



OREGON
DEPARTMENT OF
ENERGY

Clean Energy Standards

Senate Interim Committee on
Environment & Natural Resources

Director Janine Benner
with Rebecca Smith, Senior Policy Analyst
December 7, 2020



OREGON DEPARTMENT OF ENERGY

Leading Oregon to a safe, equitable, clean, and sustainable energy future.

Our Mission

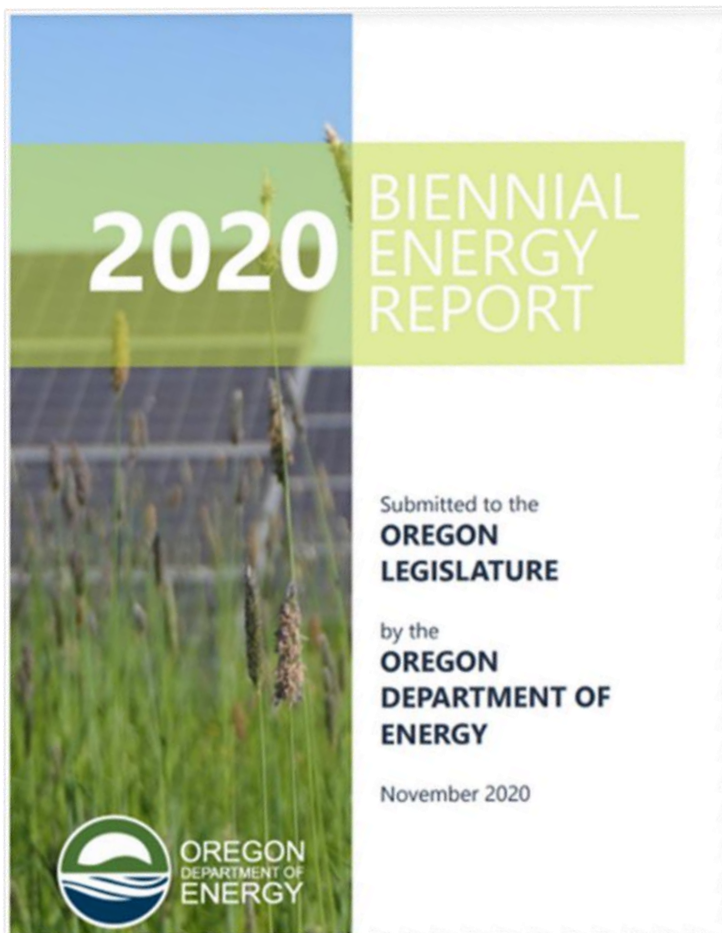
The Oregon Department of Energy helps Oregonians make informed decisions and maintain a resilient and affordable energy system. We advance solutions to shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations.

What We Do

On behalf of Oregonians across the state, the Oregon Department of Energy achieves its mission by providing:

- A Central Repository of Energy Data, Information, and Analysis
- A Venue for Problem-Solving Oregon's Energy Challenges
- Energy Education and Technical Assistance
- Regulation and Oversight
- Energy Programs and Activities

2020 BIENNIAL ENERGY REPORT



<https://energyinfo.oregon.gov/ber>

Energy 101: Energy Jobs in Oregon

In 2019, Oregon's energy industry employed 96,727 Oregonians.¹

Figure 1: Energy Jobs in Oregon (2019)

Category	Jobs
Electric Power Generation	10,053
Fuels	3,662
Transmission, Distribution, and Storage	13,948
Energy Efficiency	42,935
Motor Vehicles	26,129

The 2020 U.S. Energy and Employment Report, issued by Energy Officials and Energy Futures Initiative, categorizes energy jobs into the following groups: **traditional energy, energy efficiency, and energy services.**

Traditional Energy Jobs

Electric Power Generation | Fuels | Transmission

Oregon Traditional Energy Jobs

In 2019, about 6.8 million U.S. jobs (4.6 percent of total U.S. jobs) were in energy efficiency sectors. Before the COVID-19 pandemic, the U.S. projected 4.8 percent job growth in 2019, driven by strong employment growth in 2018 (3.2 percent) and wind generation (3.2 percent), the fastest growing sector in Oregon, about 1.4 percent of the state's employment.

Electric Power Generation

The 2020 U.S. Energy and Employment Report defines "all utility and non-utility employment across electric, nuclear, and renewable energy technologies. Also included are jobs in facility construction, turbine and other equipment maintenance, and wholesale parts distribution."

2020 Biennial Energy Report

Resource Review: Wind Power

- Total MW Capacity in Oregon: 3,415 MW
- Facilities in Oregon (1.65 to 290 MW): 46 (3 under construction)
- Total Generation (2018): 7,447,442 MWh
- Total Consumption (2018): 2,396,878 MWh
- Total Exports (2018): 5,050,564 MWh

Wind turbine blades capture the wind's motion and transform that mechanical energy into electricity.¹ The average individual utility-scale wind turbine in Oregon has a capacity of 2.5 MW.² While wind turbines coast where the wind is constant,³ they generate electricity where the wind is strong and consistent. In Oregon, wind turbines are used in the mountains and in the coastal areas. Wind turbines are used in the mountains and in the coastal areas. Wind turbines are used in the mountains and in the coastal areas.

Figure 1: Horizontal-axis Wind Turbine

Wind farms and four state jurisdictional facilities under construction. Oregon is ninth nationally in terms of overall wind capacity. The Western Electricity Coordinating Council, a regional power grid, is planning large, utility-scale projects.

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Energy 101: Bill Basics

Energy is part of everyone's household budget. Lighting, heating, cooling, cooking, and refrigeration all require energy in the forms of electricity and direct use fuels like natural gas, propane, fuel oil, and even wood. Water and wastewater have a big energy component because of the energy needed to obtain, distribute, and treat water. Transportation has an energy bill too, every time you buy gasoline or plug in your electric car. Telecommunications, from internet to TV to cell phones, all require electricity to operate and provide the services used a part of our daily lives.¹

This section looks at Oregonians' typical main energy costs: electricity, natural gas, and transportation.

Energy Bill Basics

The key to deciphering charges on an energy bill is understanding the terminology used to describe each charge. Following are some general energy terms and types of charges that apply to most energy bills:

Meter. Meters measure how much energy is consumed. Some electric utilities are updating their meters to "smart meters," which help track when energy is used in addition to how much.

Rate Schedule. Rates vary between residential, commercial, and industrial customers, based on the type of service and the maximum demand. More than one rate can be used for the energy a building or facility uses. Schedules can be created for specific uses, like traffic signals, streetlights, irrigation and drainage pumping, or for time-of-day service or special pilot programs like demand response.

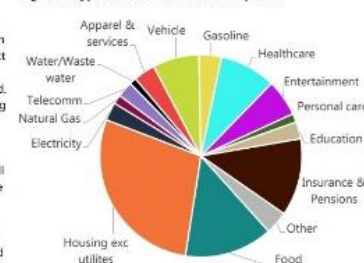
Every Utility Bill has certain things in common:

Basic Charge or Service Charge. A minimum cost of service, regardless of the amount of energy used. This funds some of the utility provider's costs like maintenance and customer support.

