ENERGY SUPPLY WORKING GROUP

BEND COMMUNITY CLIMATE ACTION PLAN

OCTOBER 23, 2018

Community Climate Action Plan

MEETING OVERVIEW

1. Introductions
2. Background of C-CAP
3. Background Information
4. Exercise: Feedback from Group on Draft Objectives, Input on Barriers and Equity Considerations

City Council Resolution No. 3044

CITY OPERATIONS

Strategic Energy Management Plan to:

- Become carbon neutral by 2030
- Reduce fossil fuel use for City facilities and operations by
  - 40% by 2030
  - 70% by 2050

COMMUNITY WIDE

Community Climate Action Plan to:

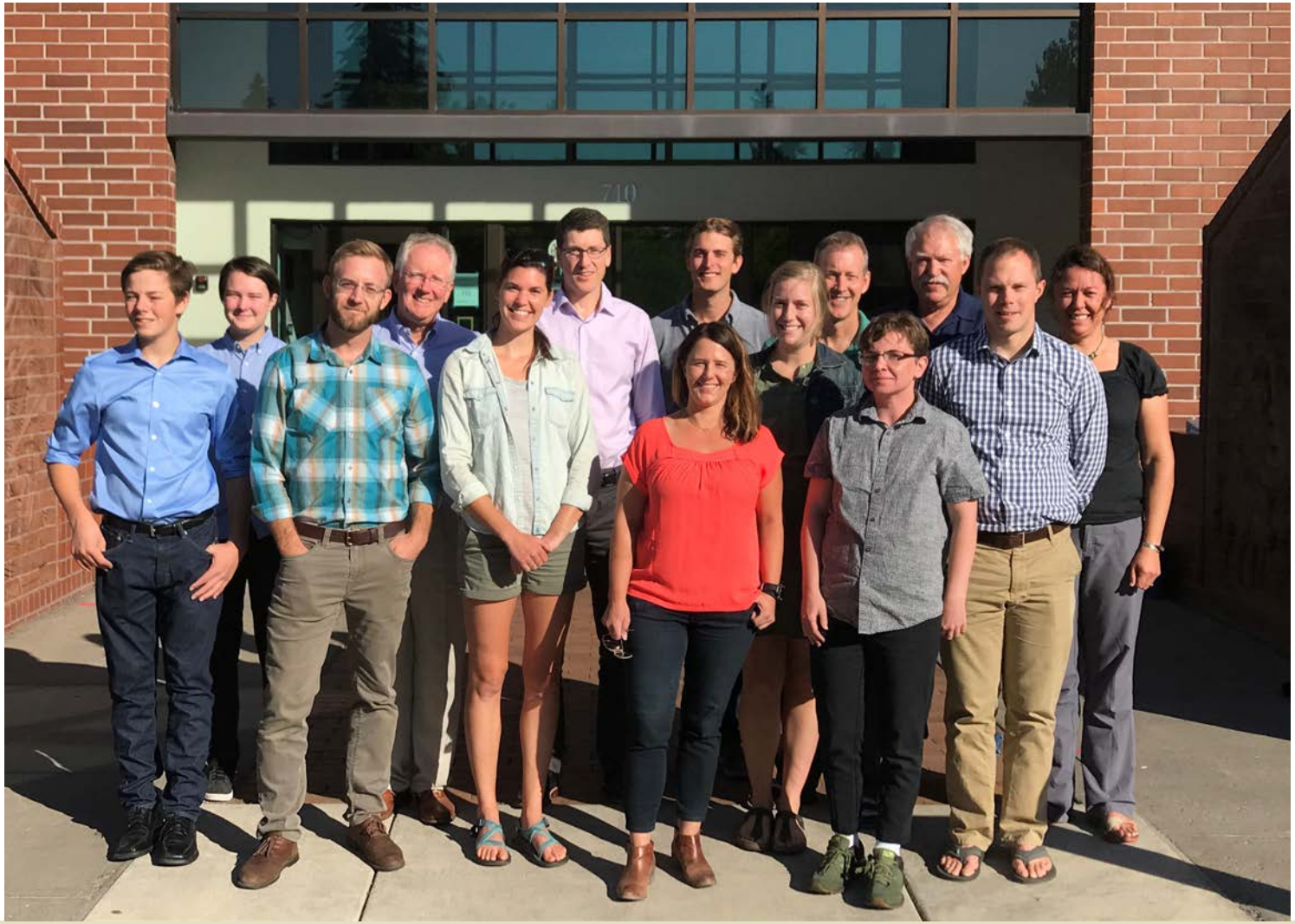
- Reduce fossil fuel use community wide by
  - 40% by 2030
  - 70% by 2050

City Council Resolution No. 3099

- Established Climate Action Steering Committee (CASC) to create Community Climate Action Plan (C-CAP)

Community Climate Action Plan

CLIMATE ACTION STEERING COMMITTEE



Community Climate Action Plan

OVERVIEW OF TIMELINE

- October – December 2018: **Brainstorming actions** with community engagement
- January 2019: **Community Survey**: Feedback on Ideas
- February – May 2019: **Evaluating actions** through triple-bottom-line lens

May 2019

Community Survey: Feedback on final actions

June – August 2019

Implementation Planning: Engage the relevant stakeholders

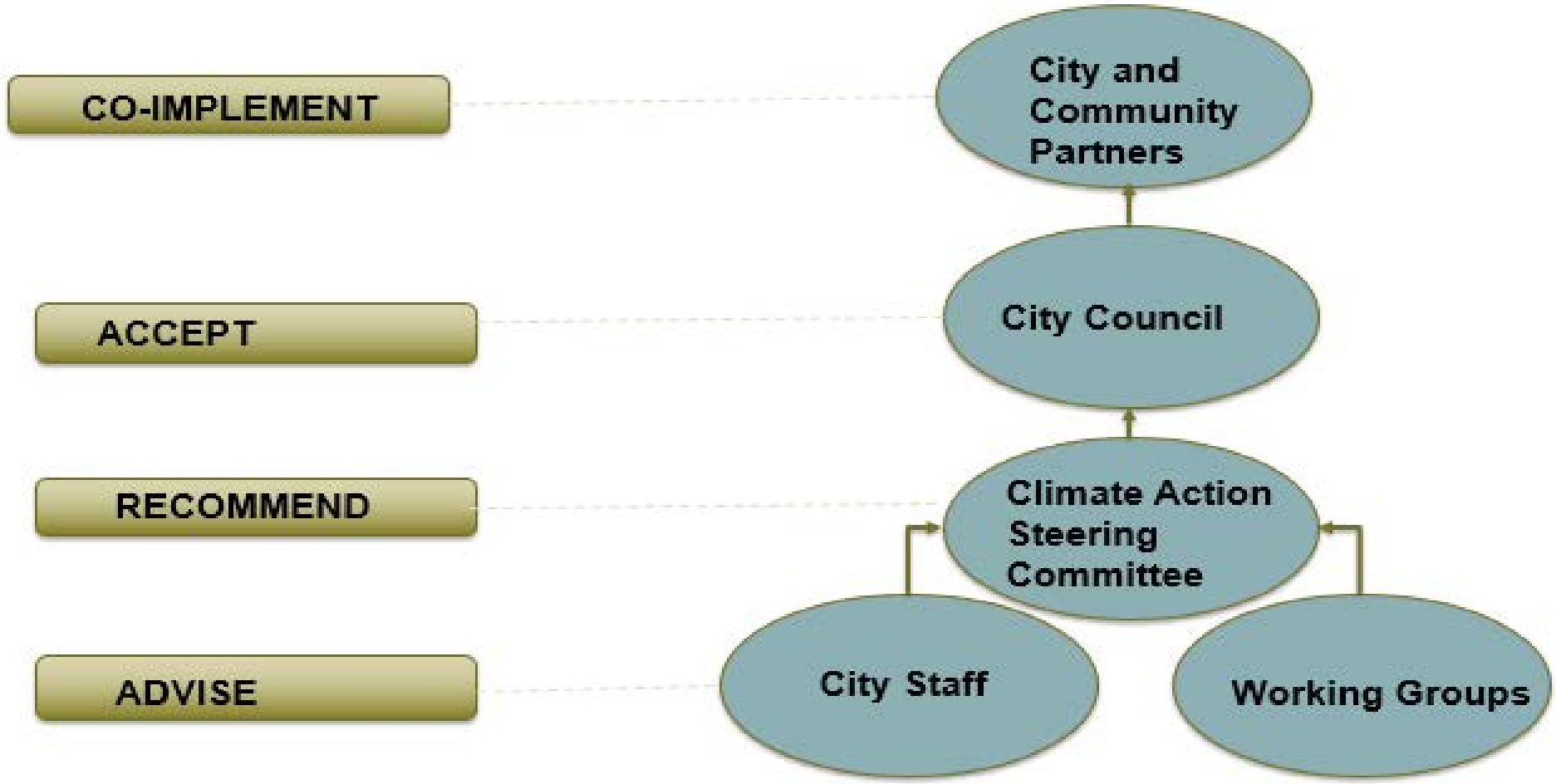
September 2019

Draft plan to Council

Sector Working Groups

- Led by Climate Action Steering Committee members
- Direct input on barriers, objectives, and equity considerations
- *Brainstorm and create* list of potential climate actions

