ENERGY EFFICIENCY IN BUILDINGS WORKING GROUP

BEND COMMUNITY CLIMATE ACTION PLAN

OCTOBER 25, 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:

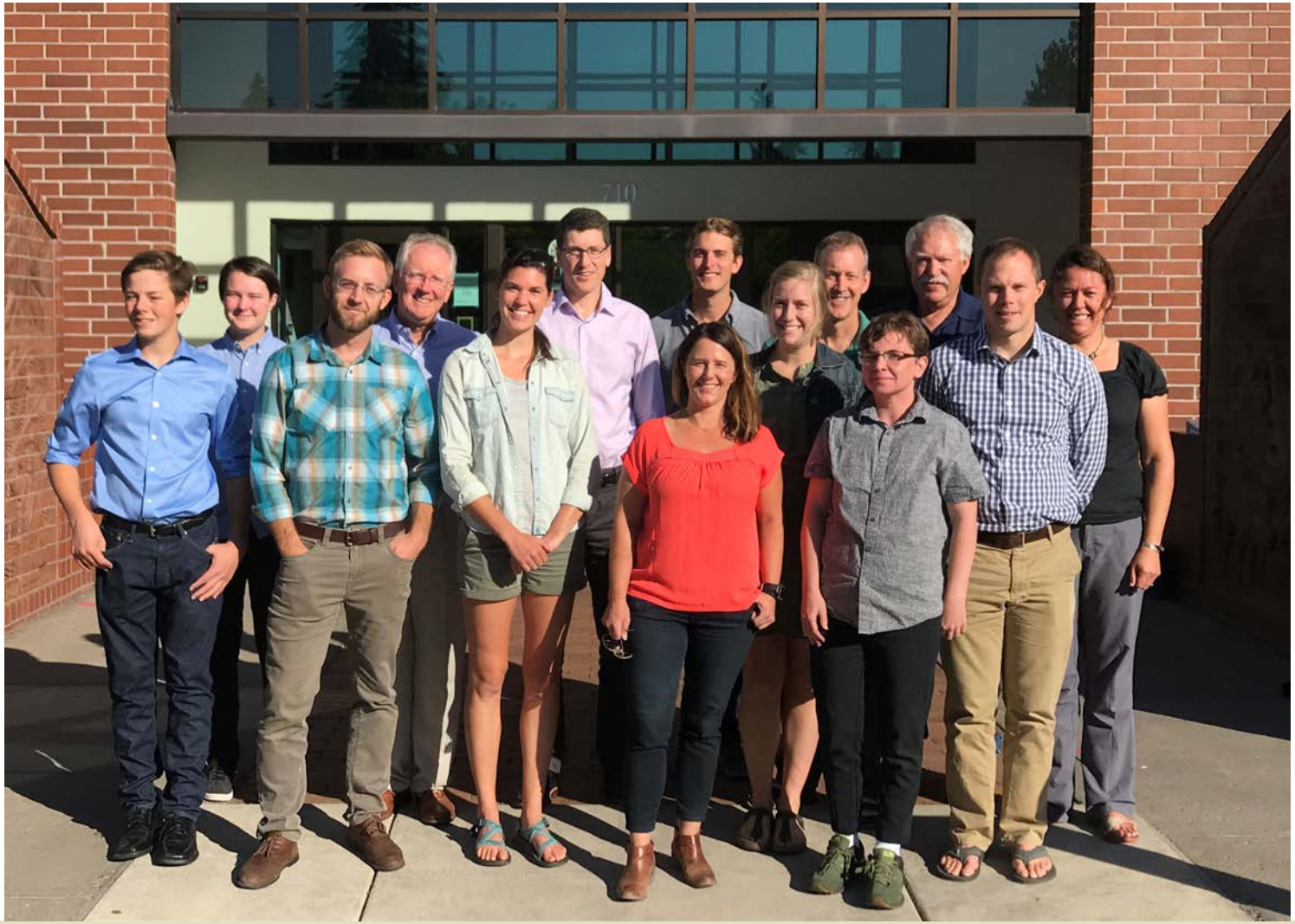
- Reduce fossil fuel use community wide by
  - 40% by 2030
  - 70% by 2050

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

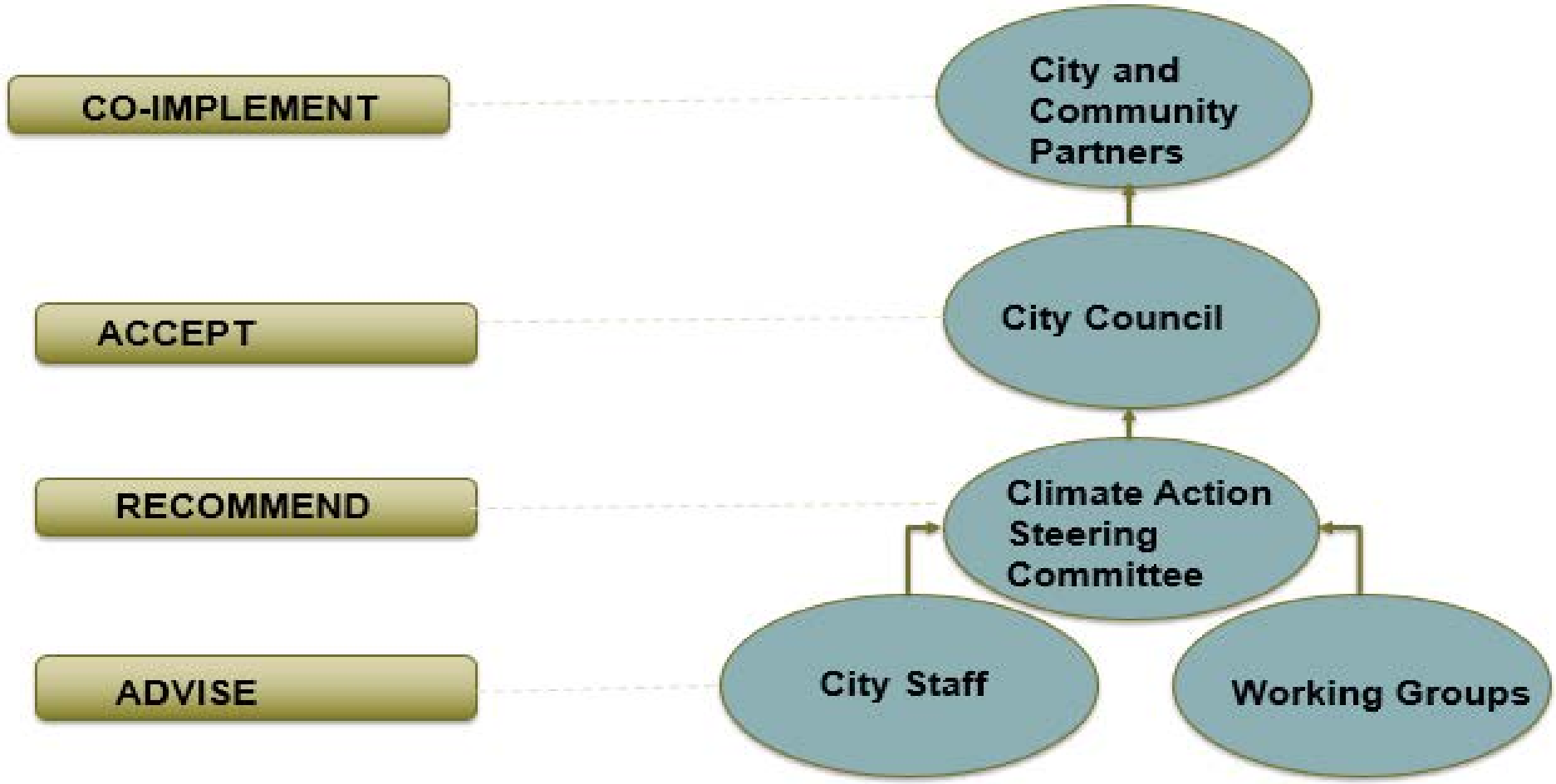
Evaluating actions through triple-bottom-line lens


