus much of its analysis on Cascade's Climate Protection Program (CPP) compliance plan. CUB is concerned that the Company's CPP compliance plan is based on assumptions that are not reasonable. It is important to assess and address these assumptions now, because near and mid-term planning are significantly affected by the viability of the Company's long-term plan.

In these comments, CUB discusses the following:

- A. The Action Plan**
- B. Looking Beyond the Action Plan**
- C. Renewable Natural Gas**
- D. Hydrogen Blending**
- E. Establishing Standards for Planning Beyond the Action Plan**
- F. Conclusion**

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A. The Action Plan

CUB is concerned that Cascade’s 2-4 year Action Plan is not the least cost, least risk pathway available to the Company to meet Oregon’s needs from a resource and compliance mandate perspective. CUB is still investigating whether Cascade’s near-term CPP compliance strategy overuses expensive renewable natural gas (RNG) when much cheaper community climate incentives (CCI) are still available and not used.

CUB believes it is first important to establish the cost difference between using CCIs and RNG for CPP compliance. CUB calculated that to offset a dekatherm (Dth) of methane in 2023 using CCIs costs \$6.52.¹ Under the CPP, this price will only increase by a few cents (~5-6 cents) each year, in addition to being adjusted for inflation. Cascade’s projected price of RNG is \$13/Dth from now until 2028 and \$19/Dth thereafter. In these comments CUB argues that Cascade’s RNG price projections are unreasonably low,² but even using Cascade’s \$13/Dth projection, RNG is clearly a much more expensive compliance option than CCIs. This sets a very high bar for justifying the selection of RNG in lieu of CCIs.

Further, depending on the means of procuring RNG, RNG adds additional risks and uncertainties relative to CCIs. Gas companies have two options for procuring RNG: they can develop their own RNG projects or negotiate RNG procurement contracts with developers. Cascade’s IRP includes planning for both options.

As CUB discussed in its testimony for UG 462, utility RNG development projects are long-term investments that are expensive early on and risky because the per-unit cost to generate credits that count towards CPP compliance fluctuate with the production of a given production facility.³ Further, utility RNG development projects introduce substantial risk and uncertainty because local distribution companies (LDC) like Cascade have no experience in RNG production. CUB requested cost-of-service modeling for the RNG development projects in Cascade’s IRP

(START CONFIDENTIAL) [REDACTED] **(END)**

CONFIDENTIAL). CUB is especially concerned about large and uncertain investments in gas infrastructure now when Cascade has not provided a reasonable long-term compliance strategy for the CPP, which CUB discusses in the following sections of these comments. The lack of a reasonable plan to remain an emissions-compliant and cost-competitive LDC casts doubt on the long-term usefulness of new gas infrastructure.

	\$/ mtco2	mtco2/therm	therm Dth	\$/ mmbtu
1	123 x	0.0053 x	10 =	\$6.52

Sources: <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references> and <https://www.oregon.gov/deq/ghgp/Documents/CCI-ContributionAmountInflation.pdf>

² See section “Renewable Natural Gas” for CUB’s assessment of Cascade’s RNG modeling.
³ UG 462, *In the Matter of NORTHWEST NATURAL GAS COMPANY, dba NW NATURAL, Renewable Gas Adjustment Mechanism - Dakota City*. Opening Testimony of William Gehrke on Behalf of Oregon Citizens’ Utility Board.
⁴ See CUB DR 1.

Conversely, procuring RNG through purchase agreements with developers allows LDCs to adapt flexibly to changes in load and concurrent emissions-offset requirements without the risks associated with long-term development projects. Avista’s 2023 IRP near-term RNG procurement strategy favored purchase agreements over RNG development projects and CUB supports this approach.

