

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UG 462

In the Matter of)
)
NW NATURAL GAS COMPANY, dba NW)
Natural,)
)
Renewable Natural Gas Adjustment Mechanism)
– Dakota City.)
_____)

**CROSS-ANSWERING AND REBUTTAL TESTIMONY
OF THE
OREGON CITIZENS' UTILITY BOARD**

July 31, 2023



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OF OREGON
UG 462**

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NW NATURAL GAS COMPANY, dba NW)	CROSS ANSWERING AND
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)	OREGON CITIZENS' UTILITY
Renewable Natural Gas Adjustment Mechanism)	BOARD
- Dakota City.)	
)	
_____)	

i. INTRODUCTION

1 **Q. Please state your name, occupation, and business address.**

2 A. My name is William Gehrke. I am a Senior Economist employed by Oregon
3 Citizens' Utility Board (CUB). My business address is 610 SW Broadway, Ste. 400
4 Portland, Oregon 97205.

5 **Q. Have you previously provide testimony in this case?**

6 A. Yes. Please see CUB/100 for my opening testimony.

7 **Q. What is the purpose of your testimony?**

8 A. I address three issues in the proceeding.

- 9 • First, I consider a sharing mechanism for Dakota City Renewable Natural Gas
10 (RNG) Project and associated intervenor testimony AWEC/100 to which NW
11 Natural (NWN or the Company) responded in Exhibit NWN/300.

- 1 • Second, I consider rate spread for the Dakota City Project and respond to the
- 2 proposal raised in AWEC/100 and associated exhibits to which NW Natural
- 3 responded in Exhibit NWN/400.
- 4 • Finally, I address CPP compliance and SB 98 for RNG procurement, discussed
- 5 in CUB/100 to which NW Natural responded in Exhibit NWN/300.

6 **Q. How is your testimony organized?**

7 A. My testimony is organized as follows:

8	II.	Issue 1. Dakota City Project Cost Sharing	2
9	III.	Issue 2. Dakota City Rate Spread.....	5
10	IV.	Issue 3. CPP Compliance and SB 98 Procurement.....	8

11

II. Dakota City Project Cost Sharing

12 **Q. Please summarize CUB’s position on this topic.**

13 A. CUB recommends that the Commission allow recovery of costs associated with
14 the Dakota City Project, subject to a cost cap similar to that which is used to govern
15 cost recovery for NWN’s Lexington Project.

16 **Q. What was AWEC’s response to the Dakota City Project cost sharing?**

17 A. AWEC stated “it may be appropriate for the Commission to impose conditions
18 requiring NW Natural to share in the production risk to the extent the actual
19 performance of the Dakota Project significantly exceeds the cost of an alternative
20 source of RNG.”¹

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¹ UG 462 – AWEC/100/Mullins/6.

1 **Q. How did NW Natural respond to AWEC's testimony?**

2 **A.** NW Natural argues that a risk sharing mechanism is not needed because the cost of
3 Dakota City compares favorably to all other RNG resources available to NWN that
4 is actionable.

5 **Q. What is CUB's response to AWEC's testimony on the cost cap?**

6 **A.** CUB agrees with AWEC's position from opening testimony. CUB is concerned
7 about the fluctuations around production associated with the RNG projects and the
8 risk that NWN's customers would be exposed to absent some form of cost sharing.
9 Under an RNG offtake agreement, the developer takes the risk of production, and
10 customers pay a fixed cost per RTC associated with the project. Conversely,
11 capitalized development projects like Dakota City, without a cost cap, expose long-
12 term production risk to NW Natural's customers. Since under Schedule 198, NW
13 Natural is allowed to update the cost of RNG projects annually, production risk is
14 primarily shifted to customers. Due to the production risk of the Dakota City and
15 changes in production levels projections, CUB recommends that the Commission
16 adopt CUB's proposal which is detailed below.

17 **Q. What is CUB's recommendation on this topic?**

18 **A.** CUB recommends that the Commission adopt a cost cap on the Dakota city
19 project, with the Company sharing 25% of costs past the cost cap.

20 **Q. What changes does CUB propose to make to the cost cap for Dakota?**

21 **A.** CUB's proposed Dakota City cost cap is a modified version of the cost cap that was
22 agreed to by NW Natural, AWEC, CUB and Staff for Lexington. As discussed,
23 under an offtake agreement, the operator of the project bears the 100% of the risk

1 associated with production volumes because the operator is compensated based on
2 a flat fee per unit of RNG produced. If an offtake agreement underperforms, then
3 that operator does not receives guaranteed recovery of costs associated with the
4 project.

5
6 CUB's proposed cost cap enables equitable cost sharing between the company and
7 customers for Dakota City. CUB's proposal ensures that production risk is not
8 solely passed onto NWN's customers, and this balance aligns with regulatory
9 treatment of RNG offtake agreements, where neither NWN or its customers bear
10 any production risk. It would be poor ratemaking to allow NWN to completely
11 avoid long term production risk associated with these projects. CUB recommends
12 that the Commission adopt a cost cap, where the average forecasted RTC price of
13 the Dakota City project is the cost cap. For any costs that exceed the cost cap, NW
14 Natural may recover 75% of such costs from customers.

15
16 Rather than using a flat average cost cap, CUB proposes to shape the cost cap by
17 the expected RTC cost per year. Capital cost streams associated with the Dakota
18 City project are front loaded and will paid off over several decades through rates. In
19 the Lexington case, parties agreed to use the next two actionable RNG bids as the
20 basis for the cost cap, in order to account for how RNG procurement costs are front
21 loaded as customers pay off the costs of RNG assets. Since CUB's proposal shapes
22 the cost cap to account for this effect, CUB proposes to use the average cost of the
23 Dakota City project. CUB's cost cap is detailed in CUB Exhibit 201.

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iii. Dakota City Rate Spread

Q. What is CUB’s recommendation on this topic?

A. CUB recommends that costs associated with Dakota City be spread on an equal cents per therm basis to all customers except storage customers.

Q. What is the Company’s proposal on Dakota City rate spread?

A. The Company proposes to spread the costs of the Dakota City project on an equal cents per therm basis to all customers except customers, consistent with the Commission-approved rate spread methodology for Lexington.

Q. What was AWEC’s response to NWN’s proposal to spread Dakota City Project costs on an equal cents per therm basis?

A. AWEC recommends that Schedule 198 revenues be allocated on the difference between the actual throughput and the CPP cap, calculated based on average throughput over the CPP base line period of 2017 and 2019. Additionally, AWEC recommends that the rate spread in Schedule 198 be modified based to include a true-up mechanism based on actual load requirements on the deferral portion of the renewable natural gas adjustment clause.

Q. How did the Company respond to AWEC’s rate spread?

A. The Company indicated equal cents per therm to all non-storage customers is the proper allocation because it is consistent with cost causation, promotes stable and consistent rates, and administratively simpler.²

Q. Does CUB agree with the Company’s position on RNG rate allocation?

A. Yes. CUB agrees with the points raised by the Company on the RNG rate spread.

² UG 462 – NW Natural/400/Bourdo-Walker/2.

1 **Q. What is major issue with AWEC's proposed rate spread?**

2 **A.** CUB is concerned that AWEC's rate spread would yield RNG rates that are
3 inconsistent with Bonbright's Principles of Public Utility Rates. If the Commission
4 were to adopt AWEC's proposed spread, this could led to unexpected swing on
5 RNG retails prices experienced by all customer classes.

