Northwest **Power** and **Conservation** Council

February 5, 2019

MEMORANDUM

TO: **Council Members**

FROM: **Leann Bleakney, Oregon staff**

SUBJECT: **Presentation of the Oregon Biennial Energy Plan by representatives of the Oregon Dept. of Energy**

BACKGROUND:

Presenter: Alan Zelenka, Assistant Director of the Planning and Innovation Division of the department, and Adam Schultz, Senior Policy Analyst for the Oregon Department of Energy

Summary: Alan Zelenka and Adam Schultz will present to the power committee a summary of the department's Biennial Energy Report.

Relevance: This report presents both an exhaustive history and current snapshot of the energy landscape in the state of Oregon.

Background: Alan Zelenka, Assistant Director of the Planning and Innovation Division of the department, and Adam Schultz, Senior Policy Analyst for the Oregon Department of Energy, will present to the power committee a summary of the department's Biennial Energy Report.

The Biennial Energy Report (BER) is an exhaustive examination and summary of Oregon's energy landscape. It is a major undertaking by the department and symbolizes months of work by the department's staff. The Oregon Biennial Energy Report can be found online at: https://energyinfo.oregon.gov/ber/

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The report is divided into chapters and includes:

Chapter 1—A focus on Oregon's past energy policies and regulatory structure. It details Oregon's sector-based energy use, production and generation and the strategies Oregon has employed to meet energy demand.
Chapter 2—Climate change strategies for reaching deep decarbonization is the focus of this chapter, including issues such as environmental tradeoffs, costs and benefits and mitigation options.
Chapter 3—The renewable energy chapter looks at policies and changes in technologies and the interest in these technologies.
Chapter 4—Transportation is the focus here, with an overview of national and state trends as well as policies and strategies for Oregon to meet its greenhouse gas reduction goals.
Chapter 5--This chapter also looks at resilient energy systems and how the state is working to prepare for major natural events like earthquake or tsunami.
Chapter 6—Energy efficiency has been the cornerstone of Oregon energy policy for decades and this chapter details those policies and how Oregon acquires energy efficiency.
Chapter 7—This chapter looks forward to issues facing Oregonians: energy burden, consumer protection, and equity.
Chapter 8—Finally, the report recommends that the state of Oregon work to address gaps in data, ensure equity in relative energy burden, and plan for a future that includes differently structured energy markets, uses and products.

More info:

Alan Zelenka is the Assistant Director of the Planning and Innovation division of the Oregon Dept. of Energy. He has been involved in state energy issues for most of his career. He oversees 21 people who work on policies related to energy efficiency and technology. For 21 years, Alan worked for Emerald Utility District in Eugene, Oregon, as a resource specialist. He helped create an integrated resource plan in 1988, which few public utilities were doing at the time. He has served on the Oregon Global Warming Commission (2013-2018), the Climate Trust (2004-2010), the Public Power Council (2000-2006), Renewable Northwest (1994-2008), the Solar Energy Association of Oregon (1988-1998) as well as serving on the Eugene City Council.

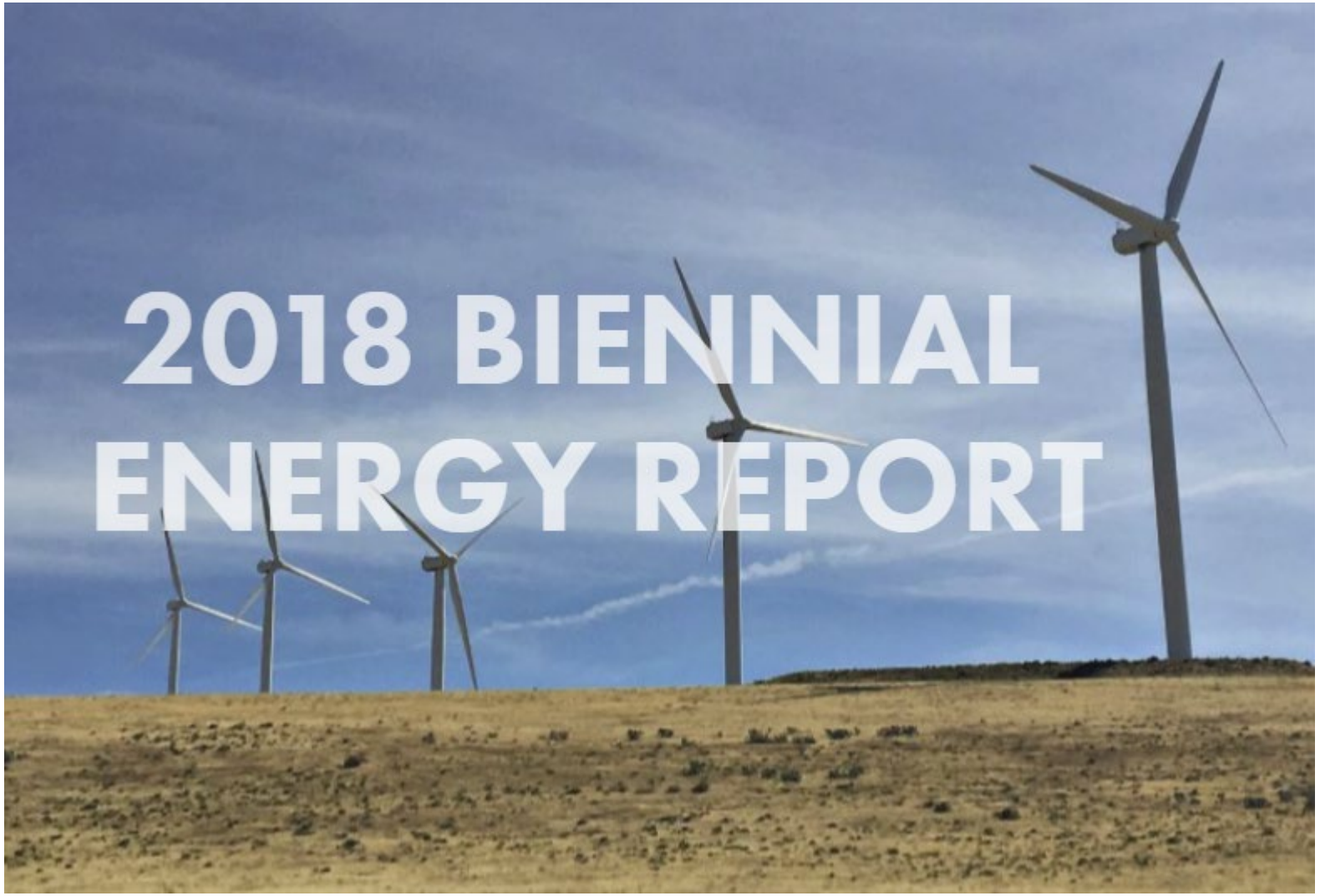
Adam Schultz is a Senior Policy Analyst in the Planning and Innovation Division of the department. He is the department's lead for matters related to Bonneville and the state's consumer-owned utilities. In addition, he also works on many other issues dear to the Council, including: demand response, smartgrid, energy storage, regional energy markets, distributed energy resources, and energy resilience. He participates in several of the Council's advisory committees. Adam has a J.D. and previously managed the UC Davis Energy Institute, worked as a regulatory analyst for the California PUC, and served as a Wayne Morse Legal Fellow for Senator Ron Wyden.

Oregon Department of **ENERGY**

An Introduction to the Biennial Energy Report

February 12, 2019

Northwest Power & Conservation Council: Power Committee



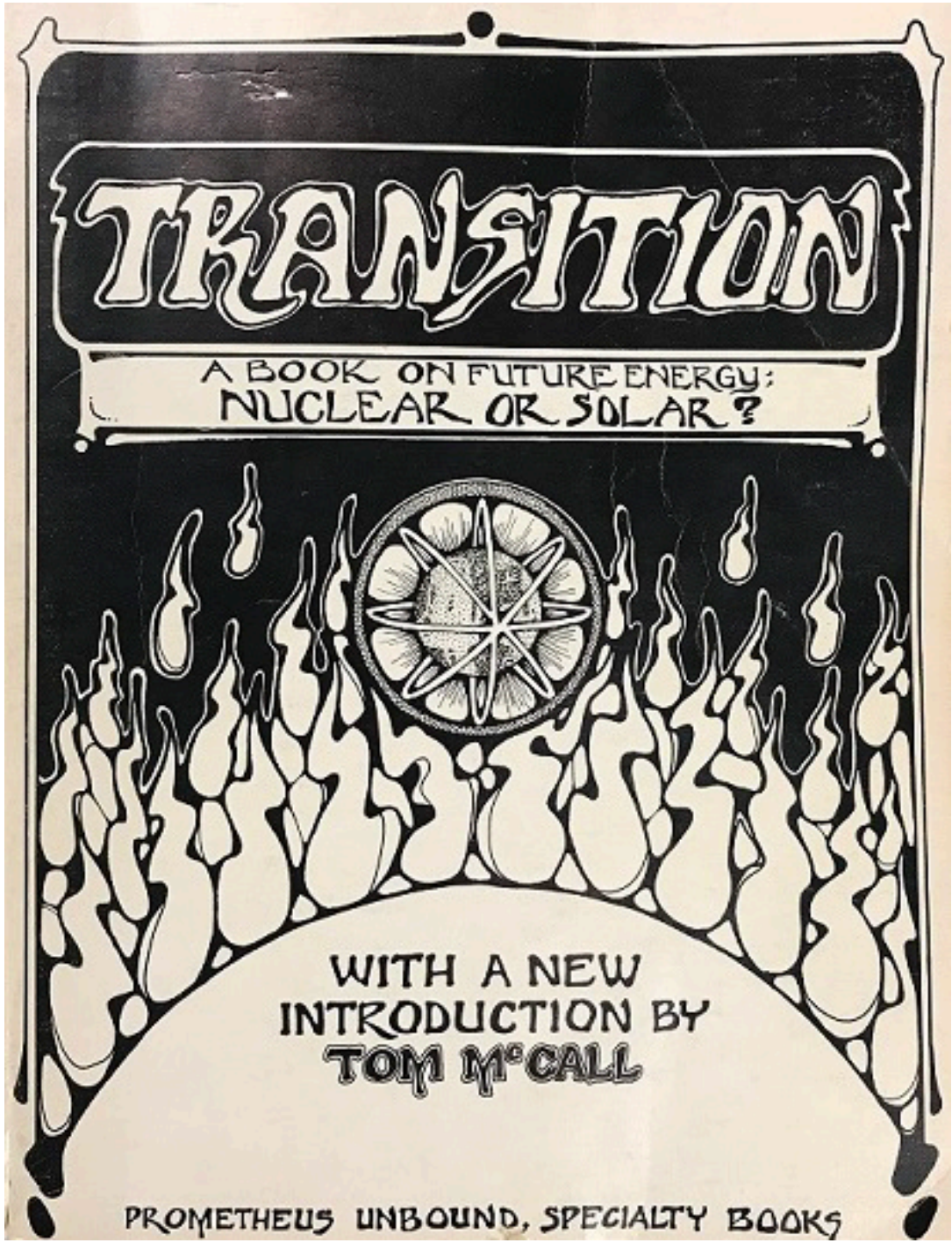
OREGON DEPARTMENT OF ENERGY

1975: Oregon's First Energy Report

- Written in the midst of an energy supply crisis
- Discussed Oregon's energy future, including the "solar versus nuclear" question
- *"Faced with such powerful world forces beyond our control, and to which we are currently so vulnerable, how can a small geopolitical region such as Oregon hope to maintain and increase its potential for self-determination?"*

~ Gov. Tom McCall

OREGON DEPARTMENT OF ENERGY



2018: Oregon's New Biennial Energy Report

- Inform local, state, regional, and federal energy policy development and energy planning and investments
- Collect and analyze energy data and information
- Review energy resources, policies, trends, and forecasts – and what they mean for Oregon

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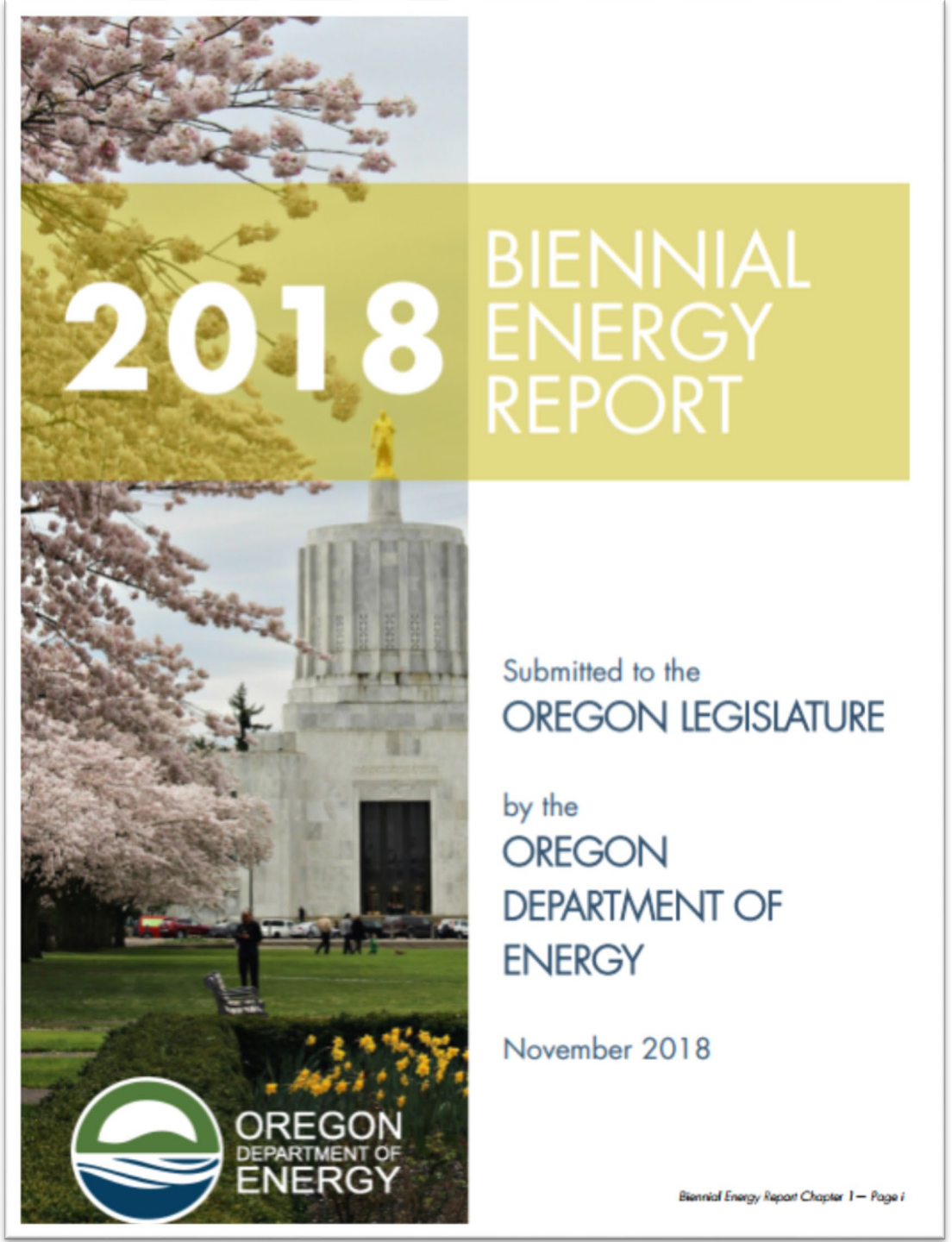
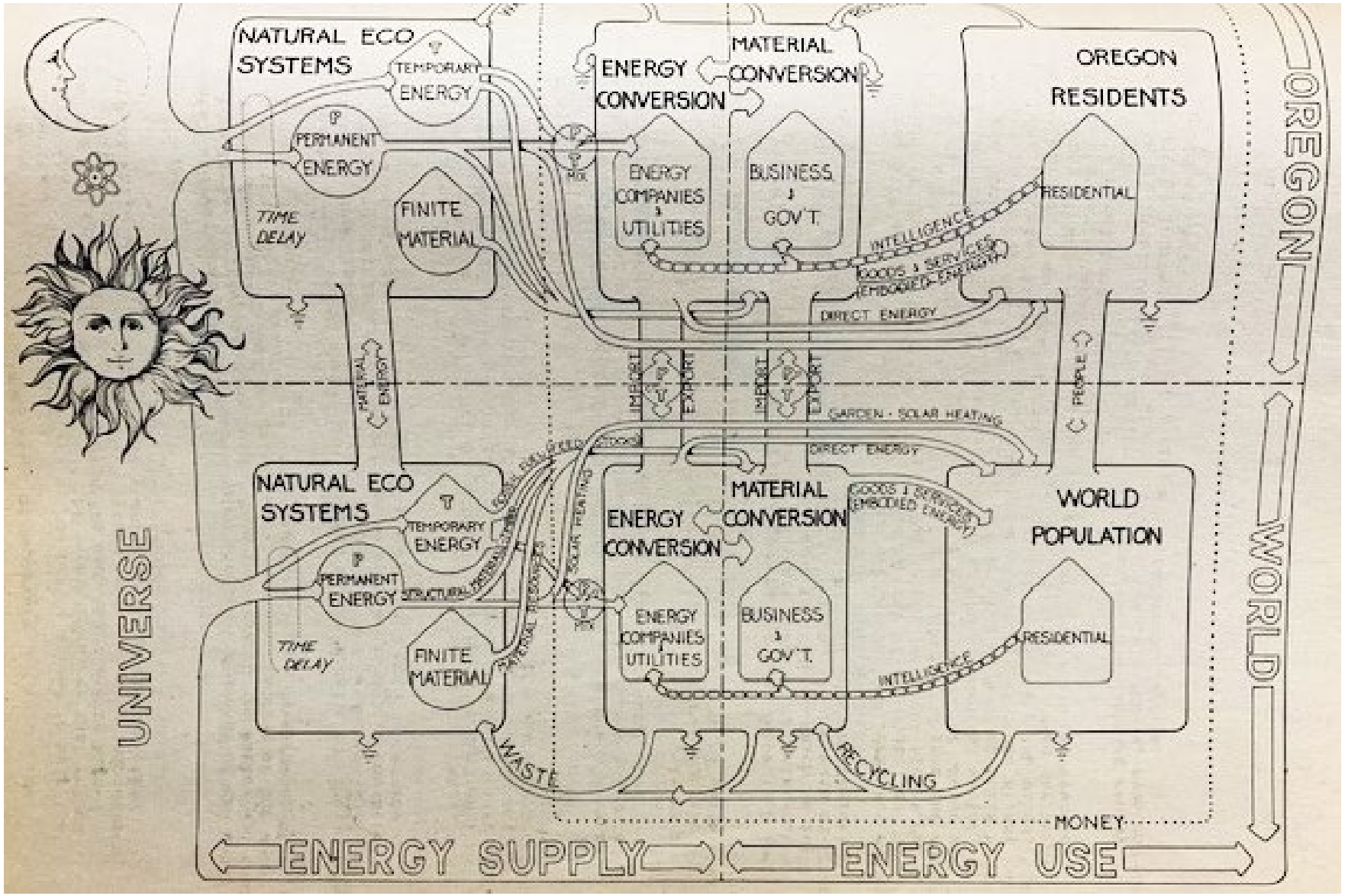


