BEFORE THE PUBLIC UTILITY

COMMISSION OF OREGON

LC 79

In the Matter of NORTHWEST NATURAL GAS COMPANY DBA NW NATURAL, 2022 INTEGRATED RESOURCE PLAN.	COMMENTS OF THE ALLIANCE OF WESTERN ENERGY CONSUMERS

Introduction and Summary

Alliance of Western Energy Consumers ("AWEC") appreciates the opportunity to provide comments in response to the February 13, 2023 memorandum of Administrative Law Judge ("ALJ") Spruce in this matter. As noted in the memorandum, the purpose of these comments is to provide the Public Utility Commission of Oregon ("Commission") with further information to develop expectations about future integrated resource plan ("IRP") cycles, specifically with respect to the Opening Comments of Staff regarding electrification.

AWEC is supportive of reasonable and responsible efforts to decarbonize both the gas and electric system. To the extent measures are being adopted, however, it is important that they produce real and meaningful impacts on carbon emissions.

AWEC notes that the concept of electrification is a generic term that has not been defined and may mean different things to different people. For purposes of these comments, AWEC assumes that electrification means the gradual migration of certain types of customers and appliances from the natural gas system to the electric system.

As a general matter, electrification planning presents myriad issues for consideration. They pose impacts on Northwest Natural Gas Company ("NW Natural") and other gas utilities, but also for customers of electric utilities. The costs and benefits of electrification to NW Natural, for instance, may be different than the costs and benefits to Portland General Electric Company. There are unique equity concerns associated with electrification between the service lines, and those concerns are highly fact specific, depending on the individual resource portfolios of the different utilities. For example, the migration of certain customer loads from gas to electric services may benefit or harm different customer groups, as the case may be, and it would be inconsistent to evaluate electrification without considering such impacts to electric and gas service customers. Increased demand, driven by electric vehicle adoption, will exacerbate the impact on electric loads and should not be ignored in this process.

As part of the electrification discussion, it is important to consider other ways to decarbonize the energy system that may be in the best interest of ratepayers. To that point, AWEC is not aware of any accepted Oregon study demonstrating that electrification, in whole or part, rather than decarbonizing the natural gas system, is the least costly option for ratepayers.

Also, there needs to be assurances that, if electrification takes place, customers will continue to be provided safe and reliable service, particularly during peak events. Further, most industrial processes are unable to fuel switch. For those customers that are unable to fuel switch, they continue to rely on a viable natural gas industry for service. AWEC is interested in ensuring that its members continue to have safe, reliable and affordable access to energy, including both natural gas and electricity.

The gas system also provides the vast majority of energy to residential customers in Oregon during winter peak conditions.[1] In order to electrify, renewable resources would need to be developed at an unprecedented level, accompanied by new transmission lines to deliver power, which takes many years to permit and build. And because renewable resources are intermittent, these resources need to be overbuilt, and battery storage will likely be required to maintain safe and reliable service. Further, firm carbon free resources will be needed for reliability if gas Resources Are Retired, Including Nuclear, Geothermal, Fossil Generation With Carbon Capture And others. Even assuming all this is possible, natural gas service will continue to provide service to industrial customers and gas will likely be used to provide peaking service for all customers. Indeed, even California has a plan for thousands of MWs of gas fired generation in 2045 when California is "net-zero."[2]

As it stands today, electricity consumption results in more carbon emissions than natural gas consumption. In the Western Interconnection, for instance, consumption of natural gas produces almost half the amount of carbon emissions than the equivalent amount of electricity. Natural gas emits 52.91 kilograms of carbon dioxide per dekatherm.[3] At 3.41 megawatt-hours per dekatherm, this equates to emission 180.5 kg/MWh for natural gas. In comparison, the equivalent carbon emissions for the Western Interconnection in 2021 was 330.9 kg/MWh, almost double that of natural gas. This is detailed in Figure 1, below.