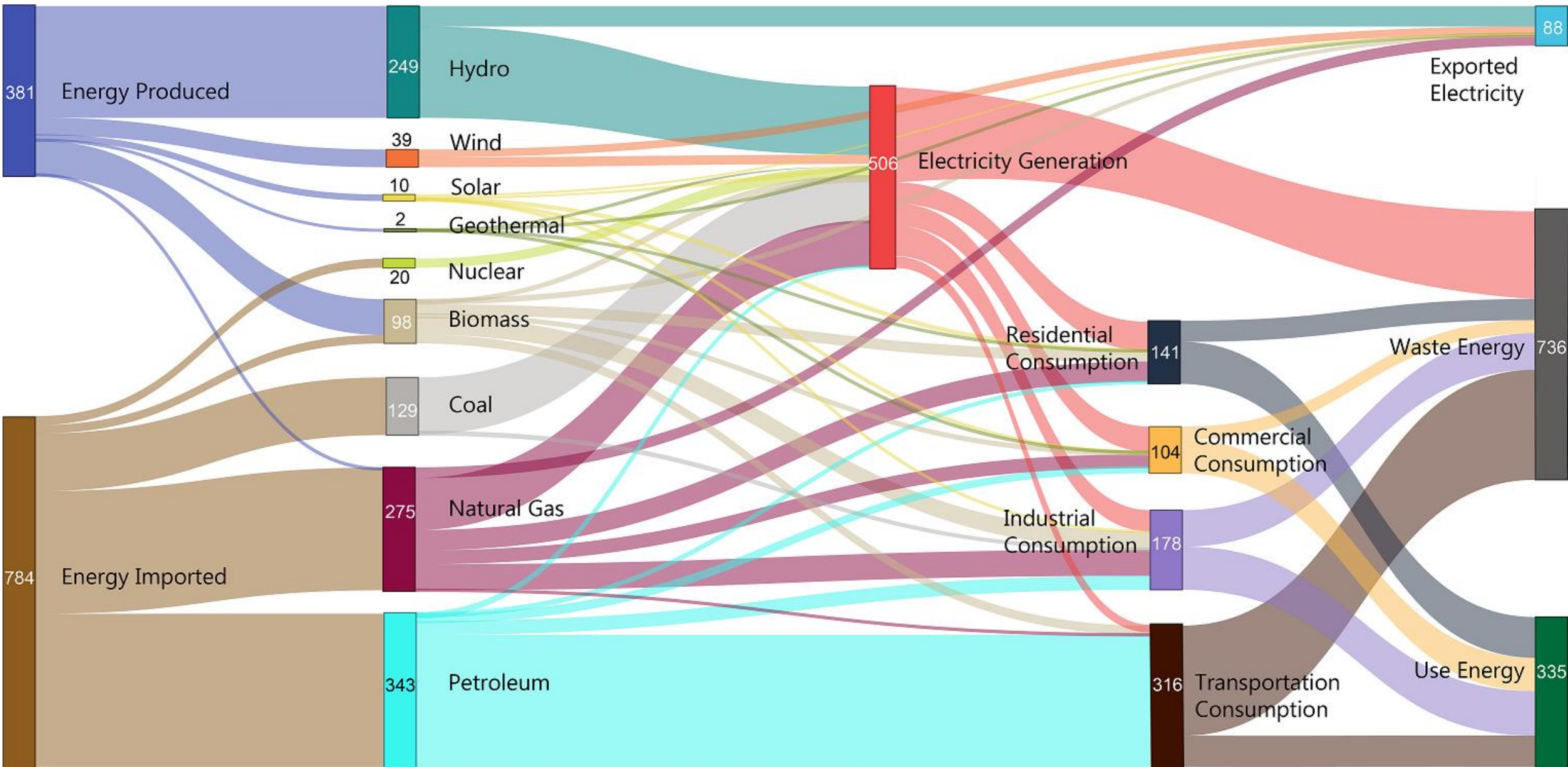
Use Charge. Utilities charge by how much energy is used, measured in kilowatt hours for electricity, and therms for natural gas. There are additional types of use charges that are explained later in this section.

2020 Biennial Energy Report

Figure 1: Typical Share of Household Expenses

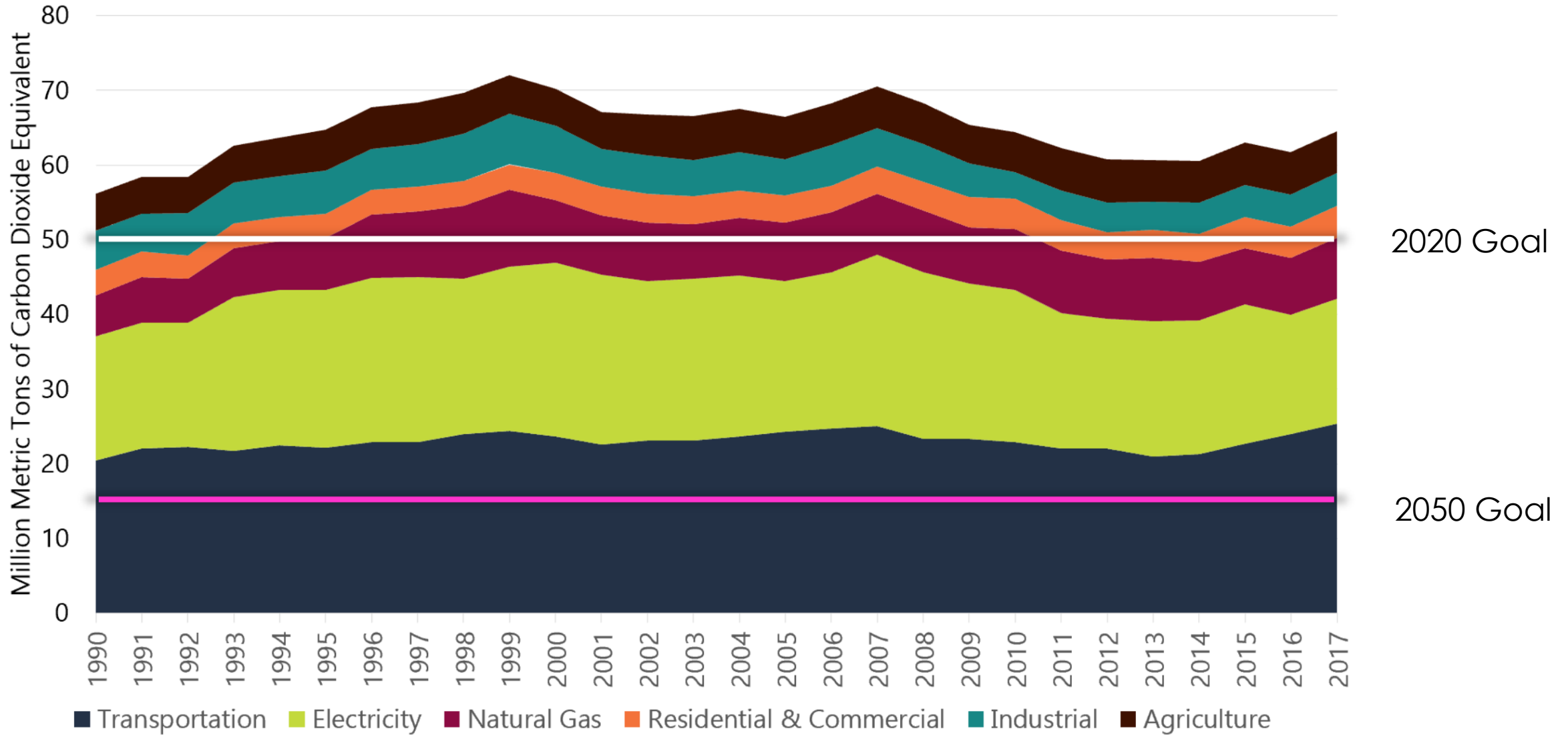


Oregon's Energy Flow



Numbers are in trillions of British thermal units (Btus)