1975: Low-Tech Energy Reporting



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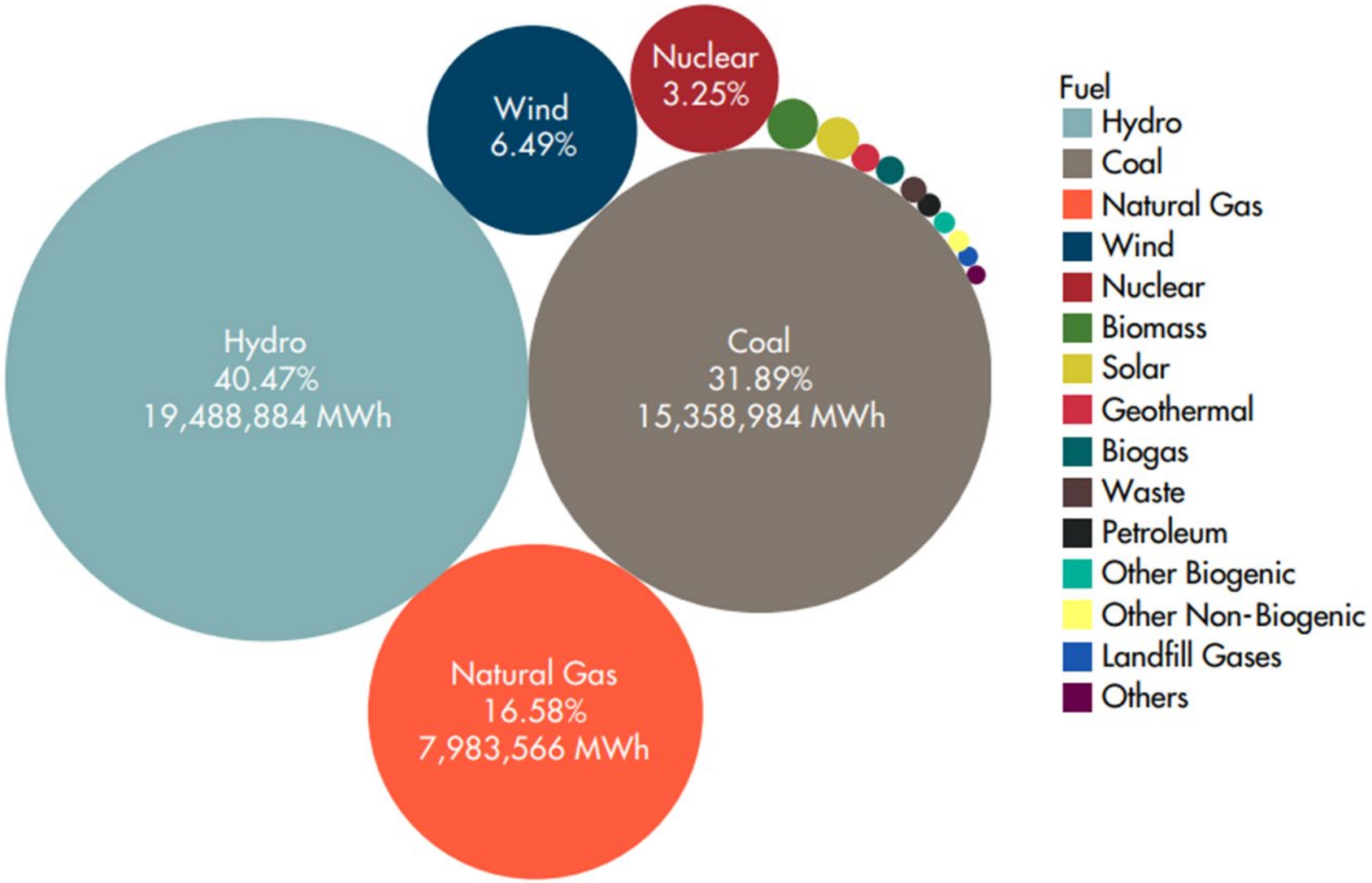
2018: Reporting Tools Have Improved



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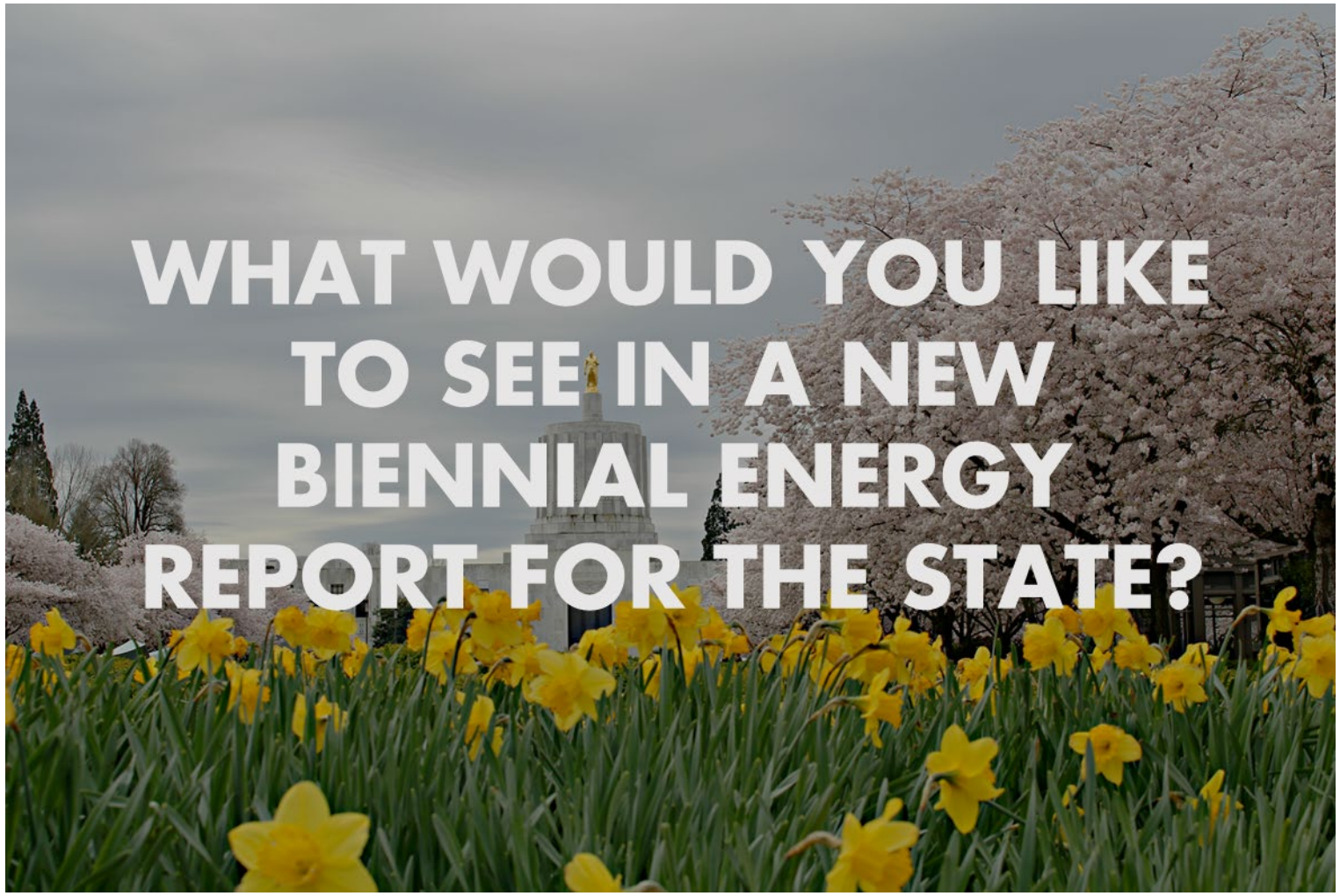
We Started With One Question

Throughout fall 2017:

- Online survey
- In-person meetings
- Informal conversations

We heard from more than 250 people across Oregon.



OREGON DEPARTMENT OF ENERGY

Eight Comprehensive Chapters

Full Report

(large file)

Introduction

Exec. Summary

Chapter 1

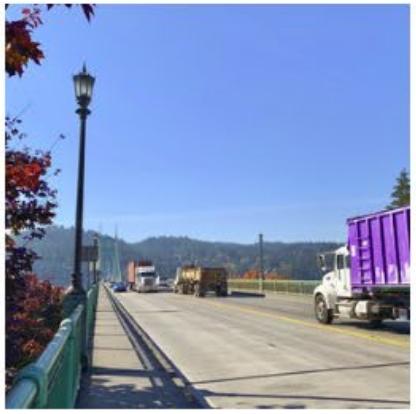
Energy Numbers

Chapter 2

Climate Change

Chapter 3

Renewable Energy



Chapter 4

Transportation

Chapter 5

Resilience

Chapter 6

Energy Efficiency

Chapter 7

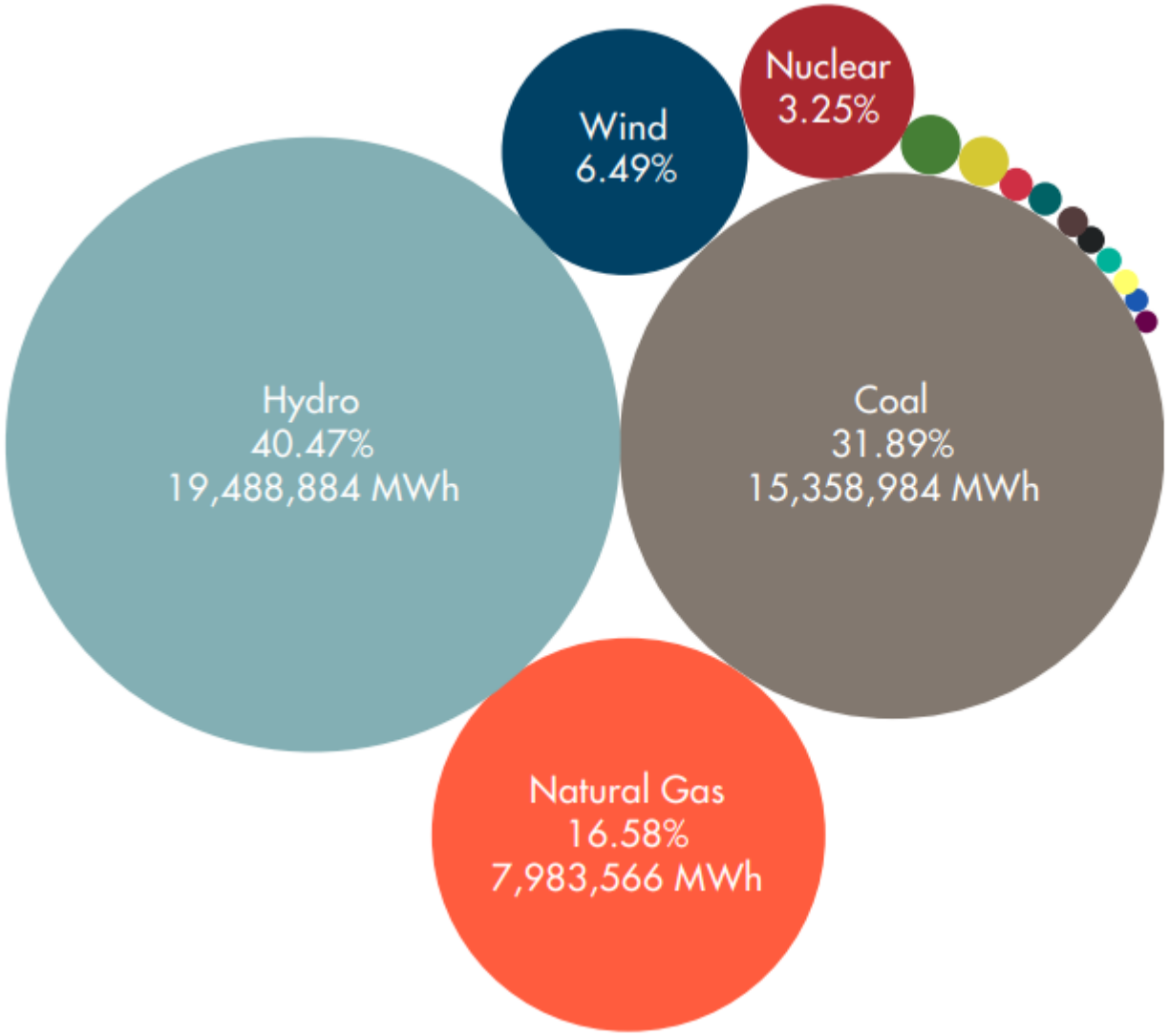
Consumers

Chapter 8

Recommendations

Chapter 1: Energy by the Numbers

- Explains the differences between what we use and what we make
- Reports trends and information about end-use sectors
- Compiles state energy expenditures
- Shows changes over time



Resources Used to Generate Oregon's Electricity

Based on a three-year average (2014-2016), this chart shows the energy resources used to generate the electricity that is sold to Oregon's utility customers.

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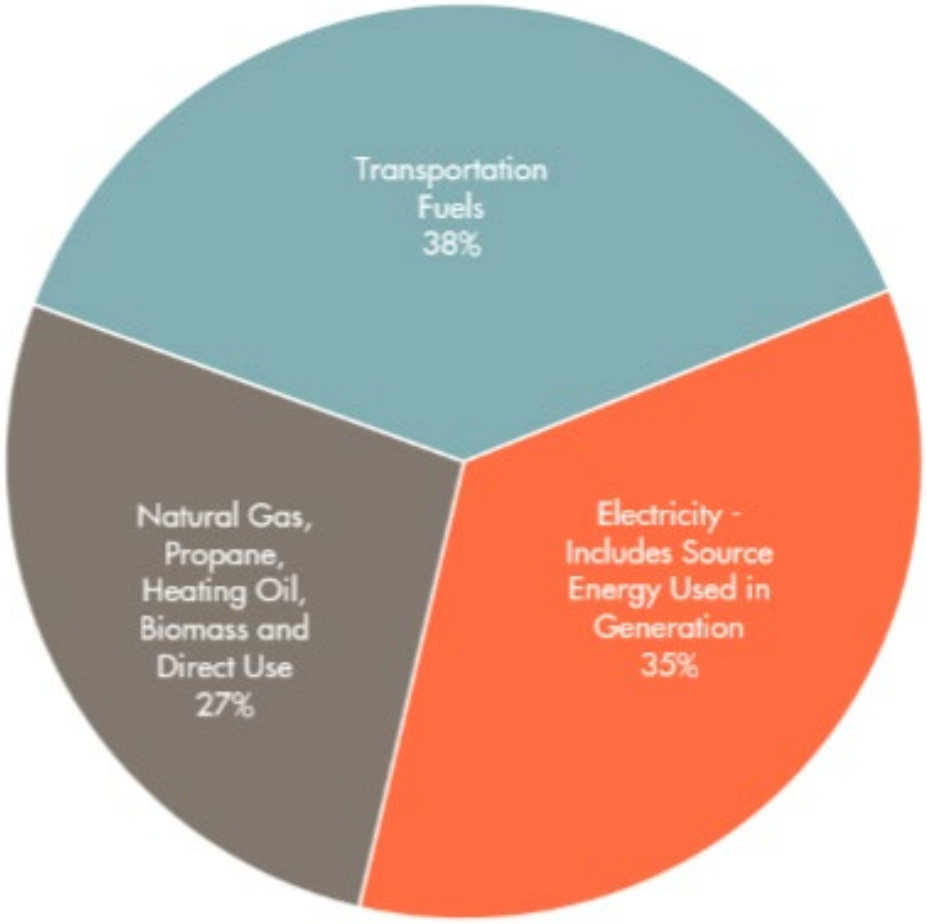
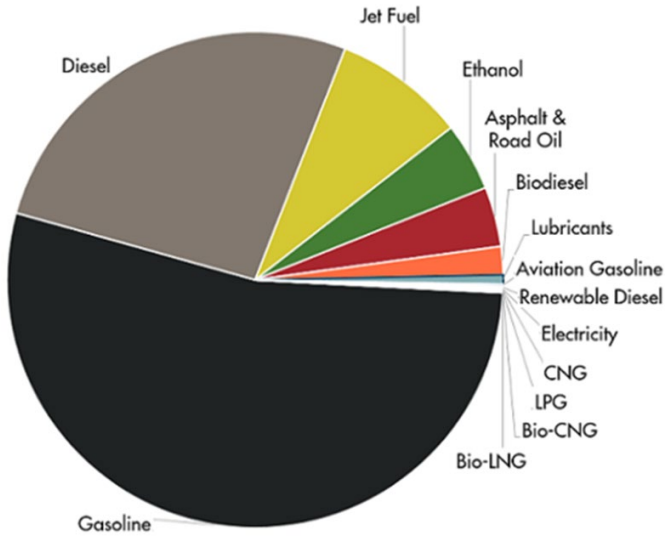
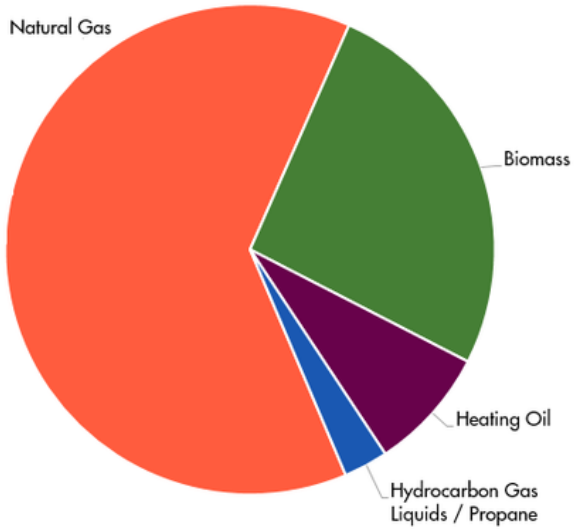
Energy We Use: By Fuel Type



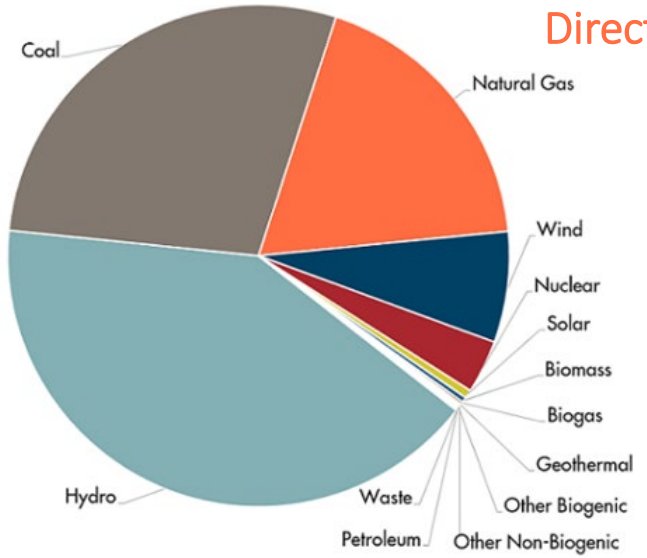
2016: Oregon Energy Consumption by Fuel Type



