

# Roadmap to 2035

Overview

OGWC - April 18, 2022

SSG



OREGON  
DEPARTMENT OF  
ENERGY

# Agenda

Commission member updates

Project overview (a reminder)

Review modeling inputs for the business-as-usual and business-as-planned projections

Public comment

Commission discussion

Next steps

# What is the Roadmap to 2035?

- Ambitious, transformative and financially realistic economy-wide decarbonization actions and pathways
- Includes the identification and analysis of co-benefits that support an equitable economy-wide transition
- Designed to meet or exceed Oregon's target of 45% GHG reductions from 1990 level by 2035

# Updated Schedule

Project Steps	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Modeling of scenarios and actions										
Production of MAC Curves, Co-Benefits Analysis										
Stakeholder meetings (Evaluation of Co-Benefits)										
OGWC: Evaluation Criteria, Scoring & Ranking of actions										
Modeling of a preferred scenario, based on Co-Benefits and public input										
"Roadmap to 2035" Report										

# Today's To Dos

- Here is what we are here to do today
  - Review business-as-usual (BAU) and business-as-planned (BAP) data inputs and assumptions
- Here is what we are not here to do today
  - Review low-carbon scenarios and actions

## **Overview**

# BAU and BAP Scenarios

# BAU Assumptions

- Population growth
- Employment growth
- Transportation fuel standards
- Heating and cooling degree days
- Energy use by buildings
- New building growth

# Business-as-usual (BAU)

## Action

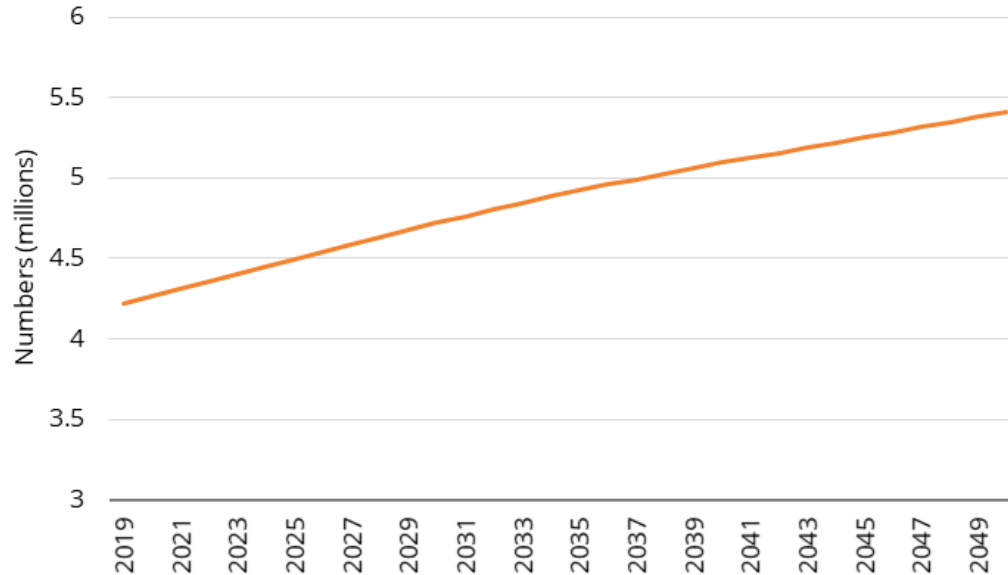
## Details

## Sources

### Population Growth

4.22 million people in 2019  
4.92 million people by 2035 (avg of 1.0% per year)  
5.41 million people by 2050 (avg of 0.6% per year)  
  