6 **Q. Does CUB have additional concerns with AWEC's approach?**

7 **A.** Yes.

8
9 Energy efficiency is a tool that LDCs will use to comply with the targets established
10 by the CPP. Presently, sales customers pay for the cost of energy efficiency
11 programs, and transportation customers pay nothing in current rates for energy
12 efficiency

13
14 Because transport customers have not historically participated in energy efficiency
15 programs and industrial transport customers make up a large portion of energy
16 efficiency programs, NW Natural is evaluating offering energy efficiency programs to
17 industrial transportation customer to help with CPP compliance requirements. This
18 would reduce the throughput of industiral customers. That is expected to be a major
19 program, because transport customer are forecasted to provide 17% of total demand
20 reduction need for CPP from 2025 – 2027.³

21

³ LC 79 – Staff Final Comments, Page 30.

1 New transport customer energy efficiency programs will reduce the amount that
2 large customer classes pay for RNG spread under AWEC's proposed spread.⁴

3
4 AWEC's proposal relies on changes to the customer classes baseline compared
5 actual throughput. Throughput can decline for variety of reasons. For example,
6 economic conditions can yield higher or lower throughput for each customer class.
7 For example, if economic conditions led to Schedule 32 (large industrial
8 customers) led to large throughput customers no longer operating. The Schedule
9 32 class would have a reduction of throughput, which would result in being
10 allocated less RNG costs, or zero RNG costs annually, under AWEC's proposal.

11
12 CUB is also concerned that AWEC's proposal allocates zero costs to specific rate
13 schedule. It is CUB's position that the costs associated with system natural gas
14 emission reduction should be equally spread to all therms on the system regardless
15 of customer class.

16 **Q. Is it necessary to have a true-up mechanism on rate spread?**

17 **A.** No. It is unnecessary and overly complex. Rates are set by dividing each classes
18 allocated revenue requirement by normalized throughput. For example, the
19 Purchase Gas Adjustment (PGA) for the gas commodity tracks differences between
20 forecasted natural gas commodity costs and actual natural gas commodity costs for
21 sales customers. These costs are spread on an equal cents per therm basis to all of
22 NWN's sales customers. The PGA does not examine differences in natural gas

⁴ CUB Exhibit 202

1 usage during the gas year when allocating costs because it is administratively
2 simpler and promotes stable and consistent rates to spread historic costs on a
3 normalized basis. This is a long standing way that NW Natural has spread
4 differences in gas commodity costs to future years.

5 **Q. What is CUB's recommendation on rate spread for the Dakota City**
6 **project?**

7 **A.** CUB recommends that the Commission maintain the current rate allocation for
8 Schedule 198, which is an equal cents per therm to all non-storage customers.

IV. CPP Compliance and SB 98 Procurement

9 **Q. What is CUB's recommendation on this topic?**

10 **A.** While the interplay of SB 98 / CPP and the Company's plans to invest in RNG to
11 comply with one or both policies remains a significant concern, CUB has decided
12 to no longer request that the Commission make a legal determination in this
13 proceeding. This position is due to uncertainty around community climate
14 investments (CCIs) in Oregon and the Commission's recent guidance in NWN's
15 most recent Integrated Resource Plan, LC 79.

16 **Q. What was CUB's position in opening testimony?**

17 **A.** CUB asked the Commission to make a legal determination regarding the interplay
18 between the CPP and SB 98, and rule that NW Natural should only be permitted to
19 pursue SB 98's voluntary standards to the extent that they fit within a least cost,
20 least risk compliance plan to comply with the CPP.

21 **Q. Has CUB's position changed since opening testimony ?**

1 **A.** No. CUB position is that SB 98 is voluntary standard, and the NW Nautral should
2 operate in a least cost least risk manner around CPP compliance. However, CUB
3 would like to recognize the uncertainty around CCIs complaince instruments at this
4 time. Therefore, CUB does not propose addressing this issue until more
5 information about CCIs emerge from DEQ.

6 **Q. Does this conclude your testimony?**

7 **A.** Yes.

CUB Exhibit 201 is Confidential and has been served upon the Commission and each party designated to receive confidential information pursuant to Order 23-063.

Transportation Customer Energy Efficiency

Stakeholder Meeting
July 10, 2023





Forward Looking Statement

This and other presentations made by NW Natural from time to time, may contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as “anticipates,” “intends,” “plans,” “seeks,” “believes,” “estimates,” “expects” and similar references to future periods. Examples of forward-looking statements include, but are not limited to, statements regarding the following: including regional third-party projects, storage, pipeline and other infrastructure investments, commodity costs, competitive advantage, customer service, customer and business growth, conversion potential, multifamily development, business risk, efficiency of business operations, regulatory recovery, business development and new business initiatives, environmental remediation recoveries, gas storage markets and business opportunities, gas storage development, costs, timing or returns related thereto, financial positions and performance, economic and housing market trends and performance shareholder return and value, capital expenditures, liquidity, strategic goals, greenhouse gas emissions, carbon savings, renewable natural gas, hydrogen, gas reserves and investments and regulatory recoveries related thereto, hedge efficacy, cash flows and adequacy thereof, return on equity, capital structure, return on invested capital, revenues and earnings and timing thereof, margins, operations and maintenance expense, dividends, credit ratings and profile, the regulatory environment, effects of regulatory disallowance, timing or effects of future regulatory proceedings or future regulatory approvals, regulatory prudence reviews, effects of regulatory mechanisms, including, but not limited to, SRRM and the Company’s infrastructure investments, effects of legislation, including but not limited to bonus depreciation and PHMSA regulations, and other statements that are other than statements of historical facts.

Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results may differ materially from those contemplated by the forward-looking statements, so we caution you against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Important factors that could cause actual results to differ materially from those in the forward-looking statements are discussed by reference to the factors described in Part I, Item 1A “Risk Factors,” and Part II, Item 7 and Item 7A “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and “Quantitative and Qualitative Disclosure about Market Risk” in the Company’s most recent Annual Report on Form 10-K, and in Part I, Items 2 and 3 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Quantitative and Qualitative Disclosures About Market Risk”, and Part II, Item 1A, “Risk Factors”, in the Company’s quarterly reports filed thereafter.

All forward-looking statements made in this presentation and all subsequent forward-looking statements, whether written or oral and whether made by or on behalf of the Company, are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made, and we undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.