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

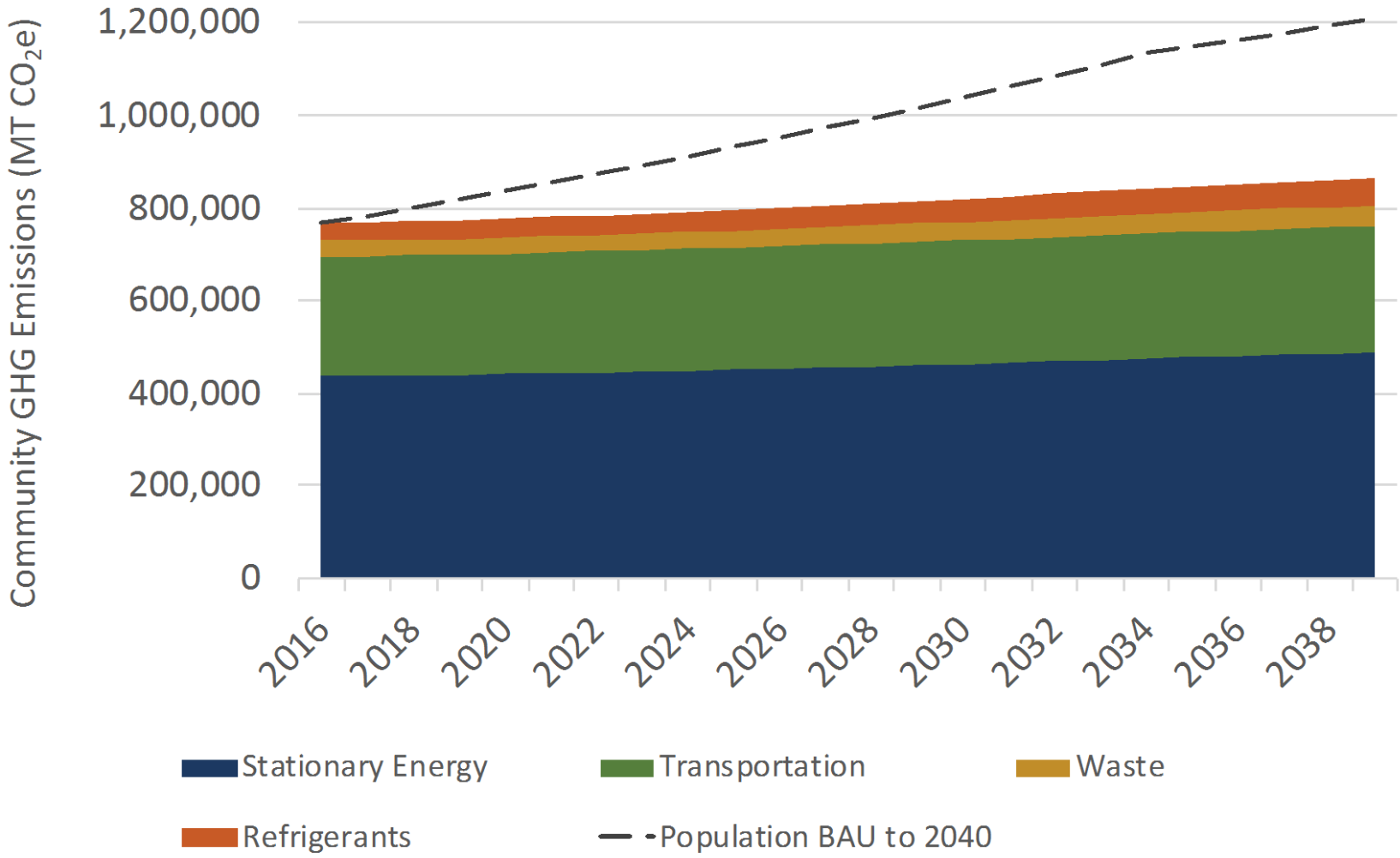

CO-IMPLEMENT
ACCEPT
RECOMMEND
ADVISE
City and Community Partners
City Council
Climate Action Steering Committee
City Staff
Working Groups