Average rate of growth - 38,500 people per year

[Portland State University](#)  
Population Forecasts by County





# Business-as-usual (BAU)

## Action

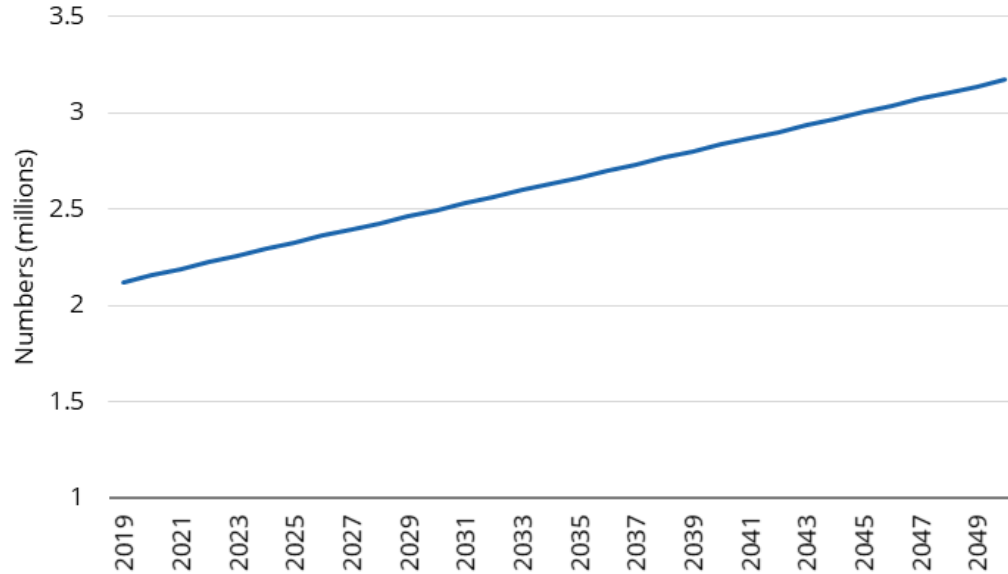
## Details

## Sources

### Employment Growth

2.12 million jobs in 2019  
2.66 million jobs by 2035 (avg of 1.4% per year)  
3.17 million jobs by 2050 (avg of 1.2% per year)  
Average rate of growth - 33,800 jobs per year

[State of Oregon Employment Department](#)



# Business-as-usual (BAU)

Action	Details	Sources
<b>Transportation Fuel Standards</b>	CAFE Fuel standards: Vehicle fuel consumption rates reflect the implementation of the U.S. Corporate Average Fuel Economy (CAFE) Fuel Standard for Light-Duty Vehicles, and Phase 1 and Phase 2 of EPA HDV Fuel Standards for Medium- and Heavy-Duty Vehicles.	(2012) (CAFE standards) retrieved from <a href="https://www3.epa.gov/otaq/climate/documents/420f12050.pdf">https://www3.epa.gov/otaq/climate/documents/420f12050.pdf</a> <a href="http://www.nhtsa.gov/fuel-economy">http://www.nhtsa.gov/fuel-economy</a>
<b>Heating and Cooling Degree Days</b>	Projections of Heating and Cooling degree days by county - <a href="#">Climate Explorer (nemas.org)</a>	<a href="#">Climate Explorer (nemas.org)</a> Statistically downscaled global climate models for county and county-equivalents
<b>Energy Use by Buildings</b>	Baseline building equipment types/stocks held from 2019-2050.	<a href="#">Residential Energy Consumption Survey (RECS)</a> for baseline building equipment types  <a href="#">State Energy Data System (SEDS)</a> for building equipment efficiencies
<b>New Building Growth</b>	Residential buildings. Buildings are added alongside population growth; building types added based on building mix of county where population growth is happening.  Non-residential buildings. Growth based on projected growth in employment; building types added based on building mix of county where job growth is happening.	

