

Northwest Natural's Low Carbon Pathway for Eugene

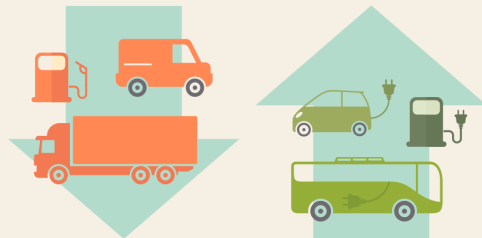


Eugene City Council Work Session May 22, 2019

COMMUNITY CLIMATE RECOVERY ORDINANCE GOALS

Reduce Fossil Fuel Use

50% reduction by 2030 compared to 2010

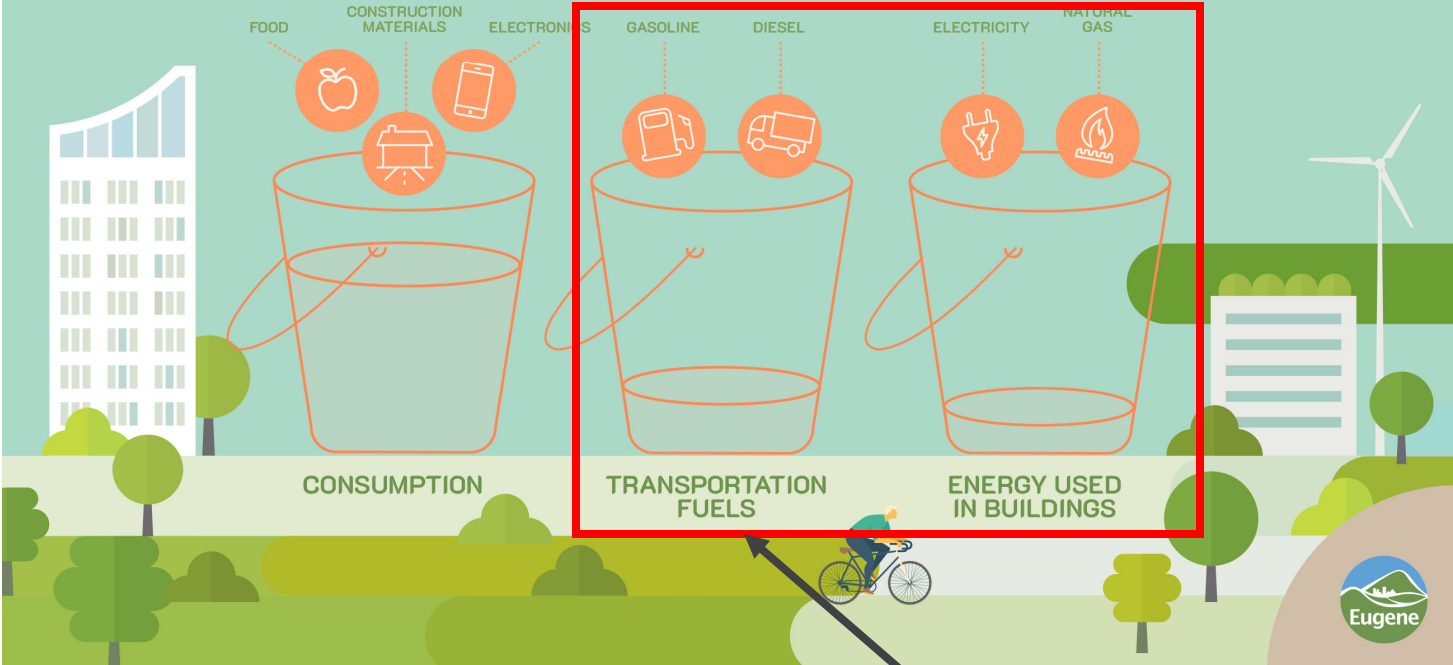


Reduce Community-wide GHG Emissions

Science-based goal to reduce ghgs to
Eugene's average share of 350ppm by 2100



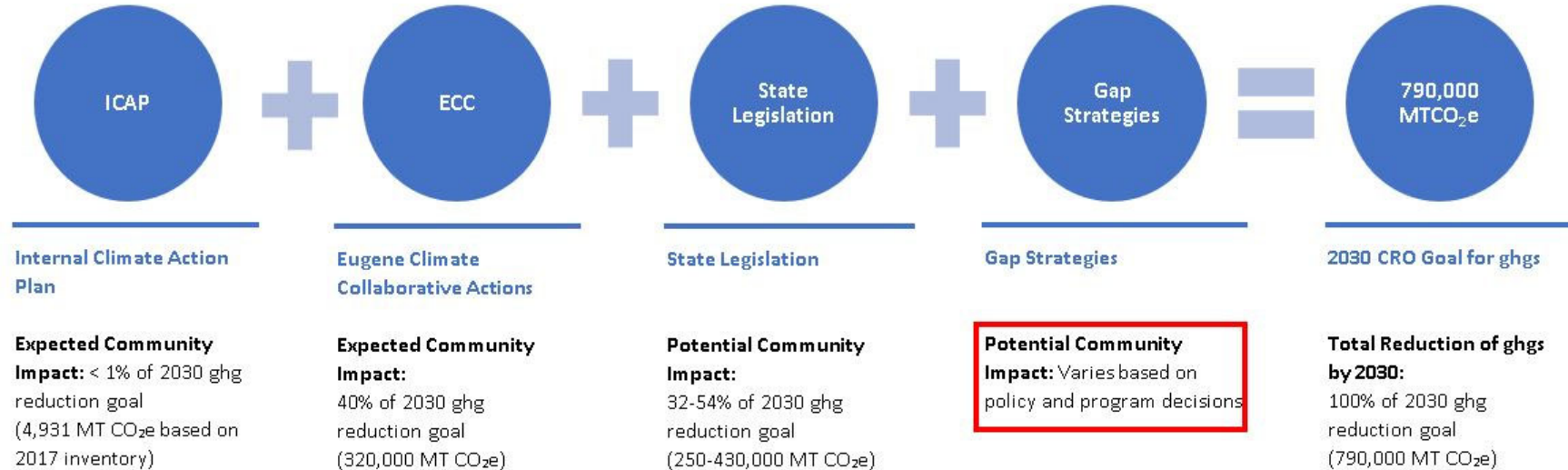
EUGENE'S GREENHOUSE GAS EMISSIONS



Sector Based Buckets



CAP2.0 Equation



EUGENE CITY COUNCIL WORK SESSION

NW Natural's **Low Carbon Pathway** Options for Eugene

Kim Heiting, SVP of Operations
Bill Edmonds, Sr. Director of Environmental Policy



Our Shared Values

- There is a climate imperative
- We must innovate and evolve together
- In a way that leaves no one behind

Our Triple Bottom-line Objectives



EQUITY

Provide warmth
affordably to the people
that depend on us



ENVIRONMENT

Drive down emissions with
efficiency, renewables,
new technology



ECONOMY

Use our tightest, modern
system to support economic
vitality and health

2050 Decarbonization Pathway

- Pacific Northwest decarbonization studies show achieving the goal is possible with economy-wide, transformational change

- Natural gas is a key part of a smart, effective climate strategy – along with other innovations

- Goal can be achieved more affordably using infrastructure in place with a blend of 25% renewable natural gas