It should be noted that although CCIs are much cheaper and bear less uncertainty than RNG, gas companies cannot rely on CCIs exclusively. The CPP places a cap on CCI usage, forcing gas companies to pursue other compliance options to meet their emissions reduction targets. Figure 1 depicts this. The graphic on the right depicts shortfalls (the white space under the orange line) that exist after maximizing CCI use. The options currently available to gas companies to complete their compliance obligations are limited and the sole supply-side fuel option is RNG. Still, a comparison of the two graphics in Figure 1 appears to show that over the next 2-4 years, Cascade plans to procure more RNG than is necessary, and not maximize CCI use.

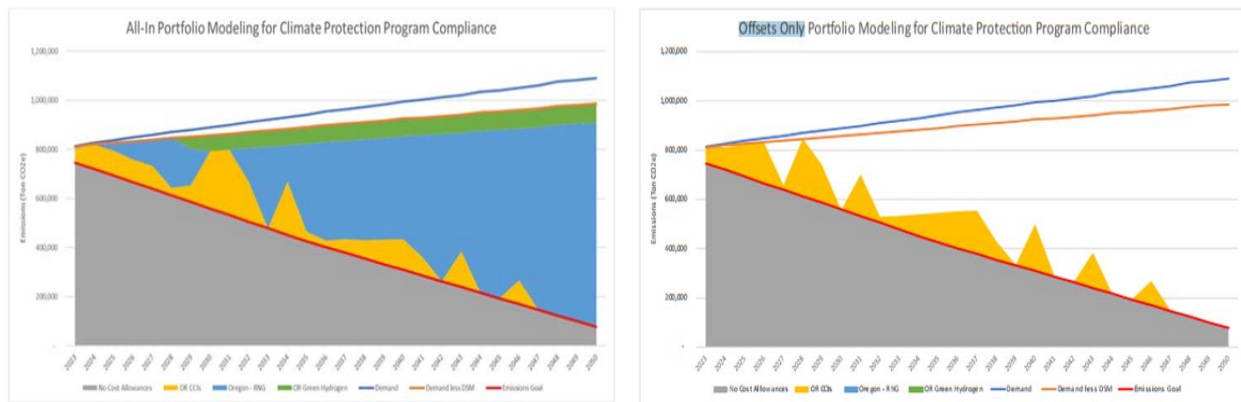


Figure 1: Cascade’s Top-Ranking, All-in Portfolio (left) and Offsets Only Portfolio (right)⁵

Cascade states:

The primary resources in the Top-Ranking Candidate Portfolio were RNG in OR and allowances from auction in WA. RNG is a particularly important resource because it solves for both shortfalls identified in as-is modeling. It has already been discussed how RNG reduces Cascade’s emissions, but on-system RNG projects that be injected directly into the Company’s distribution system are able to eliminate the need for incremental upstream transportation that would otherwise have solved Cascade’s upstream capacity shortfalls in 2046 in Washington and 2049 in Oregon.⁶

CUB seeks clarity from Cascade regarding whether this statement is intended to justify near-term, on-system RNG procurement in lieu of maximizing CCI use. The upstream capacity shortfalls in 2049 in Oregon are based on assumptions about continued growth of Cascade’s system which may be offset by electrification and should not be used to justify expensive RNG procurement in the Action Plan. Our stance on the reasonableness of Cascade’s Action Plan

⁵ Cascade 2023 IRP at 9-19 and Appendix, pdf pg 648.

⁶ Cascade 2023 IRP at 9-20.

likely hinges on whether the Company makes reasonable efforts to maximize CCI use before procuring more expensive RNG, particularly through development projects that incur significant and long-term risks.

B. Looking Beyond the Action Plan

CUB has participated in many gas utility IRPs. Normally, we focus on items in the Action Plan since most investments beyond the Action Plan will be revisited in future IRPs and can usually be considered placeholders. However, in this IRP, CUB believes it is necessary to emphasize the context beyond the Action Plan, particularly planning and assumptions regarding CPP compliance. Gas companies are having to examine entirely new resource options— a task that historically was much more significant to electric utilities than gas utilities— and although this necessitates dealing in uncertainty, that uncertainty must be properly accounted for in modeling. Acknowledging the uncertainty in writing is not adequate. This is an essential component of planning for a reliable and cost-effective energy transition.