Today's Agenda

Welcome

Background & Context

Estimated Potential – AEG Presentation

AWEC Comments

Program Implementation

Cost-Effectiveness Evaluation

Next Steps



2 Minutes for Safety:

July is UV safety awareness month

Ultraviolet (UV) rays:

- 3 types (UVA, UVB, UVC)
- are invisible
- can come from the sun, tanning beds, & sun lamps
- can penetrate & change skin cells
- UVB rays primarily cause sunburn while UVA rays penetrate deeper into the skin

Protect yourself:

- Look for broad spectrum sunscreen (protects against both UVA & UVB)
- Wear U.P.F rated clothing
- Cotton and denim can also provide some protection
- Wear UV-absorbent sunglasses
- Stay hydrated

Procedures for Participation

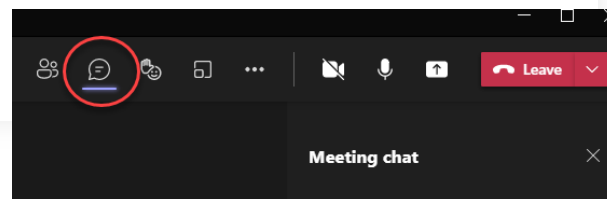
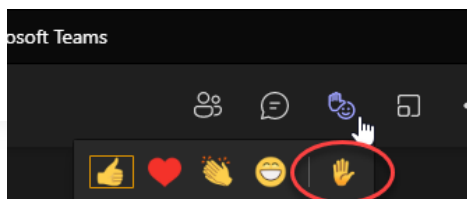
- Please mute your microphones during the presentation, except when commenting and/or asking a question
- All participants are muted upon entry into the meeting

- Cameras are optional and up to each participant to use
- All participant cameras are set to off upon entry into the meeting

- Add a comment or question at any time using the “raised hand” or the chat box

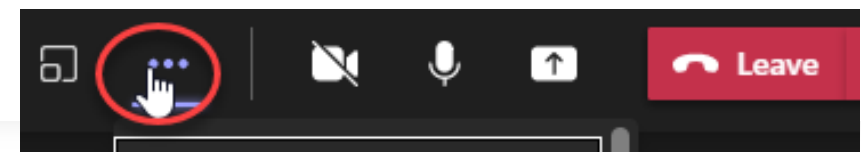
Raised hand function is found in the reactions

Chat box will open when you click on the conversation bubble



- Microsoft Teams has a live caption function for any participant to use

Click the ellipses, then chose “turn on live captions”



NW Natural Transportation Customers

Transportation customers are gas customers that purchase their own gas wholesale and pay NW Natural to transport it to their site via the Company's system.

They're typically large industrial facilities, but there is a smaller subset of commercial transportation customers.

The 10 biggest transport users in Oregon make up roughly 64% of NW Natural's Oregon transportation load.

Changing Carbon Policy

Climate Protection Program (CPP) in Oregon

- Requires 50% reduction in NW Natural's customer emissions by 2035 and 90% by 2050
- NW Natural is responsible for all transport customers

Climate Commitment Act (CCA) in Washington

- Requires 95% reduction in Washington's emissions by 2050
- NW Natural is responsible for non EITE transport customers under 25,000 metric tons of GHG emissions

Current Transportation Efforts

Oregon

- Transportation Potential Study
- LBNL 50001 Ready Cohort
- 50% Carbon Reduction Audit



Staff Recommendations

OPUC Staff Recommendation 23: NW Natural should convene a stakeholder group immediately following the conclusion of the IRP to establish a transport customer efficiency program in time to be able to report on its status in the 2024 IRP update.

OPUC Staff Recommendation 24: NW Natural, in the development of a transport customer efficiency program for 2024, should explore and share findings regarding an incentive that would adequately incentivize efficiency, but would not be applied as a flat, per therm rate to usage reductions for operational, economic, or other reasons.

Estimated Transportation Energy Efficiency Potential



NW Natural OR Transport Customer Potential Study

Date: July 10th, 2023

Prepared for: NW Natural Stakeholder Workshop





AEG Introduction



Eli Morris
Project Director



Ken Walter
Analysis Lead

*With support from
AEG analysts and engineers*

Northwest & Mountain:

- Avista Energy
- Bonneville Power Ad. (BPA)
- Black Hills Energy
- Cascade Natural Gas
- Chelan PUD
- City of Fort Collins
- Colorado Electric
- Cowlitz PUD
- Energy Trust of OR
- Idaho Power
- Inland P&L
- Northwest EE Alliance
- Northwest Natural Gas
- Northwest Power & Conservation Council
- Northwestern Energy
- Oregon Trail Electric Co-op
- PacifiCorp
- PNGC
- Portland General Electric
- Seattle City Light
- Snohomish PUD
- Tacoma Power

Southwest:

- Alameda Municipal Power
- Burbank W&P
- California Energy Commission
- HECO
- LADWP
- NV Energy
- PNM
- PG&E
- SCE
- SDG&E
- SMUD
- State of NM
- State of HI
- Tucson Electric Power
- Xcel/SPS

Midwest:

- AEP (I&M, Kentucky)
- Alliant Energy
- Ameren Missouri
- Ameren Illinois
- Black Hills Energy
- Citizens Energy
- ComEd
- Empire District Electric
- First Energy
- Indianapolis P&L

Canada:

- BC Hydro
- Fortis Alberta
- Hydro One
- Independent Electric System Operator (IESO)
- Manitoba Hydro

National:

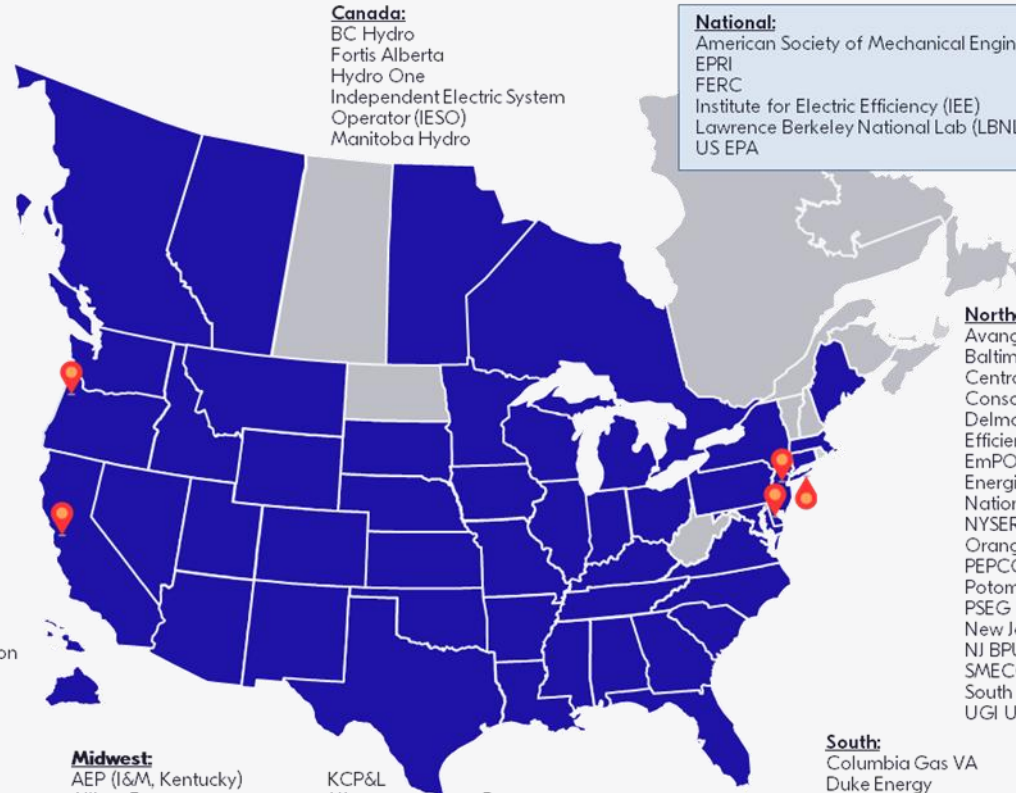
- American Society of Mechanical Engineers (ASME)
- EPRI
- FERC
- Institute for Electric Efficiency (IEE)
- Lawrence Berkeley National Lab (LBNL)
- US EPA

Northeast & Mid Atlantic:

- Avangrid (RG&E & NYSEG)
- Baltimore Gas & Electric
- Central Hudson Electric & Gas
- Consolidated Edison of NY
- Delmarva Power
- Efficiency Maine
- EmPOWER Maryland
- Energize Delaware
- National Grid
- NYSERDA
- Orange & Rockland
- PEPCO
- Potomac Energy
- PSEG LI/LIPA
- New Jersey Natural Gas
- NJ BPU
- SMECO
- South Jersey Industries
- UGI Utilities

South:

- Columbia Gas VA
- Duke Energy
- LG&E/KU
- Oklahoma Gas & Electric (OK and AR)
- South Mississippi Electric Power Association
- Southern Company (Services and utilities)
- TVA



As of January 2023

States and Provinces in which we've worked

AEG offices



Study Objectives

1. Assess the potential for energy efficiency to reduce energy consumption and on-site GHG emissions for NW Natural Oregon transport customers as a result of Oregon's Climate Protection Program (CPP).
2. Efficiently leverage information and assumptions from the potential study AEG performed for NW Natural's Washington service territory in 2021.
3. Incorporate NW Natural data and insights to understand how Oregon transport customers use natural gas and prioritize energy efficiency upgrades.