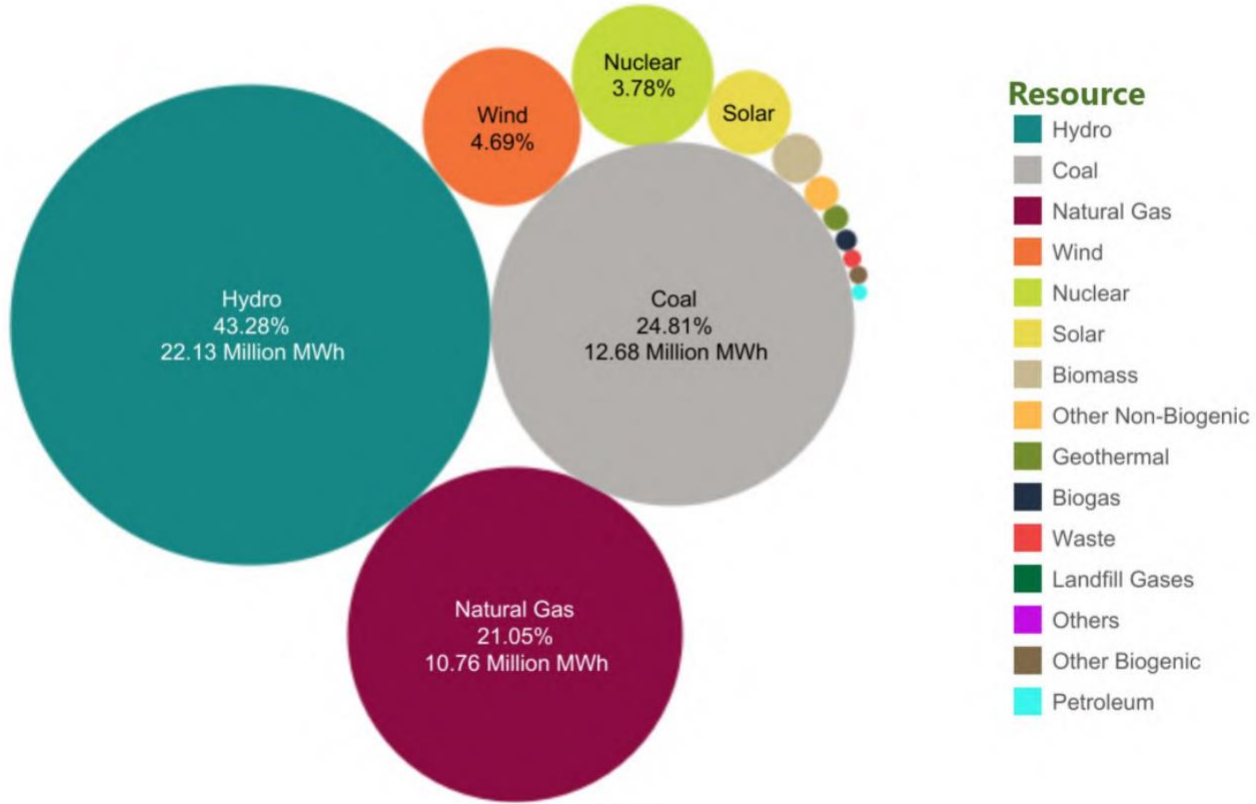
Oregon Greenhouse Gas Emissions by Source Over Time



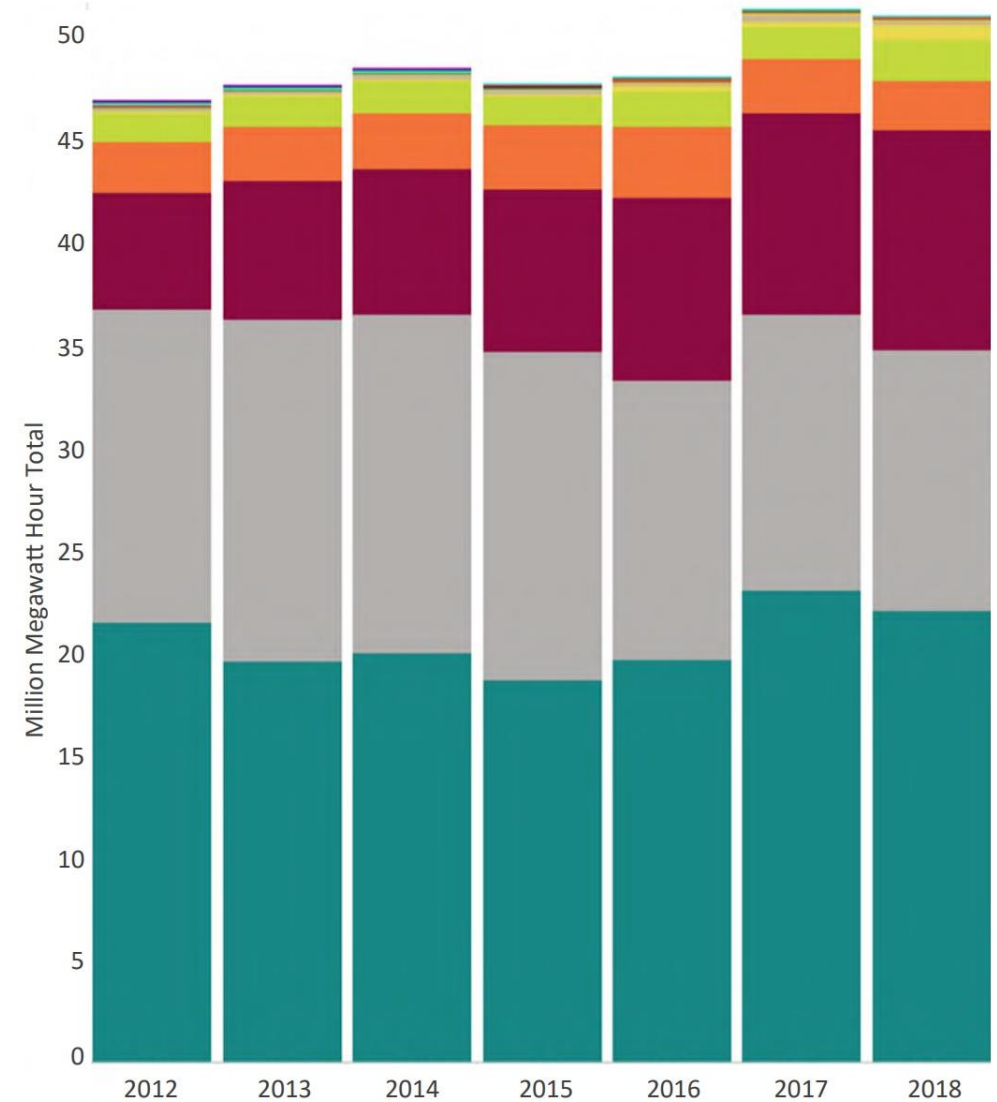
Source: DEQ Oregon Greenhouse Gas Sector-Based Inventory

Resources Used to Generate Oregon's Electricity

Based on 2018 data, this chart shows the energy resources used to generate the electricity that is sold to Oregon's utility customers.



Oregon's Electricity Mix Over Time



WHAT ARE ENERGY STANDARDS?

Market-based policies requiring **retail electricity suppliers** to procure a minimum amount of energy they sell from eligible resources.

Objectives

What are the objectives of the policy?

Targets

What proportion of renewable or clean energy is required and over what time-period?

Eligible
Resources

What resources will be included as eligible?

Regulated
Entities

What entities will the policy cover?

RENEWABLE PORTFOLIO STANDARDS

Objectives

Increase deployment of **new** renewable resources.

Targets

Proportion of electricity supplied by renewable resources. Range from 10% to 100%.

Eligible Resources

Renewable resources: solar, wind, geothermal and others; some states also include biomass resources; legacy hydro often excluded.

Regulated Entities

Large electric utilities and sometimes small utilities and other electricity service providers.

CLEAN ENERGY STANDARDS

Objectives

Increase use of low- or zero-emissions resources to meet carbon reduction goals.

Targets

Proportion of electricity supplied by clean resources. A trend in clean energy policies is to target 100% clean electricity.

Eligible Resources

Clean energy resources: renewable resources; can also include other low- or zero-emitting resources like legacy hydropower, nuclear, and fossil fuel with carbon capture and sequestration.

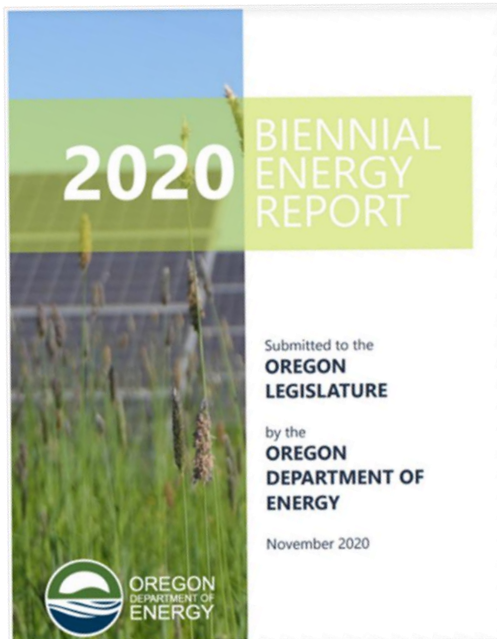
Regulated Entities

Large electric utilities and sometimes small utilities and other electricity service providers.