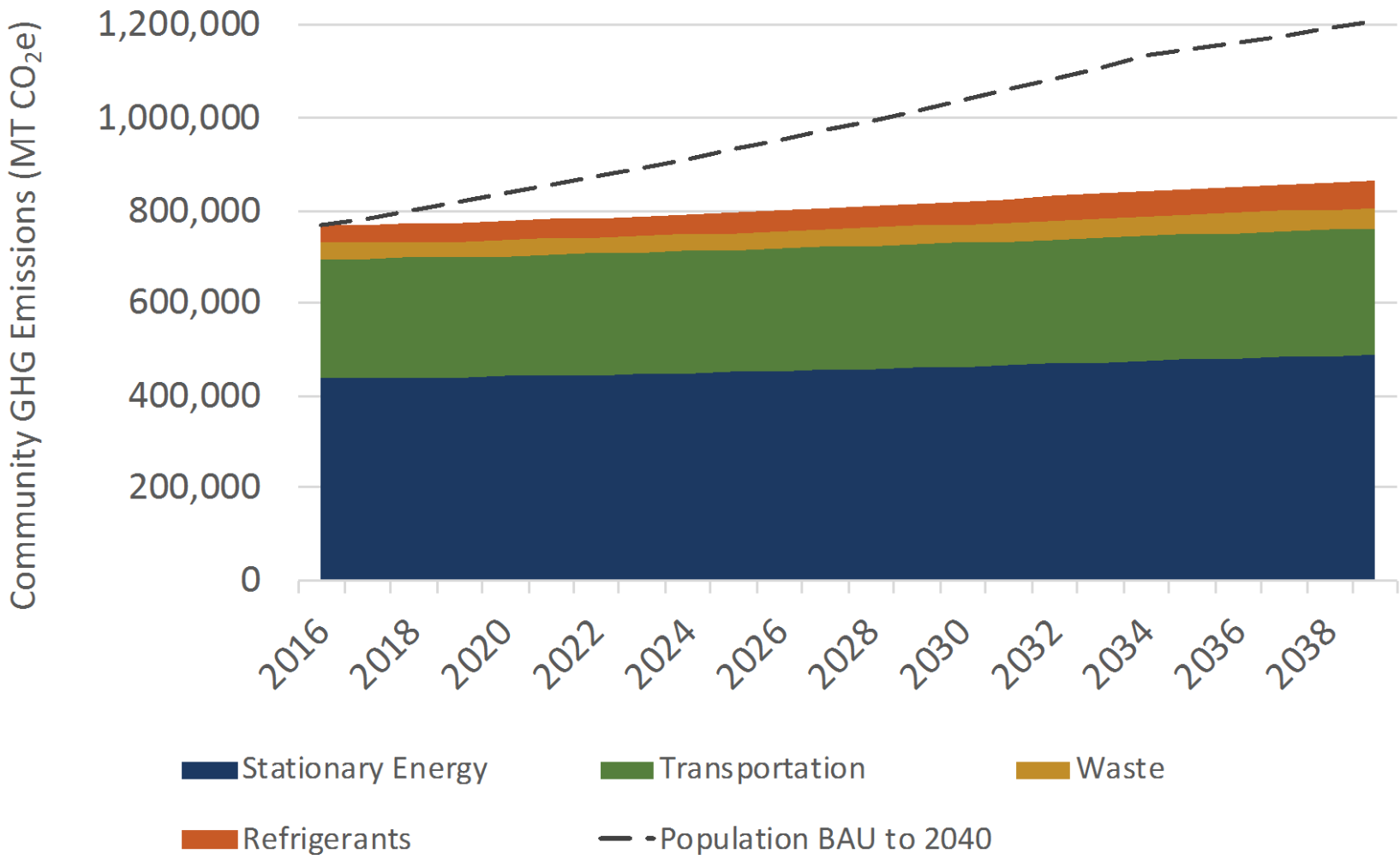
Working Groups advise the Climate Action Steering Committee

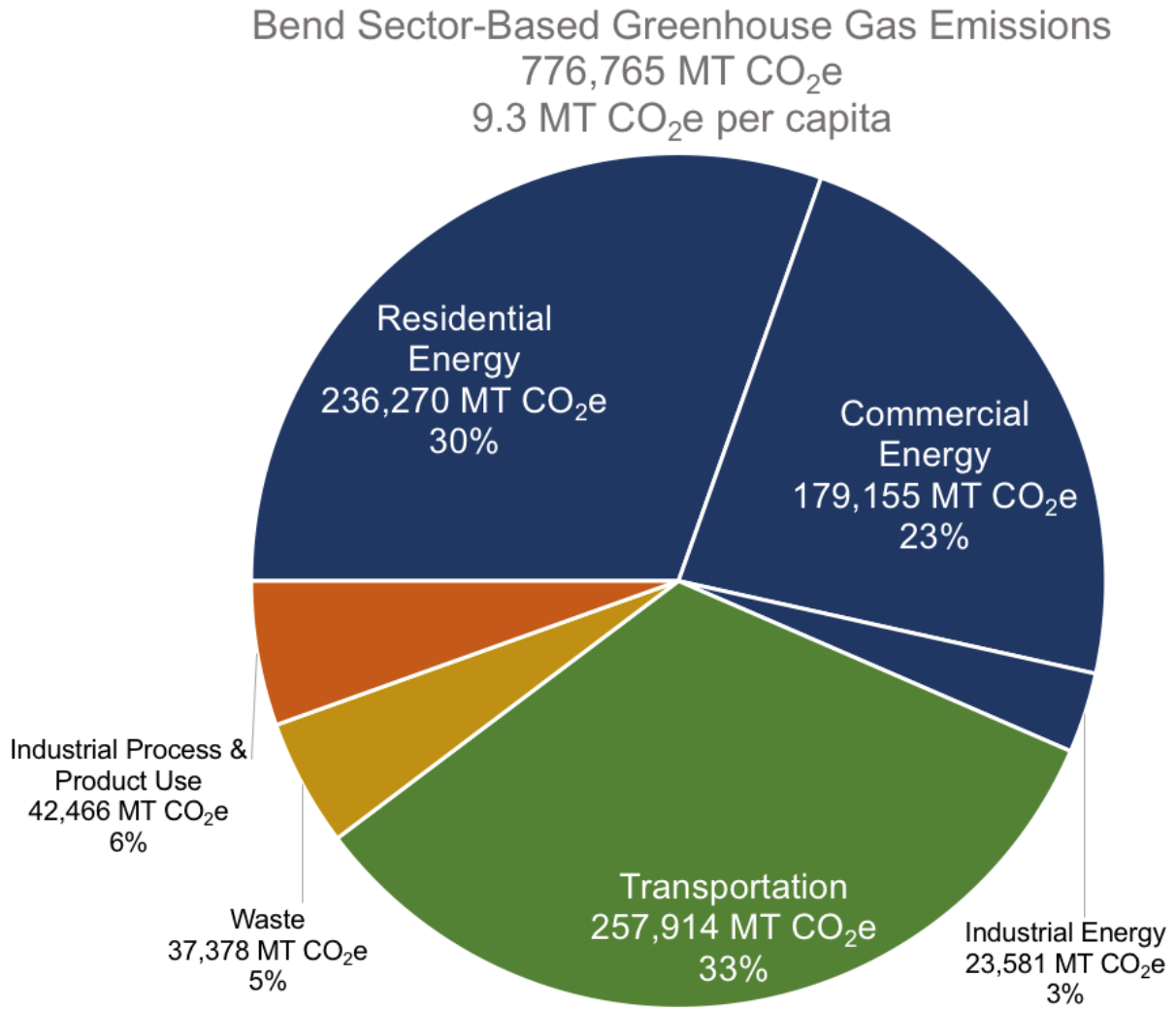

CO-IMPLEMENT
ACCEPT
RECOMMEND
ADVISE
City and Community Partners
City Council
Climate Action Steering Committee
City Staff
Working Groups