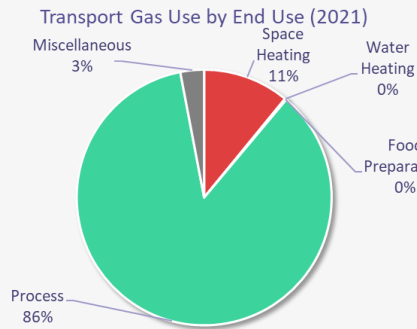
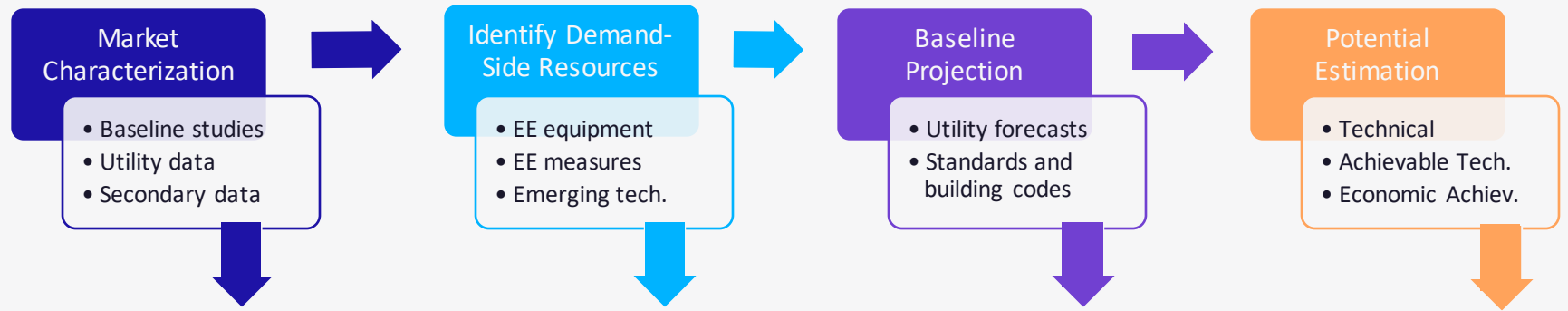




Methodology



AEG's Modeling Approach



NW Natural Data

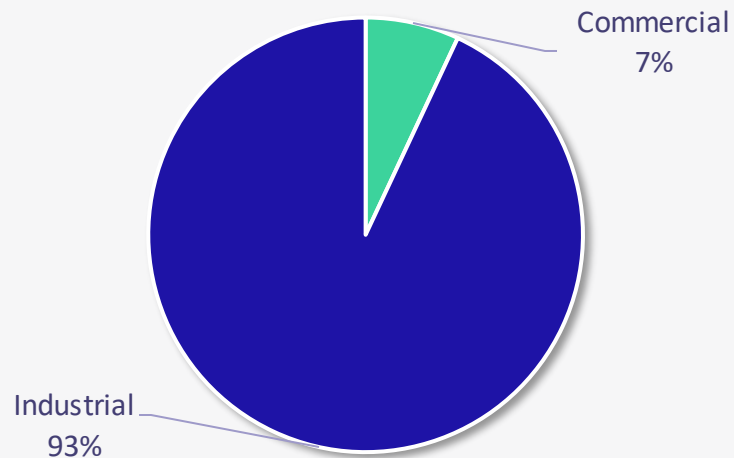
- ✔ Customer account data including SIC codes
- ✔ Customer equipment database including nameplate BTU
 - Vetted and adjusted by NW Natural field techs
- ✔ Transport customer class energy totals and forecast
- ✔ Washington CPA conducted by AEG served as a starting point for many measure characterizations and applicable market/adoption rate assumption



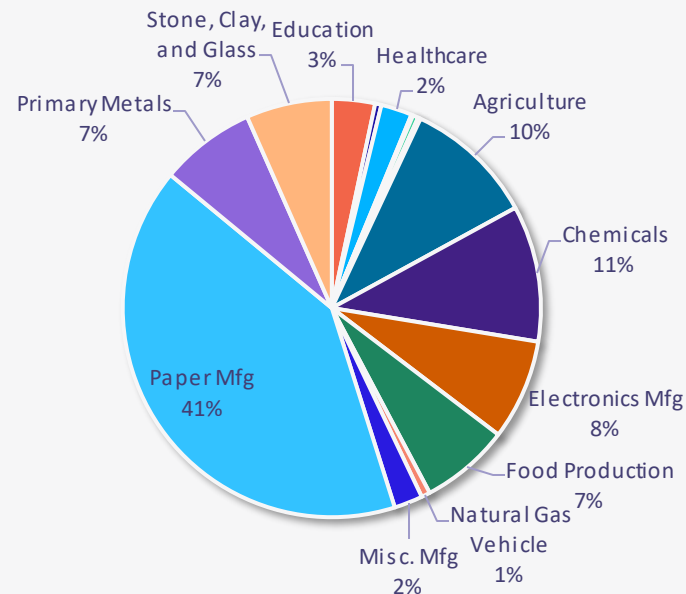
Market Characterization

- ✔ Define energy-consumption characteristics in the base year of the study (2021).
- ✔ Incorporates NW Natural’s actual consumption and customer counts to develop “Control Totals” – values to which the model will be calibrated.
- ✔ Grounds the analysis in NW Natural data and provides enough detail to project assumptions forward to develop a baseline energy projection.
- ✔ After separating gas consumption into sectors and segments, it is allocated to specific end uses and technologies.