Pacific Northwest Pathways to 2050

Achieving an 80% reduction in economy-wide greenhouse gases by 2050

November 2018



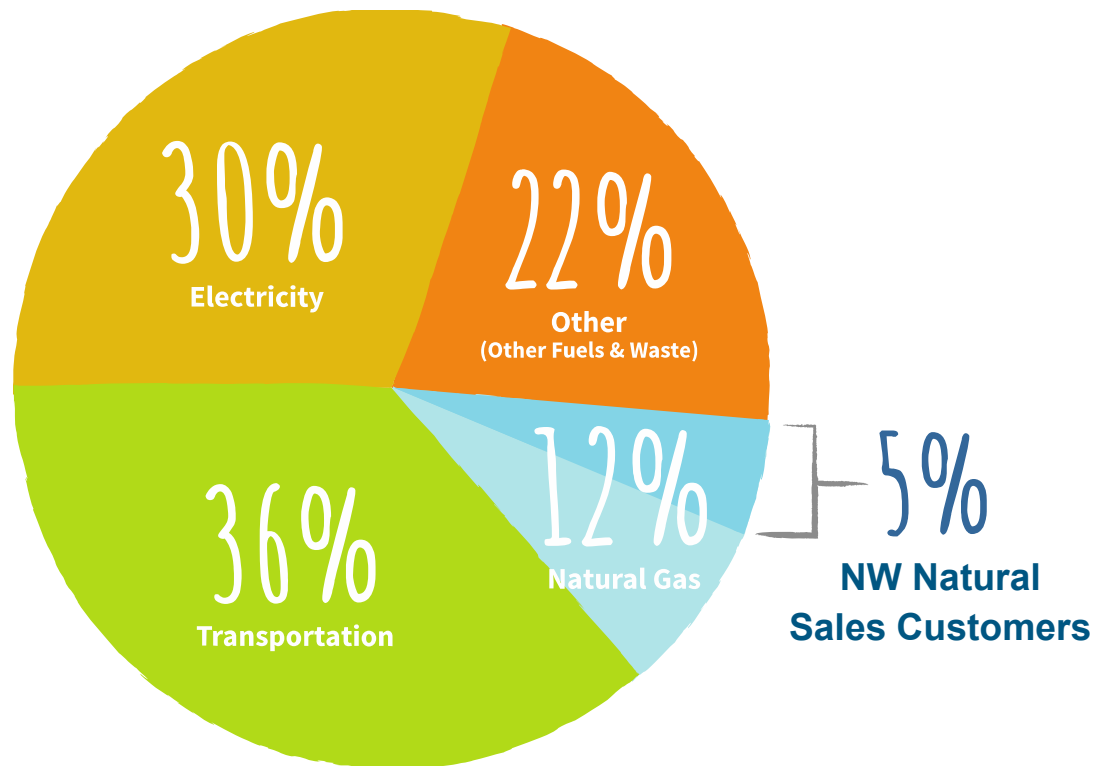
Energy+Environmental Economics

How does NW Natural's system
serve Oregon and
Eugene today?



What role does our system play?

Oregon Greenhouse Gas Emissions



NW Natural's System

- **Delivers more** energy than any other utility in Oregon
- **Heats 74%** of residential square footage in the areas we serve
- **Provides 90%** of energy needs for our residential space and water heat customers on the coldest winter days

Source: ODEQ In-Boundary GHG Inventory 2015

NW Natural serves 2 million people in 140 communities

We Provide Reliable Warmth

On the coldest winter days, NW Natural delivers more energy to Eugene citizens than EWEB



Our Eugene Customers



22,000
HOMES



3,000
BUSINESSES



78
GOVERNMENT
FACILITIES



186
EDUCATIONAL
FACILITIES



216
HEALTH CARE
FACILITIES

We share your goal of ensuring policy in Eugene that leaves no one behind.

We know **affordability** is a **challenge** for your citizens and our customers.

- We estimate about **44%** of Eugene-Springfield gas customers are low to moderate income
- In the last 5 years, we know home prices in Eugene have increased nearly **50%**
- The City has identified roughly **45%** of Eugene residents as cost burdened

How do we use our system to
achieve our climate goals?



Our Plan



OUR PRODUCT

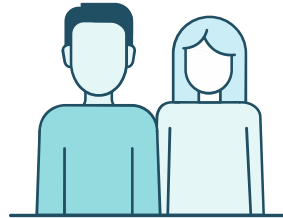
REDUCE

carbon
intensity

Renewable
natural gas

Upstream methane
reduction

Power-to-gas



OUR CUSTOMERS

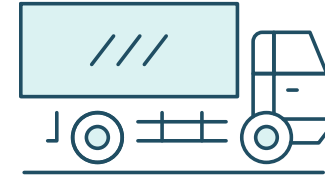
REDUCE

and offset
consumption

Energy efficiency

Smart Energy

New technology



TRANSPORTATION

REPLACE

more carbon
intensive fuels

Displace diesel
in fleets

CNG/RNG

Hydrogen

Methane Emissions Matter

Production & Processing



Transmission & Storage



Distribution



U.S. natural gas full value chain emissions: 1.2% (Obama EPA Report)