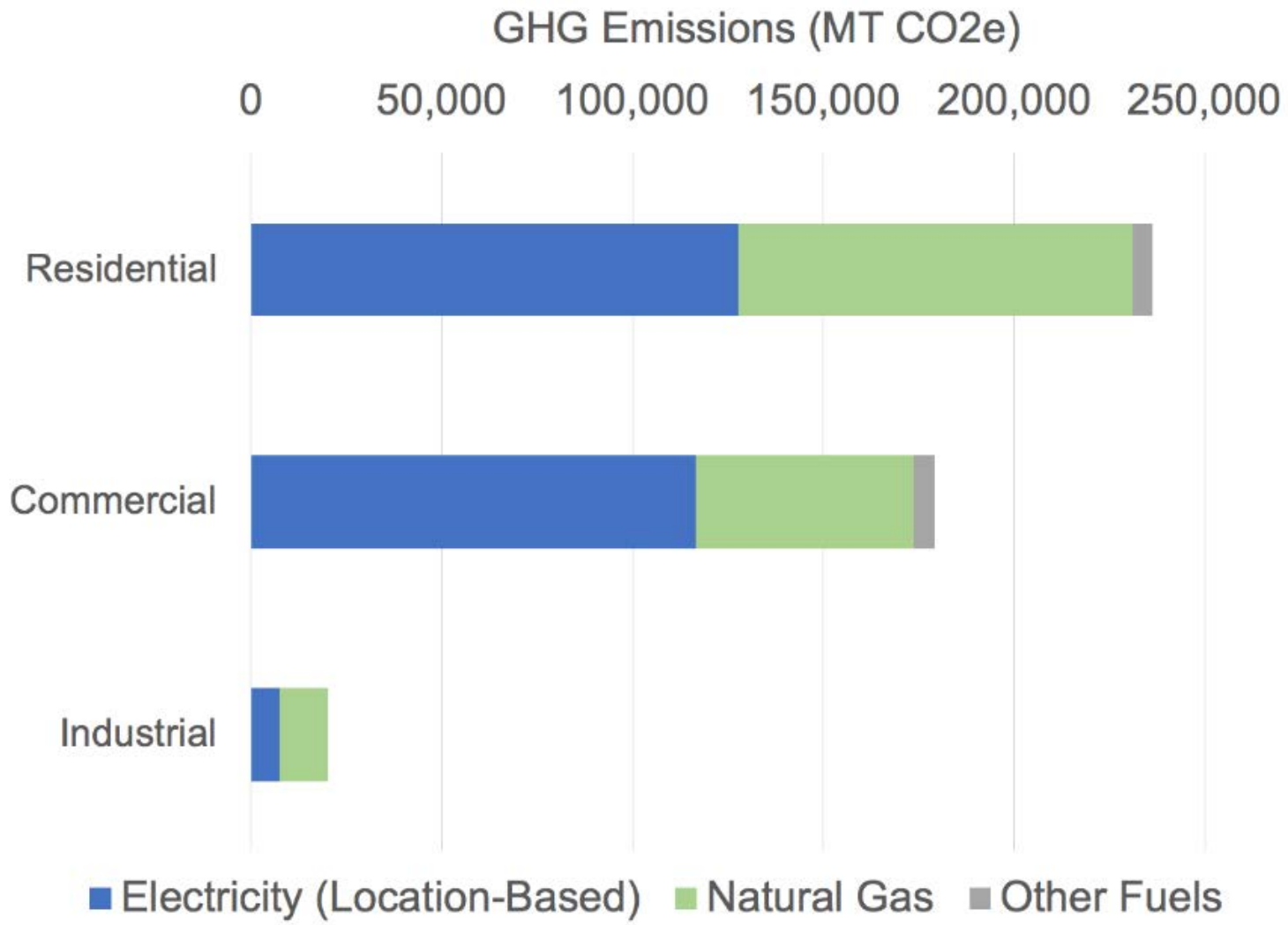
BEND COMMUNITY GHG INVENTORY & ENERGY SUPPLY

BEND COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

Business As Usual Emissions Forecast



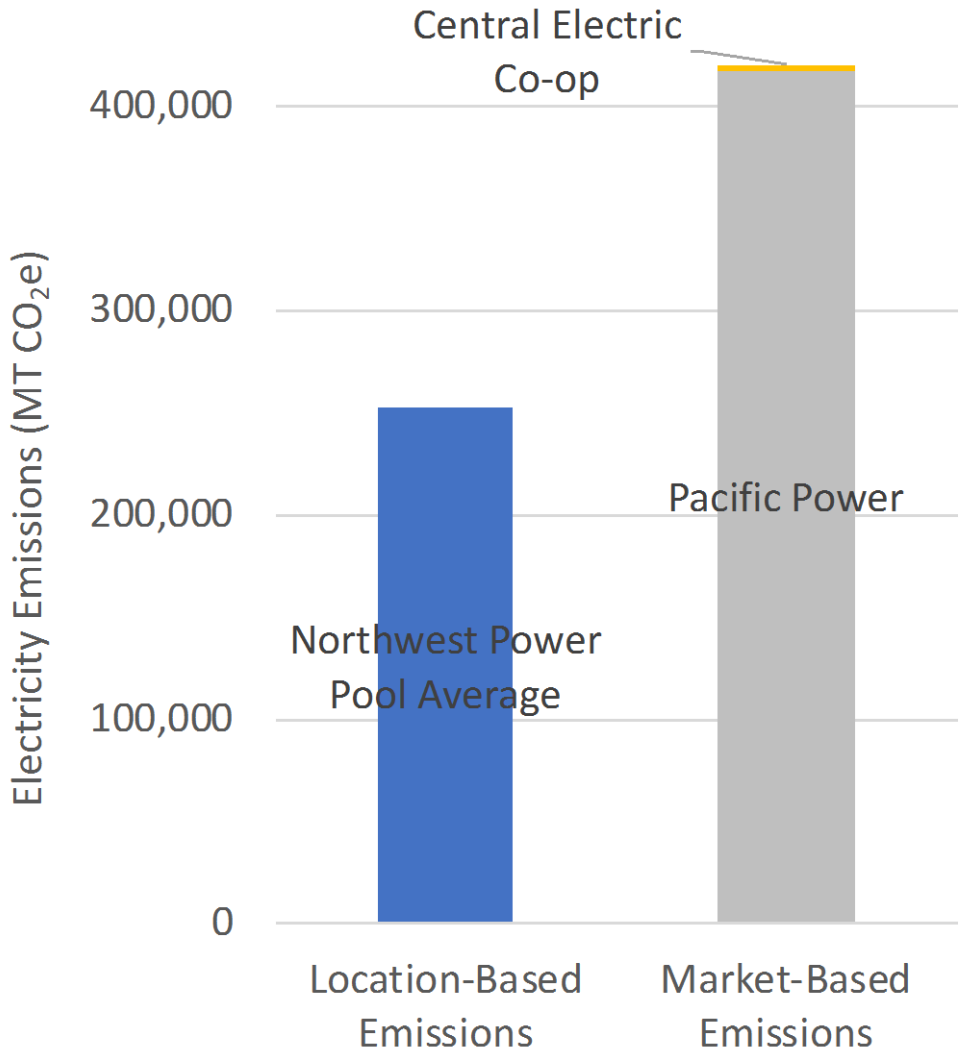

Bend Sector-Based Greenhouse Gas Emissions
776,765 MT CO_2e
9.3 MT CO_2e per capita
Residential Energy
236,270 MT CO_2e
30%
Commercial Energy
179,155 MT CO_2e
23%
Industrial Process & Product Use
42,466 MT CO_2e
6%
Waste
37,378 MT CO_2e
5%
Transportation
257,914 MT CO_2e
33%
Industrial Energy
23,581 MT CO_2e
3%


GHG Emissions (MT CO2e)
0
50,000
100,000
150,000
200,000
250,000
Residential
Commercial
Industrial
Electricity (Location-Based)
Natural Gas
Other Fuels

TRANSPORTATION EMISSIONS

Location Based Emissions: calculated using the regional electricity's grid GHG intensity and represent the average impacts of electricity use and efficiency effort. Required methodology by reporting protocol

Market Based Emissions: based on the GHG intensity of electricity contracts with local utilities.