CUB raised this issue in NW Natural’s (NWN) 2022 IRP and the Commission’s order in that proceeding validates our approach. The Commission declined to acknowledge NWN’s long-term analysis and a selection of preferred portfolio procurement of RNG, finding that NWN 1) did not adequately assess cost and risk, and 2) did not provide accurate assessments of relevant inputs, including any uncertainty around them.⁷ According to the Commission, “[u]ltimately, we lack sufficient confidence that the IRP produces a plan and preferred portfolio representing the best combination of cost and risk for utility customers.”⁸ Further, the Commission stated it was concerned that the utility was forcing selection of RNG instead of evaluating the cost and risk of alternative pathways to CPP compliance.⁹ The Commission also expressed concern about NWN’s assumptions about the cost and availability of decarbonized fuels.¹⁰

CUB shares similar concerns about Cascade’s 2023 IRP. In the following sections, CUB examines the resource options Cascade proposed to achieve CPP Compliance and assesses how reasonably they were modeled.

C. Renewable Natural Gas

In the Company’s Top-Ranking Oregon Resource Strategy, RNG is the most significant CPP compliance resource (Figure 2). The next most significant compliance resources are CCIs, green hydrogen and demand side management (DSM).

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⁷ LC 79, *In the Matter of NORTHWEST NATURAL GAS COMPANY, dba NW NATURAL, 2022 Integrated Resource Plan*, Order No. 23-281, 8 (Aug. 2, 2023).

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

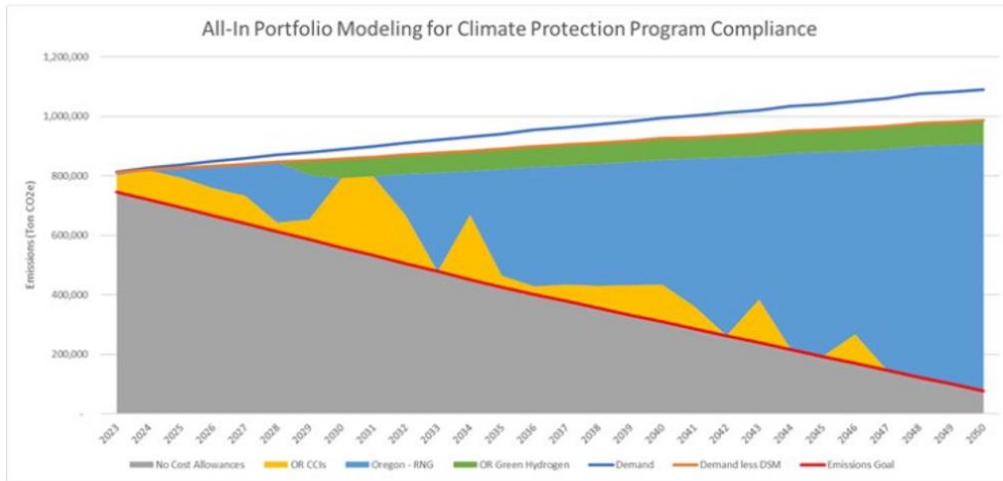


Figure 2. Cascade’s Top-Ranking Oregon Resource Strategy¹¹

Currently, RNG is the only CPP compliance fuel that is commercially available and able to safely replace brown gas without increasing the Company’s emissions. This is the case not only for natural gas utilities in Oregon, but in other markets that are decarbonizing as well. The California market, driven by the Clean Fuels Program, is one such market that will increase competition for RNG. Notably, RNG comes from limited feedstocks, such as landfills, wastewater treatment plants, and dairy operations, and cannot be produced in limitless supply. Given the Company’s heavy reliance on RNG throughout the IRP planning horizon, and the growing competition for this limited resource, CUB considers robust projections of RNG price and availability to be crucial components of Cascade’s IRP.