COMPARING RENEWABLE AND CLEAN ENERGY STANDARDS

	Renewable Portfolio Standard	Clean Energy Standard
Objectives	Increase use of new renewable energy resources; primary focus is deployment of new resources.	Increase use of new and existing low- or zero-carbon emitting resources; primary focus is GHG reduction.
Targets	Range from 10 to 100%	Range from 80 to 100%
Eligible Resources	New renewable resources ; frequently exclude “legacy” facilities like older hydroelectric dams.	New and existing low- or zero-carbon emitting resources; renewables plus technologies like hydroelectric, nuclear, and fossil-fuel with CCS.
Regulated Entities	“Point of regulation” is entities that sell electricity to end users (retail sale): utilities and electricity service suppliers.	

Oregon Energy Timeline

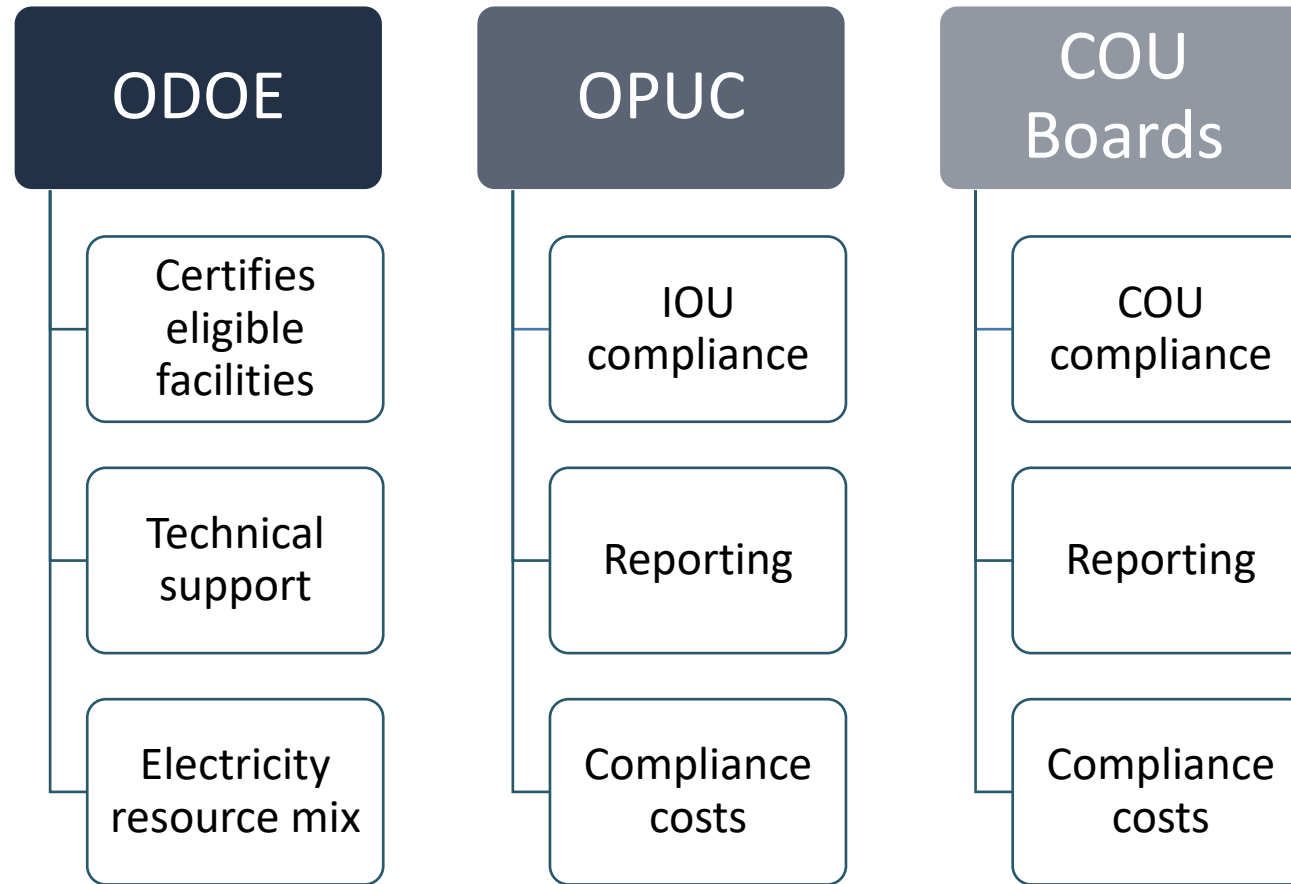


- ✓ **1941** – Grand Coulee Dam, the largest concrete structure ever built at the time, begins operation - but inundates an important, historic fishing ground at Kettle Falls under Lake Roosevelt in Washington state.
- ✓ **1983** – EFSC approves its first renewable energy project.
- ✓ **2001** – The Stateline Wind Project in Umatilla County becomes first utility-scale wind energy facility built in Oregon.
- ✓ **2007** – Oregon legislature passes a renewable portfolio standard requiring the state’s largest utilities to provide 25 percent of retail sales from eligible renewable sources by 2025 (SB 838).
- ✓ **2016** – Oregon adopts a 50 percent renewable portfolio standard and becomes the first state to legislatively mandate an end to coal in the state’s electricity mix by 2030 (SB 1547).
- ✓ **2017** – Oregon’s first utility-scale solar PV project larger than 50 MW, the Gala Solar project Crook County, begins operation.
- ✓ **2020** – Construction underway on multiple large utility-scale wind and solar energy projects, including the Wheatridge Renewable Energy Facilities in Morrow County, the Montague Wind and Solar Projects in Gilliam County, and the Golden Hills Wind Facility in Sherman County.

OREGON'S RENEWABLE PORTFOLIO STANDARD

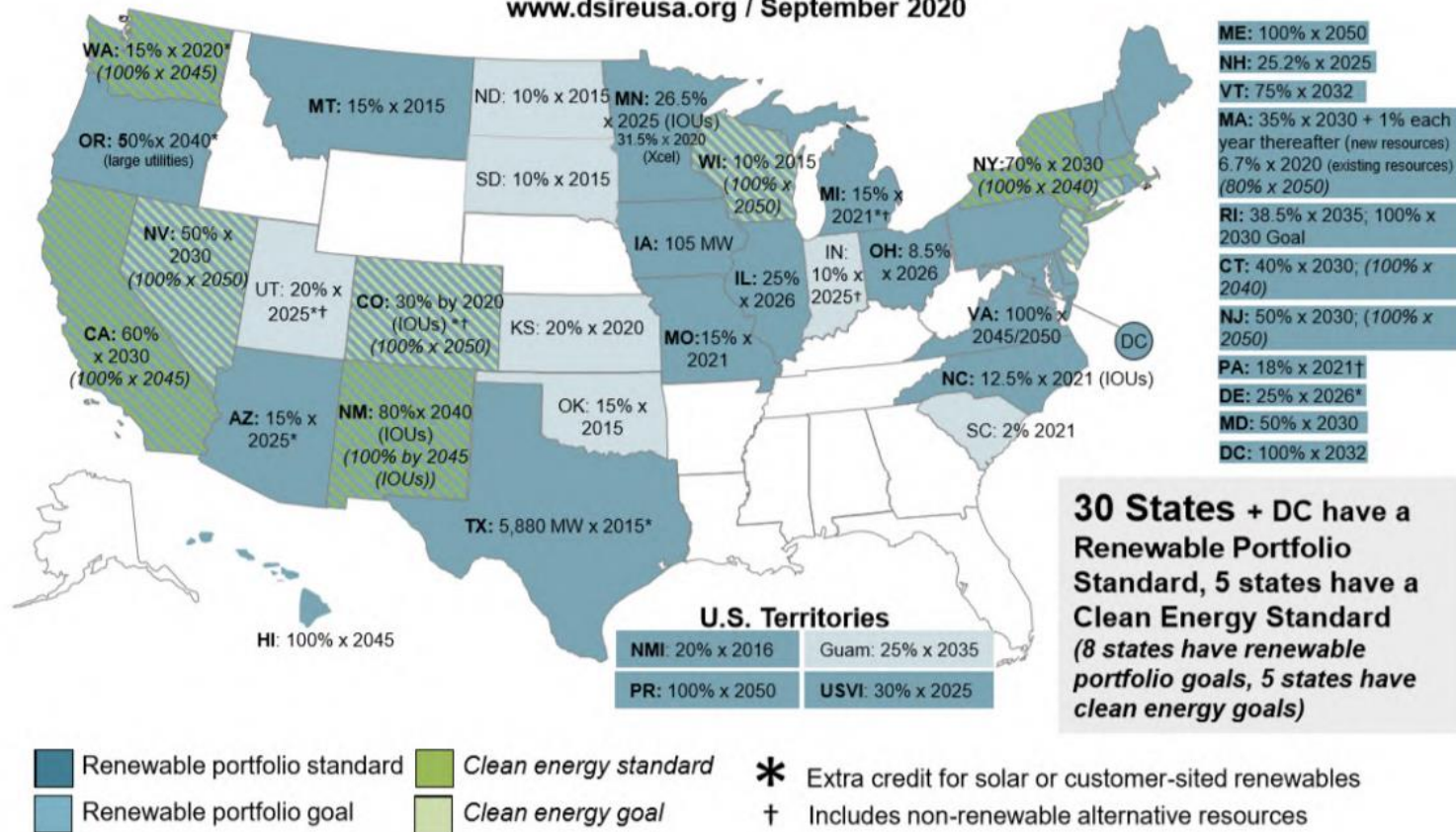
	Oregon RPS
Established	2007 (SB 838) ; updated 2016 (SB 1547)
Targets	25% by 2025 and 50% by 2040 - entities serving 3% or more of the state's load 10% by 2025 - entities serving 1.5–3% of the state's load 5% by 2025 - entities serving less than 1.5% of the state's load
Eligible Resources	Wind energy; solar photovoltaic and solar thermal energy; wave, tidal, and ocean thermal energy; geothermal energy; biomass energy; hydroelectric energy built after January 1, 1995. Some exceptions for pre-1995 energy resources.
Regulated Entities	Retail electricity suppliers: investor-owned utilities, consumer-owned utilities, and retail electricity service suppliers.