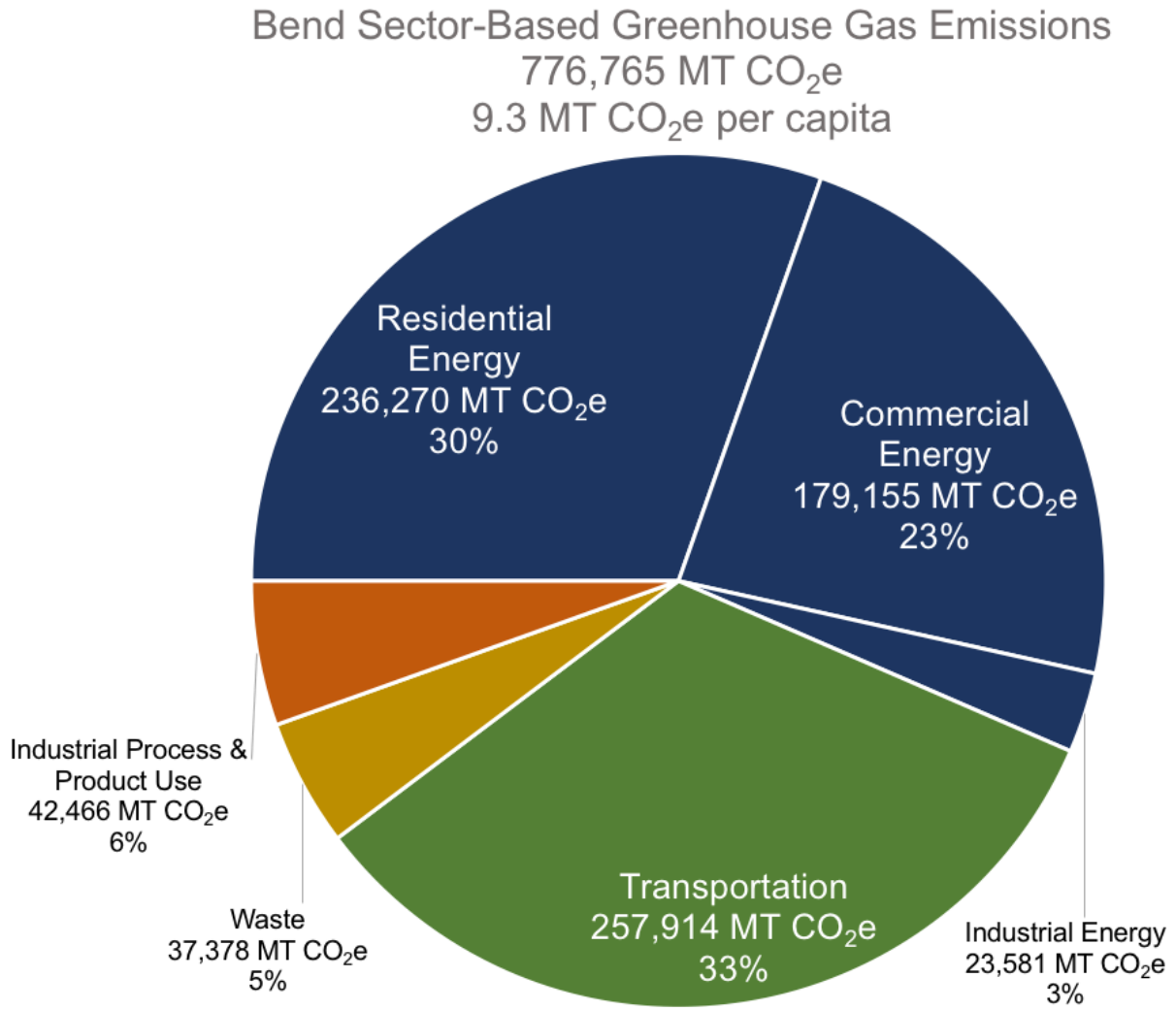
BEND COMMUNITY GHG INVENTORY & ENERGY EFFICIENCY IN BUILDINGS

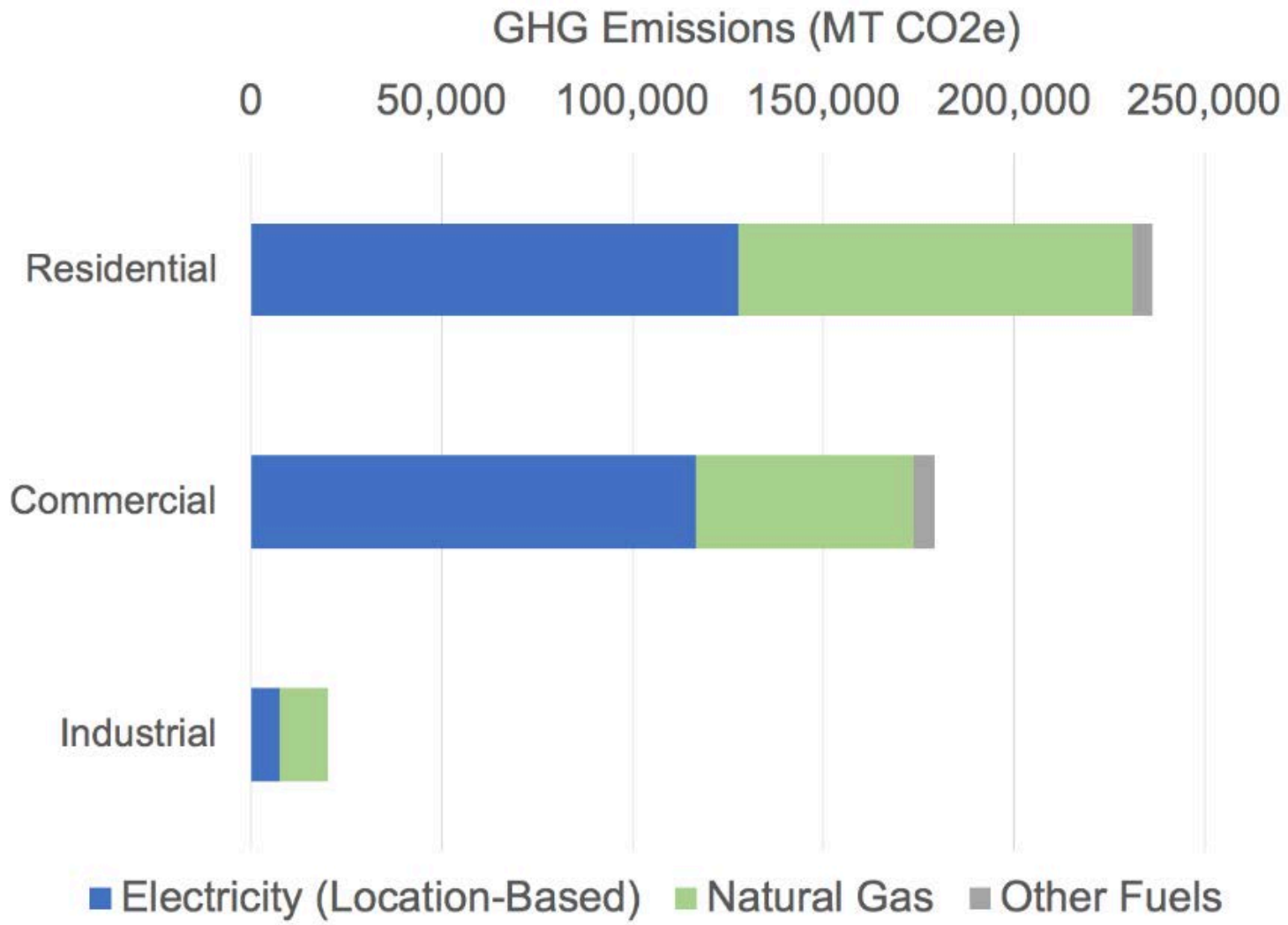
CITY OF BEND

BEND COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

Business As Usual Emissions Forecast

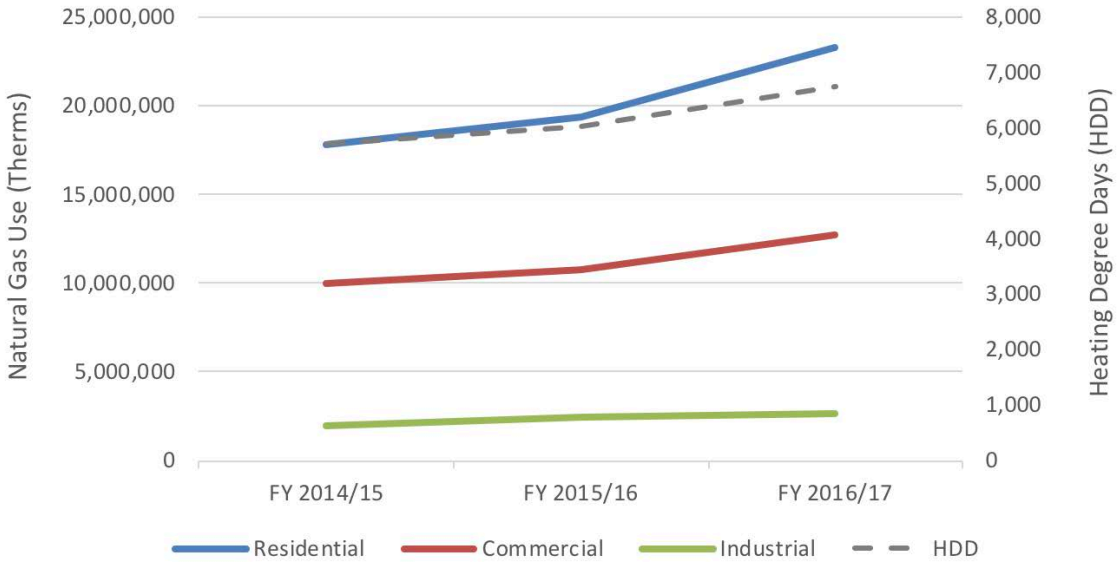



Bend Sector-Based Greenhouse Gas Emissions
776,765 MT CO_2e
9.3 MT CO_2e per capita
Residential Energy
236,270 MT CO_2e
30%
Commercial Energy
179,155 MT CO_2e
23%
Industrial Process & Product Use
42,466 MT CO_2e
6%
Waste
37,378 MT CO_2e
5%
Transportation
257,914 MT CO_2e
33%
Industrial Energy
23,581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

Bend electricity use (in MWh), by sector. Percent (%) change, FY15-FY17.

Bend natural gas use (in therms), by sector. Percent (%) change, FY15-FY17



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*	

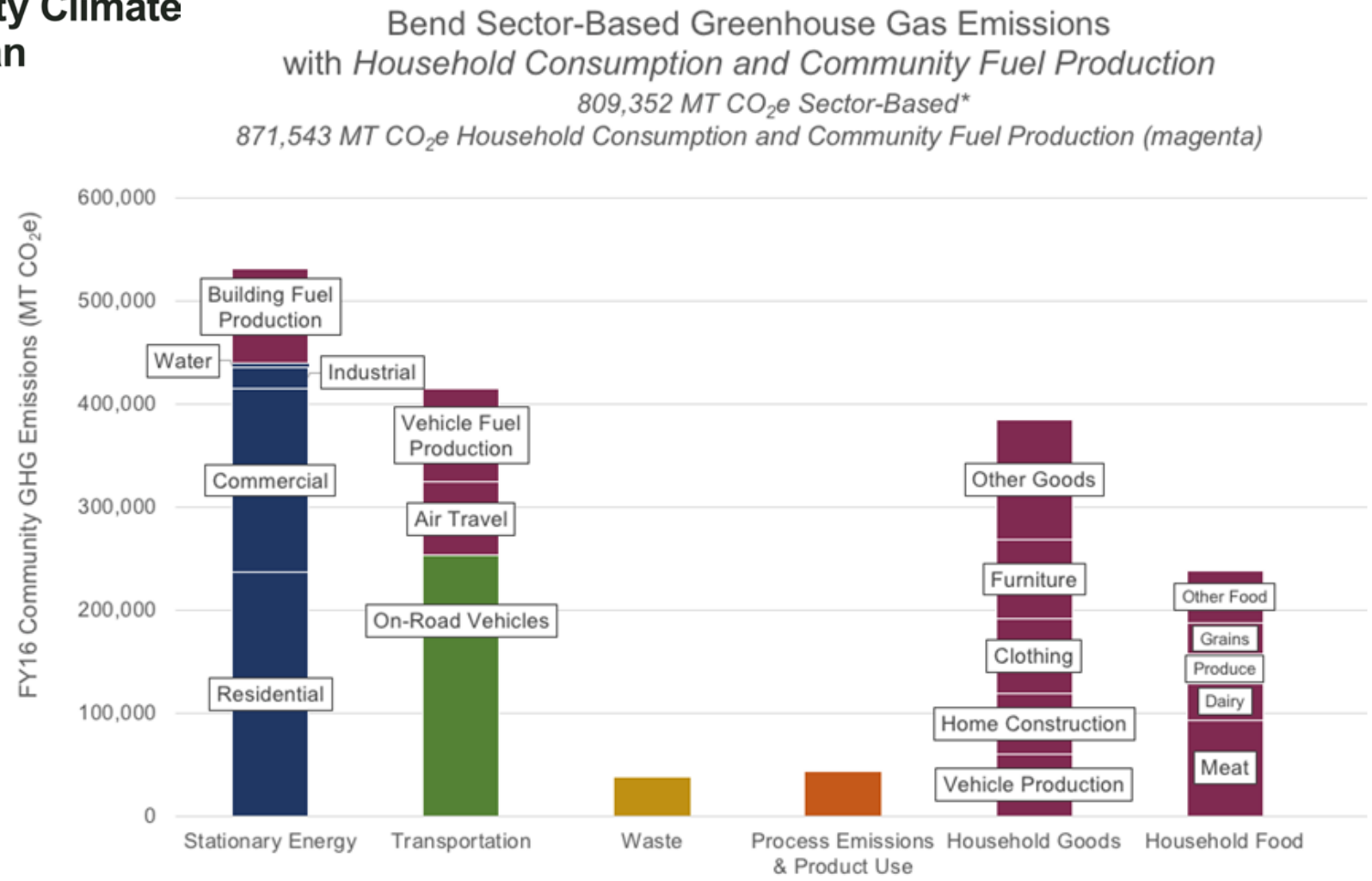


Figure 4: Detailed summary of sector-based emissions and comparison to emissions from household consumption and fuel production.