Transportation



Direct-Use Fuels

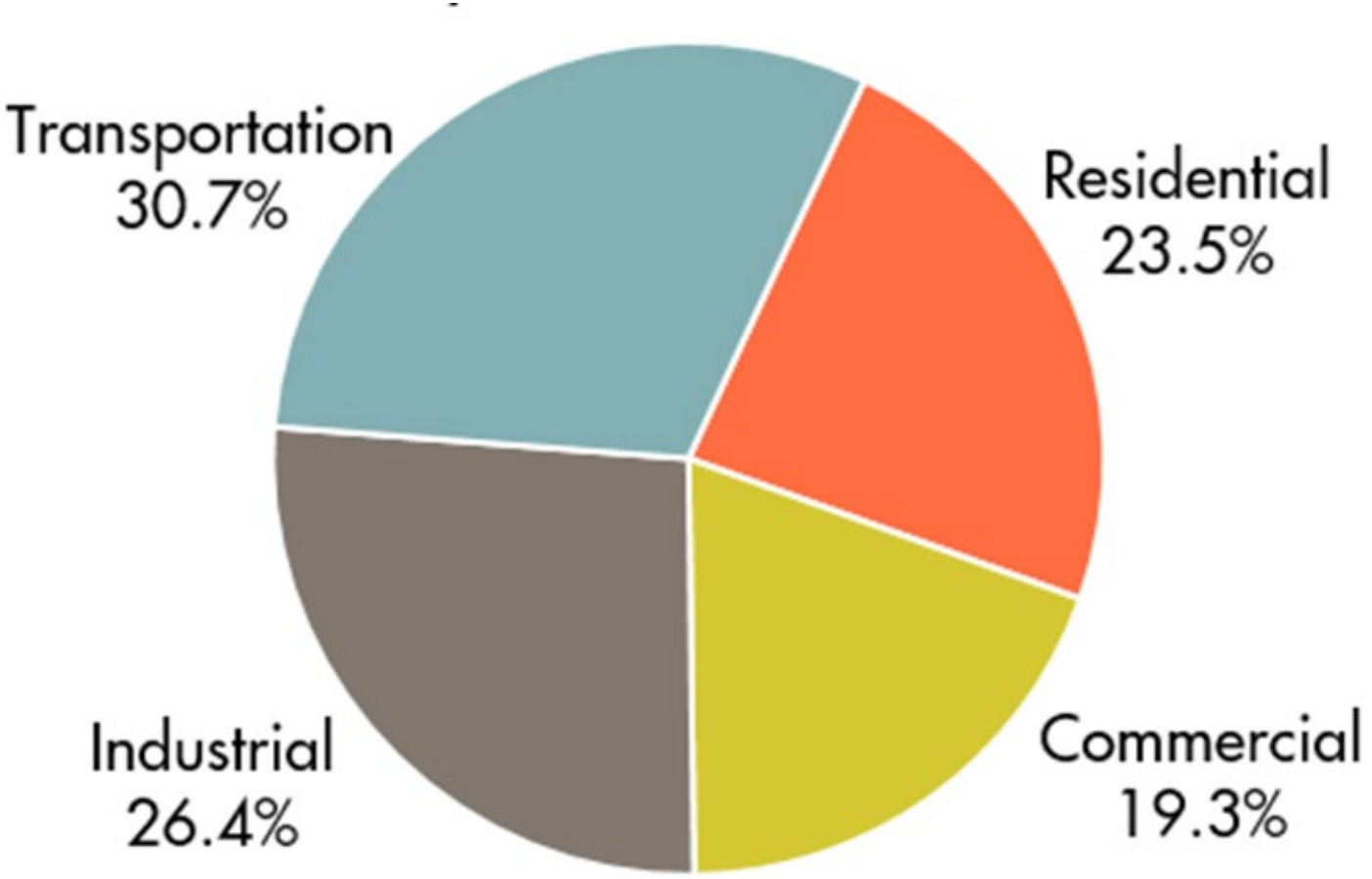


Electricity

Energy We Use: By Sector

Report also includes sector profiles and trends:

- Home energy performance scoring
- Energy code improvements
- County-specific information on how Oregonians heat their homes
- Energy efficiency gains



2016: Oregon Energy Consumption by End-Use Sector

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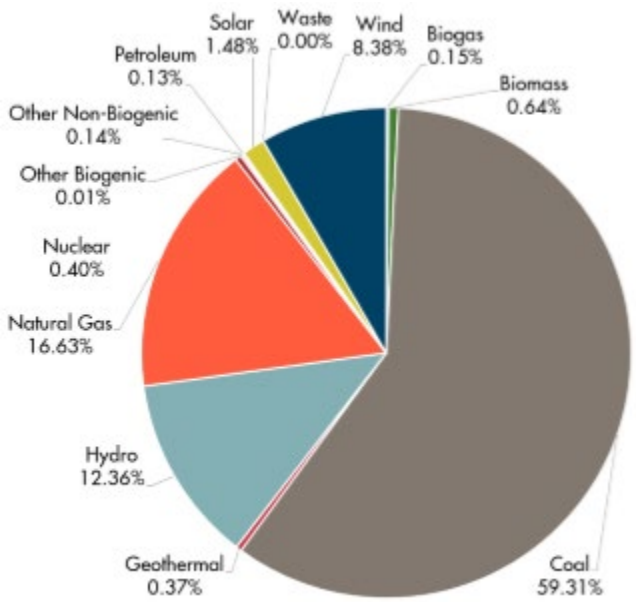
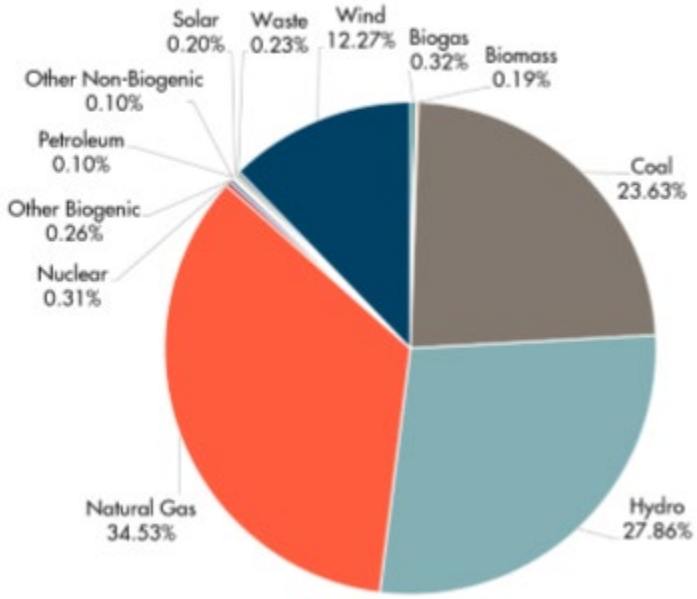
Energy We Use: By Utility

Report also includes:

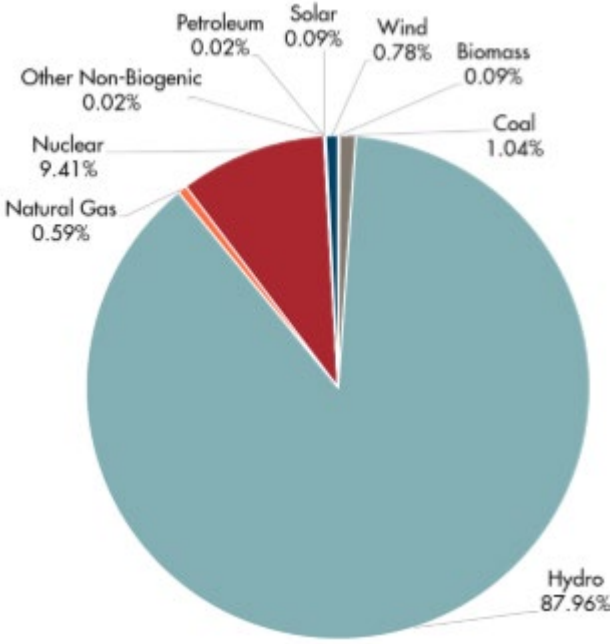
- Trends in and changes to Oregon's electricity mix
- Explanations of the Renewable Portfolio Standard