Emissions Sector / Sub-Sector	FY 16 GHG Emissions (MT CO_2e)	Notes
Stationary Energy	**439,007**	
Residential Buildings		
Electricity (Location-Based)	*127,711*	*Based on carbon intensity (CI) of regional electric grid*
Electricity (Market-Based)	*199,669*	*Based on CI for local utilities and customer purchase of green energy*
Natural Gas	*103,347*	
Other Fuels	*5,212*	*Incluces propane and fuel oil use*
Commercial Buildings and Facilites		
Electricity (Location-Based)	*116,608*	*Based on carbon intensity (CI) of regional electric grid*
Electricity (Market-Based)	*204,511*	*Based on CI for local utilities and customer purchase of green energy*
Natural Gas	*57,229*	
Other Fuels	*5,318*	*Includes propane and fuel oil use*
Industrial Facilities		
Electricity (Location-Based)	*7,603*	*Based on carbon intensity (CI) of regional electric grid*
Electricity (Market-Based)	*16,115*	*Based on CI for local utilities and customer purchase of green energy*
Natural Gas	*12,784*	
Other Fuels	*NE*	
Water (energy)	*3,195*	

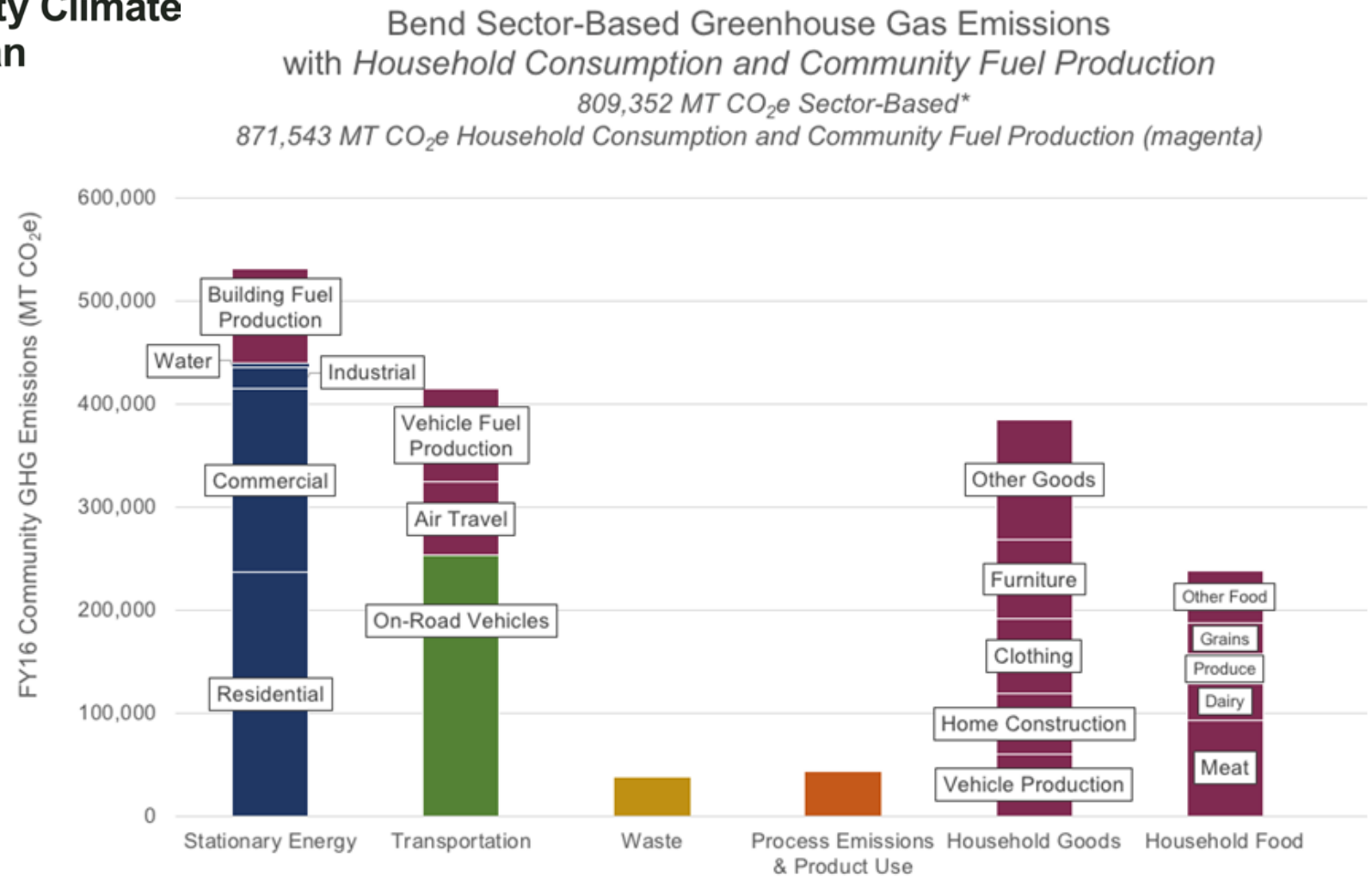


Figure 4: Detailed summary of sector-based emissions and comparison to emissions from household consumption and fuel production.

Note Figure 3 presents location-based emissions for electricity. Market-based emissions details are included in Figure 5 and Figure 7*
Note2: Other Goods include electronics, toys, personal care products, cleaning products, printed reading materials, paper, office supplies, and medical supplies.