OREGON RPS ADMINISTRATION



RENEWABLE AND CLEAN ENERGY STANDARDS TRENDS

www.dsireusa.org / September 2020



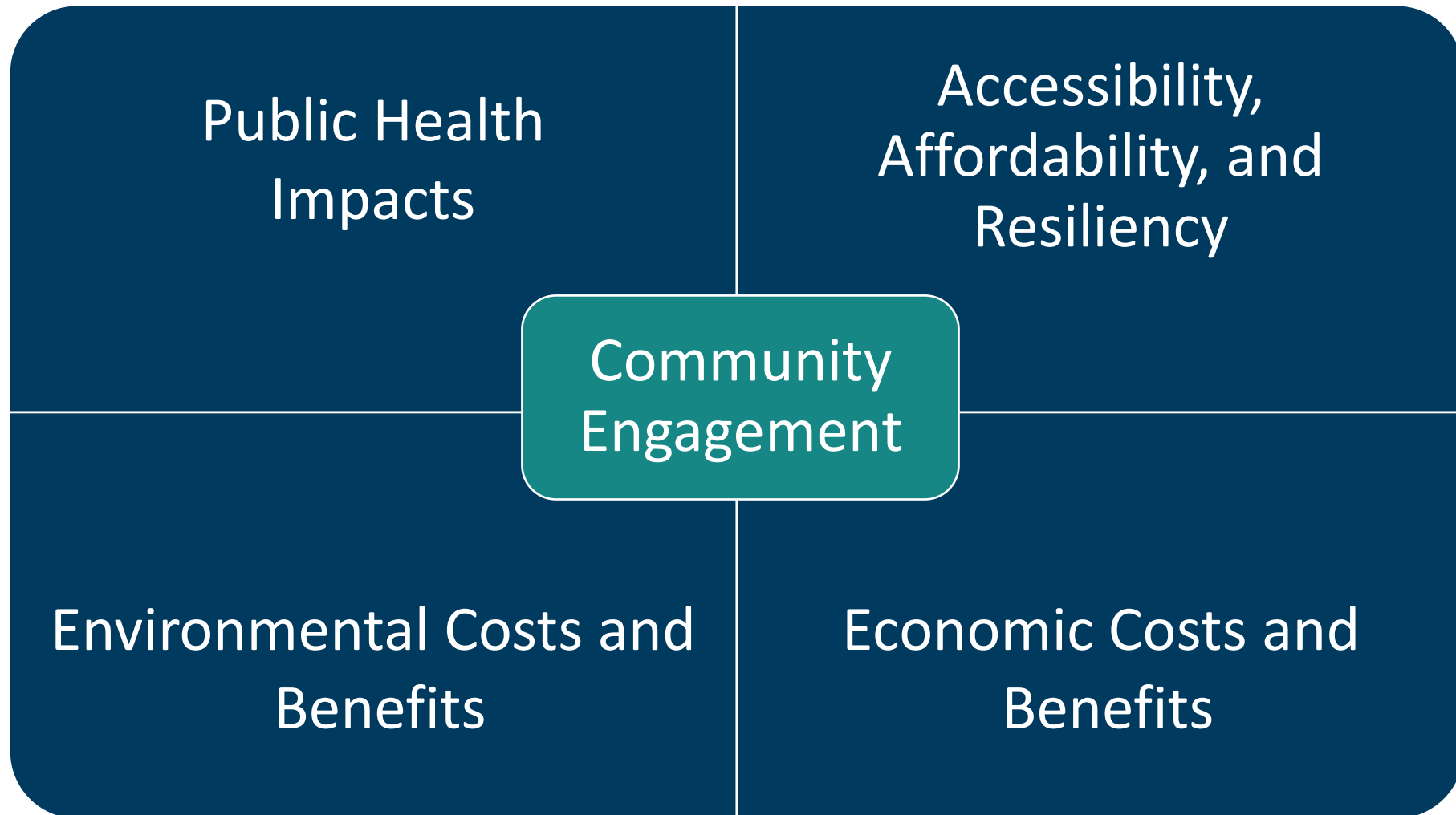
30 States + DC have a Renewable Portfolio Standard, 5 states have a Clean Energy Standard (8 states have renewable portfolio goals, 5 states have clean energy goals)

- Increasing and extending RPS targets
 - More than half of the RPS states increased their targets in recent years.
- Clean electricity standards:
 - Several states have created 100% zero-carbon electricity targets; many integrated with RPS.

KEY CONSIDERATIONS FOR A CLEAN ENERGY STANDARD

- How should equity be centered?
- How can the policy be designed to maximize cost effectiveness?
- What should be the final target date?
- Which electricity generation resources should be eligible?
- How can the policy ensure enough electricity to meet demand at all times?
- Which entities should be subject to a standard?