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.

CITY BUILDING CODE AND POLICY FRAMEWORK

State of Oregon Building Codes

- 2014 Oregon Structural Specialty Code (Commercial)
- 2017 Oregon Residential Specialty Code 2014
- 2014 Oregon Energy Efficiency Specialty Code

4 Areas of Building Energy

- Envelope
- Mechanical (Heating and Cooling)
- Water Heating
- Electricity (Lighting)

2018 Oregon Reach Code

- **Part I—Commercial Energy provisions**
- **Adopted code:** *2018 International Energy Conservation Code* (IECC) with *Oregon Reach Code* modifications
- **Commentary:** For structures covered under the *Oregon Structural Specialty Code* (OSSC), the 2018 IECC represents an improvement to the 2014 OSSC/2014 OEESC. The 2018 IECC is a contemporary code that advances energy efficiency through a timely evaluation and recognition of the latest advancements in construction techniques, emerging technologies and science related to the built environment. The 2018 IECC is recognized by the U.S. Department of Energy as the most current national energy efficiency construction code.
- **Part I—Residential Energy Provisions**
- **Adopted code:** *2017 Oregon Residential Specialty Code* (ORSC), including Chapter 11, with *Oregon Reach Code* modifications
- **Commentary:** For residential structures covered under the ORSC, the 2017 ORSC exceeds national standards that are technically and economically feasible for residential structures.

Commercial Code vs. Reach Code

5 AND MARINE 4		
Less		
Equal		
Better		
Climate Zone	All other	Group R
Roofs		
Insulation entirely above roof deck	R-20ci	R-20ci
Metal Buildings	R-13 + R-13	R-19
Attic and other	R-38	R-38
Walls, above Grade		
Mass	R-11.4ci	R-13.3ci
Metal Building	R-13 + R-5.6ci	R-13 + R-5.6ci
Metal Framed	R-13 + R-7.5ci	R-13 + R-7.5ci
Wood Framed and other	R-13 + R-3.8ci or R-21	R-13 + R-3.8ci or R-21
Walls, below grade		
Below-grade wall	R-7.5ci	R-7.5ci
Floors		
Mass	R-10ci	R-12.5ci
Joist/framing	R-30	R-30
Slab-on-grade floors		
Unheated slabs	NR	R-10 for 24 in. below
Heated slabs	R-15 for 24" below	R-15 for 24" below
Opaque Doors		

5 AND MARINE 4		
Less		
Equal		
Better		
Climate Zone	All other	Group R
Roofs		
Insulation entirely above roof deck	R-30ci	R-30ci
Metal Buildings	R-19 + R-11 LS	R-19 + R-11 LS
Attic and other	R-38	R-49
Walls, above Grade		
Mass	R-11.4ci	R-13.3ci
Metal Building	R-13 + R-13ci	R-13 + R-13ci
Metal Framed	R-13 + R-7.5ci	R-13 + R-7.5ci
Wood Framed and other	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-20 + R 3.8ci
Walls, below grade		
Below-grade wall	R-7.5ci	R-7.5ci
Floors		
Mass	R-10ci	R-12.5ci
Joist/framing	R-30	R-30
Slab-on-grade floors		
Unheated slabs	R-10 for 24" below	R-10 for 24" below
Heated slabs	R-15 for 36" below **+ R-5 full slab**	R-15 for 36" below **+ R-5 full slab**
Opaque Doors		

The American Council for an Energy Efficient Economy

Year	Overall Rank	State	TOTAL Score/Max Possible	Building energy codes and compliance Score/Max Possible
2016	1	California	45/50	7/7
	1	Massachusetts	45/50	7/7
	3	Vermont	40/50	7/7
	4	Rhode Island	39.5/50	5/7
	5	Connecticut	35.5/50	5.5/7
	5	New York	35.5/50	7/7
	7	**Oregon**	**35/50**	**6.5/7**
2015	1	Massachusetts	44/50	6/7
	2	California	43.5/50	7/7
	3	Vermont	39.5/50	6.5/7
	4	**Oregon**	**36.5/50**	**6.5/7**
	4	Rhode Island	36.5/50	5/7
	6	Connecticut	35.5/50	5/7
2014	1	Massachusetts	42/50	5.5/7
	2	California	40.5/50	7/7
	3	**Oregon**	**37.5/50**	**5.5/7**
	3	Rhode Island	37.5/50	6/7
	3	Vermont	37.5/50	6/7
2013	1	Massachusetts	42/50	5.5/7
	2	California	41/50	7/7
	3	New York	38/50	5.5/7
	4	**Oregon**	**37/50**	**5.5/7**
	5	Connecticut	36/50	5.5/7
	6	Rhode Island	35.5/50	6/7

EXISTING PROGRAMS

Energy Trust New Buildings

Cash Incentives and Resources

October 25, 2018

Energy Trust of Oregon

About Energy Trust

Who we are

Energy Trust is an independent nonprofit dedicated to helping 1.5 million utility customers invest in energy efficiency and clean, renewable power.

We provide:

- Information
- Technical services
- Engineering studies
- Cash incentives
- Contractor connections