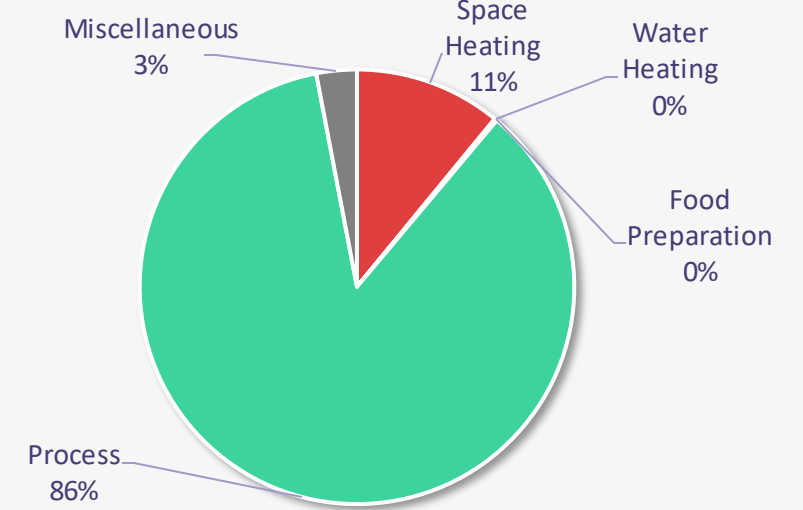
Transport Gas Use by Sector (2021)



Transport Gas Use by Segment (2021)



Transport Gas Use by End Use (2021)





Considerations for this Analysis

- ✔ Available potential is largely a function of baseline consumption – segments with the highest baseline consumption are likely to have the highest potential

- ✔ Potential studies rely on average information, which may not reflect conditions or opportunities for any single customer
 - This is particularly relevant for this study, where a small number of customers represent a large share of transport load
 - Ramp rates are derived from the Northwest Power and Conservation Council’s 2021 Power Plan and reflect expected adoption across a broad set of customers. Actual adoption of energy efficiency for large transport customers may be lumpier based on cycles for implementing large capital projects

- ✔ Equipment data provided from NW Natural’s system contain some uncertainty around frequency of use which could affect the actual impact of measures





Potential Results

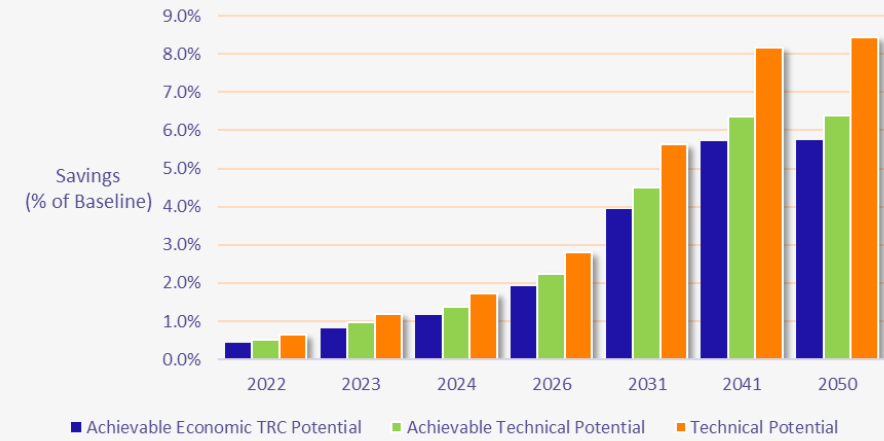
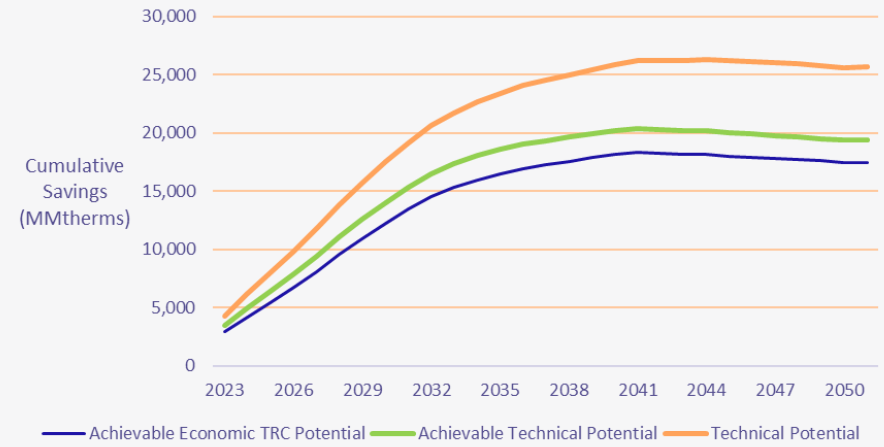


Total Resource Cost vs. Utility Cost Test

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)
Purpose	Assesses cost-effectiveness from the perspective of the utility and its customers, including attributable and quantifiable non-energy impacts . Non-energy impacts include reduced water, detergent, or wood, any electric benefits for applicable measures, etc.	Assesses cost-effectiveness from a utility or program administrator's perspective which includes the avoided energy benefits, incentive costs, and administrative costs.
Measure Passes If...	it has non-negative net benefits (i.e. its benefits equal or exceed its costs) based on the test-specific benefits and costs identified below:	
Benefits Calculation	<ul style="list-style-type: none"> - Avoided energy supply, distribution, and capacity - Includes social cost of carbon in Oregon - 10% Conservation Credit for Oregon - Quantifiable non-energy impacts 	<ul style="list-style-type: none"> - Avoided energy supply, distribution, and capacity - Includes social cost of carbon in Oregon - 10% Conservation Credit for Oregon
Costs Calculation	<ul style="list-style-type: none"> - Incremental measure cost relative to baseline (includes equipment & labor cost) - Program administration costs - Operations and maintenance costs relative to baseline 	<ul style="list-style-type: none"> - Assumed incentives and administration costs

Cumulative Energy Efficiency Potential

- ✔ AEG assessed potential for technical, achievable technical, and achievable economic scenarios.
- ✔ Economic screening is from a Total Resource Cost (TRC) perspective, including the commodity cost of natural gas.
- ✔ Potential was estimated over a 30-year period, though most potential is assumed to be acquired within the first 20 years.
- ✔ Cumulative Achievable Technical Potential by 2031 is estimated at 15.4 million therms (4.5% of baseline sales), growing to 20.4 million therms (6.4%) by 2041.
- ✔ Most of the Achievable Technical Potential is expected to be cost-effective from a TRC perspective.
 - TRC Cost-effective potential is estimated at 13.4 million therms (3.9% of baseline) in 2031, growing to 18.4 million therms (5.7%) by 2041.



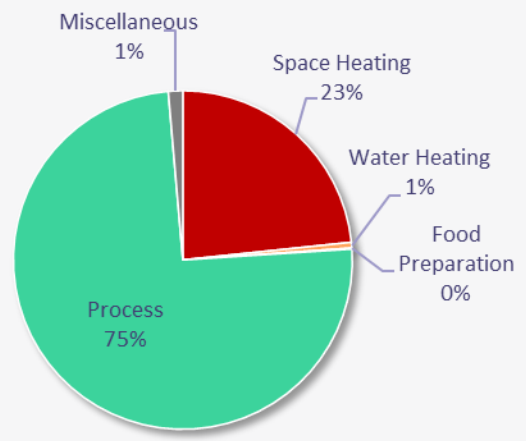


Cumulative Potential by End Use and Segment

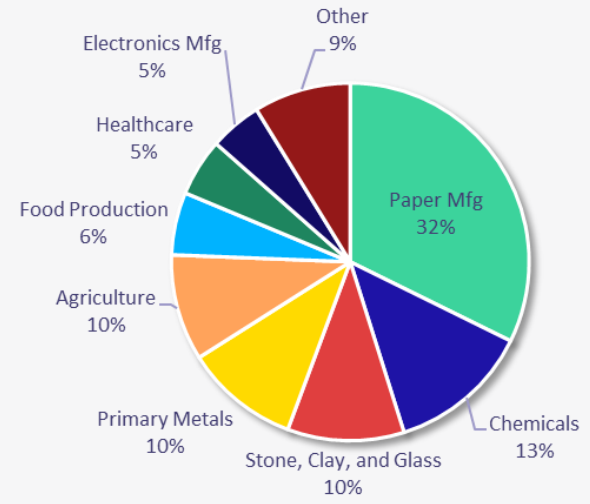
Achievable Economic Potential in 2041

- ✔ Savings are generally proportional to consumption in the base period
- ✔ Space heating savings come mainly from the commercial segments (Education and Healthcare) and have some easier/cheaper interventions compared to Process
- ✔ A large portion (32%) of potential comes from the Paper segment where there are only a few customers

2041 Savings by End Use



2041 Savings by Segment



Thank You.