KEY CONSIDERATIONS: EQUITY



KEY CONSIDERATIONS: COST EFFECTIVENESS

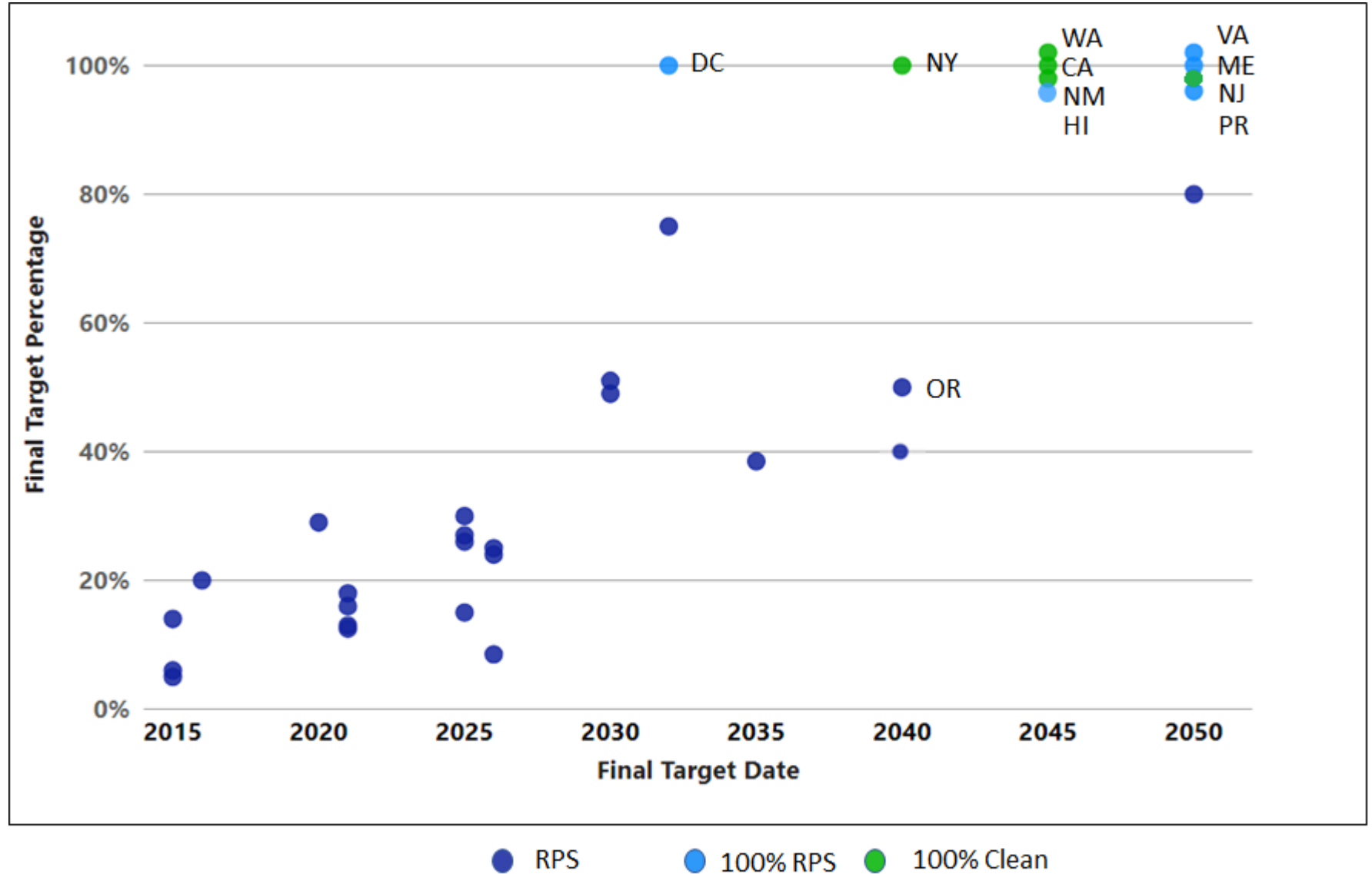
How to parse the cost implications in different decarbonization studies?

- Rapidly falling technology costs can quickly make study results obsolete.
- Transmission is a key variable.
- Studies use different strategies for balancing variable renewable energy.
- Focus varies:
 - Electricity sector only or economy-wide?
 - GHG target or 100% target?
 - State, region, nationwide?

KEY CONSIDERATIONS: TARGET DATES

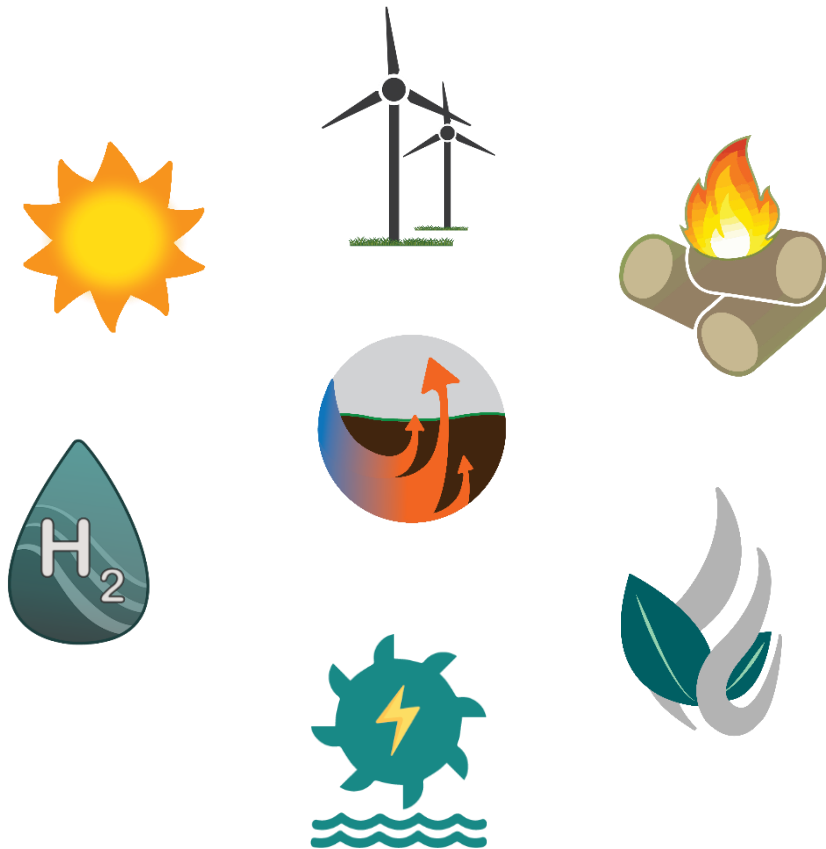
Final Target Dates for State RPS And 100% Clean Policies

Source: ODOE



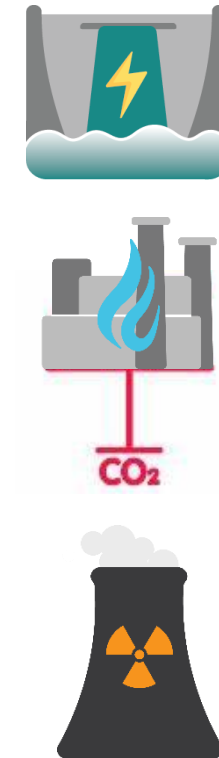
KEY CONSIDERATIONS: RESOURCE ELIGIBILITY

Oregon Renewable Portfolio Standard



Typical Clean Energy Standard

Adds:



KEY CONSIDERATIONS: RELIABILITY + FLEXIBILITY

EWEB Typical Daily Load Profiles

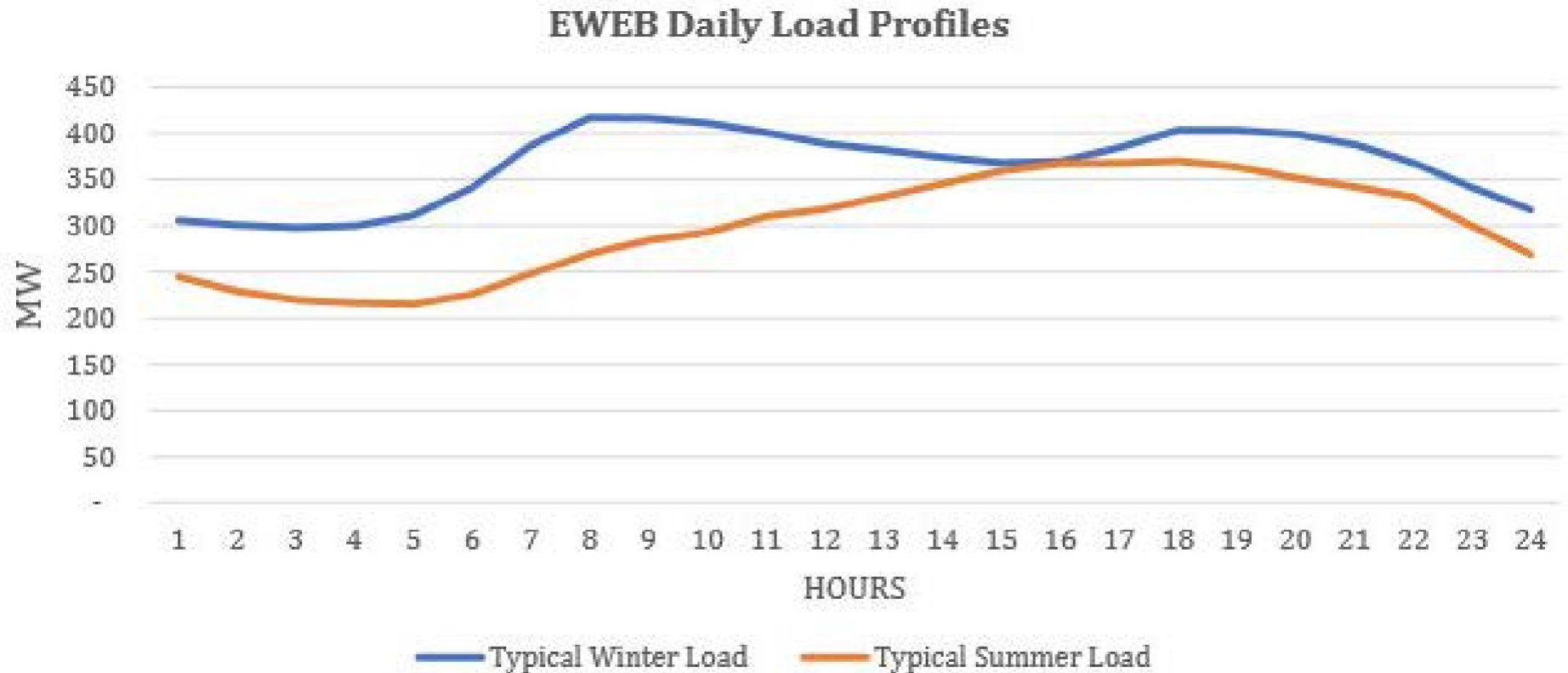
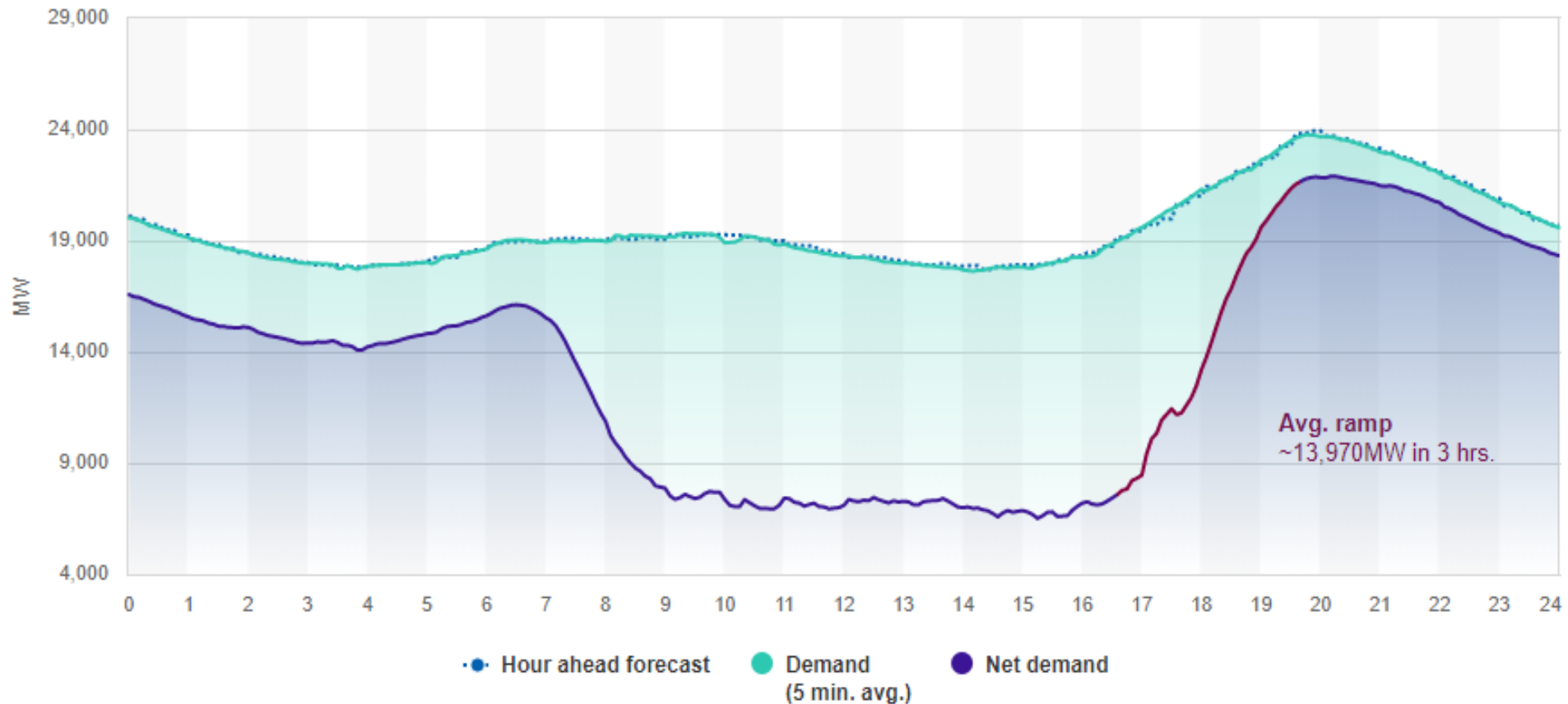


Figure E - Seasonally, Eugene's peak demand occurs in the winter months, when heaters are running continuously. On a daily basis, consumption typically peaks in the evening and winter mornings.

KEY CONSIDERATIONS: RELIABILITY + FLEXIBILITY

04/04/2020

Net demand trend



RESOURCE ADEQUACY AND CLEAN ENERGY STANDARDS

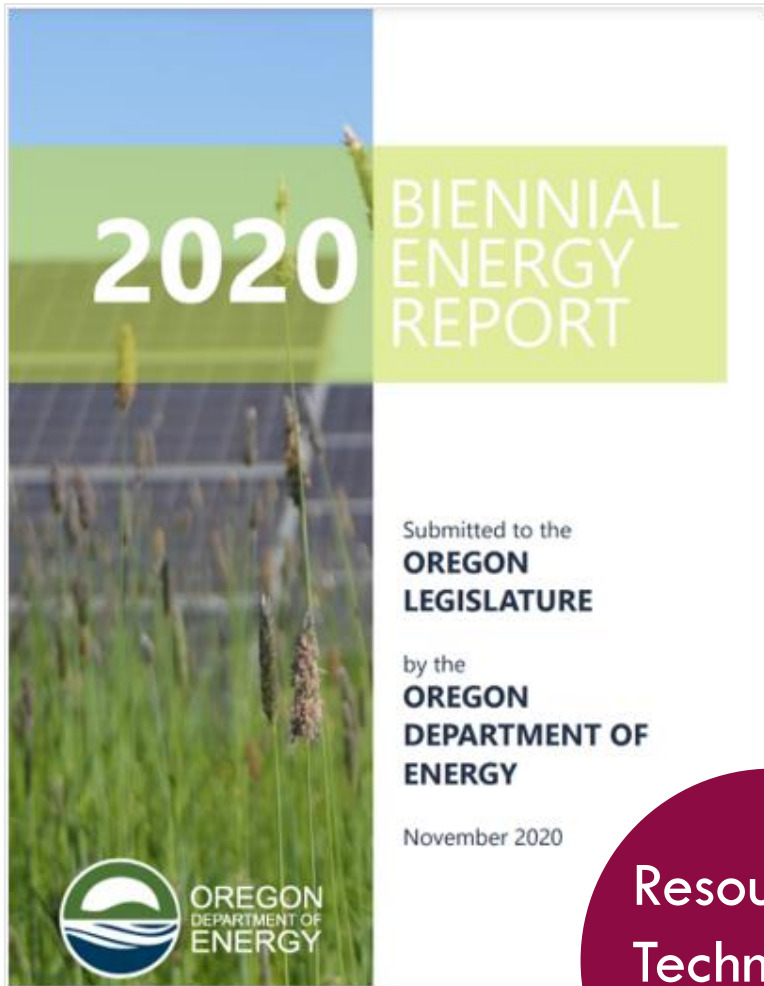
Resource adequacy ensures there are sufficient resources available to meet future electric demand. As more coal plants head toward retirement and renewable energy facilities come online, maintaining resource adequacy will become even more challenging.