LOCAL ENERGY SUPPLY

Powering our Communities



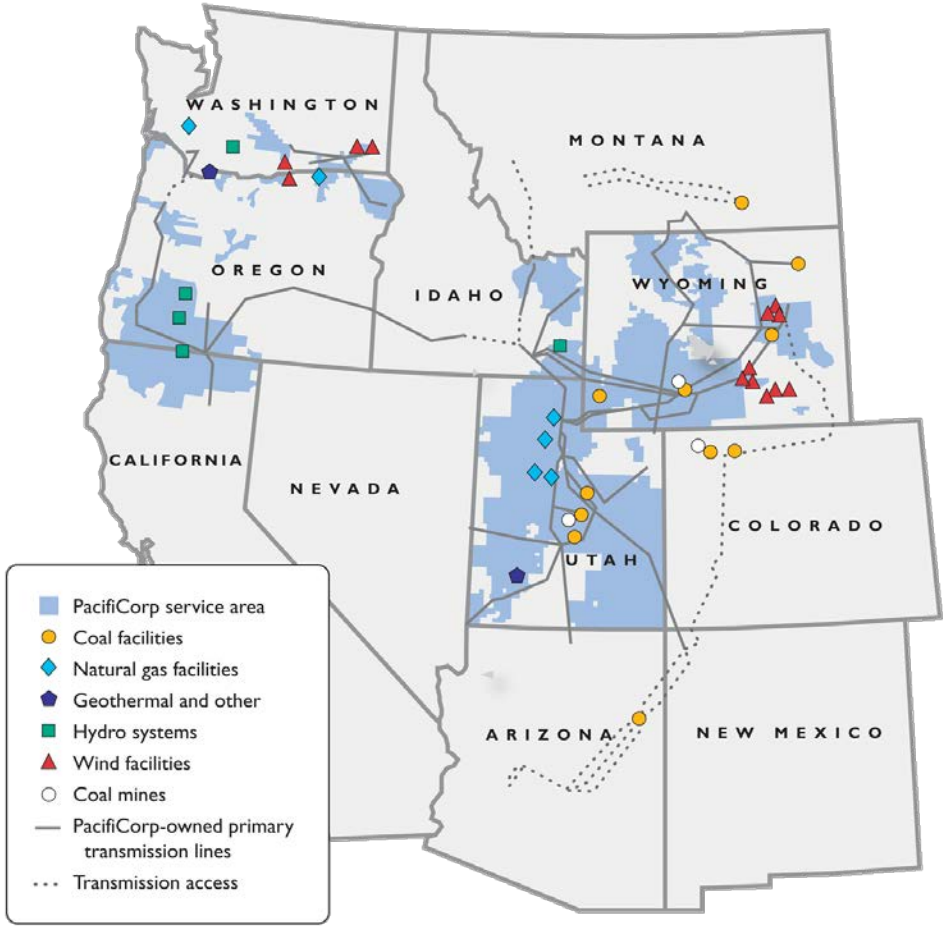



PACIFIC POWER

POWERING YOUR GREATNESS

Greening the Grid

PacifiCorp System Overview



1.8 million customers in 6 states

63,000 miles of distribution lines

16,500 miles of transmission lines

900 substations

74 generating plants—thermal, wind, hydro & solar

12,685 Megawatt (MW) peak demand

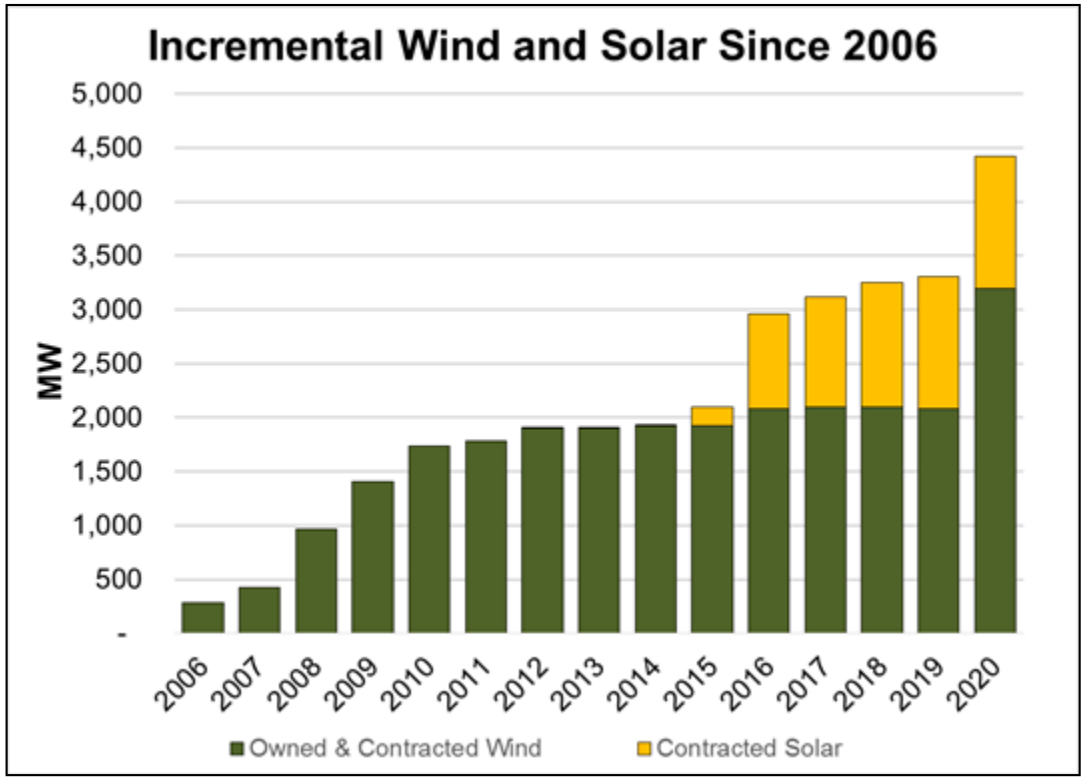
Two Balancing Authority Areas (PACW and PACE)

Regulated by six state public utility commissions

Planning for the new energy future

Energy Vision 2020 (As incorporated in 2017 IRP)

- Adding 1,000 MW of new solar in 2016-2017
- Adding 1,100 MW of new wind by 2020
- Building new 500 kV transmission
- Repowering existing 950 MW of wind fleet



Community and Corporate Partnerships

- PacifiCorp works with communities and corporations across our service territory that have clean energy goals or action plans.

- Select partnerships:
  - Portland TrailBlazers— partnership matches 100% energy needs with renewable energy credits
  - Facebook data center in Prineville, OR– partnership enabled development of 437 MW of new solar developments

BayWa r.e. Chopin Wind Project in Umatilla County, which supplies renewable energy credits for the Portland TrailBlazers


Rethink, Reimagine, Reinvent

Powering our Community
Brendle Group

- Offering is intended to complement rather than disrupt existing planning activities underway
- Could be bolt-on module to larger climate action planning that specifically addresses one of biggest components – electric energy
- Brings facilitation/stakeholder engagement and planning resources to the table
  - Workshop content and facilitation
  - Community data
  - Plan development
- Opportunity to set up short-term strategies for quick wins on electric energy that show progress toward existing goals set in resolution
- Could be a model to use for other planning efforts (transportation, waste)

Community Action Plan

Utility

WATTSMART ENERGY FACILITATOR

- Project Management
- Recruitment assistance
- Workshop facilitation
- Plan development
- Technical expertise

WATTSMART DATA TEAM

- Baseline energy profile assessment
- Historical DSM program participation
- Uptake of renewable energy
- Goals and Strategy analysis

Community

COMMUNITY ENERGY LEADER

- Energy championship
- Project management
- stakeholder recruitment
- Community Energy Plan review

COMMUNITY PLANNING TEAM

- Workshop participation
- Technical expertise
- Ambassadors to community
- Assistance in understanding local context and community priorities


Electric Transportation

Why Go Electric?

Environmental and Economic Benefits

- No tailpipe emissions
- $1 per gallon equivalent

Incentives	Amount
Federal	$7,500
Oregon State	$2,500-$5,000*
Pacific Power/Nissan	$3,000

$29,990 2018 Nissan Leaf= **$16,990**

**Income Qualifying*

Three Electric Transportation Pilots

Public Charging

Grant Funding

Outreach & Education

www.pacificpower.net/ev

Public Charging Stations

- Planning to install 7 public charging stations around Oregon
- Working with the City of Bend to determine feasibility of different locations

Electric Vehicle Charging Grants

- 1.45M in grant funding for non residential customers
- 75% of projects will consider educational, environmental, and community benefits
- 25% reserved for fast-track fleet electrification
- Quarterly application cycle through 2019


Blue Sky Renewable Energy

Making a difference in Bend

More than 8,100 customers voluntarily support renewable energy through Blue Sky.

Equivalent to 74,884 megawatt- hours in 2017 alone.

Eight community-based renewable energy projects (323 kW) installed in Bend.

Blue Sky Residential and Small Business Options (Business Rate Schedules 23 or 41)

Blue Sky Block

Sold in 100-kilowatt-hour blocks of wind (50%) and solar (50%) from the Western region. Support of this program may help develop community-based small-scale renewable energy projects.

Blue Sky Usage

Support a blend of 100% Pacific Northwest renewable resources from Oregon, Washington and Idaho.** The resource mix is likely to include wind (74%), biomass (8%), solar (17%) and geothermal (1%).

Blue Sky Habitat

Same as Blue Sky Usage and also helps restore and preserve native fish habitats in Oregon via the non-profit organization The Freshwater Trust.

Blue Sky Large Business Options

(Rate Schedules 28, 30, 41L and 48)

Blue Sky Block

Sold in 100-kilowatt-hour blocks of wind (50%) and solar (50%) from the Western region. Support of this program may help develop community-based small-scale renewable energy projects.

Blue Sky QS

Purchase of more than 101 Blue Sky blocks per month for 12 months (1,212 blocks minimum purchase)

Blue Sky Select

Custom REC pricing for customers who commit to a one year or minimum 75,000 MWh per year.

Blue Sky funded Community Projects

Since 2006 Blue Sky customers have funded

- 113 community projects in 34 communities across Oregon
- 99 solar, 8 wind, 2 geothermal, 2 wave research, 2 hydro, 2 biomass projects
- Nearly 10 MW of generation capacity from small renewable projects!

Blue Sky Funded Projects in Bend

Project Owner	Type of facility	Technology	Size (kW)
Bend Centennial Parking Plaza	Government building	Solar	33
Mountain Laurel Lodge	Low-income/affordable housing	Solar	18.36
W.E. Miller Elementary School	School	Solar	43
Bend Parks and Recreation District	Public Space	Solar	38.87
Lava Ridge Elementary School	School	Solar	38.85
Bend First United Methodist Church	House of worship	Solar	13.8
Bend Habitat ReStore	Low-income/affordable housing	Solar	56.2
Bethlehem Inn	Homeless services	Solar	50