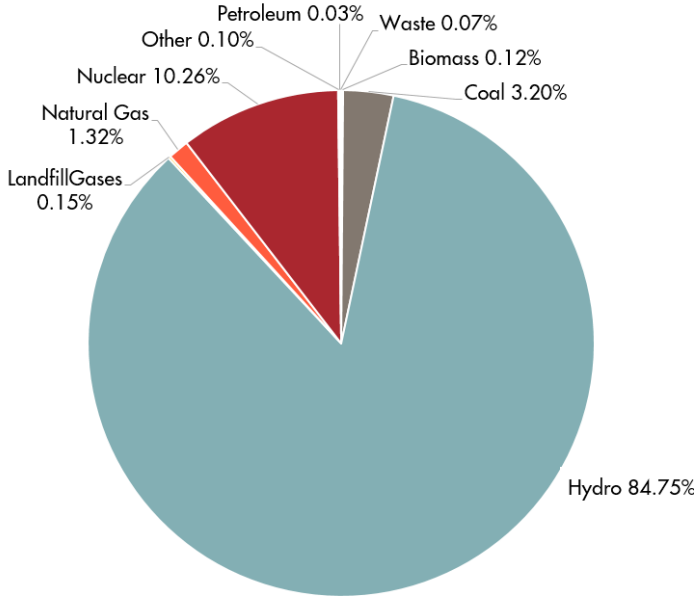
Pacific Power 2016



Portland General Electric 2016

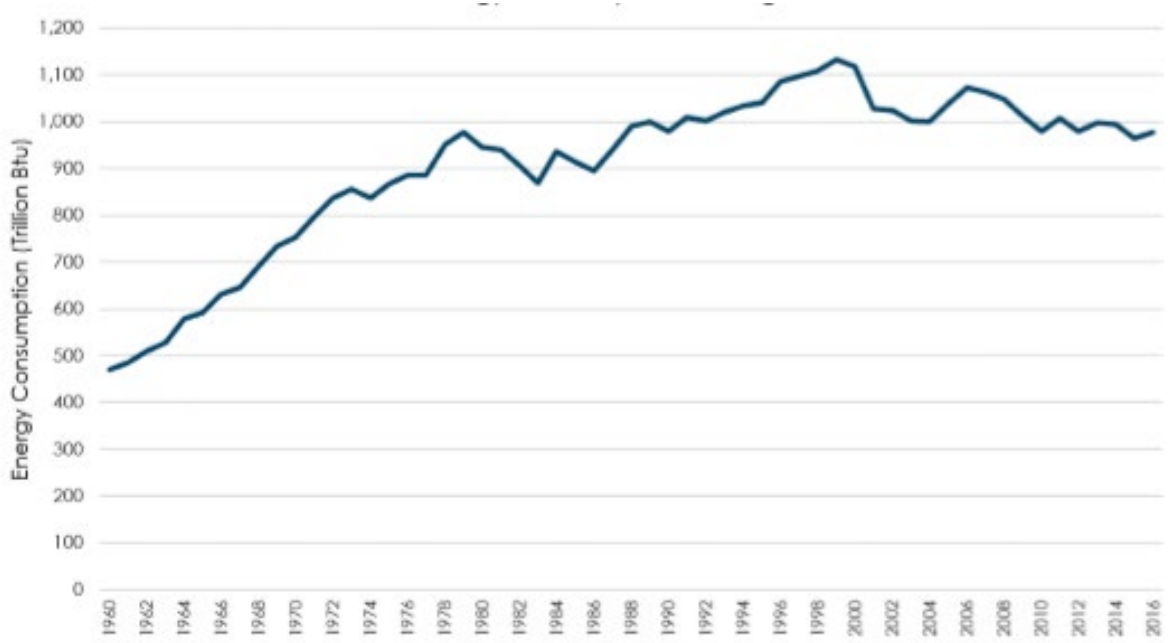


Eugene Water & Electric Board 2016

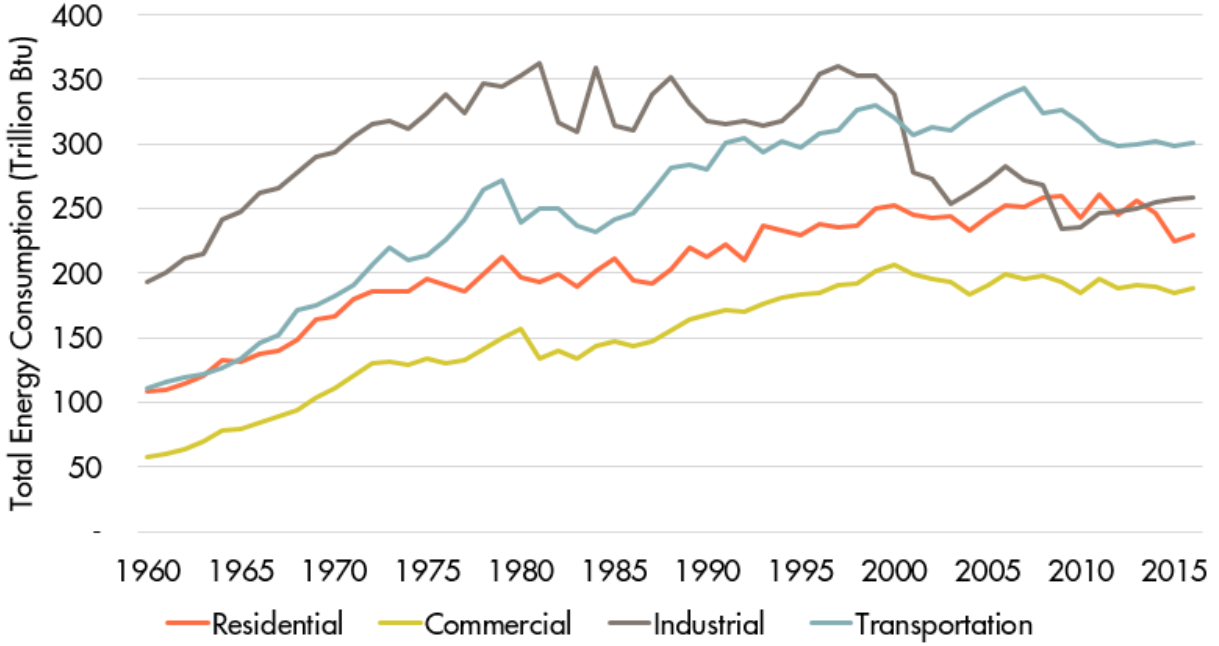


COU Average, Not Including EWEB 2016

Energy Consumption Over Time

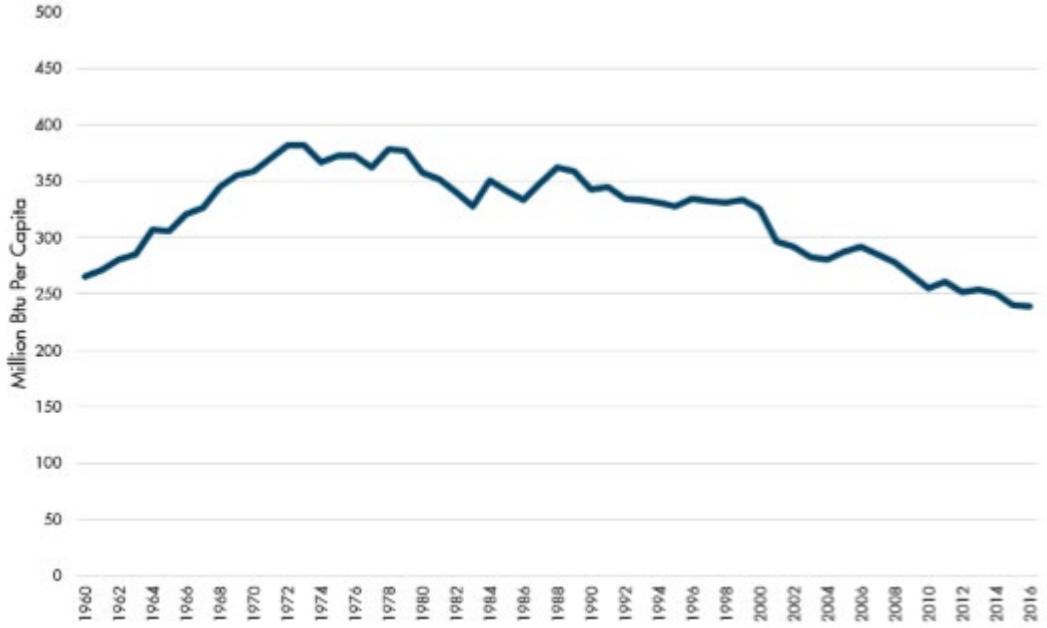


Oregon's Total Energy Consumption Over Time

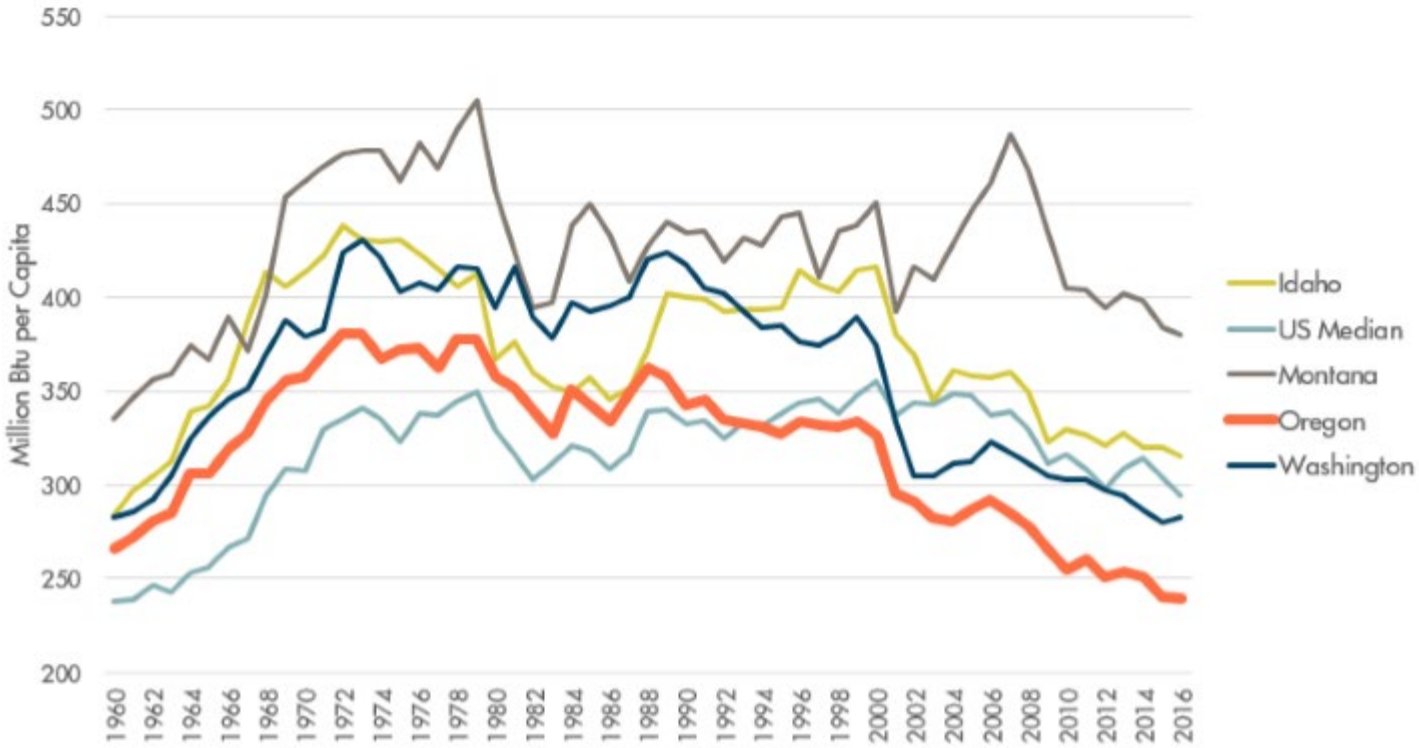


Oregon's Energy Consumption by Sector Over Time

Per Capita Energy Consumption Over Time

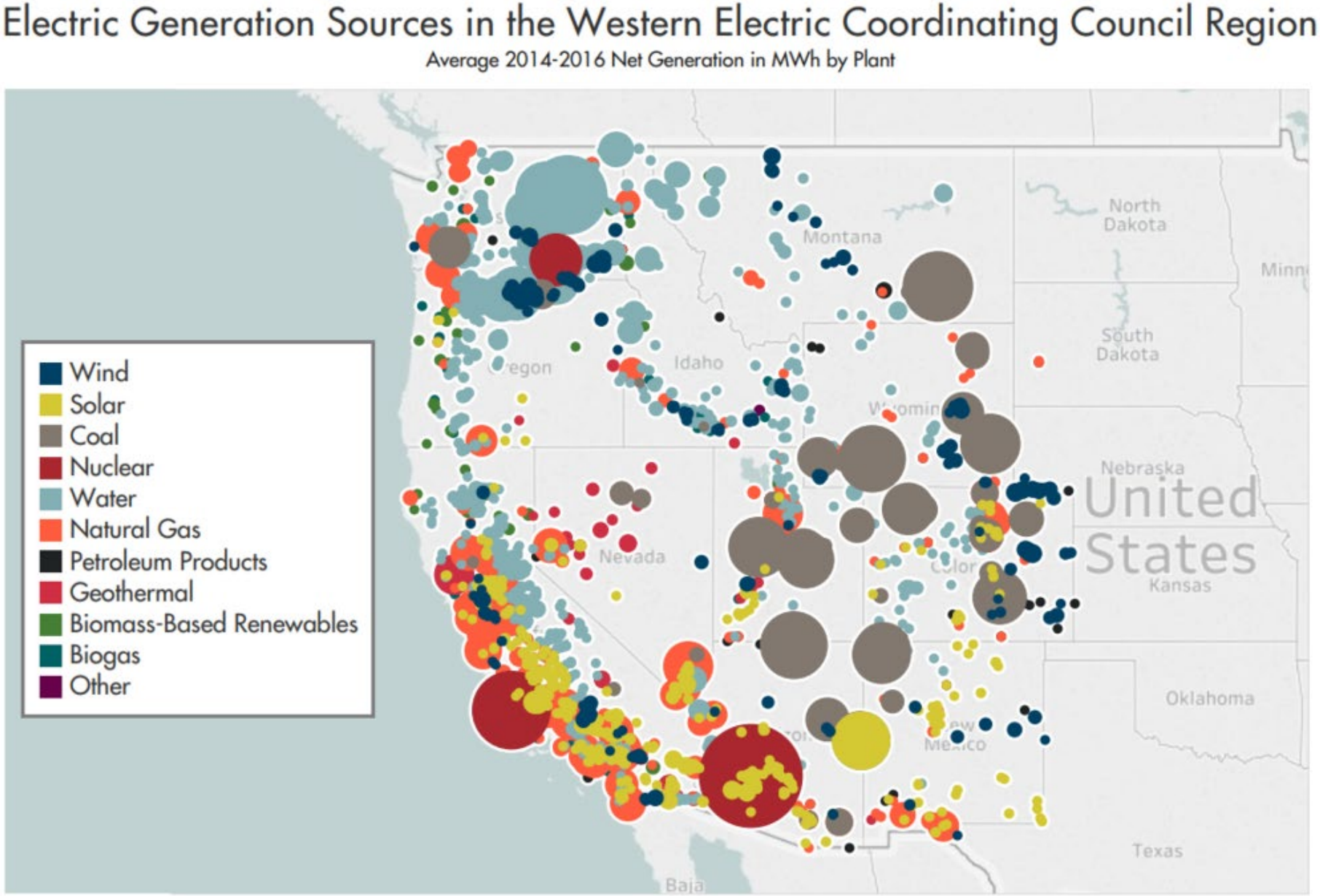


Oregon's Per Capita Energy Consumption Over Time



Oregon's Per Capita Energy Consumption Over Time Compared to Northwest States

Where Oregon's Electricity Comes From



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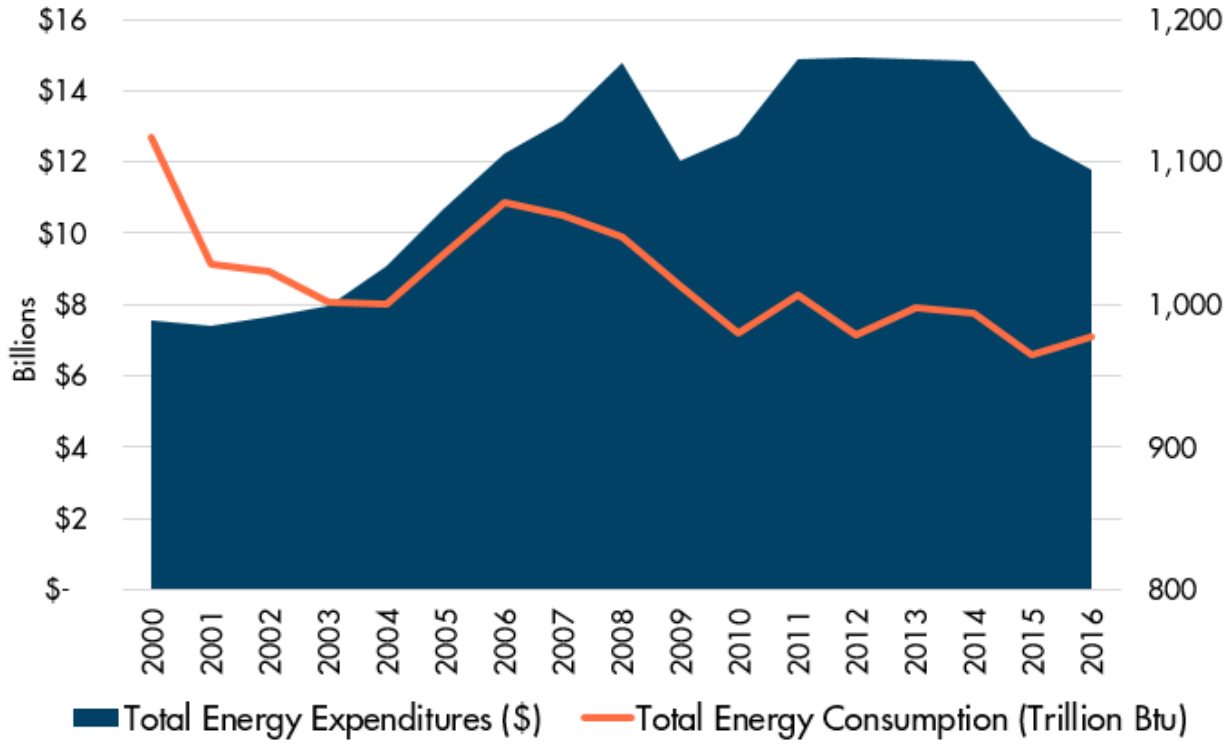
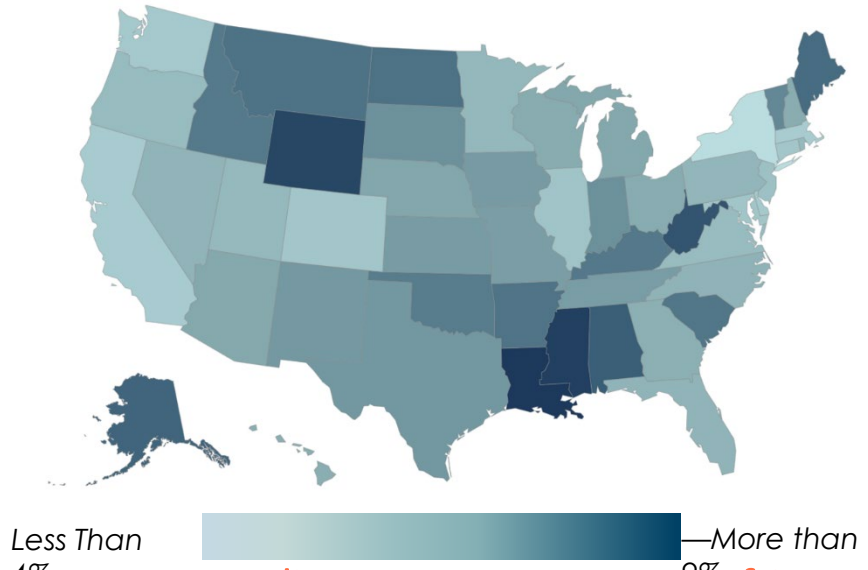
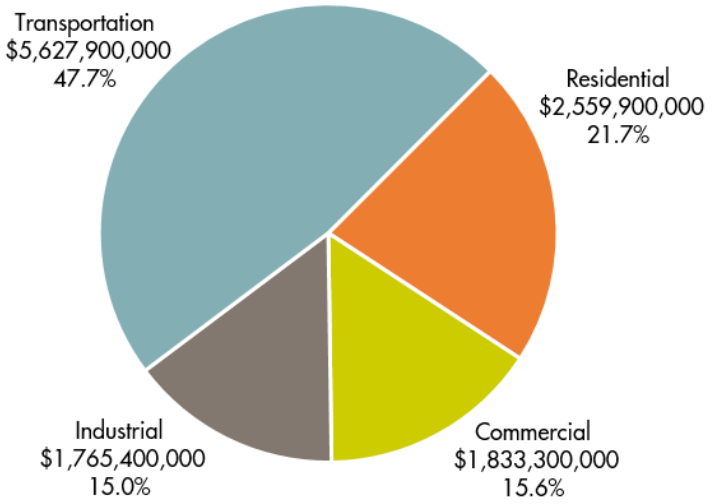
Energy Expenditures: Total and By Sector





Total Energy Expenditures as a Percentage of State Gross Domestic Product — 2016



OREGON DEPARTMENT OF ENERGY

Energy Consumption & Oregon's Economy

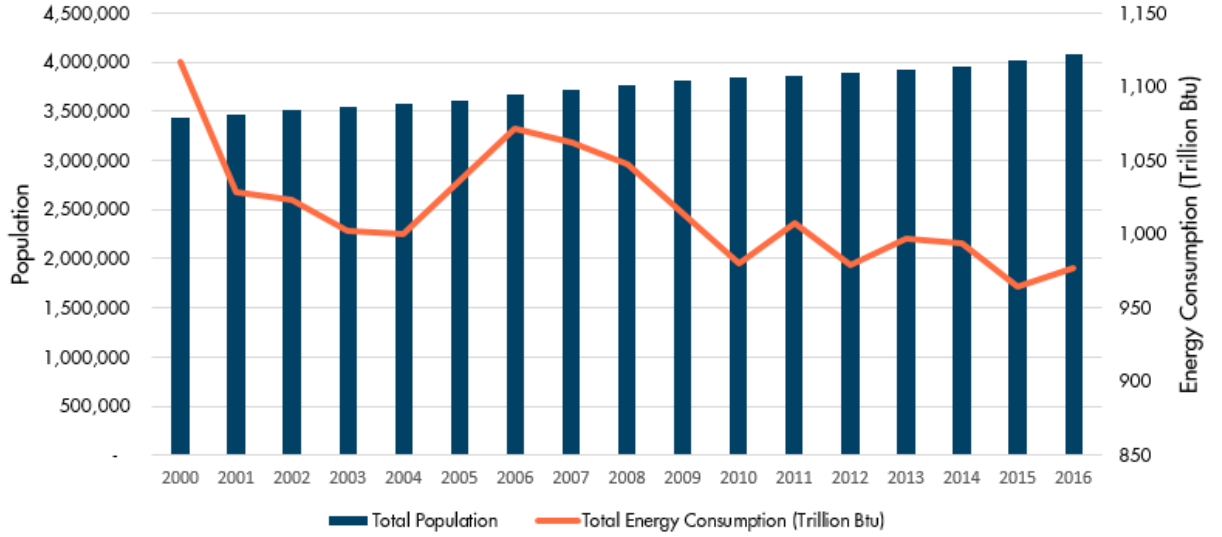
Between 2000 and 2016:

19%
Oregon Population

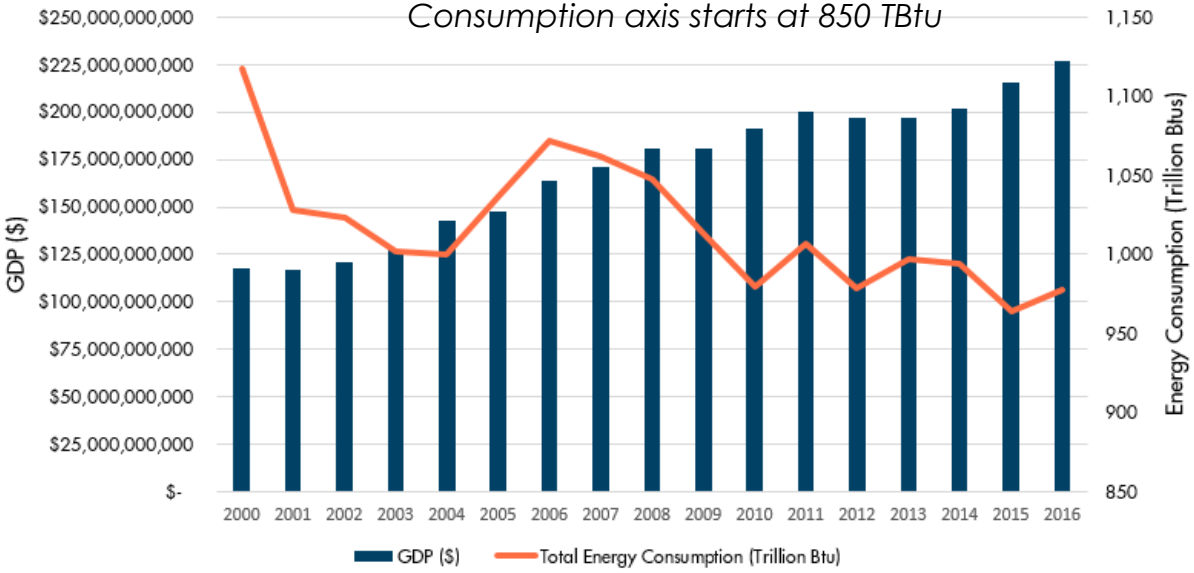
93%
Oregon GDP

12.5%
Oregon Energy Use

Oregon's Population and Energy Consumption: 2000-2016
Consumption axis starts at 850 TBtu

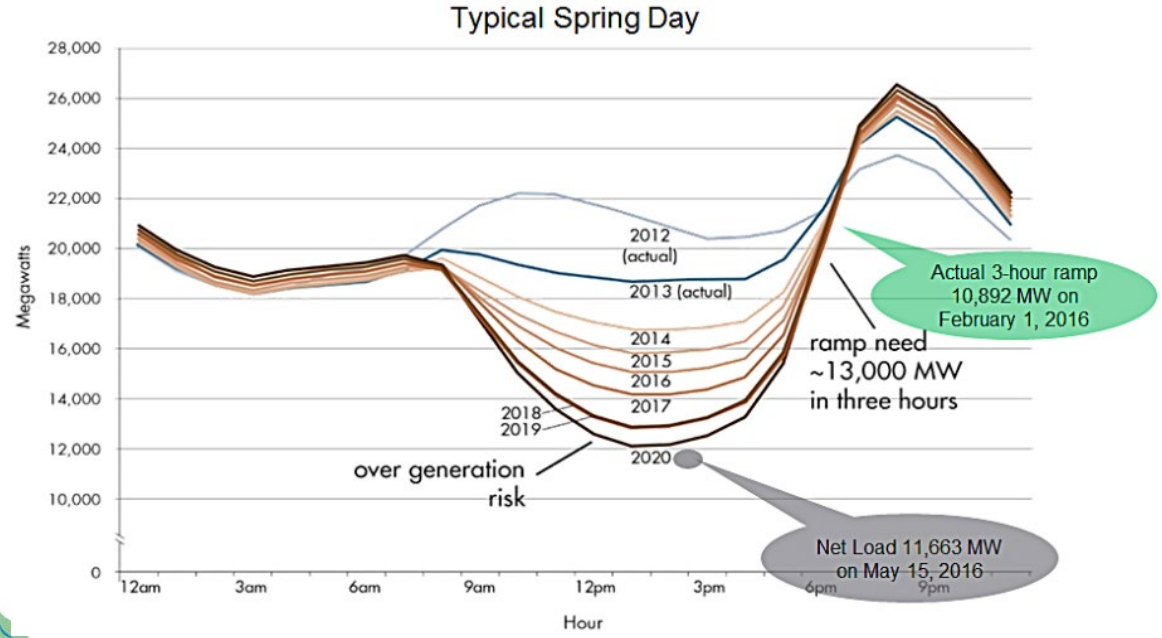


Oregon's GDP and Energy Consumption: 2000-2016
Consumption axis starts at 850 TBtu



Finding the Right Balance on Energy 101

- Common terminology and concepts: Btu, demand response, the "duck curve," regional entities like the Western Electric Coordinating Council
- Types of utilities – investor-owned, consumer-owned
- An introduction to the federal hydroelectric system, federal and regional regulatory responsibilities, and energy bill basics



Map used courtesy of the U.S. Army Corps of Engineers

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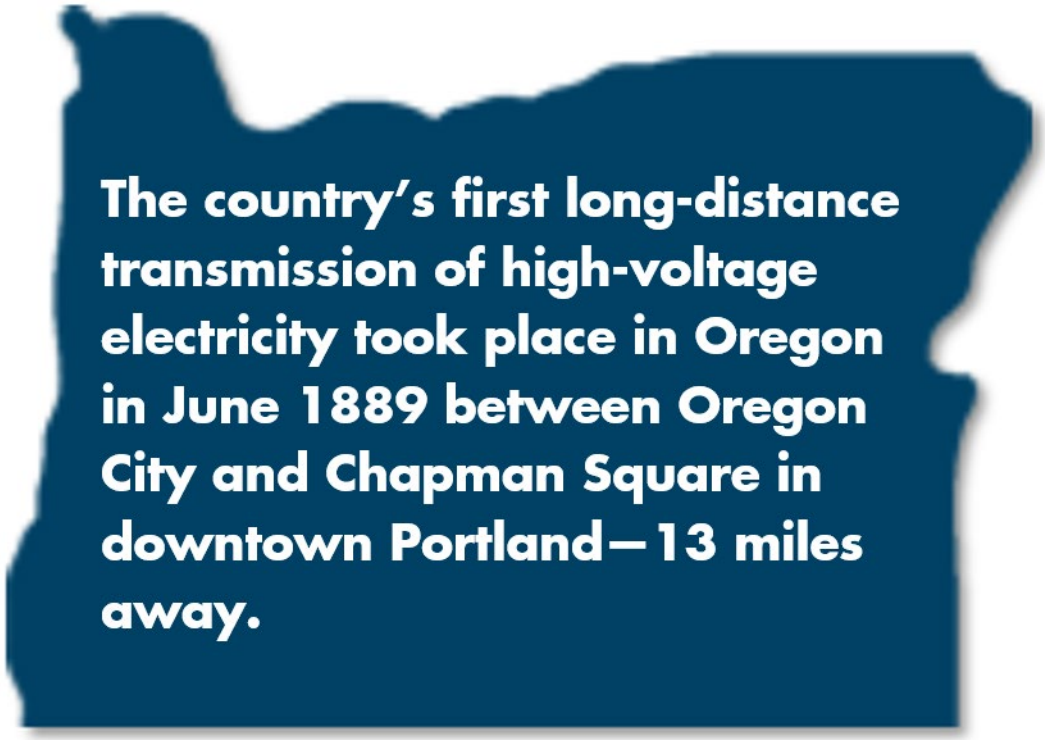
How Oregon Ranks



- 13th lowest total per capita energy use in the U.S.
- 8th lowest residential per capita energy use in the U.S.
- 7th in the country for total renewable energy production
- 8th in the nation for installed wind capacity
- Less than 2 percent of the transportation fuel used in Oregon was produced in-state in 2016
- One of the first utility-scale, grid-connected battery energy storage systems
- 12 years in a row making the list of top 10 most energy efficient states in the U.S.

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County-Specific Data

WASHINGTON COUNTY

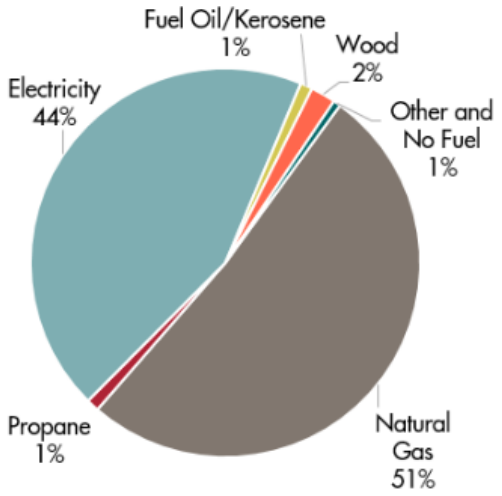
POPULATION: 588,957

COUNTY SEAT: HILLSBORO

ENERGY UTILITIES:

- FOREST GROVE LIGHT & POWER
- WESTERN OREGON ELECTRIC COOPERATIVE
- PORTLAND GENERAL ELECTRIC
- NW NATURAL

How do Washington County residents heat their homes?



Did you know?

Two natural gas pipelines, the South Mist Feeder Pipeline and South Mist Pipeline Extension, run through Washington County.