Industry pursuing innovations at an accelerated rate

- New technologies are reducing emissions in every part of the natural gas value chain
 - Tankless liquids unloading, visual imaging cameras, sensors dispatched onsite and in drones

Regional regulatory approaches result in substantially lower emissions

- Colorado and Canada are two of the most stringently regulated production areas in the world
 - As a result, our customers have access to some of the lowest carbon intensity supply

NW Natural leads in the utility sector

- We have one of the newest, tightest systems in the country and we push for improvements
 - One of the first utilities to remove bare steel and cast iron pipe from our system

How do we drive innovation?

Founding Member, US EPA Methane Challenge Program

- Members report systematic, comprehensive actions to reduce methane emissions in the system

Participant, Environmental Defense Fund (EDF) National Study

- EDF and Washington State found gas utility emissions had decreased significantly over past 20 yrs.
- NW Natural volunteered to have our system analyzed, confirmed among the nation's tightest

Member, Natural Gas Supply Collaborative

- Collaborative of purchasers promoting responsible production practices through more robust reporting and engagement from producers

Funder, The Gas Technology Institute

- NW Natural funds research and development of cutting edge technologies in leak detection and repair

Member, Downstream Natural Gas Initiative

- Natural gas utilities collaborating to address key technical and regulatory challenges for new innovations like renewable natural gas and renewable hydrogen

Renewable Natural Gas (RNG)

- Closes the loop on waste – renewable fuel from organic waste streams
- Substantially reduces CO₂ – used directly in appliances or in vehicles
- Most efficiently used in the pipeline rather than for power generation
- Turns costly waste into revenue generator with resiliency benefits for cities

ODOE STUDY POTENTIAL: 48 Bcf

Equals All Oregon Residential Gas Use

**Wastewater
Treatment Plants**

**Municipal
Solid Waste**

Landfills

Dairies

**Wood and
Agricultural
Residues**



Turning the problem of waste into renewable energy.

Nearly 100 RNG Projects in U.S.

Legend:

- OPERATIONAL/ONLINE
- UNDER CONSTRUCTION
- SUBSTANTIAL DEVELOPMENT

Driving Reductions Through RNG

- **E3 Deep Decarbonization Study:**
 - 25% renewable natural gas in the system by 2050
- **Is that doable?**  **YES**
 - Just in Oregon = nearly 50 Bcf of potential
 - Nationwide potential = estimated at 9 trillion cubic feet
 - 25% in the system = 29 Bcf by 2050

Senate Bill 98
would support
RNG targets:

2030
15%

2035
20%

2050
30%

Bring RNG to Eugene

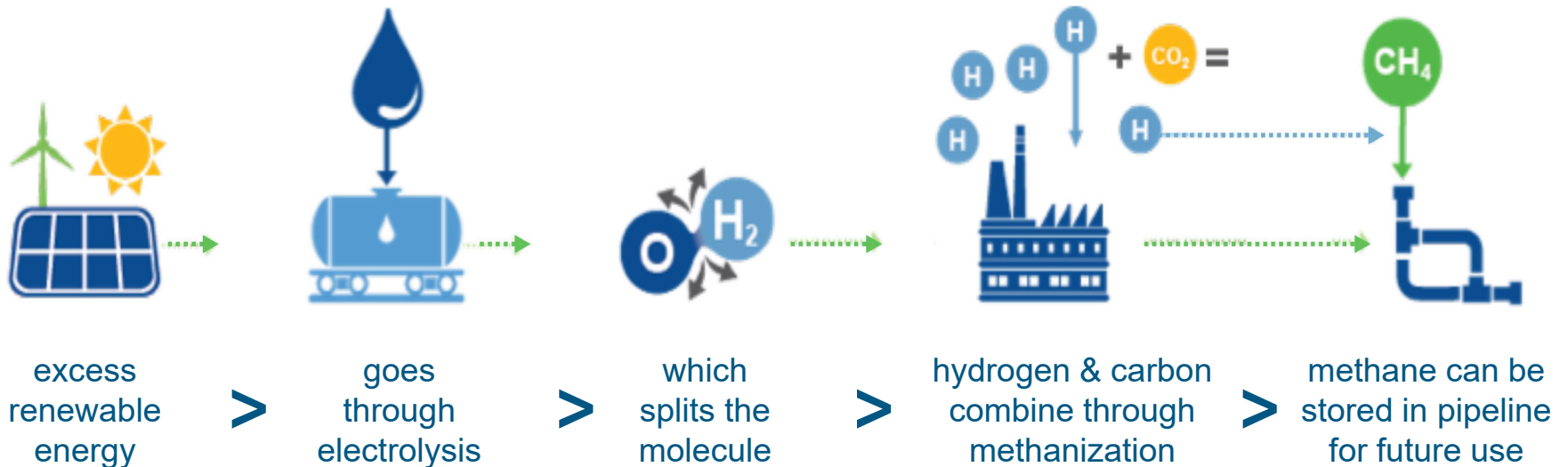
MWMC Project

- Partnership between Eugene-Springfield and NW Natural
- Provides 100% methane recovery
- Will save 7,500 MT tons of CO₂e annually
- Benefits local ratepayers



Power to Gas

Excess wind, solar or hydro converted to renewable hydrogen for use in our pipeline system



40+ projects
in Europe

3 projects in
North America

Power to Gas in Eugene

**Pursuing Pilot Project
with these Partners:**

**Hitachi Zosen
INOVA**



- Applied for federal grant under U.S. Department of Energy's H2@Scale Program
- Project would be first of its kind in the U.S.
- Applying to install public hydrogen fueling station
- Investigate methanization of the hydrogen – allowing for substantial amounts of curtailed electricity to be converted into renewable natural gas

How do we **drive reductions**
in homes, businesses,
and transportation?



Energy Efficiency Works in Eugene



Commercial

14% participation
13% avg reduction
per customer



Residential

31% participation
8% avg reduction
per customer



Industrial

9% participation
13% avg reduction
per customer



8,222 Energy Trust Program Participants

Efficiency Innovation

Strategic Partnerships

- Collaborate with EWEB to design integrated gas and electric programs
- Increased focus on Commercial and Industrial savings

Emerging Technology

- Gas heat pumps: up to 30% emissions savings per home
- Gas heat pump water heaters: up to 50% emissions savings per home



Net Zero Energy (NZE) Home

- Collaborate with builders on net zero energy homes
- Leverages deep energy efficiency design and solar
- NZE homes are carbon neutral and can be more affordable with gas

Access and Affordability

Low Income Programs

- Partnerships with Homes for Good Housing, Lane County Health and Human Services

Enhancing Support

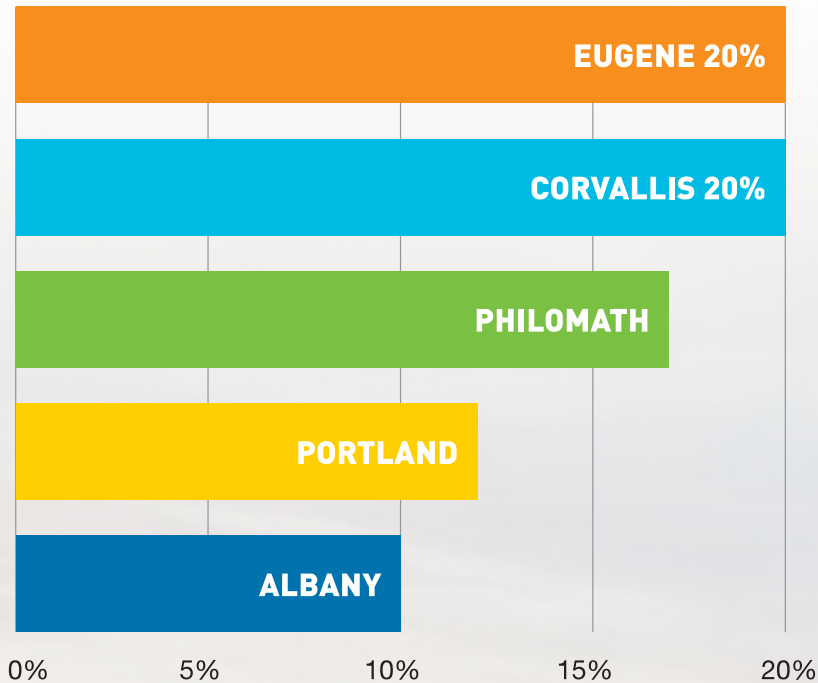
- Pilot new programs
- Data-driven targeted outreach
- Coordination with EWEB