What we do

548 average megawatts saved

119 aMW generated

45M annual therms saved

Enough energy to power

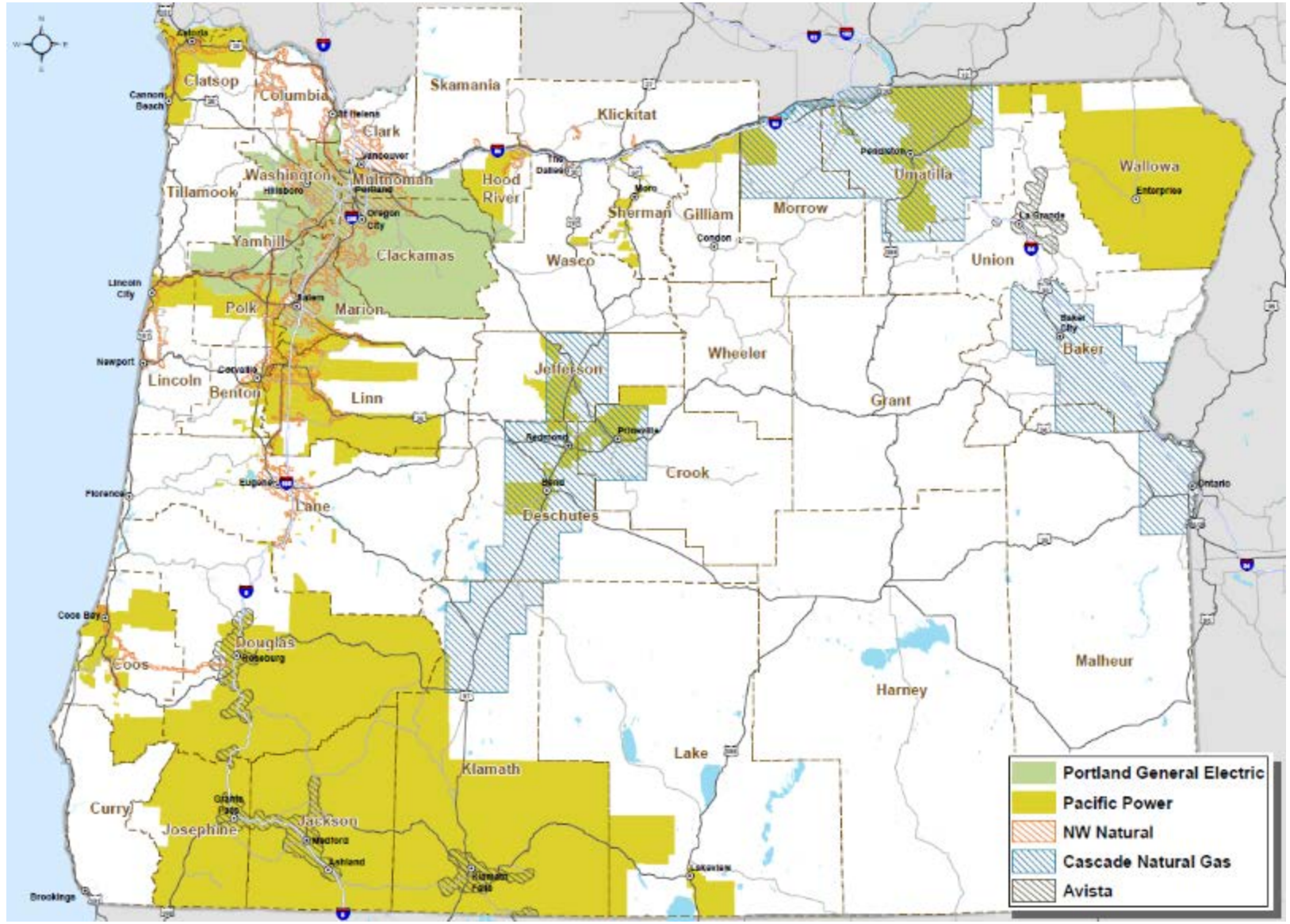
513,000 homes and heat

89,000 homes for a year

17.4M tons of carbon dioxide avoided

Who we work with

The territories we serve



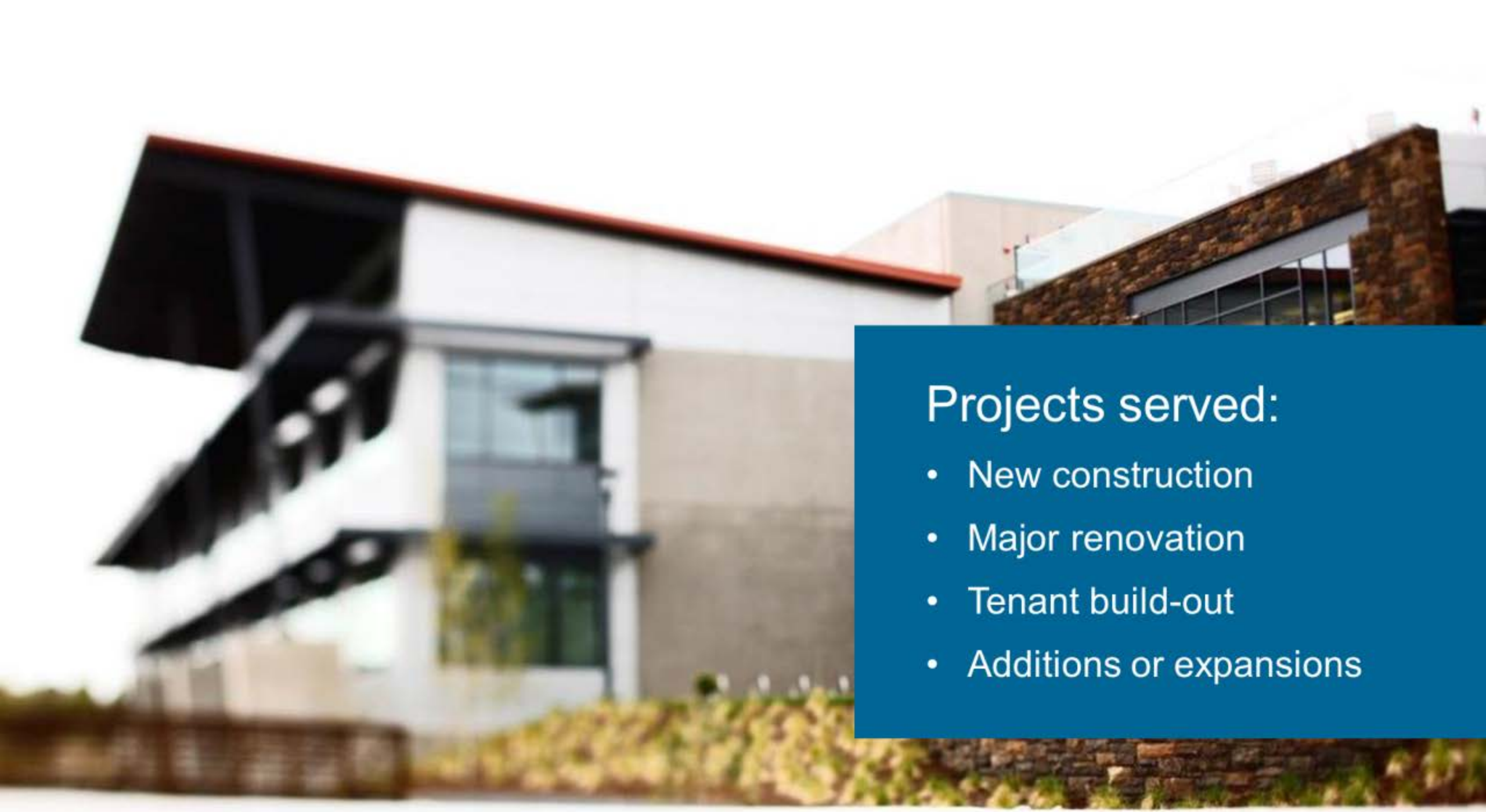
How to get involved

Start the conversation

Apply for incentives

Request payment

About Incentives for New Construction & Major Renovations



Projects served:

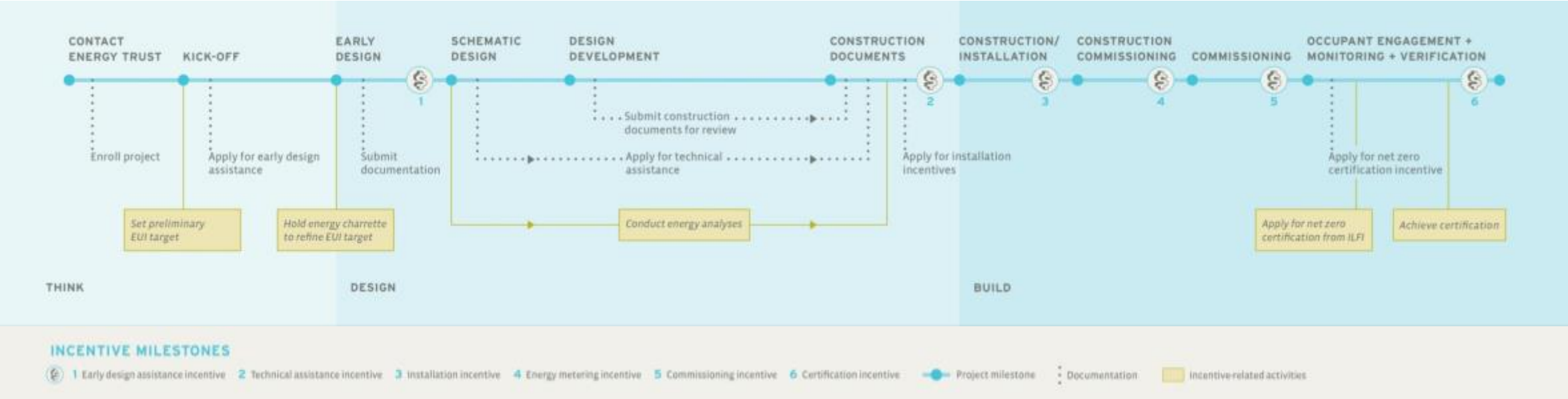
- New construction
- Major renovation
- Tenant build-out
- Additions or expansions

Assistance for all stages of your project

Packaged offers to get you on the right track

Market Solutions

- Tailored solutions to fit your business
- Good-better-best packages to help with decision making
- Easy step-by-step workbooks
- Upfront incentive estimates



Path to Net Zero

- Increased incentives for early design, technical assistance, installation and post-occupancy
- Technical resources and assistance from start to finish
- Incentives for net-zero certification

IronHorse Lodge

Low-income housing for seniors in Prineville

Path to Net Zero project featuring:

- High-performance envelope and building techniques
- Efficient variable refrigerant flow heating and cooling systems
- Long lived and highly-efficient LED lighting
- Low flow water fixtures

Energy Trust incentives: $125,200
Estimated annual savings:
200,000 kWh & 3,000 therms
Estimated utility cost savings: $10,820/year

"Energy Trust of Oregon held our hand from the get go. They made the whole process, doable, easy, and understandable in terms of what our goal was and how they were going to help us achieve that."

-Rob Roy, Co-Founder, Pacific Crest Affordable Housing

Thank You

ML Vidas
ml.vidas@CLEAResult.com

Rob Doughtie
robert.doughtie@CLEAResult.com

EnergyTrust of Oregon

Community Climate Action Plan
Energy Efficiency Workgroup
October 25, 2018

NeighborImpact
Energy Assistance & Weatherization

NeighborImpact Mission:

NeighborImpact supports people and strengthens communities.

NeighborImpact
Energy Assistance & Weatherization

NeighborImpact Services

- Child Care Resources
- Early Head Start
- Energy Assistance
- Financial Skills Support
- Food Programs
- Head Start
- Homebuyer Assistance
- Housing Assistance
- Mortgage and Foreclosure Assistance
- Weatherization

NeighborImpact
Energy Assistance & Weatherization

Energy Assistance

Purpose: To provide low income residents assistance with their home energy expenses.

What kind of energy does it cover?

- Electricity
- Natural Gas
- Propane
- Oil
- Wood/Pellets

What is the eligibility criteria?

- Determined by household size and gross income.
- Income must be less than 60% of State Median Income
- Must reside in Crook, Deschutes or Jefferson counties

What is the benefit?

Energy Assistance provides a one-time payment on behalf of eligible households directly to the utility provider. In some cases and depending on the availability of funding, crisis assistance may be available.