Portland General Electric is planning to open an "Electric Avenue" electric vehicle charging hub in Hillsboro. It will have two Level 2 and four DC Fast Charge stations.

KLAMATH COUNTY

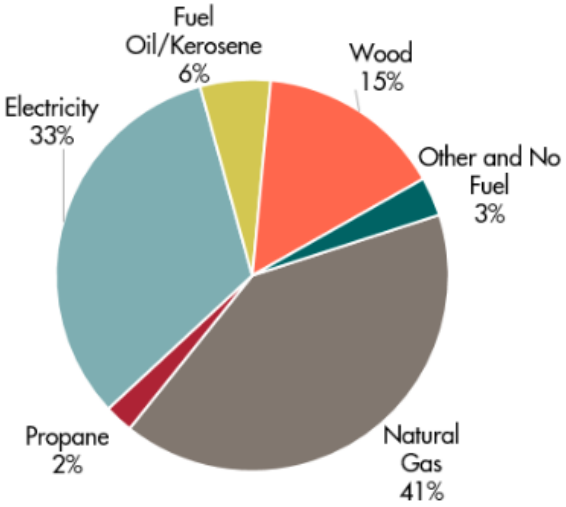
POPULATION: 66,935 (2017)

COUNTY SEAT: KLAMATH FALLS

ENERGY UTILITIES:

- MIDSTATE ELECTRIC COOPERATIVE
- PACIFIC POWER
- CASCADE NATURAL GAS
- AVISTA

How do Klamath County residents heat their homes?

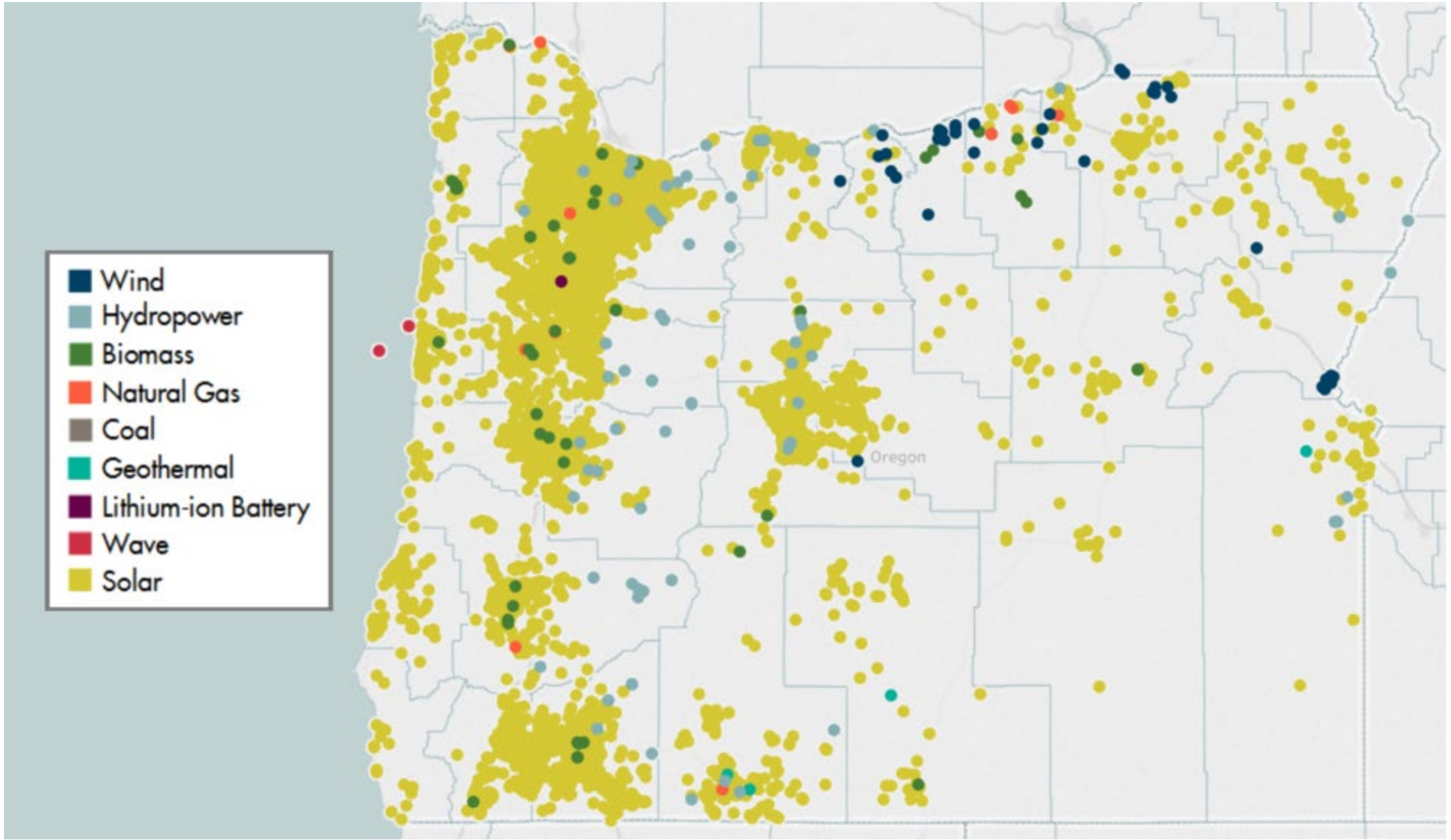


Did you know?

The Klamath Falls area is well-known for its geothermal heat resources. Buildings, outdoor swimming pools, and even sidewalks are toasty warm (and free of snow) year-round thanks to geothermal heat. Local university Oregon Tech is heated with geothermal energy beneath the campus — and the Geo-Heat Center on campus offers resources for others looking to capture earth's heat.

Klamath County is also home to a 525-megawatt cogeneration plant and a 95-megawatt natural gas plant, both owned by Avangrid Renewables.

Energy We Make



Oregon Electricity Generation

HYDROPOWER

- 8,865 MW of capacity
- 88 hydropower facilities — 80 in Oregon, 8 crossing state borders
- Smallest: .04 MW
- Largest: 2,160 MW
- 12 facilities over 100 MW
- Third highest installed capacity of hydropower in the U.S.

WIND

- 3,383 MW of capacity
- 44 operating facilities, 1 spans Oregon and Washington state line
- 2,147 MW of additional capacity proposed, approved, or under review
- Sites range from 1.6 to 300 MW
- 13 largest facilities make up 69% of total capacity
- 15 facilities, representing 590 MW, came online in 2009

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Oregon Electricity Generation

NATURAL GAS

- More than 4,066 MW of capacity
- 20 facilities produce electricity
- 45% of state's capacity comes from 3 facilities larger than 500 MW
- 3 state universities use on-site natural gas to generate their own power
- Oldest facility came on line in 1950, newest in 2016

COAL

- 601 MW of capacity
- 1 operating facility
- State authorization issued in 1975
- Boardman facility due to cease coal operations by December 31, 2020

OREGON DEPARTMENT OF ENERGY

Oregon Electricity Generation

SOLAR

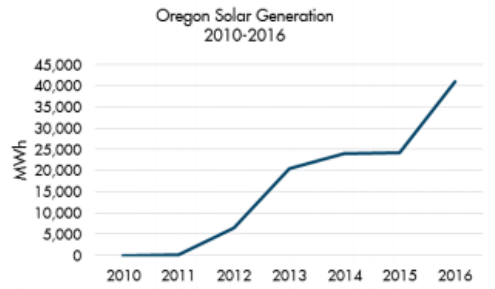
- 296 MW of capacity for projects 1 MW or larger
- More than 15,000 residential solar projects
- Median number of residential solar projects by county: 114
- First facility greater than 75 MW approved in 2018
- 685 MW of capacity proposed, approved, or under review

BIOGAS AND RENEWABLE NATURAL GAS

- 51.1 MW of capacity
- 25 operating facilities
- 10-20% of state's total yearly use of natural gas could be replaced by RNG if potential is realized

SOLAR
296 MW of capacity for projects 1 MW or larger
More than 15,000 residential solar projects
Median number of residential solar projects by county: 114
First facility greater than 75 MW approved in 2018
685 MW of capacity proposed, approved, or under review

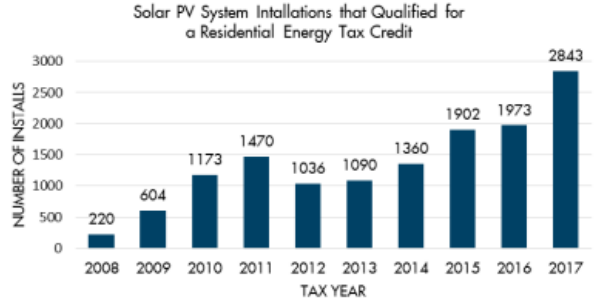
Solar photovoltaic systems make up a small percentage of electricity generation in the state — less than 1 percent. But our output has grown exponentially, and solar is growing at a faster rate than any other energy resource in the country.



The chart above shows solar generation from facilities over 1 MW through 2016. Oregon's output in 2017 and beyond has grown dramatically over this data, and future reporting will include solar rooftop and smaller commercial generating facilities.

Solar in Oregon

In 2017, solar was the third largest source of renewable energy in the United States after hydropower and wind power. In Oregon, total solar capacity at the end of 2017 also included 70 MW from more than 15,000 residential solar PV systems and more than 40 MW from commercial projects. The 56 MW Gala solar project in Prineville is located on over 300 acres of rangeland and is currently the largest solar project in the state. By comparison, California has installed solar capacity in excess of 20,000 MW.



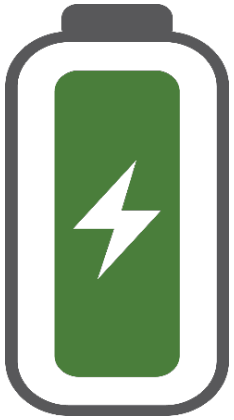
Residential solar projects are increasingly common. This chart shows installations per year under the state's residential energy tax credit program.

Solar is available on unshaded sites across the state, including individual customer sites such as residential or commercial rooftops. As a result, many solar PV projects in Oregon, as elsewhere, are located at customer sites and are commonly called "behind-the-meter" solar. Most of these projects are designed to serve on-site demand when the systems are generating and then to export excess to the grid. These type of solar projects are widely distributed across the state.

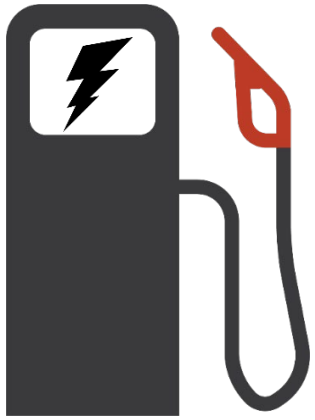
References: 1,2, 15, 19, 23, 30, 40, 41, 42

Emerging Industries

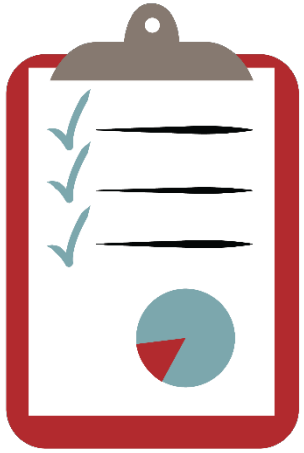
Wave Energy



Energy Storage



Transportation Electrification



Home Energy Scoring

Renewable Natural Gas

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Energy Jobs

Nearly 26,500 Oregonians work in the electric power generation, fuels, or transmission/distribution/storage fields.

- 6,000 in the solar industry
- 1,500 in hydroelectric generation
- Just under 1,300 in the wind industry

Nearly 42,000 Oregonians work in the energy efficiency sector.

- Around 25,000 in the construction industry
- Another 7,200 in manufacturing

More than 25,800 Oregonians work in the motor vehicles sector.

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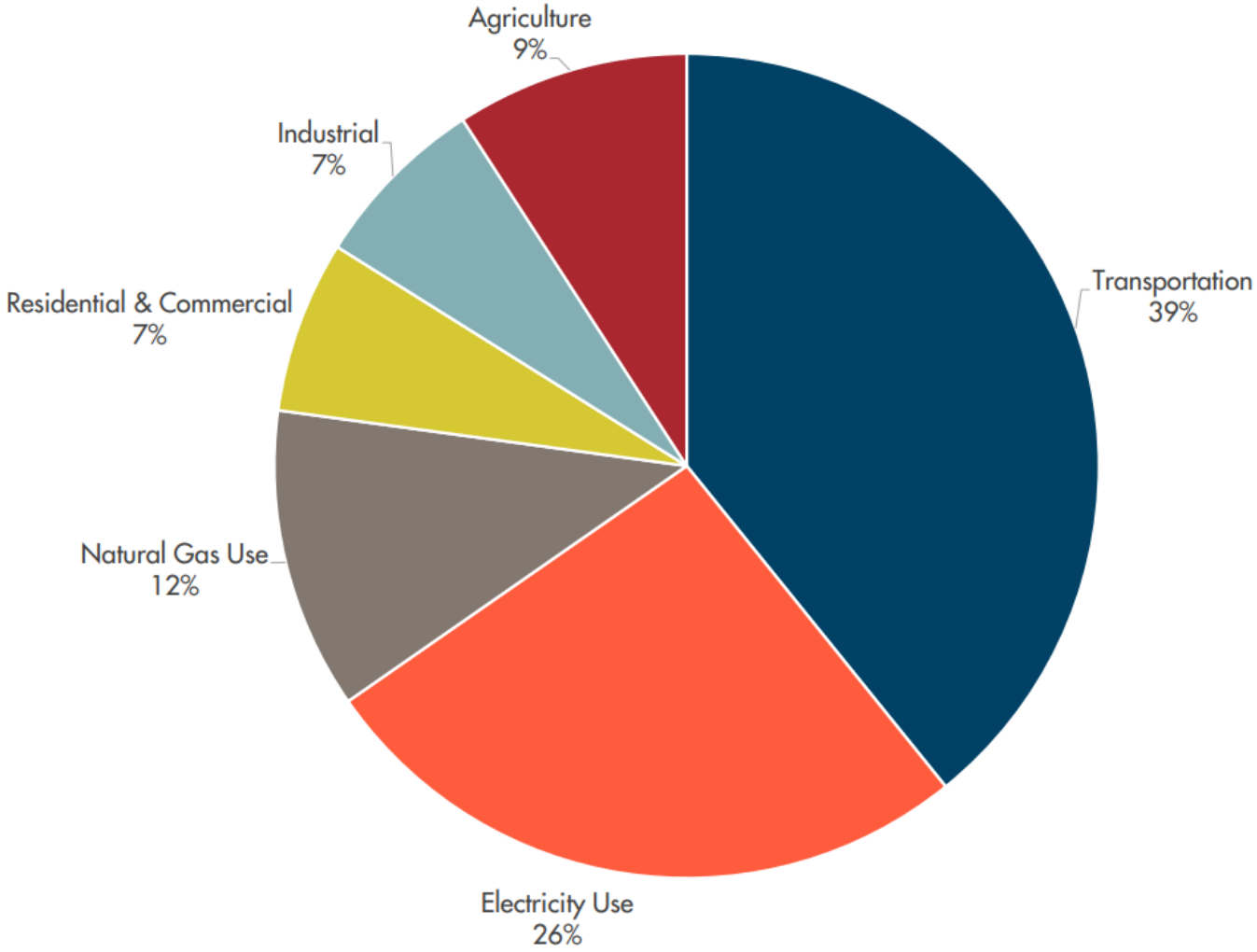
Chapter 2: Climate Change

- Reviews Oregon's greenhouse gas reduction goals, commitments, policies, and progress
- Discusses deep decarbonization pathways for Oregon
- Explains greenhouse gas emissions mitigation options and opportunities across Oregon's energy sectors



Oregon 2016 GHG Emissions

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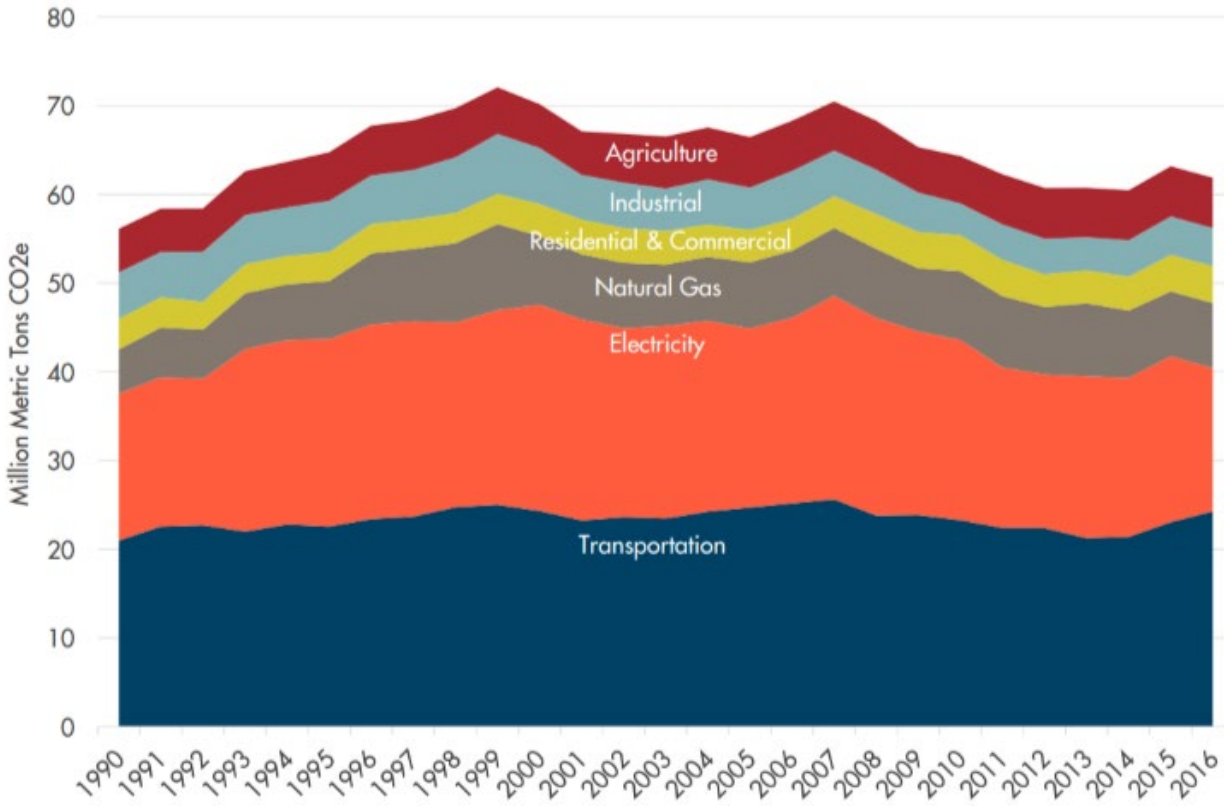
Understanding Emissions, Effects



Oregon Greenhouse Gas Emissions by Sector Over Time

EFFECTS OF CLIMATE CHANGE ON FIRST FOODS

Of paramount importance are "first foods," the traditional plant and animal species used for physical and spiritual sustenance over generations, to the Indigenous peoples across the United States. Beyond the nutrition they provide, first foods are central to traditional community practices, sacred ceremonies, physical and mental health, and subsistence and commercial economic activities.[50] In Oregon, these foods are gathered, harvested, and hunted in a variety of ecosystems that are projected to be affected by climate change.[56] This includes urban ecosystems, such as the city of Portland, which is home to the ninth largest urban Native American population in the country, including an estimated 58,000 or more people from more than 380 tribal nations.[57] The summary table[50,58,59,60] below highlights climate vulnerabilities of a number of first foods in Oregon, but is not comprehensive. Effects on fish and shellfish species of concern have been well-studied and documented, while more studies are needed on climate effects on berry, root, and game species.

Tribal Salmon Bake.
Photo: Oregon State University.