Figure 3 shows the Company’s price projections for RNG over the IRP planning horizon.

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¹¹ Cascade 2023 IRP at 9-19.

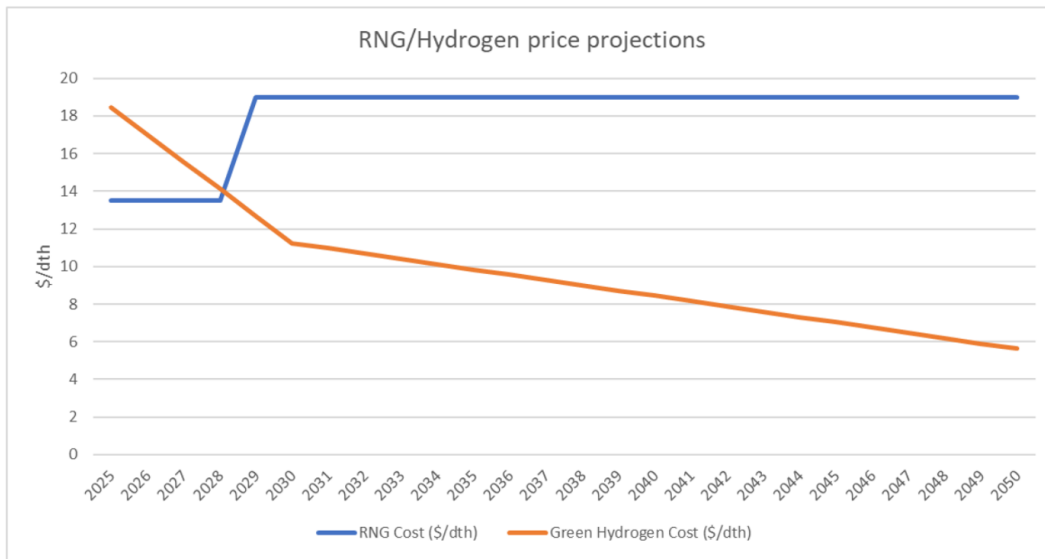


Figure 3. Cascade’s RNG and Hydrogen Price Projections¹²

Regarding RNG price projections, Cascade stated:

Cascade utilizes all known RNG project quantities and pricing that are described in the RNG Projects subsection, as well as actual RNG attribute offers Cascade has received for near term projections. For long term projections, Cascade is utilizing a 2019 ACF/ICF study on the potential of various feedstocks for Renewable Natural Gas supply. Using this study, Cascade used a 50/50 blend of the High and Technical Resource Potential Scenario (Tables 39 and 40 of the study), since the Companies who are active in procuring RNG will have higher availability to RNG.¹³

In CUB DR 1 CUB requested information regarding the “RNG project quantities and pricing that are described in the RNG Projects subsection” and how Cascade utilized this information to inform near-term price projections. **(START CONFIDENTIAL)**

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(END CONFIDENTIAL)

Regarding Cascade’s utilization of the 2019 ACF/ICF to create RNG price projections, CUB argues that Cascade’s use of “a 50/50 blend of the High and Technical Resource Potential Scenarios” is not reasonable and the Commission should not consider this modeling. By definition, the High Resource Potential already includes resources that would only be available

¹² Cascade 2023 IRP at 4-21.

¹³ Cascade 2023 IRP at 4-19.

in aggressive procurement markets, and the Technical Resource Potential includes resources that are too expensive to develop. Assuming that resources only in the Technical Resource Potential will be available at the same price as more accessible and cost-competitive resources is not reasonable. CUB criticized this same assumption in UM 2178,¹⁴ but Cascade continues to use it.