TOGETHER, WE CAN MAKE A DIFFERENCE

Central Electric Co-op Profile

Climate Action Steering Committee Work Group October 23

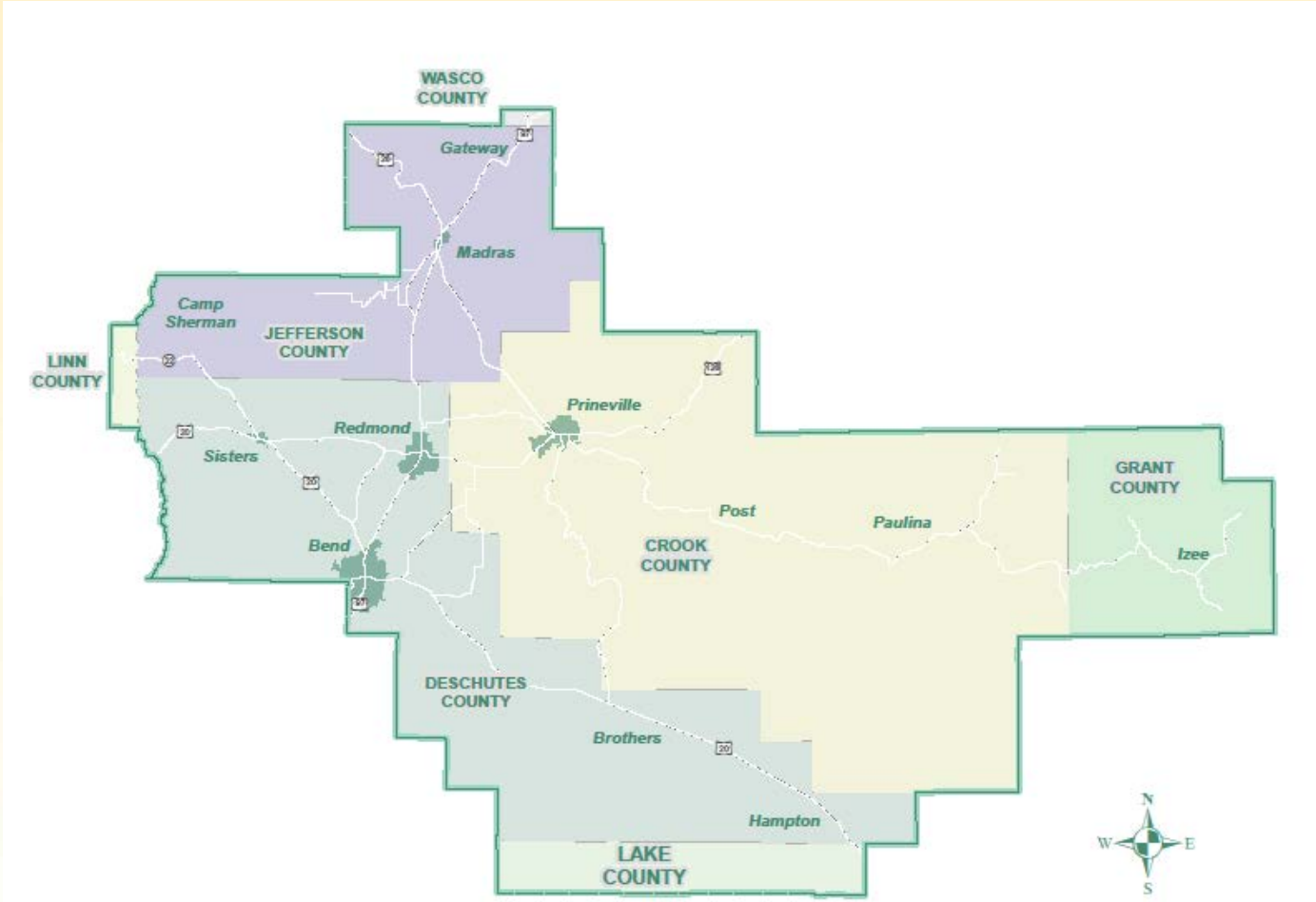
December 30, 2016

CENTRAL ELECTRIC COOPERATIVE, INC.

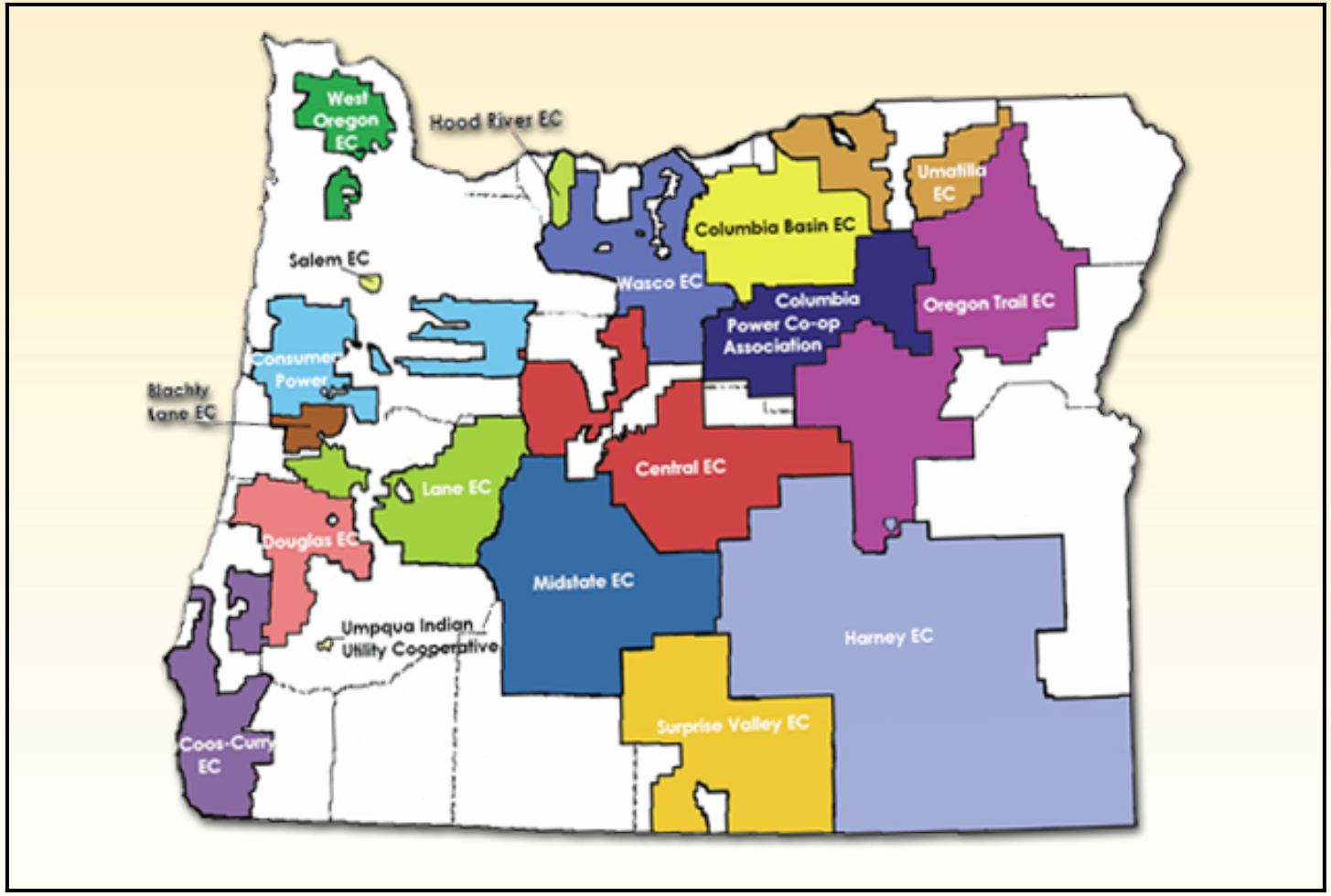
Business/Member Statistics

- **Member-owned not for profit**
  - **Capital Credits - 2017 Retired $2,105,000**
  - **Average Check Amount was $132**
- **$247 Million – Total Utility Plant**
- **$60 Million – Revenue**
- **33,853 meters/27,162 members – Oregon's Largest Electric Co-op**

5,300 Square-mile Service Area



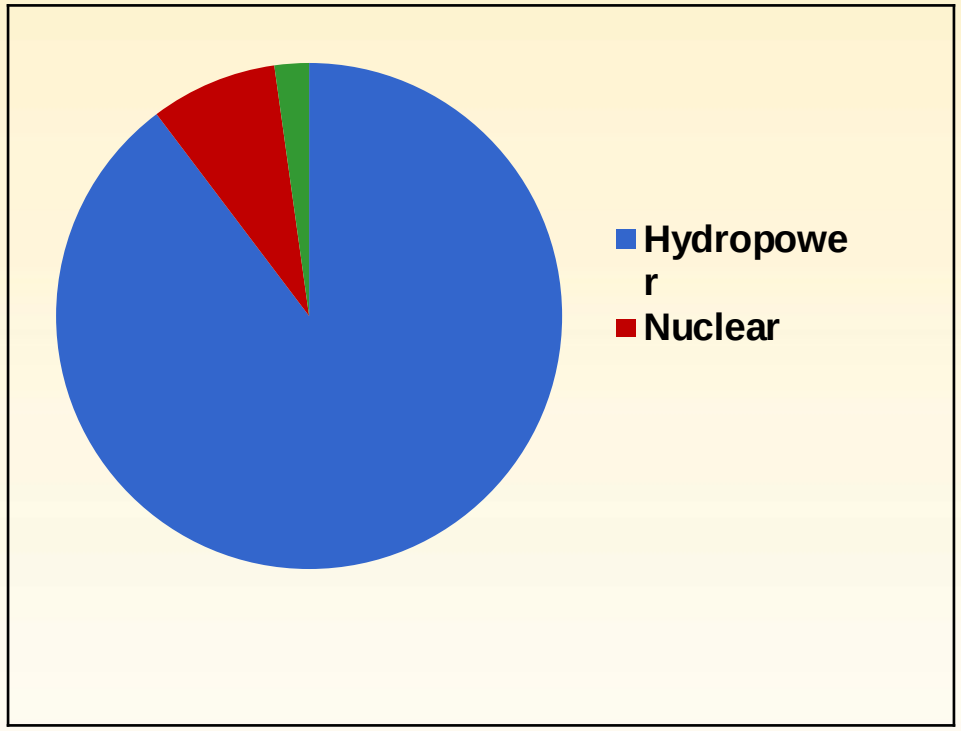
Oregon's Electric Co-ops



CEC Power Supply

–BPA Resources
- Hydropower – 86.5%
- Nuclear – 8.8%
- Small Hydro – .9%
- Wind – .8%
- Non Specified – 3%