Eli Morris
emorris@appliedenergygroup.com

Ken Walter
kwalter@appliedenergygroup.com

Phone: 631-434-1414



AWEC Perspective

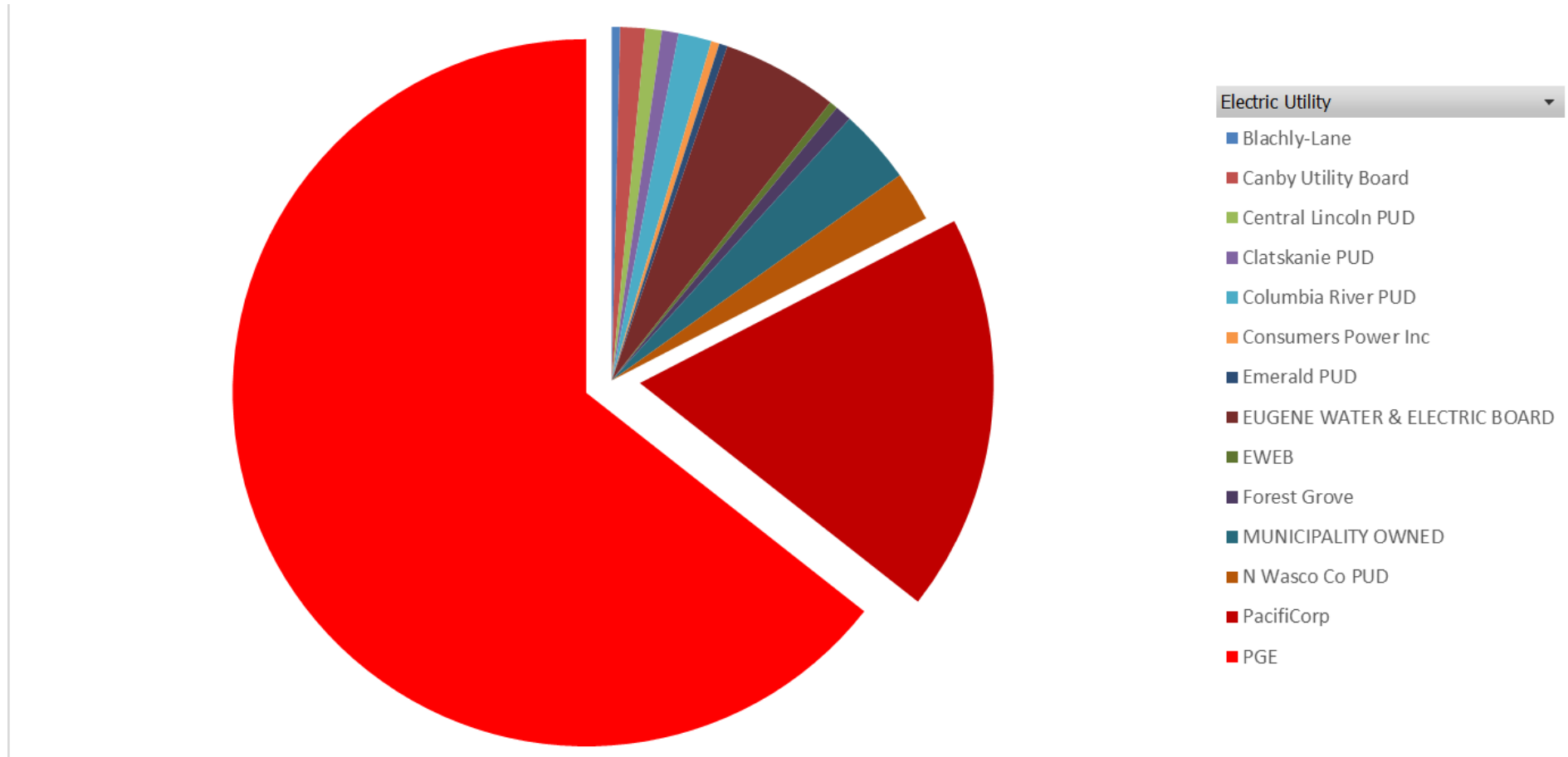
Program Implementation



Program Opportunities

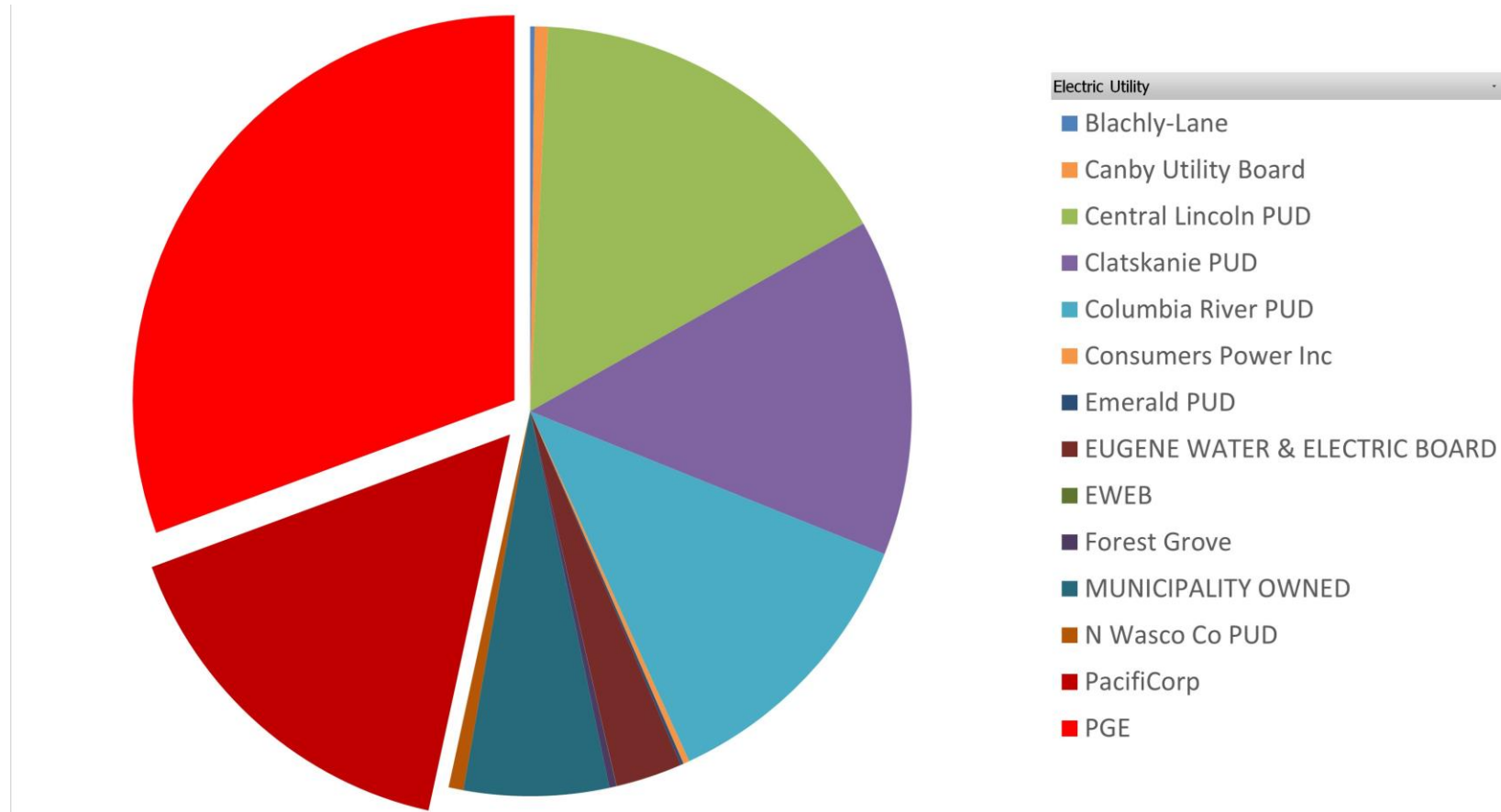
- Transportation customers are a unique group of customers that vary in size and needs. Additional programs to target decarbonization of the largest customers may be prudent
- Energy Trust has been running industrial programs which may directly benefit a large portion of transport customers, as is
- NW Natural would like to have multiple programs to maximize achievable savings
- Multiple entities have important relationships with the customers which are important for implementing programs
 - NW Natural account managers and industrial technicians regularly meet with large customers
 - Energy Trust has established relationships serving customers in electric IOU territory
 - AWEC represents large customer needs and interests, for both gas and electric