Strive to increase participation rates by **50% or greater**

Smart Energy Participation

Residential Customer Participation Rate¹



7% of all residential customers participating

Funding 10 regional projects

Reduced 800,000 MTCO₂e

¹As a percentage of NW Natural sales customers in each city December 31, 2018.



Transportation Opportunities with RNG



DISPLACE DIESEL

Police Fleet (Bi-fuel)

- Up to 760 MT ton reduction
- Pursuit rated
- Long range, lower cost

Medium / Heavy Duty

- 14,500 tons by 2030 (50% adoption)
- Near zero emissions
- Mature technology

Lane County Transit

- Up to 7,600 MT ton reduction
- Near zero emissions
- Mature technology

Oregon Cap & Trade Bill

- HB 2020 to price carbon emissions
- We support a fair policy
 - Sought treatment in line with existing cap and trade programs

- Amendments released
 - Customer dollars used to reduce rate impacts and support innovations that will reduce emissions
 - Support SB 98 that allows for the purchase of renewable natural gas



How do your
citizens feel about
these issues?



Citizens Want Collaboration & Smart Solutions



82%

Citizens want impacts on carbon emissions and costs identified before increasing fees



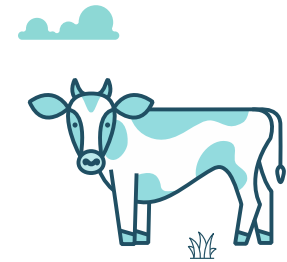
76%

Families can't afford added expenses from a local proposal to increase gas bills



84%

Encourage partnering on new approaches to meet climate goals



80%

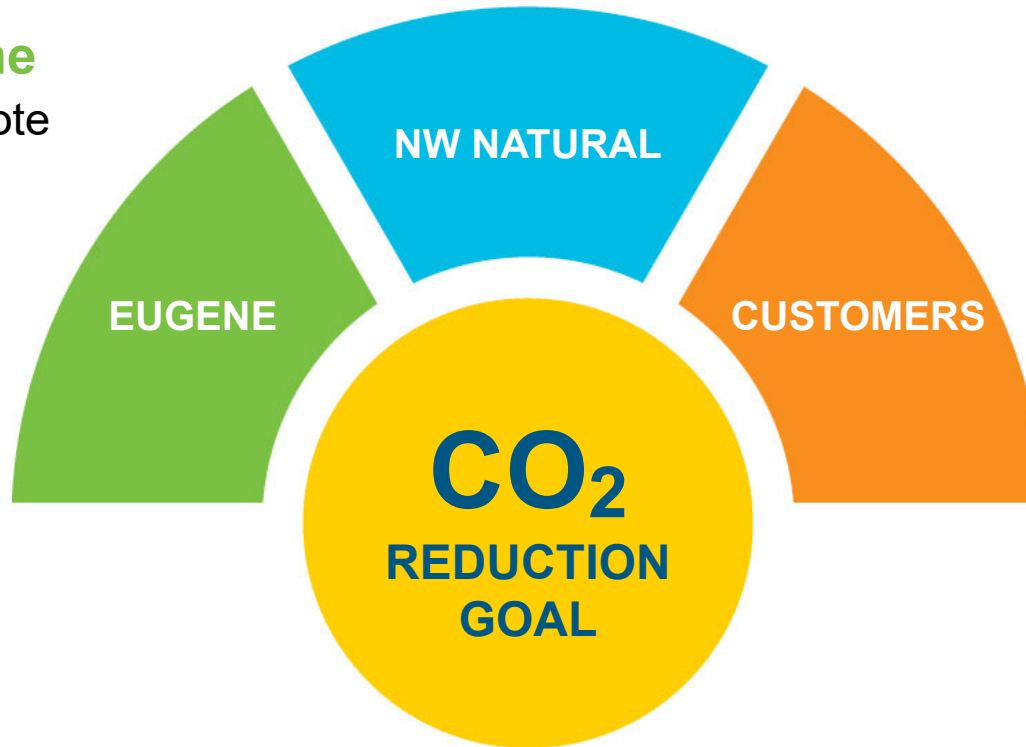
Support the City encouraging renewable natural gas from waste streams