–Coffin Butte Resources < 1%



Renewable Portfolio Standard

- Small Utilities: < 3 percent of retail electricity sales
- 2025: 5 percent renewables if retail sales are less than 1.5 percent or total Oregon retail sales
- 2025: 10 percent renewables -- between 1.5 percent and 3.0 percent
- CEC → 5 percent renewables, on target

Integrated Resource Planning

- BPA contract thru 2028
  - Preference customers
- BPA gen mix affected thru rate cases and BPA's Focus 2028 Planning
- Historically: IRP development n/a for Coop
- Evolving approach: EE Growth/Secondary Benefits
- BPA Relationship → front burner ~ 2022/23

Green Programs (or Programs w/ Green Benefits)

Required:

- Green Power: Voluntary Contributions
- Net Metering
- Some EE offerings, e.g. weatherization

Voluntary:

- 16 EE program offerings
  - Energy Challenge Direct Install
- AMI
- Prepay Program
- Community Solar
- Electric Vehicles

Decoupling Program

- Separate energy costs from delivery costs
- Gradual implementation: 2017-2025
- Next change Jan. 2019
- Monthly residential charge: + 80%
- Avg. residential kWh charge: - 14.3%
- Revenue neutral for co-op
- Clarifies behavior on energy use

Central Electric Cooperative

Mission:

The aim of Central Electric Cooperative, Inc. is to make electric energy available to its members at the lowest cost consistent with sound economy and good management.

Adopted: 1941

www.cec.coop

CITY OF BEND
CLIMATE ACTION STEERING COMMITTEE
ENERGY SUPPLY WORKING GROUP

Cascade Natural Gas Corporation
Bend Energy Supply Snapshot
Presented to the CASC
Tuesday, October 23, 2018

ABOUT CASCADE NATURAL GAS CORPORATION (CASCADE)

Cascade delivers natural gas service to approximately 70,000 customers in Oregon
Nearly half reside in Bend

30,491 residential customers

4,240 commercial

33 core industrial/large volume customers

5 transport customers.

MAKING THE BEST USE OF OUR AVAILABLE ENERGY

- ✓ Promoting resiliency and reliability
- ✓ Consideration for full fuel cycle energy and emissions
- ✓ Focus on energy strategy that lets each fuel do what it does best

ANTICIPATED GROWTH IN BEND AND SURROUNDING COMMUNITIES

Oregon 20-Year Load Growth by Weather Location	
Redmond (includes Bend)	**45.7%**
Pendleton	**34.6%**
Baker City	**28.9%**

Central Oregon expected to see an increase in growth due in part to Bend's urban growth plan which is projected to allow for the development of 2,380 acres of land

MEETING CUSTOMER DEMAND

Cascade uses population and employment projections for Bend to accurately capture growth trends for the Bend area in its load forecast and cost-effectively meet demand

*Bend's growth rate is currently **52%***

- **December 1, 2017,** Cascade purchased 10,000 dth/day of incremental upstream transport to serve central Oregon

- **October 9, 2018,** Cascade's Gas Supply Oversight Committee authorized the acquisition of supplemental NWP and GTN capacity to help address growth in central Oregon

- Per Cascade's 2018 OR Integrated Resource Plan, there are three large distribution system projects to be completed in Bend over the next several years

- Multiple smaller distribution system projects will also be completed in Bend

OREGON DSM DELIVERY

- Cascade targets DSM savings of approximately 11.86 million therms in Oregon over the 20-year planning horizon in partnership with Energy Trust

- Programs funded through a public purpose charge, which applies a percentage charge to customers' bills

- Cascade also partners with Oregon Community Action Agencies (CAAs) to provide whole-home weatherization services to qualified customers

INFLUENCING FACTORS

- Avoided cost forecasts are used to establish a cost-effective threshold for demand side resources

- If demand side resources cost as much as or less than the avoided cost, the resource is deemed cost-effective

- Externalities including CO^2 emissions prices, cost adders, carbon policy, and supply costs impact avoided costs

- Code changes, cost-effectiveness exemptions, and changes in avoided cost and valuation methodologies impact DSM offerings

BIOGAS AND RENEWABLE NATURAL GAS

- Cascade continues to explore the viability of biogas and RNG
- Reliability and cost-effectiveness of the Company's natural gas supply remains a priority
- Rigorous quality standards are necessary to maintaining the safety and reliability of the gas entering the pipeline
- Preliminary discussions with developers have identified biogas/RNG resources available at $30/dth, which is not economically viable at this time
- Recovery of cost-effective utility investments in RNG infrastructure essential to integration of RNG

SCHEDULE 800: BIOMETHANE RECEIPT SERVICES

- Establishes terms and conditions for eligible producers to inject qualifying biomethane on the Company's distribution system

- Applies to biomethane from agricultural byproducts; wastewater; landfill waste; or food and beverage waste

- Biomethane Producer must secure end users that are Company's customers and agree to purchase all the estimated biomethane production

SUMMARY

- Cascade is pleased to support the efforts of the Bend CASC in making the greatest use of our natural resources
- Looking towards win-win solutions to streamline energy use while maintaining reliability
- Continued exploration of RNG/Biogas viability and ability to recover costs
- Cost recovery/cost-effectiveness will continue to be major factors influencing natural gas fuel mix

QUESTIONS?

Al Spector (206) 310 -1120; alyn.spector@cngc.com

EXISTING PROGRAMS, OPPORTUNITIES AND BEST PRACTICES

Renewable Energy Programs in Central Oregon

Residential
solar incentives

1

Cash incentive from the Energy Trust of Oregon
$0.45/W up to $3,600.

+

2

Federal Tax Credit
30% Out of pocket cost

Commercial
solar incentives

1

Cash incentive from the Energy Trust of Oregon
0 -15 kW: $0.35/W
15 – 200 kW: $0.35-$0.20/W

2

Federal Tax Credit
30% Out of pocket cost

3

Depreciation
Accelerated depreciation (MACRS)

4

Grants
Blue Sky – Pacific Power
Renewable Energy Development – Oregon Dept. of Energy

Commercial renewable incentives

1. **Biopower**
   Water resource recovery facilities, dairies, food waste, wood waste

2. **Hydropower**
   Irrigation canal piping, municipal pressure reduction valves

3. **Geothermal**
   Depends on the geothermal resource of the site

4. **Wind**
   Not recommended for most areas within Pac Power territory

Community Solar

Overcoming Obstacles

Shading, roof capacity, renters, financing, up-front cost

The Framework

Final rules still being developed by the OPUC
Program Administrator has been selected
Pac Power territory
Interim bill credit rate equal to residential retail rate
72 MW available in Pac Power territory
Minimum project size of 25kW, max 3 MW
10% of each project reserved for low income

Community Choice Aggregation

Local energy model, authorized by State statute, that allows cities, counties or groups of them to aggregate their electric load for the purpose of procuring power that is cheaper and greener than that provided by the investor-owned utility.

Not currently allowed in Oregon, but groups are organizing to start working on this.

Oregon Department of ENERGY

Senate Bill 334
Biogas and Renewable Natural Gas Inventory (2017)

City of Bend

October 24, 2018

Michael S. Graham
Energy Research Analyst

OREGON DEPARTMENT OF ENERGY

Goals of SB 334

1. Locate and estimate the statewide biogas and RNG resource potentials
2. Assess commercial and near-commercial technologies for producing, cleaning/upgrading, and utilizing biogas and RNG
3. Estimate potential air pollution and GHG reduction potentials
4. Assess potential markets for RNG
5. Assess economics of biogas and RNG supply chains
6. Pinpointed barriers, draft and submit recommendations on behalf of the ODOE-appointed advisory committee

OREGON DEPARTMENT OF ENERGY

Biogas Fuel Production Pathways

Anaerobic Digestion

Food Waste

Landfills

Animal Manures

Municipal Wastewater

Thermal Gasification

Forest Harvest Residuals

Agricultural Harvest Residuals

Other Near-Commercial Technologies

- Power to Gas
- PyroCatalytic Hydrogenation
- Hydrothermal Liquefaction

OREGON DEPARTMENT OF ENERGY

State and Deschutes County RNG Potentials

Fuel Production Pathway	State of Oregon Potential *Cubic Feet of Methane*	Deschutes County Potential *Cubic Feet of Methane*
Wastewater Treatment Plants	1,225,228,606	33,417,094
Food Waste	138,571,656	2,606,974
Landfills	4,351,052,420	231,842,160
Agricultural Manures	4,639,626,825	22,205,100
Anaerobic Digestion Subtotal	**10,354,479,507**	**290,071,328**
Forestry Residuals	16,998,108,771	115,433,822
Agricultural Residuals	22,686,775,137	22,205,100
Thermal Gasification Subtotals	**39,684,883,908**	**137,638,922**
TOTAL	**50,039,363,416**	**427,710,250**