Types of First Foods in Oregon	Habitat Vulnerability to Climate Change
Fish, including salmon, steelhead, lamprey	Ocean and rivers (anadromous species spend time in both) affected by rising water temperatures and ocean acidification
Shellfish, including several types of clam (Gaper clam, Nuttall's Cockle, butter clam, razor clam)	Nearshore and coastal habitats affected by sea level rise, rising water temperatures, and ocean acidification.
Berries, including huckleberries and chokeberries	Potential drought, wildfire, invasive species, flooding effects on: subalpine slopes, forests, bogs, and lake basins; and low- and mid-elevation, typically riparian zones.
Roots, including Wapato, Camas, Couse or Kowsh (also known as biscuitroot)	Potential drought, wildfire, invasive species, flooding effects on: marshes and wetlands; prairies and grasslands; and open, rocky slopes and meadows.
Game, including elk and deer	Potential stress related to wildfire, drought, pests, and disease effects on forests

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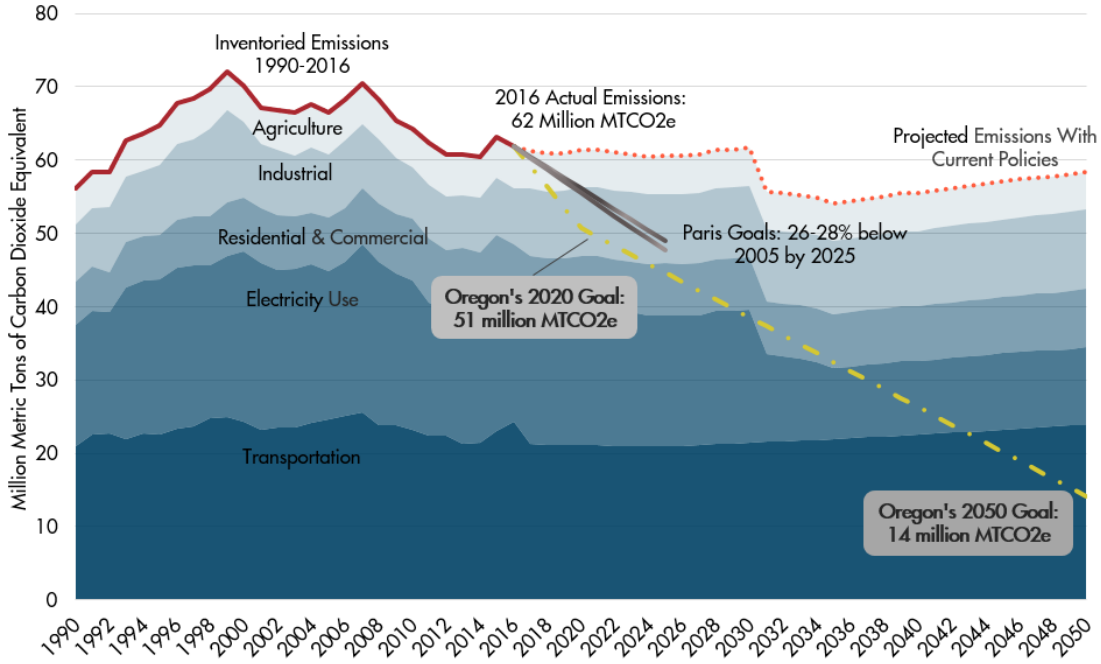
Comparing Policies and Goals

Table 2.1: Jurisdictions in Oregon Taking Climate Change Actions

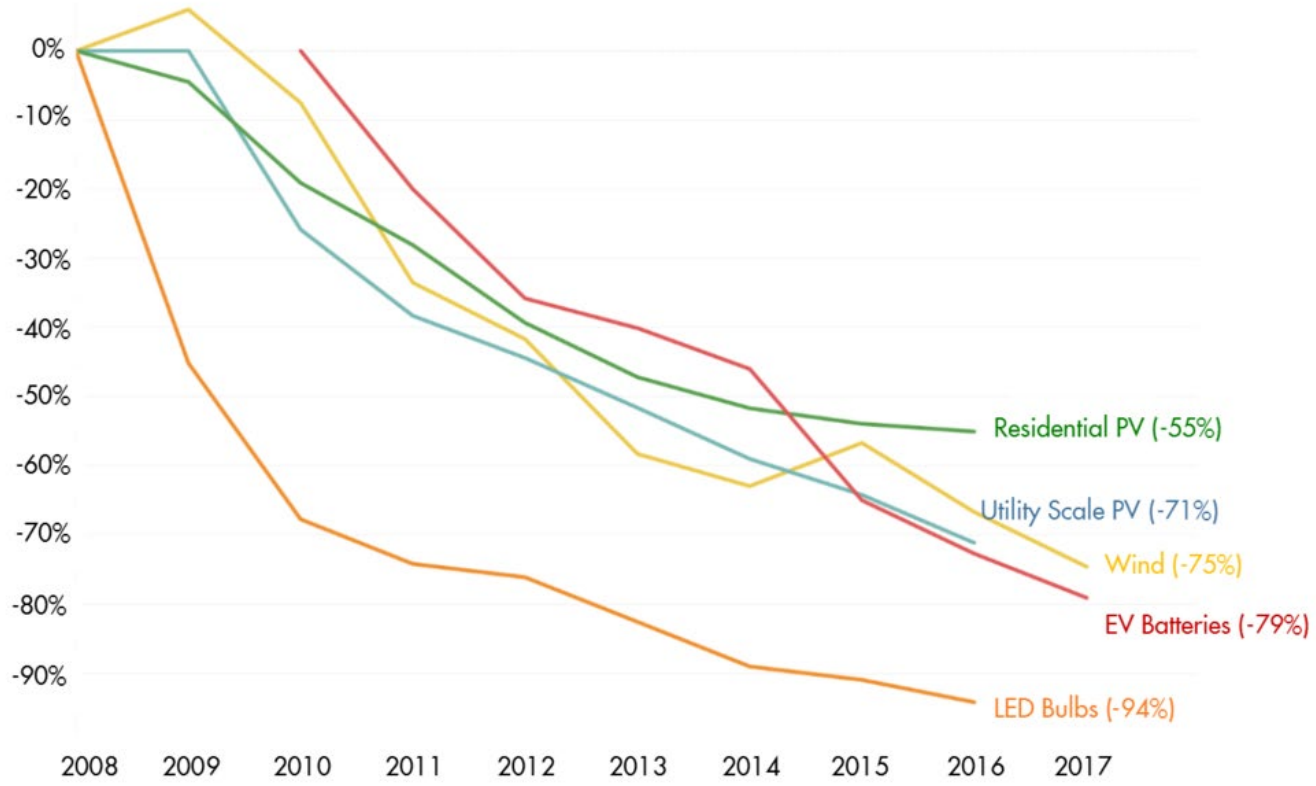
✓ = complete → = in progress	GHG Inventory	GHG Mitigation Goal	Climate Adaptation Goal	Focus Areas for GHG Mitigation: Renewable Energy	Transportation & Land Use	Buildings	Materials Management	Carbon Sequestration
Ashland	✓	✓	✓	✓	✓	✓	✓	
Beaverton	✓	Carbon neutral by 2050; 1.5°C goal	→	✓	✓	✓	✓	
Bend	✓	✓	→	→	→	→	→	
Clackamas County	✓	80% reduction by 2050		✓	✓	✓	✓	
Corvallis	✓	✓	✓	✓	✓	✓	✓	
Eugene	✓	Carbon budget for city residents consistent with 350 ppm in atmosphere by 2100, requiring an annual average emission reduction of 7.6%		✓	✓	✓	✓	
Forest Grove					✓	✓	✓	
Gresham	✓	→					✓	
Hillsboro	✓	✓		✓	✓	✓		
Hood River County	✓	Replace 30%, 50%, and 80% of fossil fuel power with renewable energy by 2030, 2040, and 2050 compared to 2016	✓	✓	✓			
Lake Oswego	✓		→	✓	✓	✓	✓	
Milwaukie	✓	Carbon neutral by 2050	✓	✓	✓	✓	✓	✓
Portland and Multnomah County	✓	80% reduction from 1990 levels by 2050	✓	✓	✓	✓	✓	✓
Salem	→	✓			✓	✓		
Washington County	✓			✓	✓	✓	✓	



Oregon's Projected GHG Emissions vs. Goals

Chapter 3: Renewable Energy

- Explains the growth of renewable energy capacity and consumption in Oregon
- Reviews policies, growing demand, and reductions in cost
- Discusses challenges and opportunities as Oregon integrates more variable renewable electricity onto the grid
- Provides a case study on solar energy



Cost Reductions in Clean Energy Technologies

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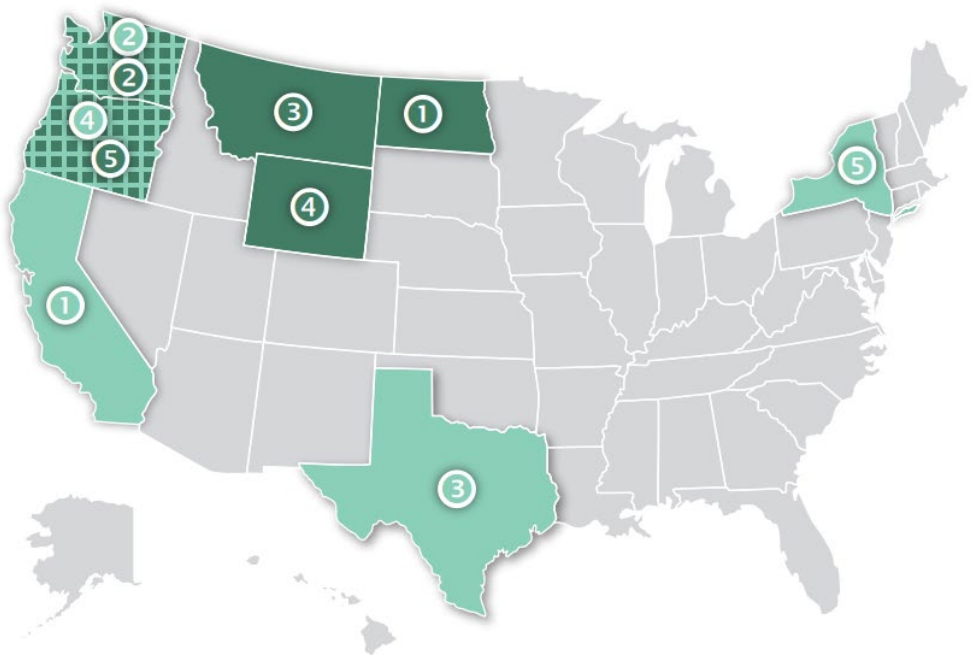
Renewable Energy Growth and Effects



Total Renewables
1 California
2 Washington
3 Texas
4 Oregon
5 New York

Per Capita Renewables
1 North Dakota
2 Washington
3 Montana
4 Wyoming
5 Oregon

Top States for Cumulative Renewable Electricity Installed Capacity for 2016

RENEWABLE ENERGY: COMMUNITY EFFECTS

The Economy

Like many places in Oregon, Sherman County is largely defined by its geography and weather. For decades, the county in north-central Oregon had its economic wagon tied to dryland wheat and barley, and cattle. When the rains came at the right time, times were good. But the rains didn't always come.

Much more dependable than rain on the Columbia Plateau is the wind, which regularly blows between the Cascade Mountains to the west and the rolling desert to the east. The wind industry noticed this about 20 years ago and came knocking on doors in Sherman, Gilliam, and Morrow counties. At the time, Sherman County was second-to-last in Oregon's per capita personal income. Since that time, a host of large and small wind farms have cropped up in Sherman; the big ones sited through the state (Biglow Canyon and Klondike III) and the smaller ones going through the county (Biglow I & II, Pa'Tu, Hay Canyon and Star Point).

Gary Thompson, Sherman County Judge for the past 18 years, saw it all coming and was convinced the nascent industry would help diversify the agriculture-dominated region. It did, and Thompson looks back with great pride at what the industry and County put together for the residents. "Since wind energy projects came to Sherman County, the County has received more than $25 million in property taxes, over $14 million in community service fees, and in excess of $57 million in Strategic Investment Program fees," he said.[49]

The taxes and fees have allowed the County to fund two dozen buildings or projects, including a new school and library, a Residential Incentive Program, two scholarships, fiber for 911 emergency services, a new weed district building, a courthouse addition and renovation, and the Rufus Industrial Park. The Residential Incentive Program awards $590 each year to the head of a household that has proven a year's residency. Since the program began in 2009, it has distributed $3.66 million.[49]

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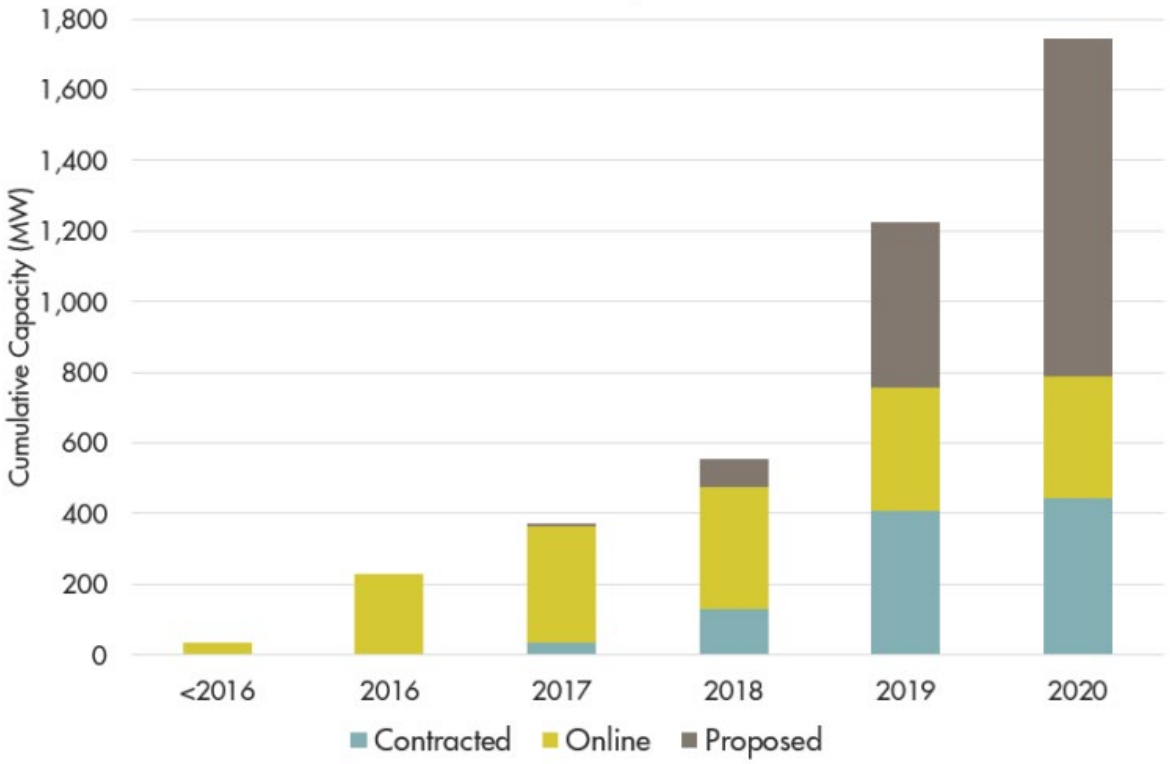
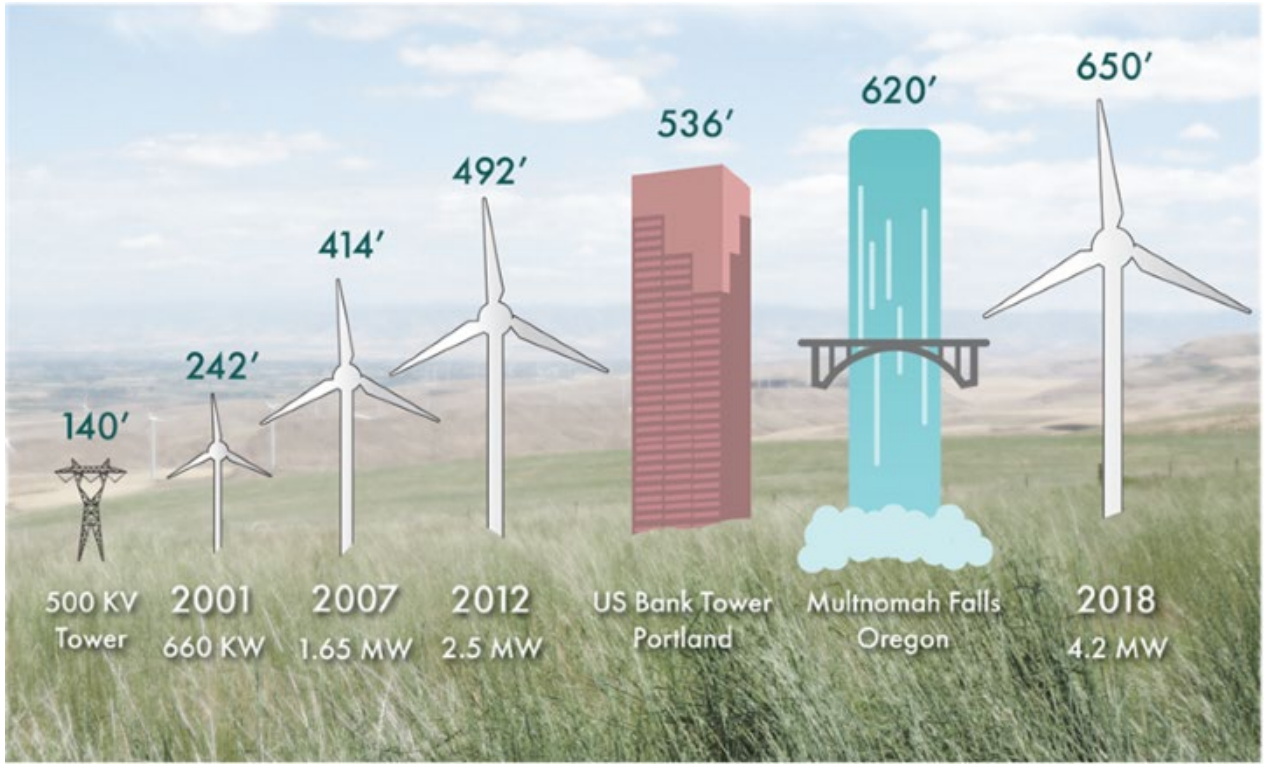
Industry is Changing in Real Time





Total Online, Contracted, and Proposed Utility-Scale Solar Capacity Reported by PGE, PacifiCorp, and Idaho Power

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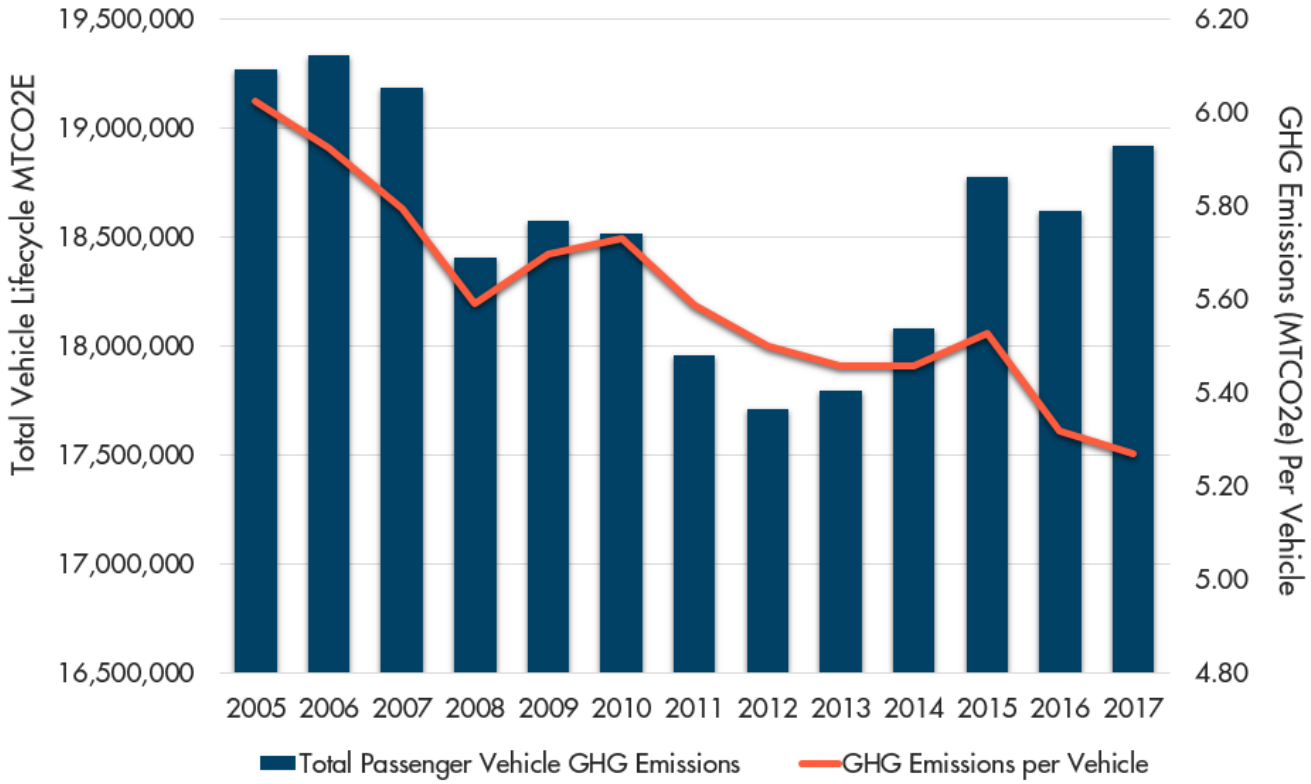
Chapter 4: Transportation

- Focuses on fuels used by and emissions from cars, trucks, and SUVs – which represent the bulk of Oregon's transportation-related fuel costs and sector greenhouse gas emissions
- Provides an overview of national and state trends, policies, and strategies to address Oregon's GHG reduction goals
- Outlines actions and trends that are encouraging electric vehicle adoption in Oregon



Total and Per Passenger Vehicle GHG Emissions

While overall on-road fuel consumption and emissions are on the rise in Oregon, per vehicle consumption and emissions are dropping.