When is the program available?

Energy Assistance is available beginning on October 1, depending on the availability of funding.

NeighborImpact
Energy Assistance & Weatherization

Energy Assistance Program Impact

12,058 individuals received energy assistance between October 1, 2017 and August 9th, 2018.

$2,490,803 in payments made to utilities on behalf of **4,941** qualified low-income households.

The average energy assistance benefit amount is **$425.78**.

2,220 utility disconnections were prevented.

267 households had their utility service reconnected.

900 households had not received energy assistance previously.

1,644 households have a disabled family member.

1,618 households have a senior family member.

1,094 households have children under the age of six in their family.

372 households have a family member who is a veteran.

NeighborImpact
Energy Assistance & Weatherization

Weatherization

Purpose: To provide installation of materials which will increase energy efficiency, comfort and durability of homes.

- Detailed energy audit including diagnostic testing (combustion appliance testing, air leakage testing) to assess which measures will save the most energy.
- Use of a computer modeling software to determine how much energy savings will be realized by the homeowner/renter.
- Installation of measures which will save the most energy.
- Addressing health and safety issues to protect installed measures.

NeighborImpact
Energy Assistance & Weatherization

Typical Weatherization Measures

Installation depends on the household's energy use and the needs of the home.

- Air sealing to reduce air leakage and drafts
- Insulation (attic, floors, walls)
- Health & safety repairs (addition of ventilation, minor electric and plumbing repairs)
- Seal and insulate ducts. Verify results with duct blaster test.
- Repair or replace heating source (furnaces, permanent electric heaters, oil & wood stoves, etc.)
- Repair or replace inefficient water heater
- Refrigerator replacement

NeighborImpact
Energy Assistance & Weatherization

Weatherization Program Impact

92 homes, with 218 household members, were weatherized between July 1, 2017 and June 30, 2018.

48 of these homes have senior household members.

32 of these homes have disabled household members.

19 of these homes have children aged six and under.

The total energy savings realized in these homes is 2,337 MMBTUs. This is equivalent to 684, 907.09 kilowatt hours or 23,370 therms of energy.

The average energy savings per home weatherized is 7,444 kilowatt hours or 254 therms.

The average Oregon home uses 16,324.06 kilowatt hours or 557 therms of energy; the total savings of the energy in these homes can provide energy to approximately 41 homes.

NeighborImpact
Energy Assistance & Weatherization

BEST PRACTICES AND OPPORTUNITIES

BEST PRACTICES – OTHER CAPS

- Encourage benchmarking and disclosure
- Set energy targets for efficiency and renewable energy
- Green building certification programs
  - LEED
  - Living Building Challenge
  - Earth Advantage
- Develop incentives and partnerships

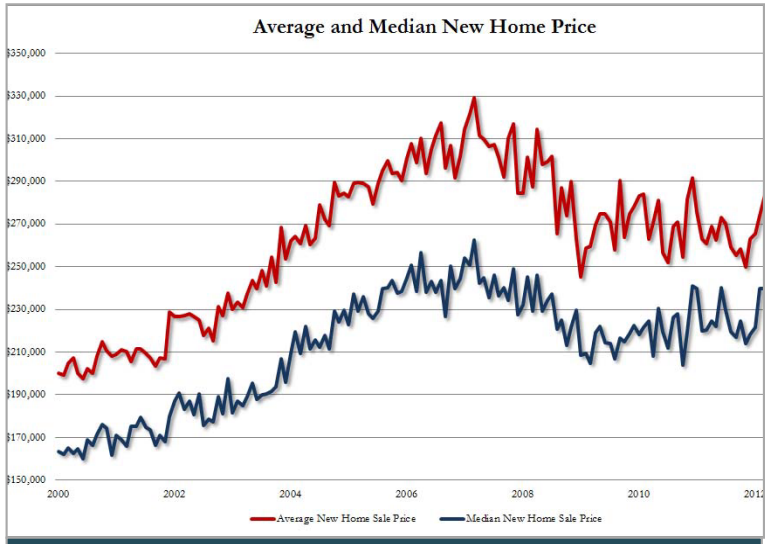
https://access.living-future.org/case-study/bertschiscience/

Best Practices from Oregon Communities

Ryan LaPoma
Education Manager + Technical Field Consultant
Earth Advantage

Earth Advantage Programs

CERTIFICATION

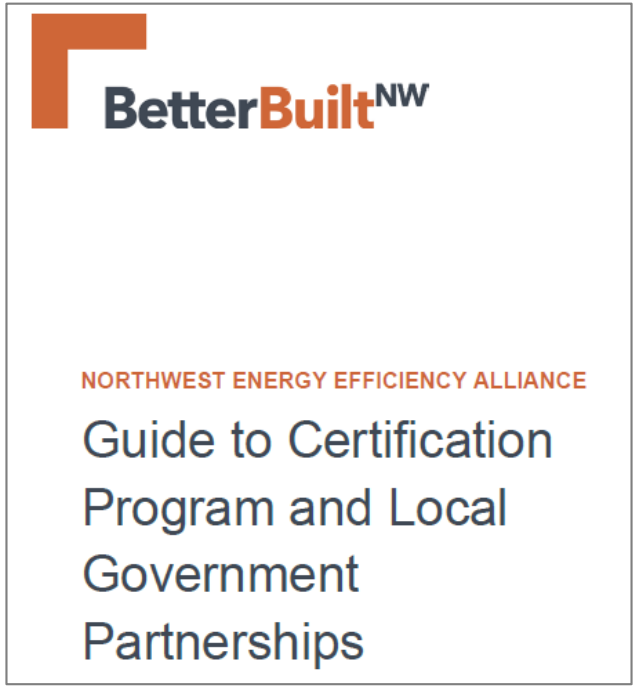


RESEARCH

EDUCATION

Policies & Incentives

- Policy Toolkits
  - Shift Zero
  - BetterBuiltNW



Policies & Incentives

- Policy Toolkits
  - Shift Zero
  - BetterBuiltNW
- Land Use/Code Allowances & Financial Incentives

- ✓ Expedited permitting
- ✓ Density bonuses
- ✓ Floor-area-ratios
- ✓ Setback allowances
- ✓ Solar roof optimization allowances
- ✓ ADU allowances
- ✓ Permits, SDCs, transportation, park, stormwater fees
- ✓ Property tax abatement
- ✓ Loans/rebates/discounts

CITY OF BEND

Policies & Incentives

- Policy Toolkits
  - Shift Zero
  - BetterBuiltNW
- Land Use/Code Allowances & Financial Incentives
  - Expedited Permit Processes

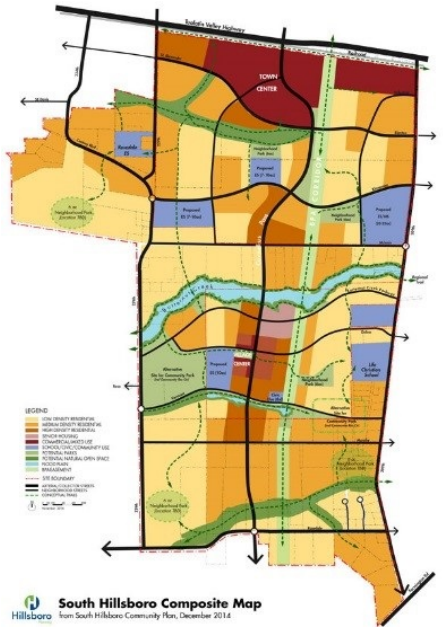
City of Seattle

Hood River County

Policies & Incentives

SOUTH HILLSBORO

- Policy Toolkits
  - Shift Zero
  - BetterBuiltNW
- Land Use/Code Allowances & Financial Incentives
  - Expedited Permit Processes
- Public/Private Partnerships



Hillsboro OREGON

SolarWorld REAL VALUE

EnergyTrust of Oregon

OREGON DEPARTMENT OF ENERGY

Portland General Electric

earthadvantage.

Policies & Incentives

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- Land Use/Code Allowances & Financial Incentives
  - Expedited Permit Processes
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Policies & Incentives

- Policy Toolkits
  - Shift Zero
  - BetterBuiltNW
- Land Use/Code Allowances & Financial Incentives
  - Expedited Permit Processes
- Public/Private Partnerships
- Technical Assistance & Training

Energy Labeling & Benchmarking

- City of Portland
  - Home Energy Score (HES) Program
  - Commercial Benchmarking

City of Portland HOME ENERGY SCORE

U.S. DEPARTMENT OF ENERGY

THIS HOME'S SCORE 4 OUT OF 10

THIS HOME'S ESTIMATED ENERGY COSTS $1,507 PER YEAR

HOME PROFILE

LOCATION:
7432 SE 68th Ave
Portland, OR 97206

YEAR BUILT:
1939

HEATED FLOOR AREA:
1,439 sq.ft.