# Business-As-Planned Definition

To be a business-as-planned action, it must be:

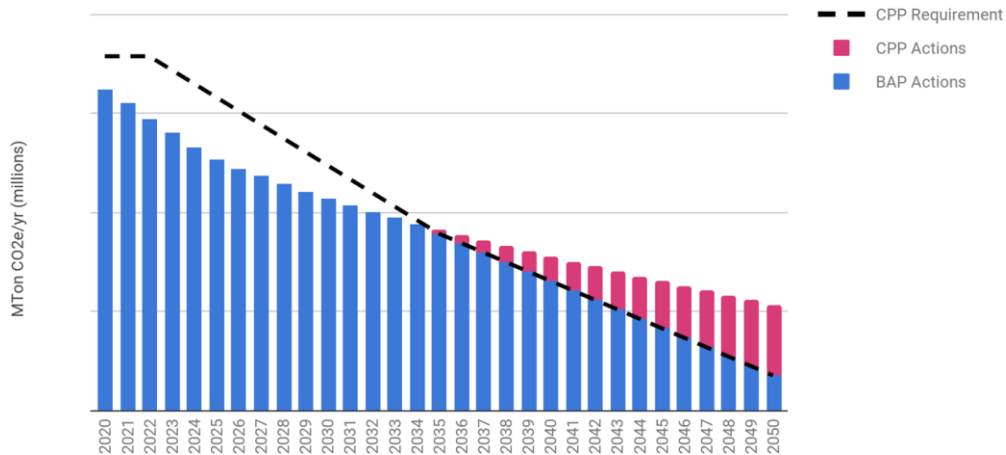
- Through rule-making;
- Funded;
- Legislatively required; or
- Following market trends (e.g., observed EV adoption rates)

# The BAP Incorporates:

- HB 2021
- Climate Protection Program (CPP)
- Clean Fuels Standard
- Increased EV Light-Duty Sales
- Advanced Clean Trucks
- Energy Efficiency Standards for Appliances
- Manufactured Home Replacement
- Solar + Storage Rebate Program
- Heat Pump Rebate Programs
- Community Renewable Energy Program
- Implement Healthy Homes Repair Fund

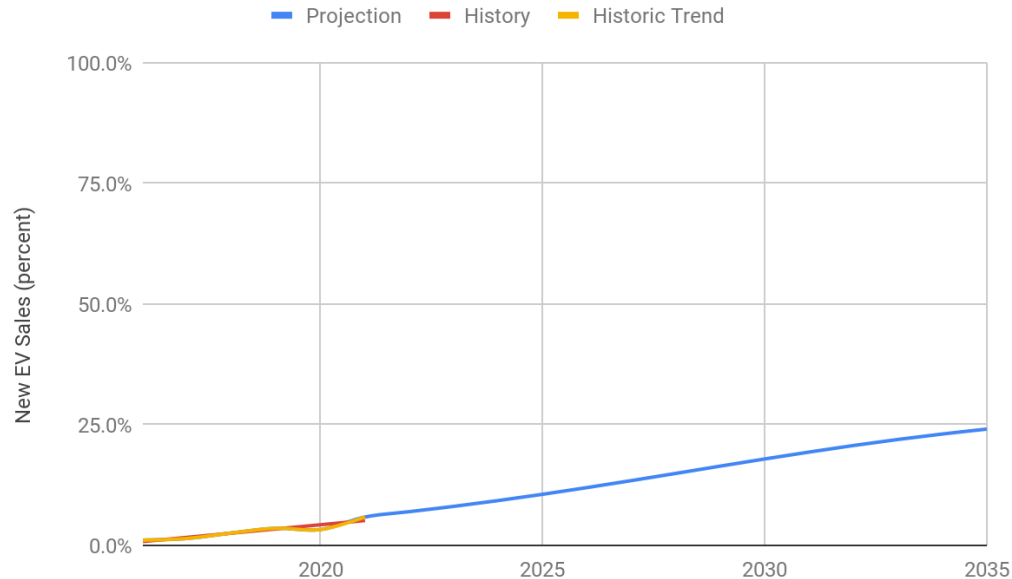
# Business-as-planned (BAP)