In contrast to Cascade's price projections, a 2022 report by S&P Global, which Staff relied on in their final comments on NWN's 2022 IRP,¹⁵ found:

Transportation RNG— which is typically priced around the value of conventional gas, plus D3 RIN credits— is currently marketable between \$30-\$35/MMBtu, while RNG sold to utilities, manufacturers and other end users in the voluntary market is marketable between \$20-\$25/MMBtu... Kinder Morgan's Holsapple told S&P Global.¹⁶

Note that 1 Dth (dekatherm) is equal to 1 MMBtu, so the Company's and S&P Global's cost estimates are directly comparable. The S&P Global report also states that producers are expecting prices for RNG around \$20/MMBtu for long-term projects.¹⁷

The Company's RNG price projections, particularly its near-term \$13/Dth projection, are unreasonably low. This has several ramifications. First, the Company's resource modeling underestimates the cost to customers of using RNG. Second, using an unreasonably low cost for RNG in resource mix modeling undercuts other resources options, such as efficiency measures and electrification, and causes them to be underrepresented. Third, these unrealistic assumptions present an unrealistic future that enables business as usual for the gas company. This undermines reasonable planning which must prepare for the likely impacts to customers of the energy transition that market prices are likely to drive. This includes protecting low-income customers, who could become the last customers left on the gas system and stuck with system costs intended for a larger customer base if they cannot afford the upfront costs of fuel-switching technologies.

D. Hydrogen Blending

Hydrogen blending involves offsetting methane emissions by blending green hydrogen (i.e. hydrogen produced from renewable energy) into the natural gas systems. By displacing fossil gas with a renewable resource, hydrogen blending has the potential to offset carbon emissions. Cascade notes:

One challenge from utilizing hydrogen is that it burns at a lower heating quality than traditional natural gas. A blend of 20% hydrogen by volume, which is Cascade's base

¹⁴ See UM 2178, Natural Gas Fact Finding per Executive Order 20-04 PUC Year One Work Plan. Comments of the Oregon Citizens' Utility Board on Modeling and Alternative Scenarios.

¹⁵ See LC 79, *In the Matter of NORTHWEST NATURAL GAS COMPANY, dba NW NATURAL*, 2022 Integrated Resource Plan. Staff's Final Comments.

¹⁶ <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/121622-rng-industry-expects-us-voluntary-customers-to-spur-demand-after-early-transport-boom>

¹⁷ *Id.*

case blending volume in the 2023 IRP, only equates to an offset of about 7.4% of traditional natural gas by energy.¹⁸

As such, assuming a 20% hydrogen blend is found to be safe and approved in Oregon, this blend equates to only a 7.4% emissions offset under the CPP.

A safe and approved hydrogen blending percentage

Currently, hydrogen blending is not done in gas distribution systems in Oregon. Hydrogen has distinct properties relative to methane and the distinct infrastructure requirements for various blends of hydrogen and methane are a matter of ongoing inquiry. CUB appreciates that Cascade discusses this uncertainty in multiple places throughout its IRP.

In its Top-Ranking Resource Portfolio, Cascade assumes a 20% hydrogen blend will be compatible with its system and approved in Oregon by 2028-2029, when hydrogen appears in the Portfolio. Cascade assumes a 20% blend based on findings from a 2013 NREL study.¹⁹ However, a 2022 California Public Utilities Commission (CPUC) study suggests that only lower blending percentages may be safe and that LDC-specific infrastructure limitations may be significant.²⁰ The study suggests there are some risks at blends as low as 5% hydrogen and greater risks at higher percentages and that future demonstration projects and pilot programs should focus on “hydrogen percentages [that] are 5 to 20%.”²¹

The 2022 CPUC study has two significant implications. First, a safe hydrogen blending percentage is a matter of ongoing inquiry and further research and pilot and demonstration projects are still needed. It is unclear if or when hydrogen blending will be found to be safe and then approved in Oregon. Second, it is not clear that a 20% hydrogen blend will be possible. The CPUC suggests that 20% is more likely an upper range, yet Cascade considered 20% the expected blend in the majority of its resource scenarios. The assumption of a 20% hydrogen blend, particularly as soon as 2028-2029, injects risk and uncertainty into Cascade’s resource modeling. If only lower hydrogen blends are found to be safe without expensive system modifications, then the maximum potential to offset emissions with green hydrogen will be a fraction of 7.4%.