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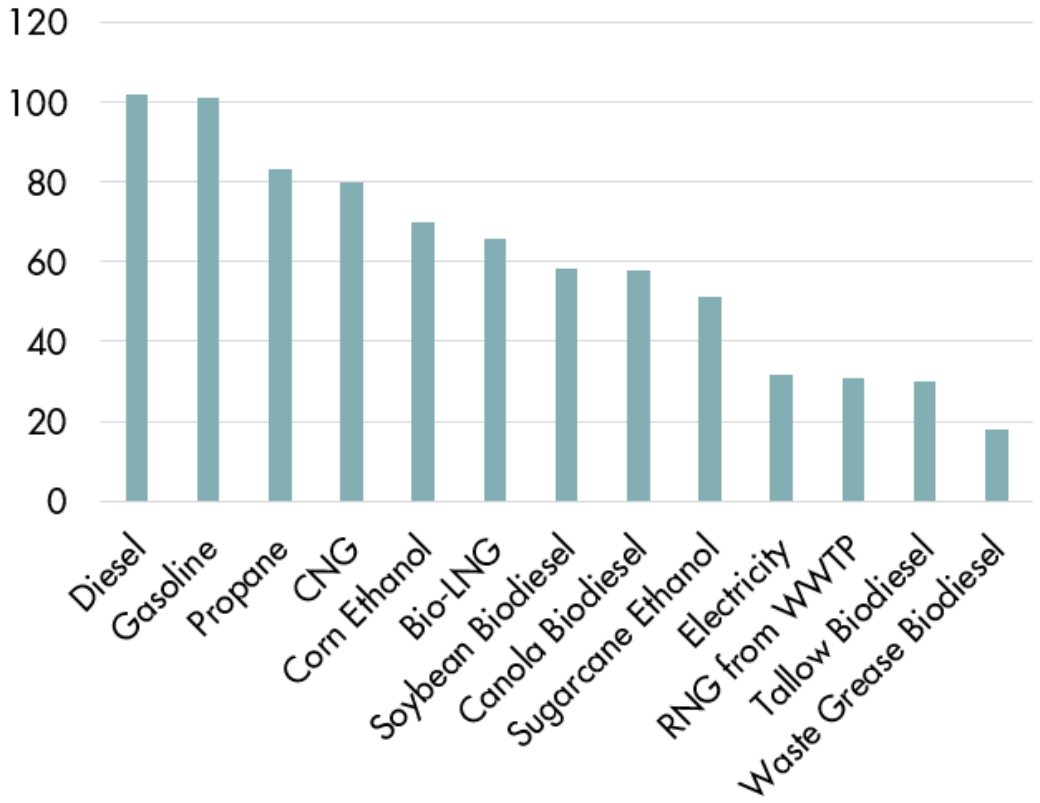
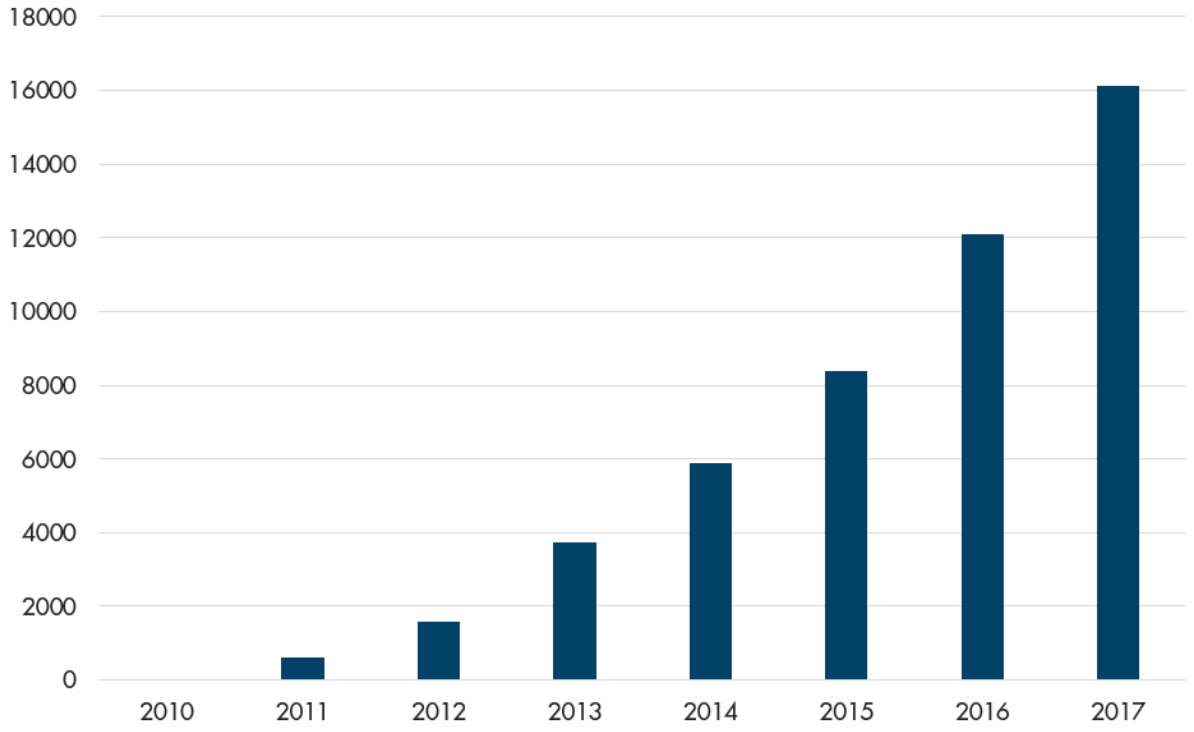
Transportation Fuels and Trends



Oregon Fuel Source Carbon Intensities



Cumulative Total Electric Vehicle Registrations in Oregon

25% Year-Over-Year Increase Since 2010

17,893 EVs registered in Oregon as of June 2018

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Chapter 5: Resilience

- Discusses how Oregon is working to prepare for extreme or disruptive events – including activities to improve the resilience of the energy sector
- Considers what more can be done, with a focus on community energy resilience
- Explains how and why energy resilience factors in to climate change discussions

HIGHLIGHTING TRIBAL ENERGY VULNERABILITIES

Fisheries management and hydropower generation are inextricably linked as both depend on the region's rivers and streams. Two Oregon tribes — the Confederated Tribes of Warm Springs and the Confederated Tribes of Umatilla Reservation — are founding members of the Columbia River Inter-Tribal Fish Commission, the mission of which is to "ensure a unified voice in the overall management of the fishery resources, and as managers, to protect reserved treaty rights through the exercise of the inherent sovereign powers of the tribes."[36] Climate change is a priority area for the Commission, with a focus on efforts "to prepare for the coming changes, including helping salmon in an altered climate with habitat projects designed to cool down tributaries and exploring alternative hydrosystem operations."[36] As described more in Chapter 2, tribes are uniquely vulnerable to climate change effects on water and fisheries resources that have religious, spiritual, and cultural significance and sustain tribal subsistence and commercial economies.[37]

Pelton Round Butte Hydroelectric Dam
Photo by U.S. Forest Service

Some Oregon tribes will also be affected by climate impacts to federal and non-federal hydropower.[32] For example, the Confederated Tribes of Warm Springs has joint ownership with Portland General Electric of the Pelton Round Butte hydroelectric project.[38] The Umpqua Indian Utility Cooperative is the first utility in the Northwest both owned and operated by a tribe, the Cow Creek Band of Umpqua Indians; it distributes solely BPA power to its customers. Climate change vulnerabilities facing the Federal Columbia River Power System will also affect UIUC and any other Oregon utilities that rely on BPA power to serve tribal customers. Additional research in partnership with tribes would be needed to comprehensively identify and evaluate energy system vulnerabilities of relevance to Oregon's tribes.

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Resources and Opportunities

Central Lincoln People's Utility District's New Operations Center

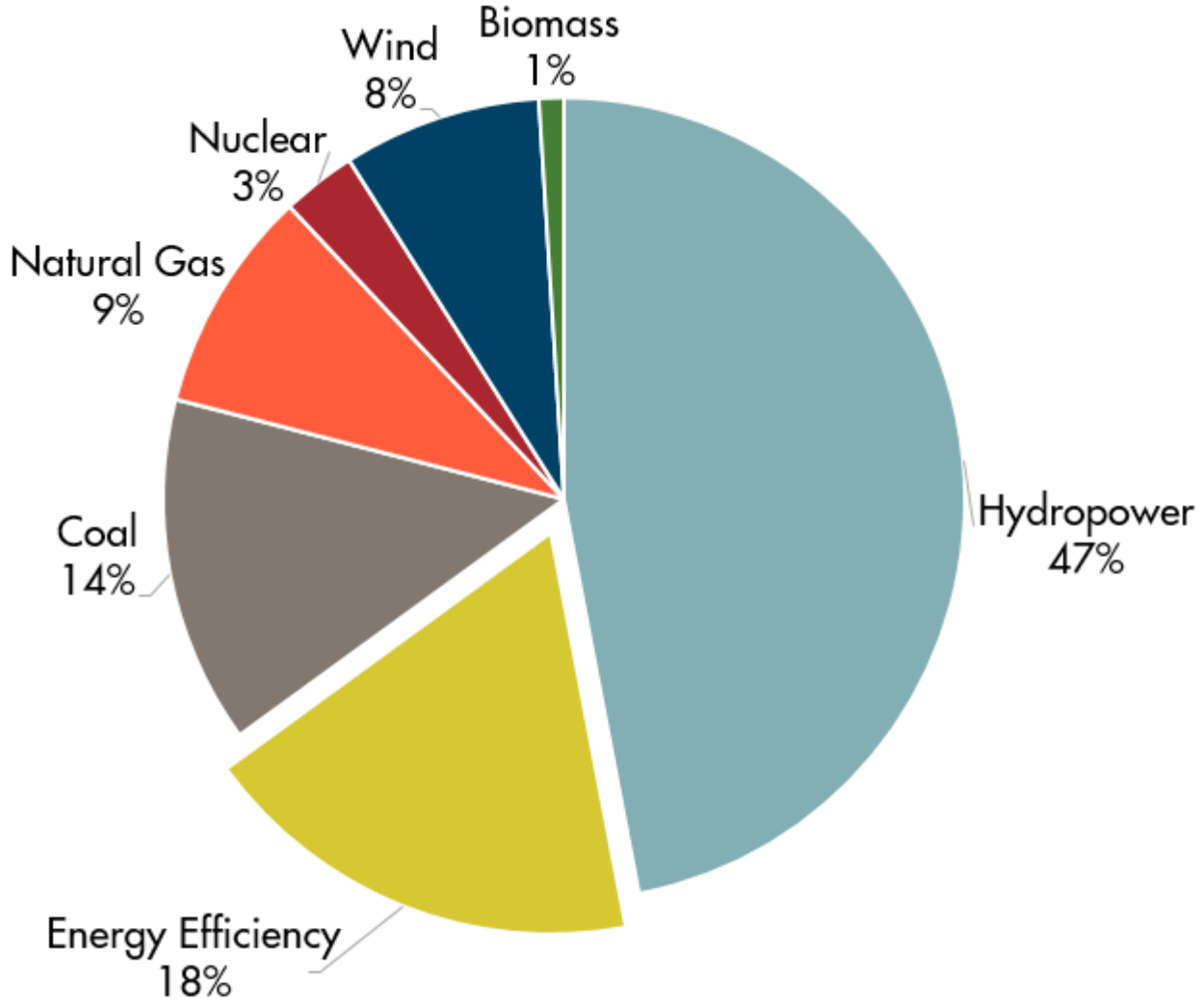
MICROGRIDS

A microgrid is "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode."[26]

- **Size and Location.** A microgrid can range in size from a single home or building to an entire campus or even a city. The larger the size, the more complicated and expensive it is to design, build, and control.
- **Energy Efficiency.** The first step in designing a microgrid is to evaluate ways to reduce energy demand for the microgrid by improving energy efficiency.
- **Isolate Critical Loads.** All system loads should be evaluated to identify and isolate only those that are critical. For example, providing power from a microgrid to a building's heating system may be considered critical, while powering the cooling system may not be.
- **Technology Selection.** A microgrid can include virtually any type of energy technology. Additional efficiencies can be achieved through combining technologies. This might include, for example, supplementing an existing diesel generator with a solar plus storage system that can enable the microgrid to utilize its on-site liquid fuel supplies for a longer period of time, and to operate during some hours without the generator at all.
- **Control Equipment.** The key distinguishing characteristic of any microgrid involves its ability to disconnect or "island" itself from the larger electric grid. Advanced control equipment can automatically island the system from the grid and optimize the use of DERs within the microgrid.

Chapter 6: Energy Efficiency

- Discusses energy efficiency – the second largest resource in the Northwest – as a cornerstone of Oregon energy policy
- Explains policies that promote energy efficiency, efficiency through programs and incentives, how Oregon is performing
- Looks at what actions Oregon can take to achieve further energy efficiency



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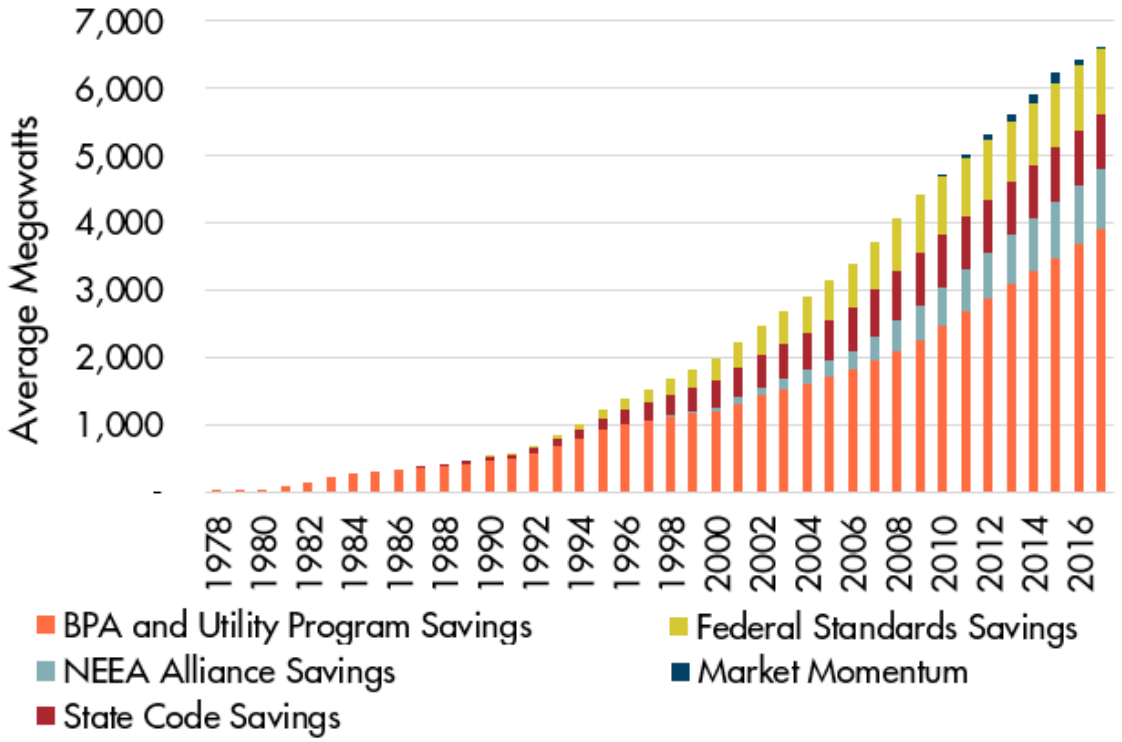
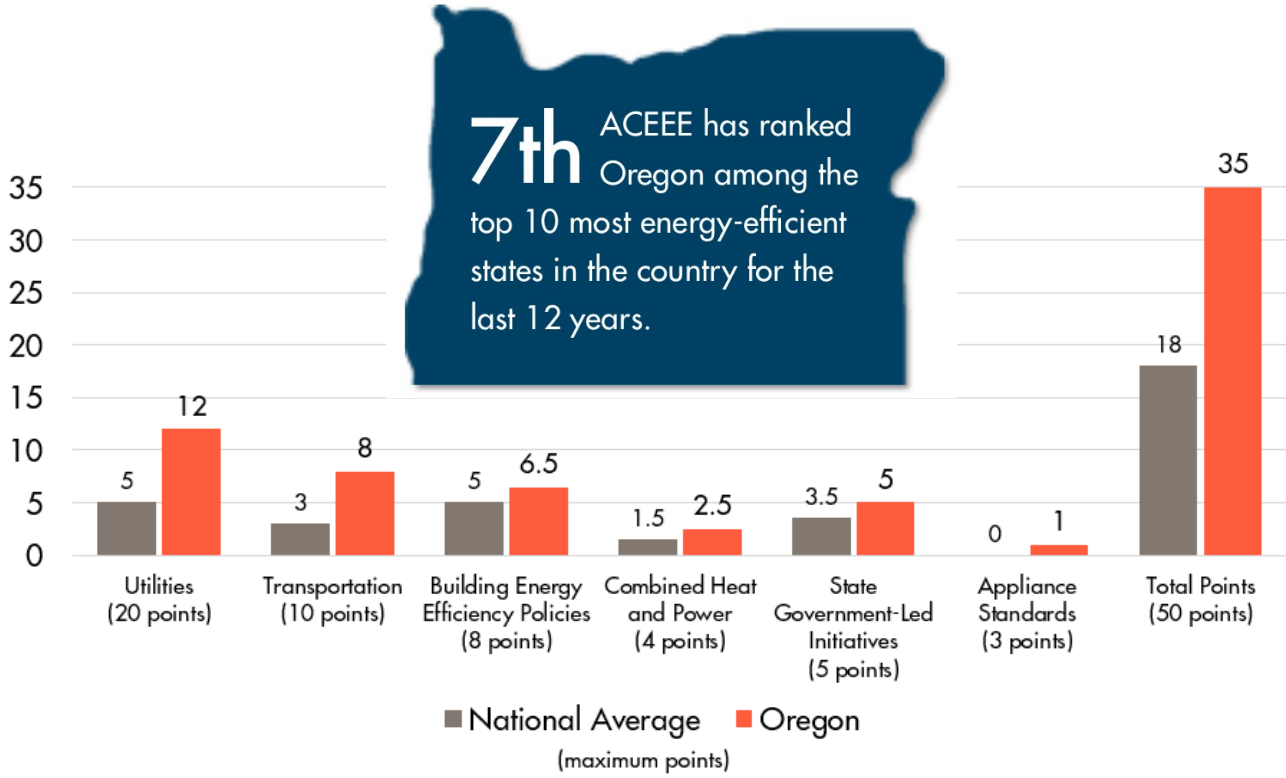
Oregon's Leadership in Energy Efficiency