Electric Providers by 2022 Transport Customer Count



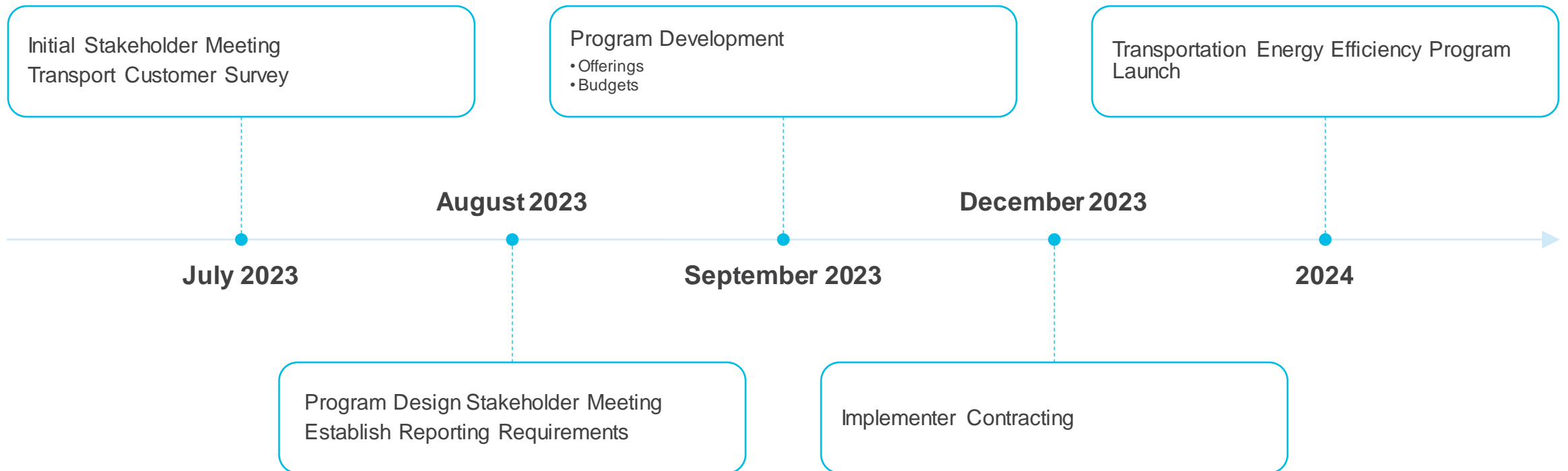


Electric Providers by 2022 Transport Usage





Program Implementation Timeline





Program Design Meeting

- NW Natural will send all transport customers a survey to gather feedback on their priorities for a program that delivers energy efficiency.
- Potential Program Design Meeting topics:
 - Program delivery
 - Eligible technology and projects
 - Reporting and evaluation requirements

Cost-Effectiveness



Discussion Questions

- Which cost-effectiveness tests are appropriate for transportation EE (TRC, UCT, RIM, PCT)?
- What avoided cost components need to be included as benefits for transportation EE?
- Are there other benefit elements to be included?
- How should the amount of the incentive for transportation EE be determined?
- Is the incentive equitable to other customer types?



EE cost-effectiveness evaluation methods and avoided costs for firm sale customers

The foundation of cost-effectiveness analysis for all demand-side resources is based on the [California Standard Practice Manual \(2001\)](#) *

- Participant Cost Test (PCT)
- Rate Impact Measure (RIM)
- Total Resource Cost (TRC)
- Utility Cost Test (UCT) or Program Administrator Cost Test (PACT)
- Societal Cost Test (SCT)

* <https://www.raonline.org/wp-content/uploads/2016/05/cpuc-standardpractice-manual-2001-10.pdf>



Elements of Cost Effectiveness Tests

Elements		TRC	UCT/PACT	RIM	PCT	SCT
Benefits	Avoided costs	√	√	√		√
	Bill reductions				√	
	Conservation credits	√				√
	Non energy benefits					√
	Indirect fuel benefits	√				√
	Incentives/rebates				√	
Costs	Implementation costs	√	√	√		√
	Direct customer costs	√			√	√
	Program Admin and M&V	√	√	√		√
	Incentives/rebates		√	√		
	Reduced sales			√		



Energy Trust of Oregon (ETO) methods

Total resource cost test (TRC) and utility cost test (UCT) are directed by OPUC

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)
Purpose	To determine whether to provide an incentive for an energy-efficiency measure.	To help determine the maximum allowable amount of the incentive.
Measure passes if...	The value of the energy saved exceeds the total cost of the measure, and the cost of the energy-efficiency resource provides good value to all utility customers and the participating customer.	The value of the energy saved exceeds the cost of the incentive, and the cost of the energy-efficiency resource provides good value to all utility customers.
Benefits calculation	<ul style="list-style-type: none"> • Savings from avoiding the use of more expensive energy • Quantifiable non-energy benefits to the participating customer or the utility, like water savings or operations and maintenance benefits 	Savings from avoiding the use of more expensive energy.
Costs calculation	<ul style="list-style-type: none"> • Amount of incentive • Remaining amount of participant's costs 	Amount of incentive
Calculation used by Energy Trust	$\frac{(\text{Lifetime (Savings)} \cdot (\text{Avoided Costs}) + (\text{Non-Energy Benefits}))}{\text{Total Cost of Measure}}$	$\frac{(\text{Lifetime (Savings)} \cdot (\text{Avoided Costs}))}{\text{Incentive Amount}}$

Source: Energy Trust of Oregon. https://www.energytrust.org/wp-content/uploads/2016/11/GEN_FS_CostEffectiveness.pdf

Energy Trust of Oregon (ETO) methods (continued)

Cost-Effectiveness Screen



- Energy Trust utilizes the Total Resource Cost (TRC) test to screen measures for cost effectiveness

$$\text{TRC} = \frac{\text{Measure Benefits}}{\text{Total Measure Cost}}$$

- If TRC is > 1.0, it is cost-effective
- Measure Benefits:
 - Avoided Costs (provided by NWN)
 - Annual measure savings x NPV avoided costs per therm
 - Quantifiable Non-Energy Benefits
 - Water savings, etc.