Potential RNG Markets

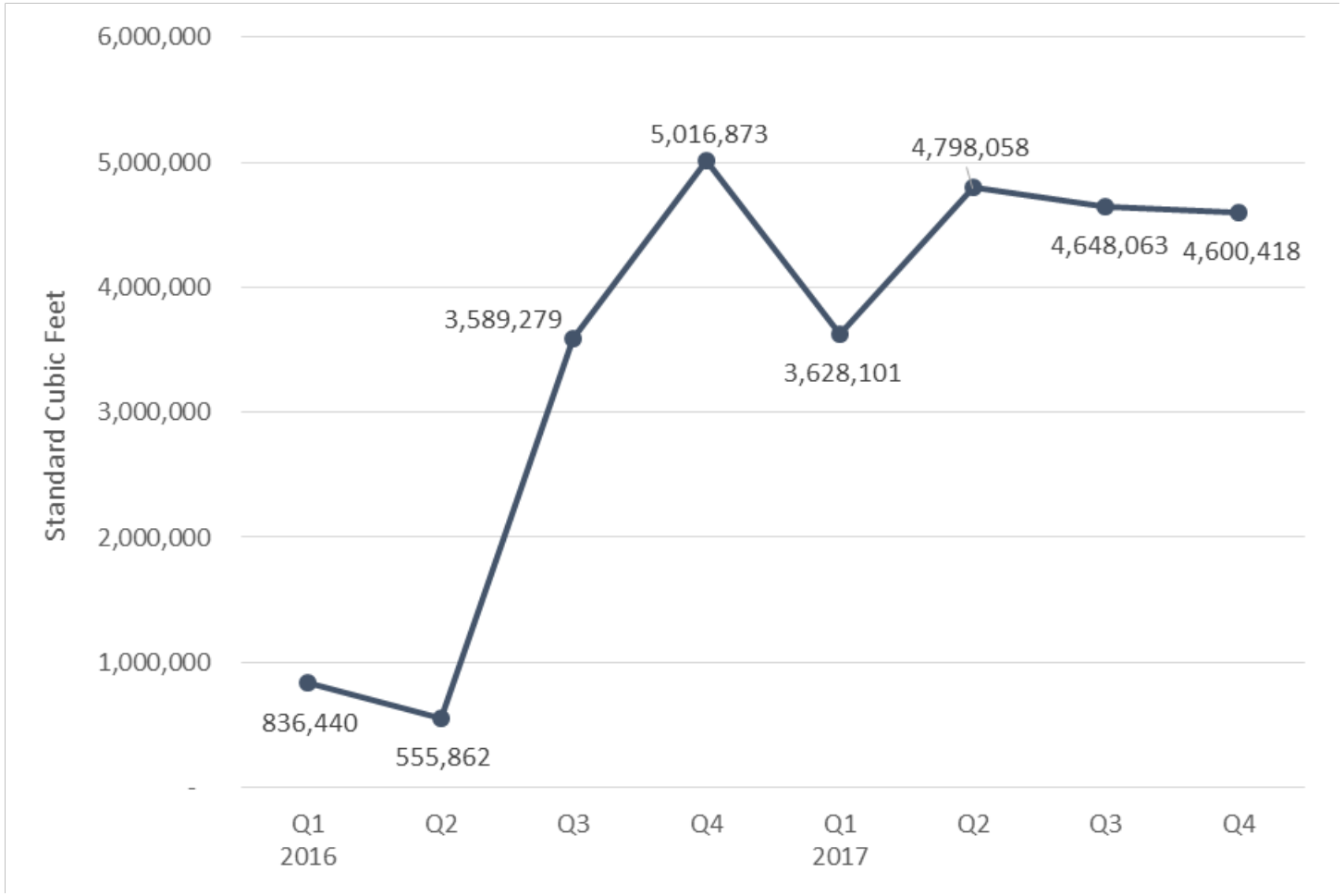
Oregon Clean Fuels Market *(8/8/18)*
- Current Price of $91.53/ MT CO2e

California Low Carbon Fuels Standard *(8/8/18)*
- Current Price of $179/ MT CO2e

Federal U.S. EPA Renewable Fuel Standard RIN
- Current Price varies by type (D3,D5,D7)

International British Columbia Carbon Tax *(2018)*
- Current Price of $35/ MT CO2e

Oregon Consumption of RNG as a Transportation Fuel (2016-2017)



Source: Oregon DEQ Clean Fuels Program

Air Pollution and GHG Reductions

RNG as an Alternative Stationary Fuel

- About 2 Million metric tonnes of fossil fuel-related emissions would be prevented if Oregon's RNG potential were realized and utilized to displace fossil natural gas.
- Combustion emissions would remain the same since renewable and fossil natural gas are molecularly identical.

RNG as an Alternative Transportation Fuel

Using only Oregon's RNG potential from Anaerobic Digestion pathway sources:

- **Reductions of 20%** or more for GHG's, CO2, and fine particulate matter (PM2.5 and PM10)
- **Reductions of 30%** or more for Organic Carbon

Highlights of the Identified Barriers

1. Natural gas companies are currently not allowed to buy and sell RNG to and for their customers.
2. Local gas distribution companies are not currently allowed to recover pipeline interconnection costs through their rates.
3. A lack of natural gas transportation fueling infrastructure.
4. Current gas quality standards for injection of RNG into the natural gas pipeline
5. A lack of financial incentives to help drive the nascent industry forward.

1. Allow the natural gas companies to buy and sell RNG to and for their customers
2. Allow local gas distribution companies to recover pipeline interconnection costs through their rates
3. Study how best to expand natural gas transportation fueling infrastructure.
4. Explore development of voluntary gas quality standards for injection of RNG into the natural gas pipeline.
5. Explore financial incentives to help drive the nascent industry forward.

Thank You!

OREGON DEPARTMENT OF ENERGY

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BEST PRACTICE THEMES – OTHER CAPS

- Decarbonizing the centralized electricity grid
  - Cities aggregating demand for renewables
  - Cities setting renewable electricity targets
  - Cities working with utilities and regulators
  - Transitioning buildings and transportation to electricity
- Investing in distributed renewables
- Grid Modernization
  - Smart grids, advanced metering infrastructure
  - Automated demand management
  - Improved storage

http://www.lunar-ai.com/drone-solar-energy/

ENERGY SUPPLY DRAFT OBJECTIVES, BARRIERS, AND EQUITY CONSIDERATIONS

DRAFT OBJECTIVES

1. Establish Bend's role in accelerating the achievement of the Oregon RPS goals
2. Identify, develop and grow a market-driven renewable energy economy in Bend
3. Reduce costs of renewable energy
4. Improve accessibility to renewable energy in Bend for all residents
5. Optimize the energy portfolio in Bend
6. Reduce energy demand and consumption and Bend
7. Invest in local infrastructure to meet energy supply goals

BARRIERS AND EQUITY CONSIDERATIONS

BARRIERS

- What are the biggest barriers that may prevent us from achieving our objectives?
- i.e. cost, concern about health impacts, alignment with state and federal initiatives
- Barriers may be financial, regulatory, social/cultural, etc.

EQUITY CONSIDERATIONS

- **Accessibility:** does everyone have equal access to the benefits?
- **Disproportionate Impacts**: will this create a larger burden on an already disadvantaged community?
- **Shared Benefits:** will this be beneficial to all members of the community or just a select few?

EXERCISE

- Split into small groups around tables – up to 6 tables total
- Each table should have a facilitator from the CASC or City Staff
- Fill out worksheet with your own ideas on sticky notes
- Provide feedback on:
  - Draft Objectives
  - Barriers
  - Equity Considerations
- Let us know if we missed any objectives
- TIME: 30-45 minutes total

BEFORE NEXT MEETING

- Brainstorm, ask your friends and networks – what actions should we take?
- Review Pre-Meeting Reading Materials to be Posted on CASC website
  - Energy Supply White Paper
  - CNCA Framework for Long Term Deep Carbon Reduction Planning Energy Supply Chapter
  - City of Aspen Greenhouse Gas Reduction Toolkit Energy and Buildings Chapter

NEXT MEETING: TUESDAY, NOVEMBER 6

Community Climate Action Plan

CITY OF BEND