86% say they should have a choice of energy options

Working Together is Key

City of Eugene

- Use and promote efficiency programs
- Use Smart Energy
- Promote low income programs
- Use RNG for fleets



Customers

- Participate in Smart Energy
- Fund and use efficiency programs
- Use low income programs

NW Natural

- Purchase RNG
- Pursue Power to Gas
- Promote Smart Energy
- Promote efficiency programs
- Fund new technology innovations

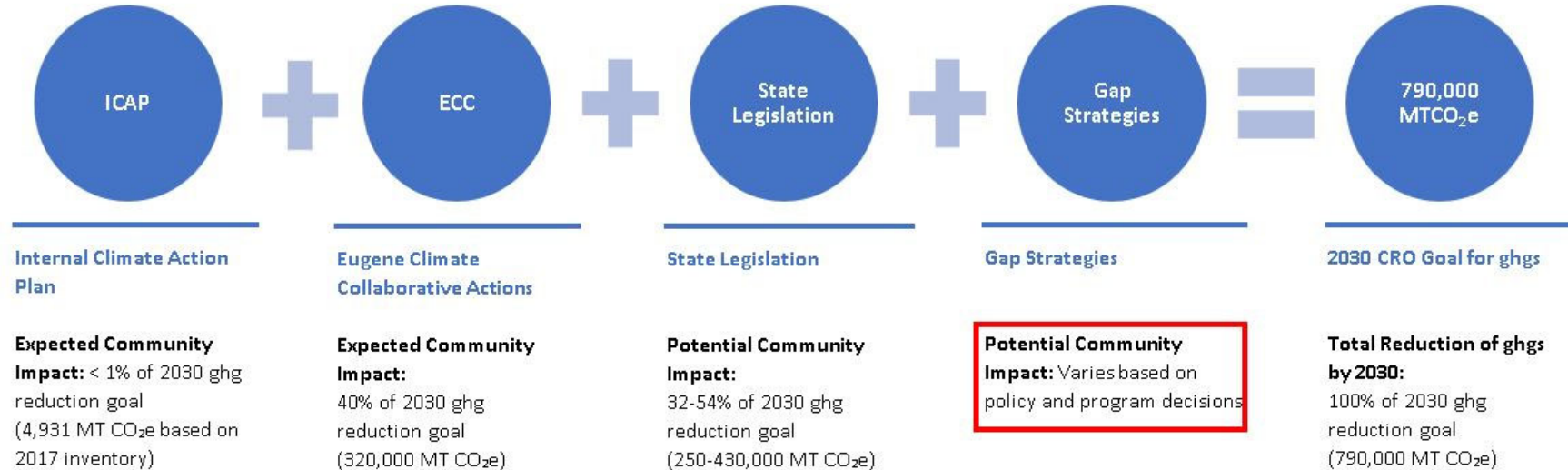
Thank You



NW Natural[®]
Celebrating 160 years



CAP2.0 Equation





Upcoming Work Session Topics

- CAP2.0 Equity Panel Recommendations
- Gap Strategies Discussion



Questions?