Action	Details	Sources
<b>HB2021</b>	IOU retail electricity providers reduce greenhouse gas emissions associated with electricity sold to Oregon consumers to: <ul style="list-style-type: none"> <li>- 80% below baseline emissions levels by 2030</li> <li>- 90% below baseline emissions levels by 2035</li> <li>- 100% below baseline emissions levels by 2040</li> </ul>	<a href="#">HB 2021</a>  Baseline emissions are from 2019 DEQ inventory
<b>Climate Protection Program (CPP)</b>	<b>50% reduction by 2035 and 90% by 2050</b> in greenhouse gas emissions from fossil fuels used throughout Oregon (including: diesel, gasoline, natural gas, and propane) across all sectors.  Site-specific greenhouse gas emissions at manufacturing facilities (such as emissions from industrial processes, with a best available emissions reductions approach).	<a href="#">Climate Protection Program</a>



# Business-as-planned (BAP)

Action	Details	Sources
<b>Clean Fuels Standards</b>	A 10% reduction in average carbon intensity from 2015 levels by 2025. Applies to gasoline and gasoline substitutes, diesel and diesel substitutes, and alternative jet fuel. (EO 20-04 expansion to 25% not included).	<a href="#">DEQ Clean Fuels Program</a>
<b>Increased EV Light-Duty Sales</b>	Following current EV adoption rate.	



# Business as Planned (BAP)

Action	Details	Sources
<b>Advanced Clean Trucks</b>	By 2035 new ZEV sales will be: <ul style="list-style-type: none"> <li>- Light Duty Truck: 75% EV</li> <li>- Medium Duty Truck: 55% EV</li> <li>- Heavy Duty Truck: 40% ZEV</li> </ul>	EQC/DEQ adopted rule - <a href="#">Clean Trucks Rule 2021</a> California Air Resources Board - <a href="#">Advanced Clean Trucks Fact Sheet</a>
<b>Energy Efficiency Standards for Appliances</b>	4.8% annual savings by 2025, 10% by 2045.	<a href="#">HB 2062</a> and ODOE rulemaking for 10 appliances
<b>Manufactured Home Replacement</b>	Implementation of the Energy Trust of Oregon Manufactured Home Replacement Pilot - assuming this can address 17,000 homes achieving a cumulative emissions reduction of ~19,000 MtonCO <sub>2</sub> e by 2035.	<a href="#">Energy Trust of Oregon Manufactured Home Replacement Pilot</a>
<b>Solar + Storage Rebate Program</b>	\$10.38 million starting 2020. Assume program covers 50% of cost and can fund approximately <ul style="list-style-type: none"> <li>- ~6.07 MW of rooftop solar PV</li> <li>- ~3.61MW of storage</li> </ul>	<a href="#">ODOE Solar + Storage Rebate Program, HB2021</a>
<b>Heat Pump Rebate Programs</b>	\$10 Million for rebates to individuals, starting 2023.  \$15 Million for rebates to landlords, starting 2023.	<a href="#">SB 1536</a>
<b>Community Renewable Energy Program</b>	\$50 million grant program, starting 2022.	<a href="#">HB 2021</a> <a href="#">ODOE Community Renewable Energy Program (CREP)</a>
<b>Implement Healthy Homes Repair Fund</b>	\$10,000,000 fund for low income homes replacement available from 2021 to 2023. Assumes 2000 of residential buildings built between 1954 and 1979 are retrofit.	<a href="#">HB 2842</a>

# Implementation

Key enabling factors important for Oregon's successful implementation of the BAP and future actions

- Programing, planning, authority, funding, and implementation
- Access to transmission infrastructure and regional electricity markets
- Storage/Battery technologies
- RNG and hydrogen technologies and markets
- Electric vehicle infrastructure
- Emerging technologies

Low-carbon scenarios will explore the possibilities of some these technologies and pathways



# Next Steps

1. Model BAP Scenario
2. Model Low-Carbon Scenarios
3. Marginal Abatement Cost (MAC) Analysis
4. Co-Benefits Analysis