NUMBER OF BEDROOMS:
3

ASSESSMENT

ASSESSMENT DATE:
02/28/2018

SCORE EXPIRATION DATE:
02/28/2026

ASSESSOR:
John Streeter
Home Energy Score.com LLC

PHONE:
503-330-1091

EMAIL:
John@
HomeEnergyScore.com

CCB LICENSE #:
216961

Flip over to learn how to improve this score and use less energy!

Better Buildings — Home Energy Score

Average Home

Higher energy use 1 2 3 **4** 5 6 7 8 9 10 Lower energy use

SCORE TODAY

Official Assessment | ID# 193810

The Home Energy Score is a national rating System developed by the U.S. Department of Energy. The Score reflects the average energy efficiency of a home based upon the home's structure and heating, cooling, and hot water systems. The average score is a 5. Learn more at HomeEnergyScore.gov.

HOW MUCH ENERGY IS THIS HOME LIKELY TO USE?

Electric: 6,153 kWh/yr.	$701
Natural Gas: 739 therms/yr.	$806
Other: _____ gal/yr	$0
TOTAL ENERGY COSTS PER YEAR	**$1,507**

How much renewable energy does this home generate?

____kWh/yr

THIS HOME'S CARBON FOOTPRINT:

6.5 This Home

15 tons/year WORSE — 0 tons/year BEST

What should my home's carbon footprint be? Between now and 2030, Portlanders should reduce carbon pollution per household to 3 metric tons per year to reach our climate goals.

- Actual energy use and costs may vary based on occupant behavior and other factors.
- Estimated energy costs were calculated based on current utility prices ($0.11/kwh for electricity; $1.09/therm for natural gas; $2.58/gal for heating oil; $2.21/gal for propane).
- Carbon footprint is based only on estimated home energy use. Carbon emissions are estimated based on utility and fuel-specific emissions factors provided by the OR Department of Energy.
- Relisting 2-7 years after the assessment date requires a free reprint of the Report from **www.greenbuildingregistry.com/portland** to update energy and carbon information.
- **This report meets Oregon's Home Energy Performance Score Standard and complies with Portland City Code Chapter 17.108.**

Energy Labeling & Benchmarking

- City of Portland
  - Home Energy Score (HES) Program
  - Commercial Benchmarking
- City of Eugene
  - Renter subsidized HES pilot

EWEB HOME ENERGY SCORE
Know the score. Outsmart energy waste.

EWEB

UNIVERSITY OF OREGON

Eugene

Energy Labeling & Benchmarking

- City of Portland
  - Home Energy Score (HES) Program
  - Commercial Benchmarking
- City of Eugene
  - Renter subsidized HES pilot
- Oregon Dept. of Energy
  - Statewide HES framework

OREGON DEPARTMENT OF ENERGY

Better Buildings®
U.S. DEPARTMENT OF ENERGY

Energy Labeling & Benchmarking

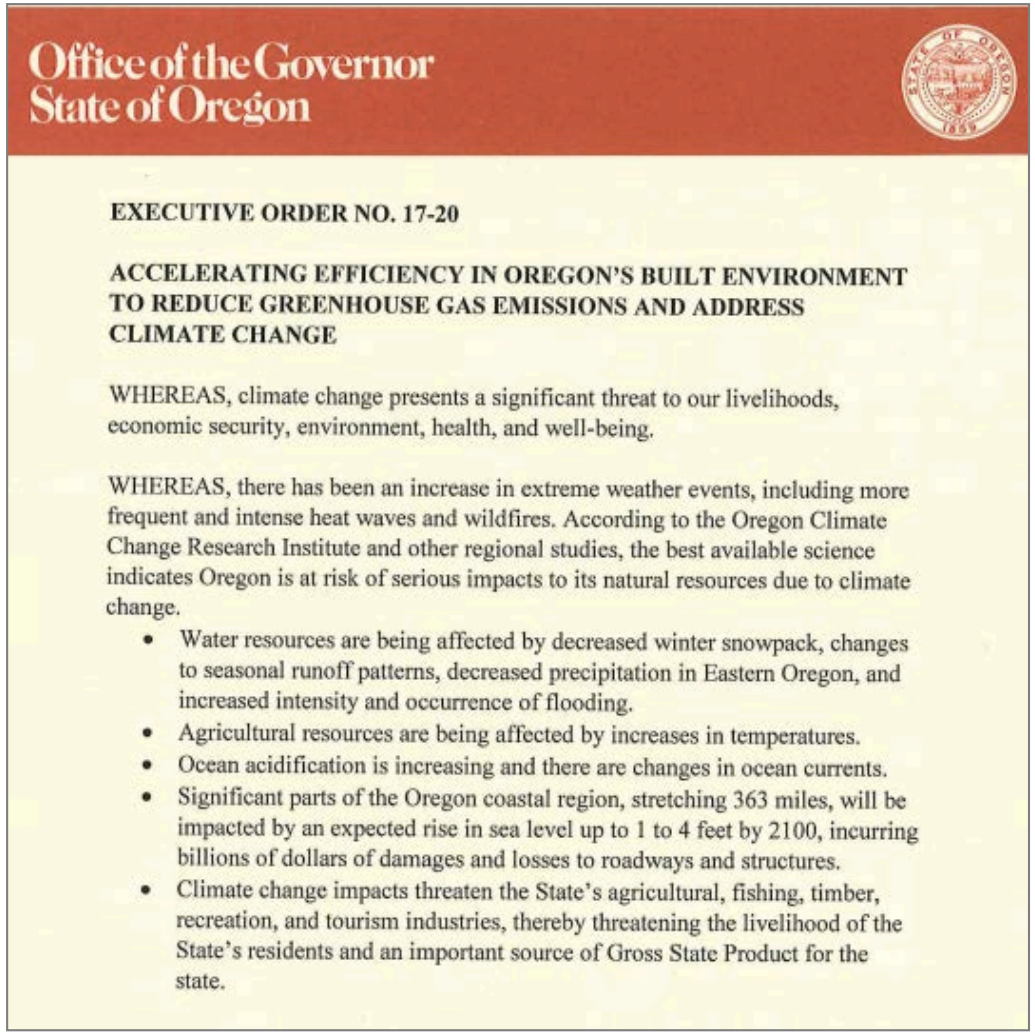
- City of Portland
  - Home Energy Score (HES) Program
  - Commercial Benchmarking
- City of Eugene
  - Renter subsidized HES pilot
- Oregon Dept. of Energy
  - Statewide HES framework
- Financing programs
  - FHA, Fannie Mae, Energy Trust of Oregon

Energy Codes

- 2017 Residential Code Update
- 2019 Commercial Code Update

Energy Codes

- 2017 Residential Code Update
- 2019 Commercial Code Update
- Governor's Executive Order



Office of the Governor
State of Oregon

EXECUTIVE ORDER NO. 17-20

ACCELERATING EFFICIENCY IN OREGON'S BUILT ENVIRONMENT TO REDUCE GREENHOUSE GAS EMISSIONS AND ADDRESS CLIMATE CHANGE

WHEREAS, climate change presents a significant threat to our livelihoods, economic security, environment, health, and well-being.

WHEREAS, there has been an increase in extreme weather events, including more frequent and intense heat waves and wildfires. According to the Oregon Climate Change Research Institute and other regional studies, the best available science indicates Oregon is at risk of serious impacts to its natural resources due to climate change.

- Water resources are being affected by decreased winter snowpack, changes to seasonal runoff patterns, decreased precipitation in Eastern Oregon, and increased intensity and occurrence of flooding.
- Agricultural resources are being affected by increases in temperatures.
- Ocean acidification is increasing and there are changes in ocean currents.
- Significant parts of the Oregon coastal region, stretching 363 miles, will be impacted by an expected rise in sea level up to 1 to 4 feet by 2100, incurring billions of dollars of damages and losses to roadways and structures.
- Climate change impacts threaten the State's agricultural, fishing, timber, recreation, and tourism industries, thereby threatening the livelihood of the State's residents and an important source of Gross State Product for the state.