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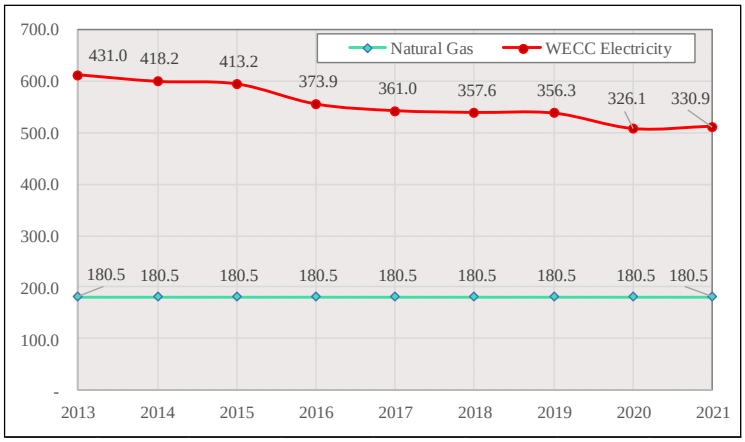
1 NW NATURAL, VISION 2050: DESTINATION ZERO, NW NATURAL CARBON NEUTRALITY SCENARIO ANALYSIS (available at https://www.nwnatural.com/about-us/the-company/carbon-neutral-future).

2 2021 CA Joint Agency (CEC, CPUD, CARB) for Achieving 100% Clean Energy in California

3 See EIA Carbon Dioxide Emissions Coefficients, available at https://www.eia.gov/environment/emissions/co2_vol_mass.php.

Figure 1
Carbon Emissions of the WECC vs. Natural Gas - kg/MWh
Source: EIA Emissions by plant and by region[4]



While there have been significant efforts to decarbonize the electric system, there is still a long way to go before the electric system reaches parity with natural gas. Further, notwithstanding recent reductions, carbon emissions on the electric system actually went up in 2021 due to increased system demands. When considering the carbon impacts of electrification, which will cause demand to increase even further, it is important to consider not only the average impacts on carbon emissions, but also marginal impacts, that tend to be much higher.

Considering the above, adopting a one-size fits all approach to electrification is a challenge. Electrification issues are difficult to analyze in NW Natural's stand-alone IRP, viewed in isolation from the impacts on electric service customers. A multi-utility investigation into electrification may yield a more comprehensive analysis, though finding consensus across such a broad range of interests may be even more challenging.

AWEC provides the following responses to ALJ Spruce's questions:

1. What should be the objective, or what should be the multiple distinct objectives, for modeling electrification of end uses in NW Natural's future IRPs?

There are two potential objectives or purposes for considering electrification in NW Natural's IRP: (1) as a demand side resource; and (2) as a Climate Protection Plan ("CPP") resource. For the reasons discussed below, AWEC does not view electrification as a viable demand side management resource. AWEC also views electrification as an questionable measure for achieving the carbon reduction objectives of the CPP.

A. Demand Side Resource.

As a demand side resource, an electrification measure would reduce both the need to acquire gas supply and potentially the need for system expansion investments. These impacts are

[4] Available at https://www.eia.gov/electricity/data/emissions/

challenging to assess, however, because the reduced gas supply to the gas utility corresponds to a reduction to sales, and a corresponding increase in electric supply costs. The electric supply cost may be more or less than the cost of gas, depending on market conditions and the electric utility from which the customer purchases electric services.

Similar challenges arise with respect to the reduced need for system expansion investments. For example, while it is possible that a new system expansion project, such as a new feeder main, might be avoided through electrification efforts, it would be difficult to deploy electrification in a meaningful way to produce that result. System expansion projects are typically dependent largely on the configuration of the utility's system and specific constraints on the pipeline. An electrification measure would only be capable of avoiding a system expansion investment if it were targeted to the specific area where the distribution constraint was identified and applied in a systematic way across a large enough number of customers that it could produce the congestion relief desired. Further, to the extent that an electrification measure were capable of avoiding a system expansion investment, there is a corresponding system expansion cost with respect to the migrating customer's electric services. Capacity in the Pacific Northwest is increasingly constrained. Accordingly, migrating customer loads to the electric system will require the addition of significant new generation and transmission resources, along with battery storage, the cost of which must be considered in any analysis evaluating the cost effectiveness of electrification.