Total Measure Costs:

- The customer cost of installing an EE measure (full cost if retrofit, incremental over baseline if replacement)

Source: Energy Trust of Oregon, Slide 74 in TWG4_AvoidedCostandDemandSideResource_April_13_2022_CombinedPresentations.pdf.



Applied Energy Group (AEG) methods

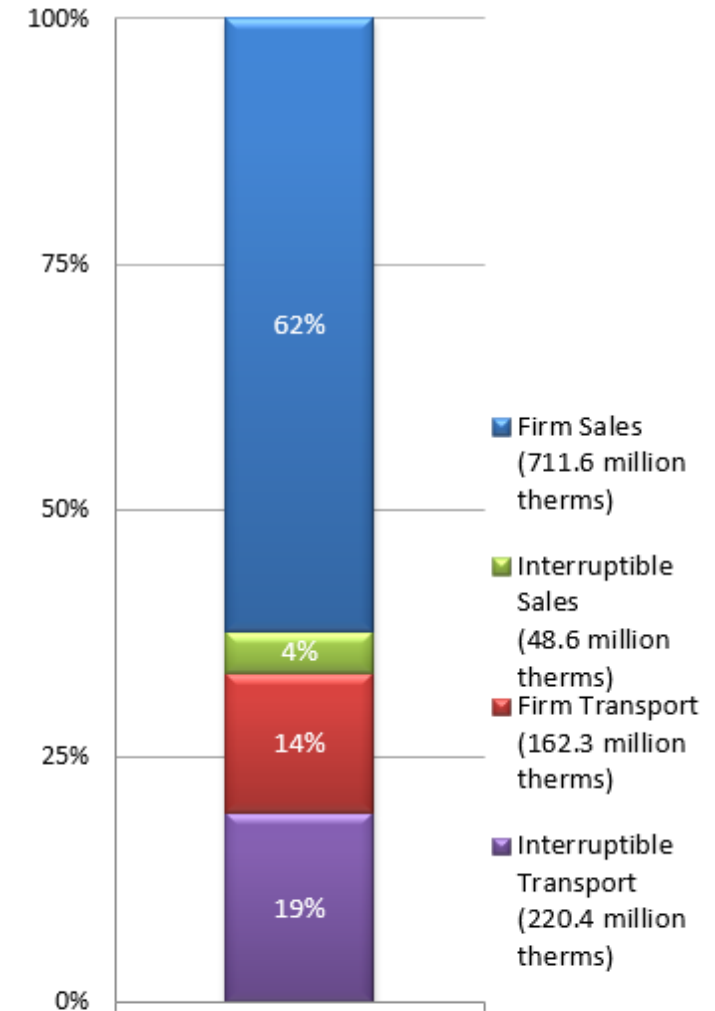
Total resource cost test (TRC) and utility cost test (UCT) are directed by OPUC

	Total Resource Cost Test (TRC)	Utility Cost Test (UCT)
Purpose	Assesses cost-effectiveness from the perspective of the utility and its customers, including attributable and quantifiable non-energy impacts . Non-energy impacts include reduced water, detergent, or wood, any electric benefits for applicable measures, etc.	Assesses cost-effectiveness from a utility or program administrator's perspective which includes the avoided energy benefits, incentive costs, and administrative costs.
Measure Passes If...	it has non-negative net benefits (i.e. its benefits equal or exceed its costs) based on the test-specific benefits and costs identified below:	
Benefits Calculation	<ul style="list-style-type: none"> - Avoided energy supply, distribution, and capacity - Includes social cost of carbon in Oregon - 10% Conservation Credit for Oregon - Quantifiable non-energy impacts 	<ul style="list-style-type: none"> - Avoided energy supply, distribution, and capacity - Includes social cost of carbon in Oregon - 10% Conservation Credit for Oregon
Costs Calculation	<ul style="list-style-type: none"> - Incremental measure cost relative to baseline (includes equipment & labor cost) - Program administration costs - Operations and maintenance costs relative to baseline 	<ul style="list-style-type: none"> - Assumed incentives and administration costs

Customer Types and Resource Planning



Customer Category	System Capacity Resource Planning			Distribution System Planning
	Design Winter Weather Energy Requirements	Peak Day Capacity Requirements	Emission Compliance	Peak Hour Capacity Requirements
Firm Sales	✓	✓	✓	✓
Interruptible Sales	✓		✓	
Firm Transport			✓	✓
Interruptible Transport			✓	



Note: Transport customers pay NW Natural to provide distribution services to transport the gas from the interstate pipeline to the customer's site location but are responsible for purchasing and upstream shipping of their gas.

Source: TWG4_Avoided Cost and Demand Side Resources on April 13, 2022, Slide 60.



Avoided Cost Component Applications

Costs Avoided		Resource Option Application						Transportation Energy Efficiency	
		Demand-Side Resources			Supply-Side Resources				
		Energy Efficiency	Demand Response		Low-Carbon Gas Supply		Recall Agreements	Firm	Interruptible
			Interruptible Schedules	Other DR	On-System Resources	Off-System Resources			
Commodity Related Avoided Costs	Natural Gas Purchase and Transport Costs	✓			✓	✓			
	Greenhouse Gas Compliance Costs	✓			✓	✓		✓	✓
	Commodity Price Risk Reduction Value	✓			✓	✓			
Infrastructure Related Avoided Costs	Supply Capacity Costs	✓	✓	✓	✓		✓		
	Distribution System Costs	✓	✓	✓	✓			✓	
Unquantified Conservation Costs	10% Northwest Power & Conservation Council Credit	✓						✓	✓

Source: TWG4_Avoided Cost and Demand Side Resources on April 13, 2022, Slide 20.



30 Year Levelized Avoided Costs (2021\$/Dth)

	Commodity Costs			Capacity Costs		10% Conservation Credit	Total Avoided Costs
	Natural Gas Commodity and Transport Costs	Greenhouse Gas Compliance Costs	Risk Reduction (Hedge) Value	Supply Capacity Costs Avoided	Distribution System Resources		
Residential Space Heating	\$3.83	\$7.61	\$0.86	\$0.64	\$4.72	\$0.92	\$18.58
Residential Hearths and Fireplaces	\$3.83			\$0.64	\$2.37	\$0.68	\$16.00
Commercial Space Heating	\$3.83			\$0.57	\$5.69	\$1.01	\$19.57
Water Heating	\$3.58			\$0.11	\$1.07	\$0.48	\$13.70
Cooking	\$3.55			\$0.12	\$2.92	\$0.66	\$15.72
Process Load	\$3.55			\$0.09	\$0.47	\$0.41	\$12.99
Interruptible Loads	\$3.55			X	X	\$0.36	\$12.38
Firm Transportation	X	\$7.61	X	X	\$0.47	\$0.05	\$8.12
Interruptible Transportation	X	\$7.61	X	X	X	\$7.61	



Questions/Feedback

Strategic Planning | Integrated Resource Planning Team
irp@nwnatural.com