Green hydrogen infrastructure requirements

Significant infrastructure, all of which is necessary to enable hydrogen blending, has yet to be planned or constructed. Electrolysis, the process for producing hydrogen from water, is energy intensive. Significant amounts of renewable energy and resource development will be needed to produce emissions-free hydrogen. Additional infrastructure requirements include the development of a commercial scale electrolyzer market, construction of commercial scale electrolyzers, hydrogen transport infrastructure, and hydrogen blending and monitoring

¹⁸ Cascade 2023 IRP at 4-18.

¹⁹ <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-issues-independent-study-on-injecting-hydrogen-into-natural-gas-systems>

²⁰ <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-issues-independent-study-on-injecting-hydrogen-into-natural-gas-systems>.

²¹ *Id.*

equipment. Each of these pieces are needed to enable commercial-scale hydrogen blending in Cascade's systems.

Hydrogen storage

Currently, Cascade is reliant on enormous methane storage facilities to meet the seasonally variant energy demands of its residential customers. By 2030, Cascade projects it will achieve annual emissions reductions through hydrogen blending of about 7%. This is the maximum emissions reduction possible if a 20% hydrogen blend is deemed safe. The Company can only achieve the full 7% emissions reduction if it consistently maximizes the blend of hydrogen in its fuel mix. To achieve this, CUB expects that hydrogen storage will be an essential requirement of supplying energy through seasonally variant demand. Furthermore, relative to methane, CUB notes that green hydrogen production, once developed, will be reliant on renewable energy resources, such as wind and solar, which have variable generation profiles. CUB expects that this added supply-side variance will increase storage requirements for hydrogen relative to methane.

Hydrogen has distinct properties relative to methane and it is not clear to CUB where large amounts of hydrogen could be stored in Oregon. Further, after a storage site is identified or built, CUB understands that new hydrogen transportation infrastructure connecting the storage site to hydrogen production sites and Cascade's distribution system will likely be needed. Despite the reasonable likelihood of these formidable hurdles to Cascade's hydrogen blending plan, Cascade does not address the need for hydrogen storage or the numerous uncertainties surrounding it in its IRP.

E. Establishing Standards for Planning Beyond the Action Plan

CUB finds the following exchange with Cascade to be indicative of resource planning across the 2022/ 2023 gas IRPs. CUB inquired about Cascade's hydrogen storage plans in CUB DR 5 and the Company responded:

Cascade's modeled procurement of Hydrogen falls outside of the Action Plan, and thus the Company is reticent to commit to one strategy related to the storage and utilization of Hydrogen. The Company will adaptively manage its utilization of Hydrogen as this market crystalizes in the coming years, and will be able to outline more concrete plans related to the generation, storage, and use of Hydrogen in future IRPs.

CUB views this response as indicative of a resource planning issue that must be addressed to establish integrity in mid- and long-term gas IRP planning. While CUB does not expect Cascade to commit to a specific hydrogen strategy now, CUB argues that it is necessary for the Company to at least present a complete and evidence-supported pathway for a novel resource option in order to consider it on equal terms with other resources in modeling. This is particularly true for planning immediately beyond the Action Plan.

Cascade's Top-Ranked Portfolio integrates hydrogen blending in 2028-2029, which falls just outside the Action Plan window, yet numerous significant uncertainties regarding hydrogen blending have yet to be resolved.

The practice of avoiding or failing to account for the significant uncertainties of novel resource options is not reasonable. If such uncertainties exist, at minimum they should not only be

discussed, but also accounted for using a discount factor that applies across all resource portfolios. This levels the playing field for other resource options that do not have such significant uncertainties, meaning their price and availability projections are more robust and reliable.