Energy
101

Clean and Renewable Energy Standards
Resource Adequacy

Policy Briefs

Renewable & Zero Emission Standards
Resource Adequacy



Resource &
Technology
Reviews

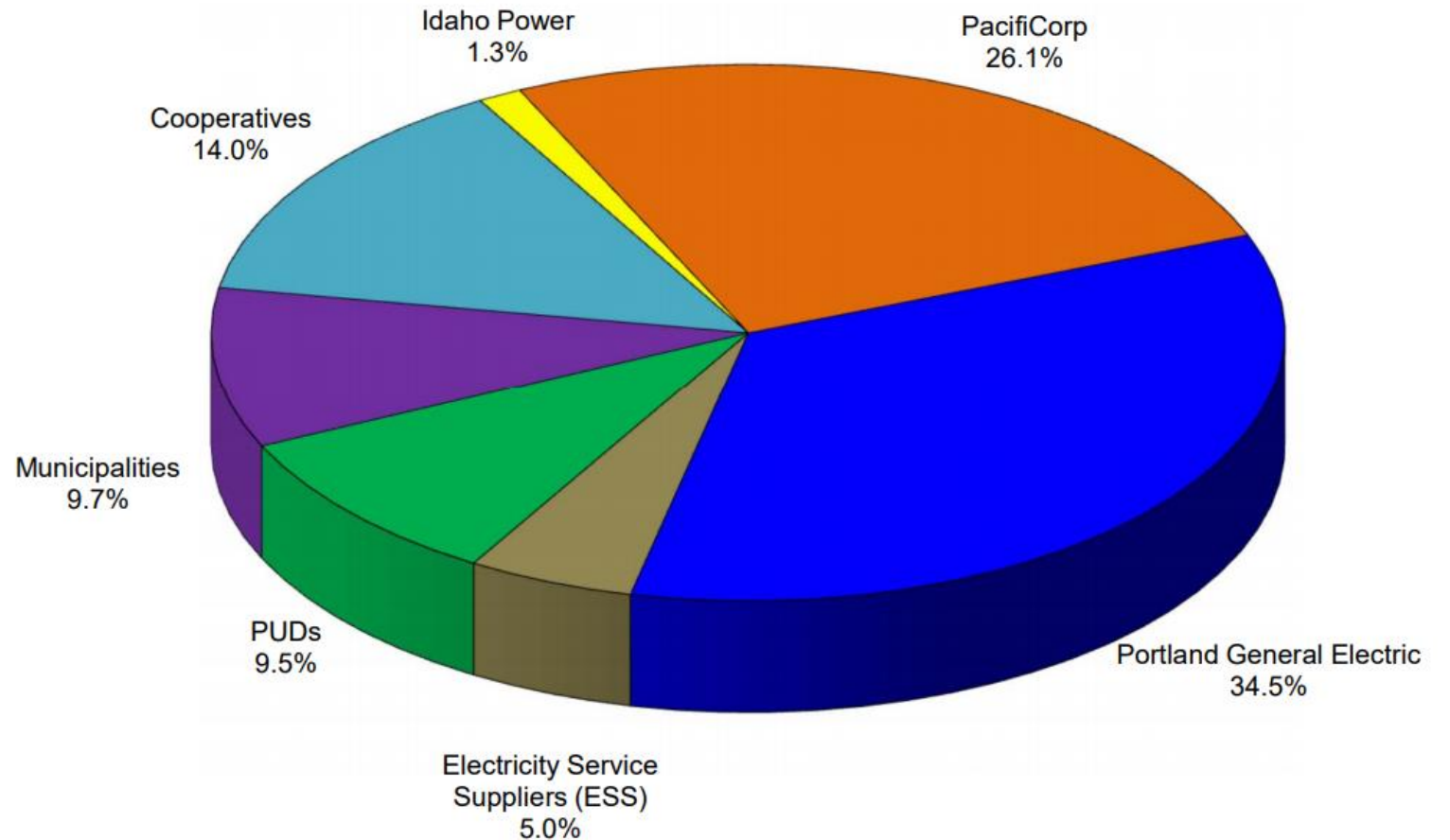
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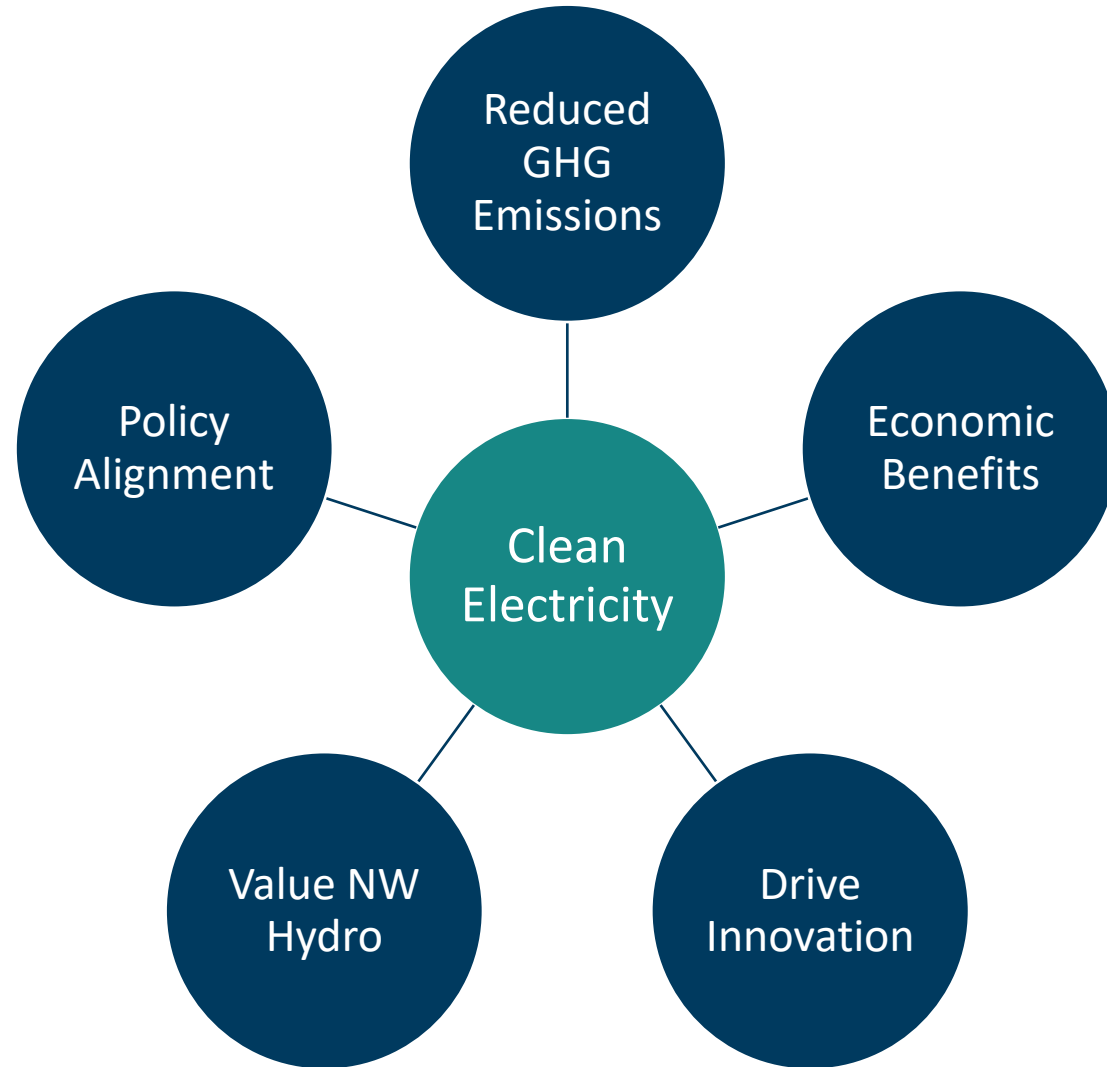
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KEY CONSIDERATIONS: WHO

Oregon Electricity Sales to Ultimate Customers During 2019 (MWh)



OPPORTUNITIES: CLEAN ELECTRICITY





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Questions/Comments?

Email christy.splitt@oregon.gov

RESOURCES:

Energy Report online: energyinfo.oregon.gov/ber

ODOE's website: www.oregon.gov/energy