Cumulative Regional Savings
from Energy Efficiency



American Council for an Energy Efficient Economy
Energy Scorecard Results: Oregon vs. National Average

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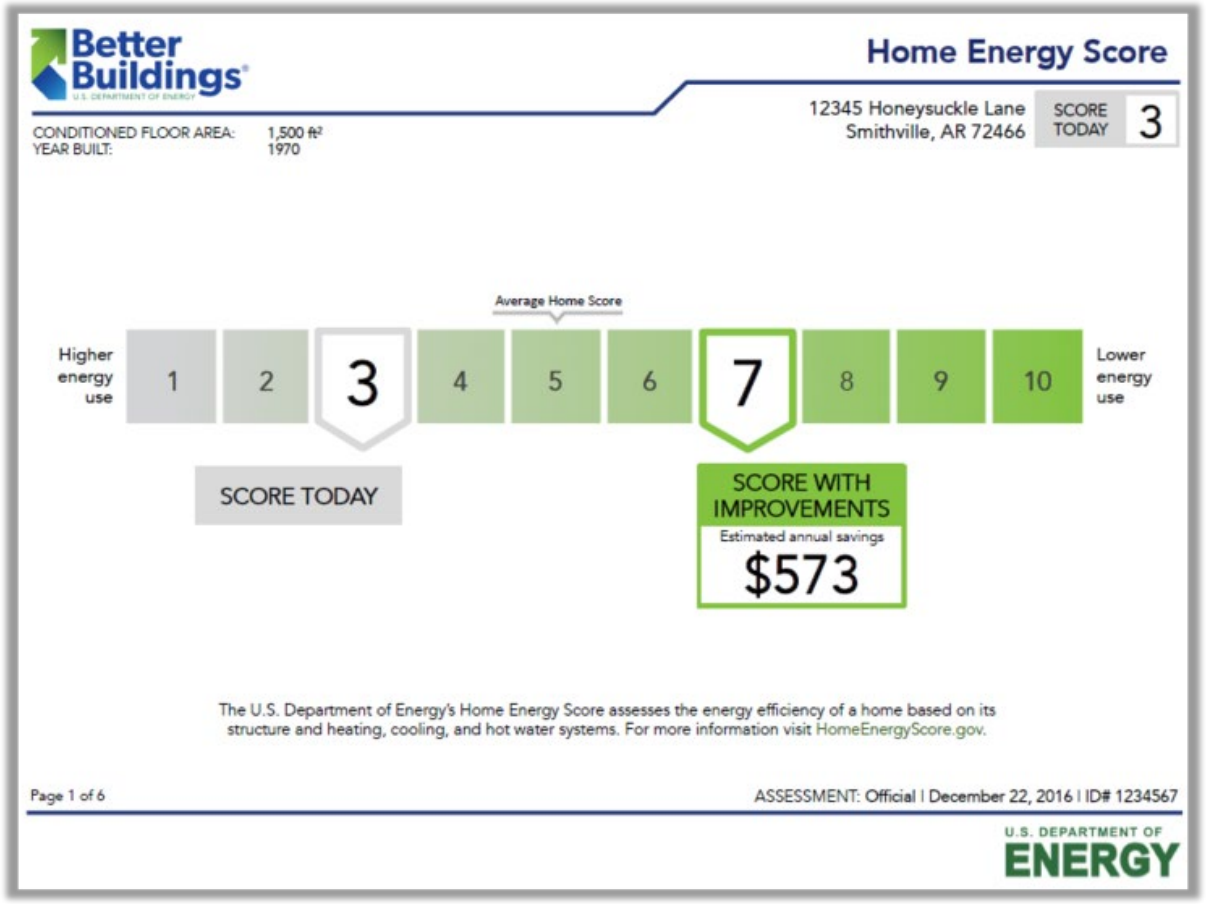
Efficiency in Homes, Businesses, Public Buildings



Better Buildings
U.S. DEPARTMENT OF ENERGY

Home Energy Score

12345 Honeysuckle Lane
Smithville, AR 72466

SCORE TODAY 3

CONDITIONED FLOOR AREA: 1,500 ft²
YEAR BUILT: 1970

Average Home Score

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

SCORE TODAY

SCORE WITH IMPROVEMENTS
Estimated annual savings
$573

The U.S. Department of Energy's Home Energy Score assesses the energy efficiency of a home based on its structure and heating, cooling, and hot water systems. For more information visit HomeEnergyScore.gov.

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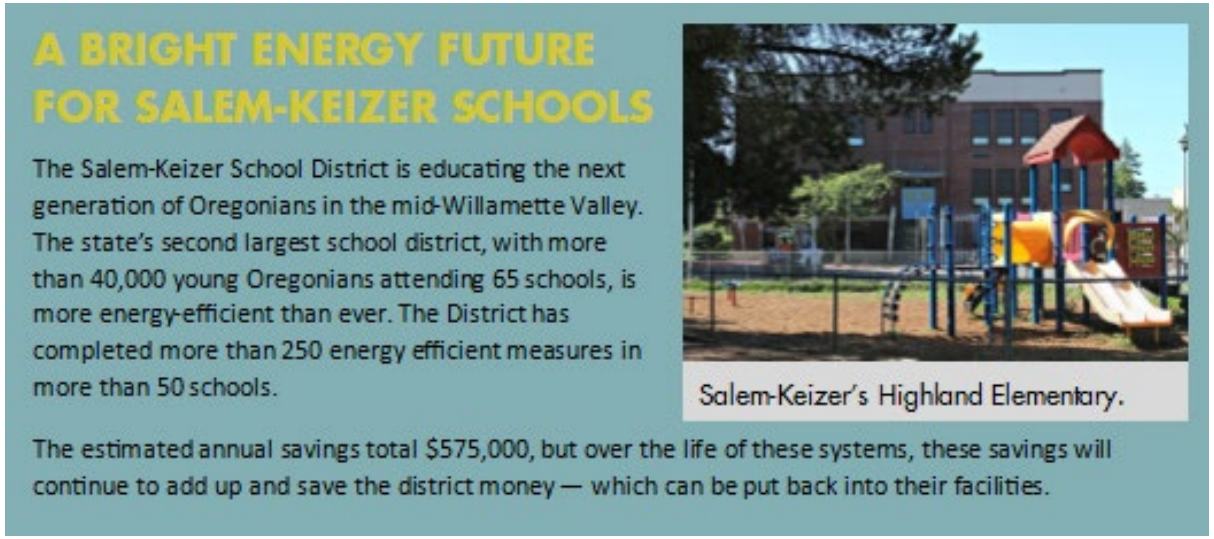
ASSESSMENT: Official | December 22, 2016 | ID# 1234567

U.S. DEPARTMENT OF ENERGY

Home Energy Scorecard



A BRIGHT ENERGY FUTURE FOR SALEM-KEIZER SCHOOLS

The Salem-Keizer School District is educating the next generation of Oregonians in the mid-Willamette Valley. The state's second largest school district, with more than 40,000 young Oregonians attending 65 schools, is more energy-efficient than ever. The District has completed more than 250 energy efficient measures in more than 50 schools.

Salem-Keizer's Highland Elementary.

The estimated annual savings total $575,000, but over the life of these systems, these savings will continue to add up and save the district money — which can be put back into their facilities.

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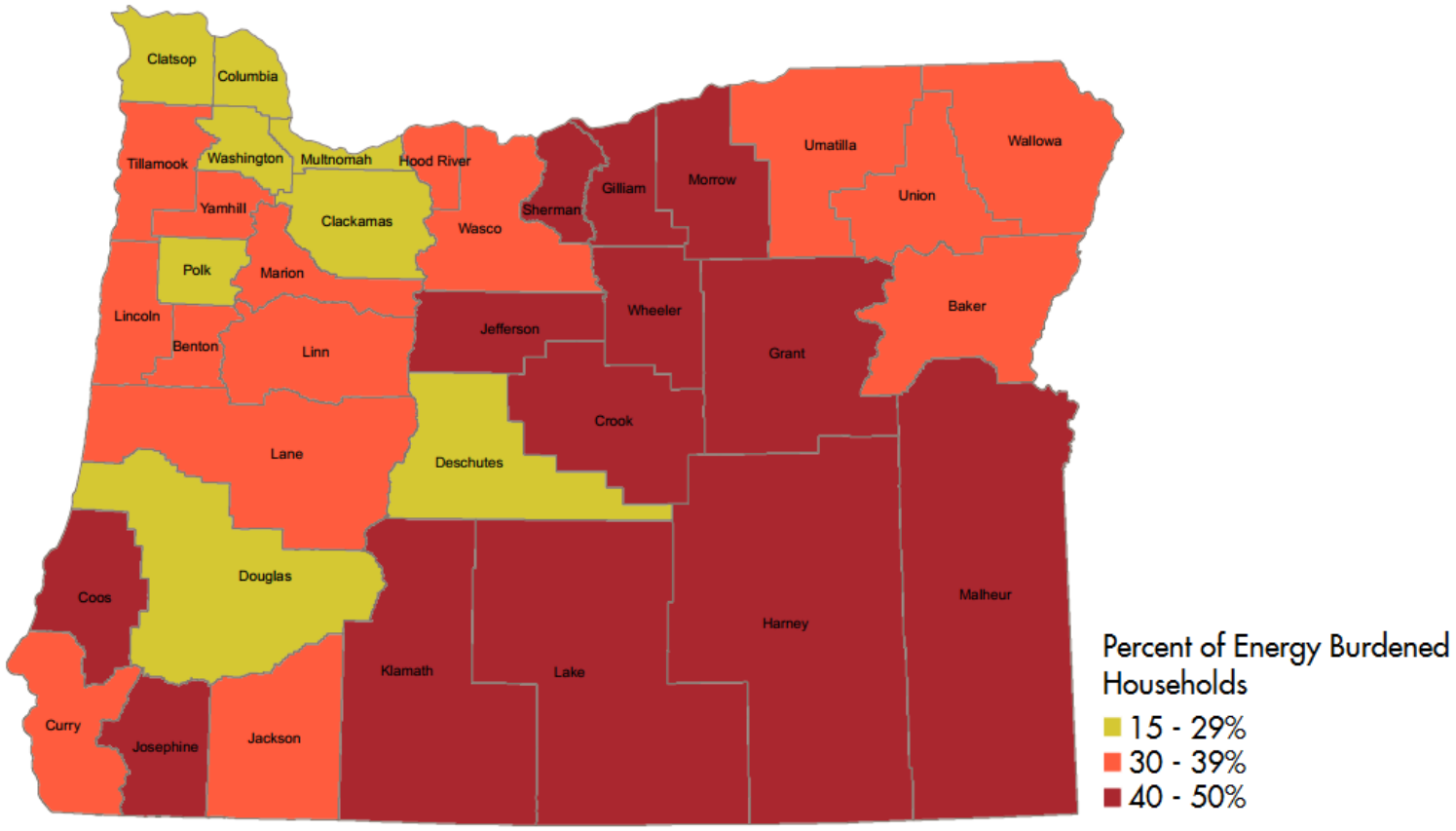
Chapter 7: Protecting Consumers

- Explores energy burden, consumer protection, and equity
- Notes the effects of and uncertainties from a rapidly changing energy sector and trends such as access to new technologies
- Discusses increasing interest in and need for securing more equitable outcomes for all Oregonians



Percentage of Oregon Households Considered Energy Burdened and Earning 200 Percent or Below Federal Poverty Level

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Assistance and Equity

- Almost 400 energy assistance programs serve Oregon
- In 2018, federal funds totaled nearly $40 million for weatherization and bill assistance
- ODOE works with partners like OHCS and OPUC to better understand Oregonians' weatherization and energy assistance needs

Equity and Energy: Does the process through which energy-related decisions are made include intentional engagement with all potentially affected communities? Is there a comprehensive analysis of potential impacts?

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Chapter 8: Recommendations

- Data Gaps
  - Increase collaboration, add state-specific data, build capacity and new relationships
- Addressing Equity and Energy Burden
  - Improve data, improve policy design, increase engagement
- Planning for the Future
  - Evaluative cost-effectiveness, regional energy systems, community preparedness; encourage local efforts, improve collaboration
- Assessing the Need for State Engagement and Investment
  - Support local activities, address market failures and valuation of benefits

Renewable Natural Gas

In September, ODOE released an inventory of all potential sources of biogas and renewable natural gas (RNG) available in Oregon. The report found that the gross technical potential for RNG production from anaerobic digestion and thermal gasification technology combined could replace up to 20 percent of Oregon's total yearly use of natural gas. Working with a stakeholder advisory committee, ODOE also identified financial, technical, market, policy, and regulatory barriers to developing and using biogas and RNG as an energy source that can help Oregon reduce greenhouse gas emissions and improve air quality. One of the recommendations included in the report was to explore financial incentives to help drive the nascent industry forward.

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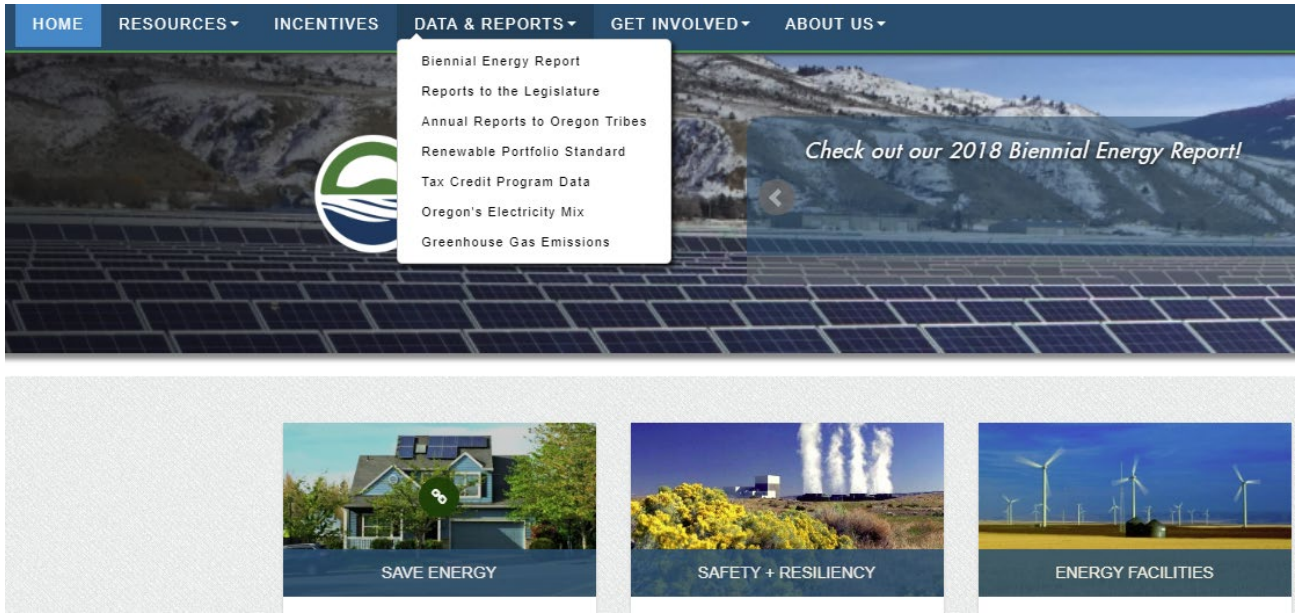
Find the Biennial Energy Report Online



Oregon.gov/ENERGY

https://energyinfo.oregon.gov/ber

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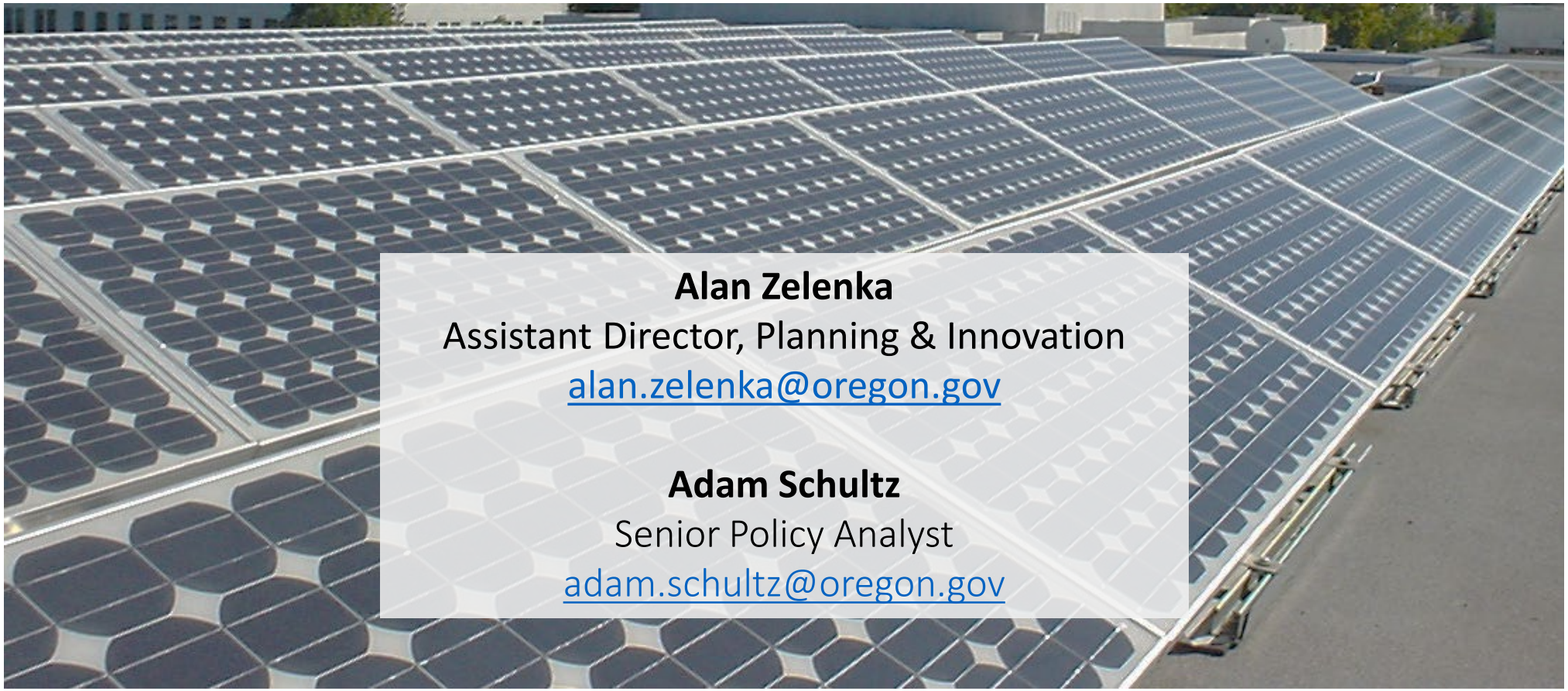
Thank you!



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