F. Conclusion

CUB is still investigating Cascade’s Action Plan and is prepared to recommend non-acknowledgement of Cascade’s long-term CPP compliance plan, but reserves the right to address concerns by other parties in this proceeding first. Assumptions made by the Company about the cost and availability of RNG and potential to offset emissions using hydrogen blending are unreasonable, which significantly undermines the results of the Company’s CPP compliance modeling. CUB is concerned that Cascade’s vested interest in retaining gas customers, which they would lose to electric utilities that operate in their Oregon gas territories, affected their resource modeling. This poses dire consequences for the Company’s Oregon gas customers who should not be subjected to expensive investments in the gas system if it cannot be used to cost-effectively meet Oregon’s CPP emissions reductions goals. Furthermore, planning for an equitable future relies on robust resource modeling. To obviate a deeply inequitable outcome—wherein only those customers who cannot afford to quickly convert their gas appliances are left on the gas system with ongoing system costs intended for a much larger customer base—stakeholders must adapt their approach to integrated resource planning now.

CUB sees Cascade’s IRP as a clear indication that more robust standards for estimating novel fuel costs and availability are needed for gas IRPs, in addition to other changes in utility resource planning to accommodate holistic, cross-utility resource planning, as well as robust analysis of energy efficiency, demand-side management, and electrification services. These changes are necessary adaptations as we work to meet clean energy goals equitably and affordably. Like the Commission found for NWN,²² Cascade must provide a long-term plan that adequately assesses cost and risk and includes reasonable and accurate inputs for its Top-Ranking Portfolio, including a realistic understanding of the uncertainty around those inputs.

Respectfully submitted,

/s/ John Garrett
Oregon Citizens’ Utility Board
610 SW Broadway, Ste. 400
Portland, OR 97205 E.
John@oregoncub.org

²² OPUC Order No. 23-281 at 8.

LC 83– CERTIFICATE OF SERVICE

I hereby certify that, on this 5th day of October, 2023, I served the **Confidential Testimony of the Oregon Citizens' Utility Board** in docket LC 83 upon the Commission and each party designated to receive confidential information pursuant to Order 23-132 through a secure, encrypted attachment to an e-mail.

AWEC

BRADLEY MULLINS (C)
MW ANALYTICS,
ENERGY & UTILITIES

LUMMINTIE 13
OULU FI-90460
brmullins@mwanalytics.com

CHAD M STOKES (C)
CABLE HUSTON LLP

1455 SW BROADWAY STE 1500
PORTLAND OR 97201
cstokes@cablehuston.com

**CASCADE NATURAL GAS
CORPORATION**

BRIAN ROBERTSON (C)
CASCADE NATURAL
GAS CORPORATION

8113 W GRANDRIDGE BLVD
KENNEWICK WA 99336
brian.robertson@cngc.com

**MARK SELLERS-
VAUGHN (C)**
CASCADE NATURAL
GAS CORPORATION

8113 W GRANDRIDGE BLVD
KENNEWICK WA 99336
mark.sellers-vaughn@cngc.com

CUB

JOHN GARRETT (C)
OREGON CITIZENS'
UTILITY BOARD

610 SW BROADWAY STE 400
PORTLAND OR 97205
john@oregoncub.org

MICHAEL GOETZ (C)
OREGON CITIZENS'
UTILITY BOARD

610 SW BROADWAY STE 400
PORTLAND OR 97205
mike@oregoncub.org

STAFF

BETSY BRIDGE (C)
OREGON

1162 COURT STREET
SALEM OR 97301-4520
betsy.bridge@doj.state.or.us

/// /// ///

/s/ Sharif Morton
Sharif Morton
Office Manager
Oregon Citizens' Utility Board
610 SW Broadway, Ste. 400
Portland, OR 97205
503.908.6010
dockets@oregoncub.org

/s/ John Garrett
John Garrett
Utility Analyst
Oregon Citizens' Utility Board
610 SW Broadway, Ste. 400
Portland, OR 97205 E.
John@oregoncub.org