B. CPP Compliance Resource.

As a CPP compliance resource, the potential objective for electrification is more straight forward. Electrification would result in a reduction to NW Natural's throughput, and, accordingly, would assist NW Natural in meeting its CPP compliance targets. For reasons discussed below, however, the cost of this alternative is impossibly difficult to evaluate in NW Natural's stand alone IRP. Electric utilities themselves are struggling, particularly with recent supply chain disruptions, to build sufficient renewable requirements for their loads. In Nevada, NV Energy, for example, recently cancelled 600 MW of new solar resources and 480 MW of battery storage, which was expected to come online by December 31, 2023 because of supply chain issues. In its place, NV Energy has proposed to build two new natural gas combustion turbines to satisfy its rapidly growing load requirements. While there might be a CPP benefit from electrification, the incremental renewable energy costs and associated storage and transmission costs must be evaluated for the corresponding electric utility.

Finally, efforts are underway to decarbonize both the gas and the electric systems. There are some advocates that strongly believe that decarbonization of the electric system is more likely or more feasible than decarbonization of the gas system. Notwithstanding, it is important to note that the electric system, as it is constructed today, still depends heavily on carbon emitting resources. In 2020, PacifiCorp's generation resource mix consisted of 49% coal generating resources and 19% gas generating resources.[5] As it stands today, consuming 1 MMBTU of natural gas on site, which does not involve the generation inefficiencies and other losses, is more carbon efficient than purchasing power, at least from PacifiCorp. Granted that evaluation of carbon emissions is complicated by the efficiencies of different technologies (e.g., heat pumps versus a furnace), if the objective is decarbonization, electrification may be contrary to that

[5]See https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/about/Generation_Portfolio_Transformation.pdf

objective until greater progress is made on the electric system.

While the carbon profile of the electric system has improved in recent years, it is carbon efficient for most heat applications to consume natural gas at the source, rather than by generating and transmitting electricity from a combustion turbine. For example, the thermal efficiency of a combustion turbine, is only 50 percent at best, even before considering line losses and other losses.

The objective for modeling electrification of end uses should be based on the economic case for electrification and done in a piecemeal fashion. While there may be a case to electrify some loads or appliances, electrification of the majority or even the entire gas system is not possible today.

2. Regarding Staff's proposal to develop a proxy cost for electrification:

a. How might the use of a proxy electrification cost in this IRP improve the ability to evaluate NW Natural's current or future IRPs?

b. How accurate should a proxy electrification cost be to provide actionable or useful information in an IRP?

c. How might electrification cost estimates be made more accurate and informative now and in future IRPs?

d. *What specific elements of the cost of electrification need to be considered and assumed in such a proxy cost assessment?*

As noted above, developing an estimate of the costs of electrification are fraught with complications. From AWEC's perspective, at least three factors need to be considered in such an analysis.

First, it is necessary to consider the direct cost of the conversion itself. Such an analysis would be measure specific, such as the cost of installing a new heat pump. This part of the analysis could be fairly straightforward depending on the type of measure, although some electrification measures, such as those for commercial and industrial customers, may be site specific and therefore more difficult to quantify on the basis of a proxy cost assessment. Further, there may be differences in the operating costs for electrification equipment compared to equivalent natural gas equipment, which should be considered in the conversion cost. Some operating costs may depend on the cost differentials between natural gas costs and electric service costs from the electric service utility, which may vary utility to utility. The ongoing operating cost of a heat pump, for example, is different than the cost of a furnace, which is appropriately considered in a proxy cost assessment.

Further considering the environmental impacts of developing new consumer appliances and equipment is also necessary to consider when developing a proxy cost for electrification. For example, if a customer exchanges an existing 90 percent efficient furnace for a new heat pump, manufacturing of the new heat pump will result in incremental carbon emissions. Therefore, a

cost of carbon must be applied to the cost of the new heat pump to account for these incremental carbon emissions.

Second, it is also necessary to consider the costs and benefits to the electric system. Those costs and benefits are more difficult to calculate as they depend on information that NW Natural does not possess. The costs and benefits of the corresponding electric service requirements must include both the cost of the electric service supply, generation capacity costs, and transmission costs. One way of quantifying these costs would be to use the avoided costs calculations that the electric utilities use to justify energy efficiency. An increase in electric supply caused by electrification can be viewed as the same as a reduction to energy efficiency. Just like direct costs, a carbon cost must also be applied to the cost of energy consumed as a result of electrification.