Energy Codes

- 2017 Residential Code Update
- 2019 Commercial Code Update
- Governor's Executive Order
- Zero Energy Ready Oregon (ZERO) Coalition

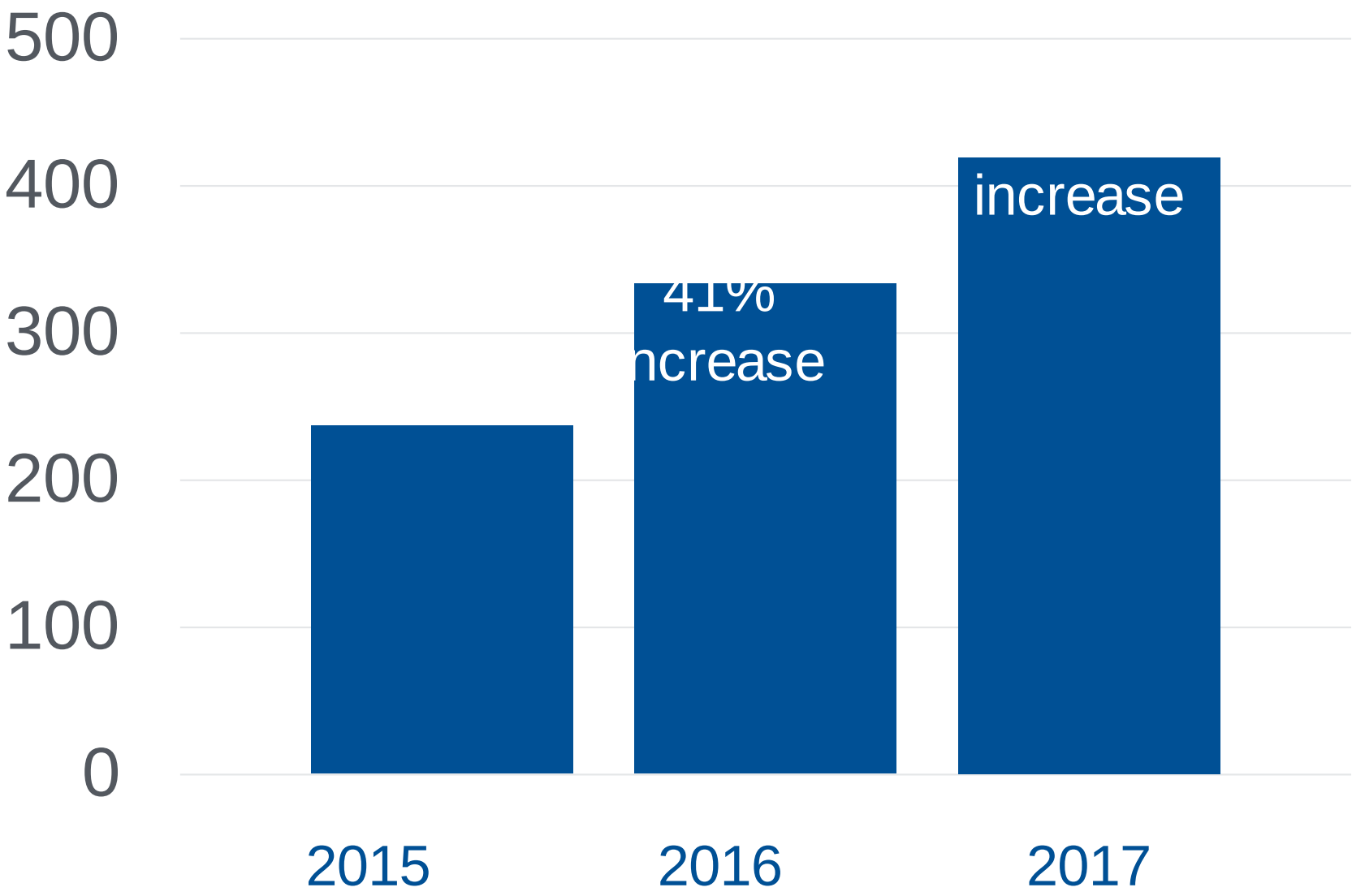
ZERO
ZERO ENERGY READY OREGON

zeroenergyreadyoregon.org

ZERO ENERGY READY OREGON (ZERO) COALITION

A group of Oregon-based organizations are announcing the formation of a coalition to advance the rapid adoption of zero energy building standards in the state of Oregon.

Growth of Energy Efficient Homes in Central Oregon



Energy Savings

Earth Advantage certified homes in 2017 provided an average energy savings of **27% better than code.**

Stone Bridge NW

Electric Vehicle Ready

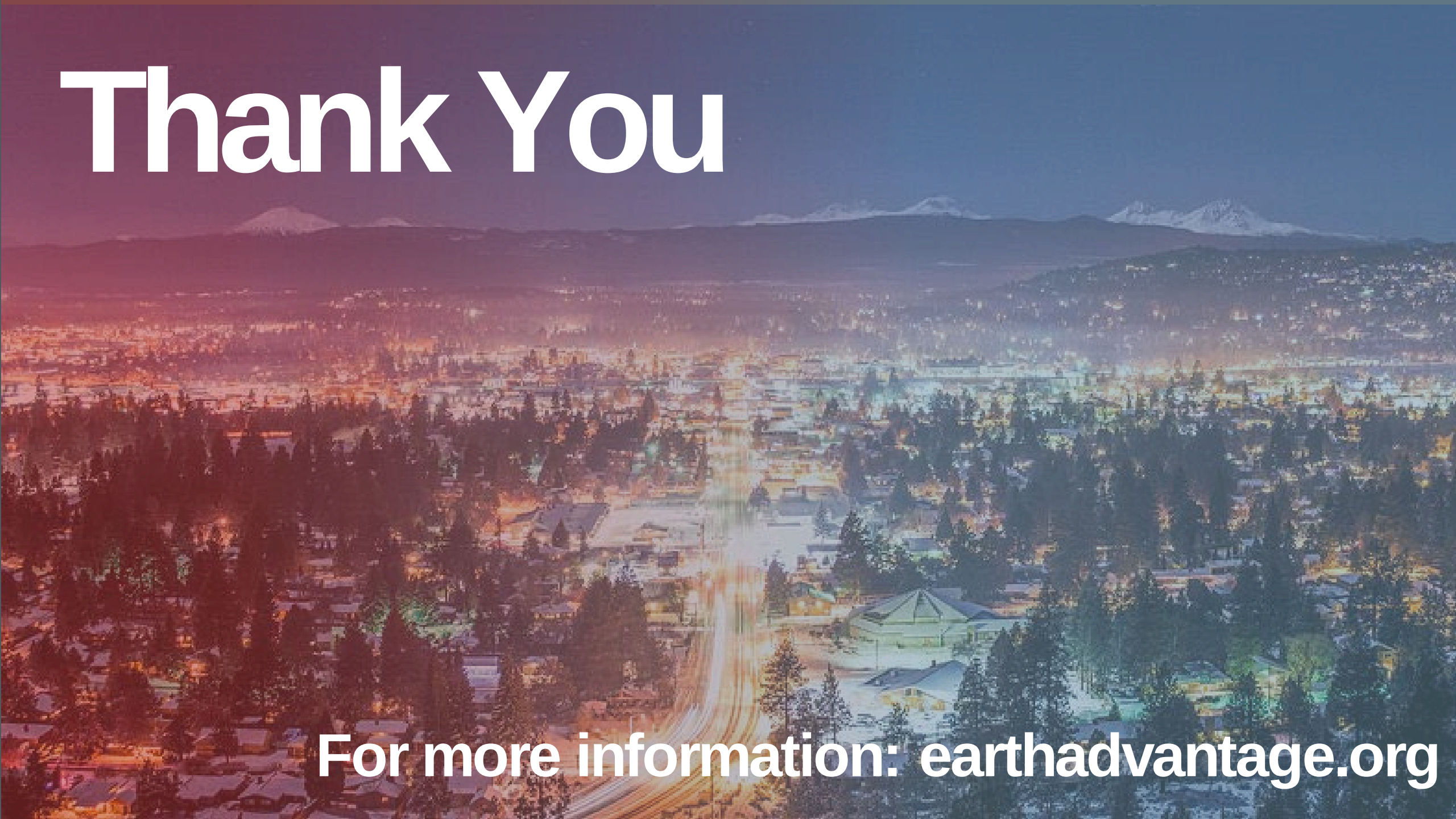
Salvesen Homes

Solar & Electric Vehicle Ready

Performance Homes

Zero Energy Ready


HEALTH | COMFORT | DURABILITY | SAVINGS


Thank You
For more information: earthadvantage.org

ENERGY EFFICIENCY IN BUILDINGS DRAFT OBJECTIVES, BARRIERS, AND EQUITY CONSIDERATIONS

DRAFT OBJECTIVES

1. Increase energy efficiency of new homes
2. Increase energy efficiency of existing homes
3. Increase energy efficiency of new commercial and multifamily buildings
4. Increase energy efficiency of existing commercial and multifamily buildings
5. Support clean and/or renewable energy sources in homes
6. Support clean and/or renewable energy sources in commercial and multifamily buildings
7. Increase equitable access to reliable information, awareness and education
8. Increase support for existing and new training programs at increasing and diversifying skilled workforce
9. Increase access to energy efficiency programs and benefits among renters and income qualifying homeowners
10. Increase efficiency of public agencies facilities, equipment and operations

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 Efficiency in Buildings White Paper
  - CNCA Framework for Long Term Deep Carbon Reduction Planning Buildings Chapter
  - City of Aspen Greenhouse Gas Reduction Toolkit Energy and Buildings Chapter