Finally, and most importantly, it is necessary to consider stranded investment costs to NW Natural. Depending on the magnitude of the electrification measure, stranded investment costs may include an individual customer's service line and meter, and the customers associated share of the system distribution investment. When a service line and meter is installed to serve a customer, it is recovered over an extended period of time with an expectation that the revenues from that customer will pay for the cost of that investment. Similarly, the distribution system is sized and built with the expectation that customers will stay on the system for the life of the investment in order for NW Natural to recognize a return of and return on its distribution system investment. If a particular customer switches from gas to electric services, it will be necessary for other customers to pay for the cost of the customer's service line, meter, and the associated distribution system investment. These real costs to non-migrating customers cannot be ignored in evaluating the cost of electrification. And if proposed legislation is passed "protecting" residential customers from stranded costs, these costs will either be imposed on NW Natural's shareholders or remaining commercial and industrial customers already facing CPP compliance costs, which will likely result in a loss of business and jobs in Oregon.

3. Regarding electrification, what is NW Natural's responsibility to model electrification, as well as the company's capability to model electrification in future IRPs?

Because NW Natural is not capable of considering electric service impacts, AWEC recommends that NW Natural's responsibility for modeling electrification be limited to the impacts of electrification on its load forecast. Future efforts in a multi-utility investigation to evaluate cross-service line impacts are warranted before requiring NW Natural to consider those impacts in a stand-alone IRP.

4. Should NW Natural's models be limited solely to its costs as a utility or should they incorporate household costs of electrification to some extent?

AWEC recommends that all ratepayer costs and impacts be considered, including household costs. Household costs would include, for example, the difference in ongoing operating costs, described in response to question 2 above.

5. What actions by the Commission, if any, are necessary or helpful to enable appropriate modeling to be done now and in future IRPs?

In general, guidance directing NW Natural to perform certain analyses in a future IRP is helpful to establish the Commission's expectation for this and future IRPs. Commission workshops also provide a meaningful arena for stakeholders and the Commission to discuss issues and for the Commission to provide feedback on its expectations.

In the end, however, it is NW Natural's responsibility to prudently plan and manage its system, regardless of the contents of its IRP. A Commission order, which acknowledges the IRP, is not necessarily a finding that NW Natural acted prudently. Correspondingly, to the extent a Commission order were to not acknowledge an IRP, or an aspect thereof, is not necessarily a finding of imprudence. Prudence is typically only evaluated when establishing whether a particular item of cost is recoverable in rates or not. Therefore, establishing the conditions that NW Natural must satisfy at the time the prudence determination is made, will encourage NW Natural to perform modeling that is consistent with the Commission's expectations.

6. How should the significant uncertainty about many future conditions, such as load estimates or zero carbon fuel cost and supply availability estimates, be addressed or weighed in the development of the near-term action plan? Is the current guidance for least cost/least risk planning sufficient?

In general, the greatest amount of emphasis in planning should be based on current conditions and the facts that are known with the greatest certainty today. Establishing a baseline scenario on the best information known at the time, and then conducting sensitivity scenarios to evaluate portfolio impacts from uncertain conditions would provide the Commission with the greatest amount of information surrounding the impacts of various uncertainties.

AWEC was concerned with the random stochastic modeling approach that NW Natural employed, for example, because it did not necessarily correspond to specific scenarios. It was difficult to evaluate any particular scenario, such as high gas prices and low synthetic gas production costs, without combing through the random scenarios to find a stochastic case that roughly contained those criteria.

From AWEC's perspective the current guidance for least-cost, least-risk planning is sufficient. Notwithstanding, understanding the relative weighting between costs and risks in that equation may require some fine tuning in the context of NW Natural's IRP. In the near-term, the uncertainty and risks associated with potentially new zero carbon fuel types is relatively high, and accordingly, the greatest wight should be placed on the base case scenario.

Conclusion

Thank you for the opportunity to provide these comments, and we look forward to participating in the remainder of this docket.

Respectfully submitted,

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