2024 Biennial Energy Report

Joint Committee on Ways & Means
Natural Resources Subcommittee

January 30, 2025

Agenda

- Background and Process
- Energy By the Numbers
- Energy History Timeline
- Energy 101
- Resource and Technology Reviews
- Updates on State Energy Projects

OREGON DEPARTMENT OF ENERGY

Leading Oregon to a safe, equitable, clean, and sustainable 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

Our Work with the Legislature

"A Think Tank for the Legislature" on Energy Issues

- Informational hearings
- Ask us questions; we're available for issue briefings
- Studies and reports as assigned
- Expertise in clean and resilient energy solutions

Doing our Part to Get Implementation Right

- Develop and implement energy programs
- Information and analysis on bills that name ODOE

Reports on Recent Legislative Sessions

- Includes concise overview of energy themes during each session
- Provides short, easy to read summaries of energy bills that passed and bills that did not pass
- Example: 2023 and 2024 ODOE Legislative Reports

Studies and Reports Library

- Recent Reports:
  - 2024 Biennial Energy Report (and 2022, 2020, 2018)
  - 2023 Biennial Zero Emission Vehicle Report
  - 2023 Cooling Needs Study
  - 2022 Renewable Hydrogen Study
  - 2022 Floating Offshore Wind Study
  - 2022 Small-Scale and Community Renewable Energy Projects Study
  - 2021 Regional Transmission Organization Study
- 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.
- Outline recommendations.

www.tinyurl.com/ODOE-Studies

2024 BIENNIAL ENERGY REPORT

Goal of the Report

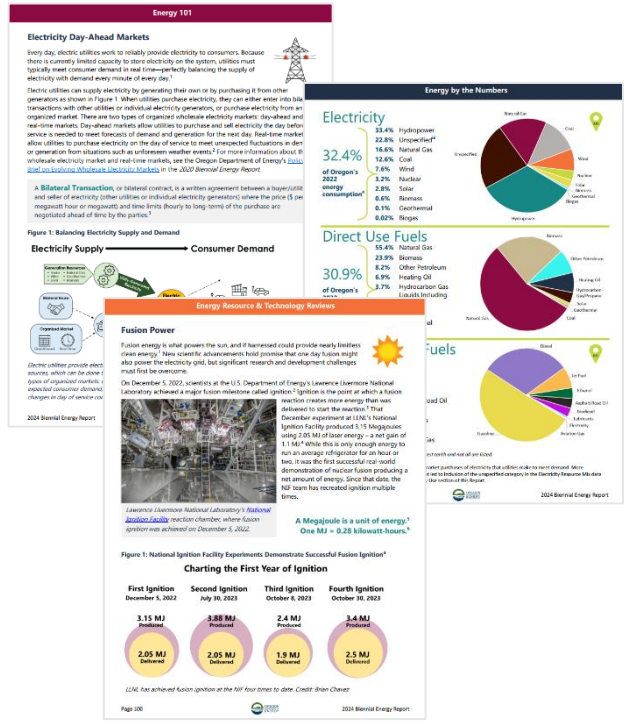
Pursuant to ORS 469.059, provide a comprehensive review of energy resources, policies, trends, and forecasts, and what they mean for Oregon.

Scoping the Report

Shaped by a data-driven process, equity considerations, and input from stakeholders and the public.

Designing the Report

Themes cross sections – energy 101s, resource and technology reviews, updates on state energy projects.



https://energyinfo.oregon.gov/ber

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50 YEARS of SERVICE

THE BER COLLECTION

Each edition of the Biennial Energy Report builds upon the last, creating a collection of data, energy resource and technology reviews, 101s, and policy briefs that can serve as reference materials for interested Oregonians.

View the whole collection:

https://energyinfo.oregon.gov/ber-collection

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50 YEARS of SERVICE

2024 TABLE OF CONTENTS

Energy by the Numbers

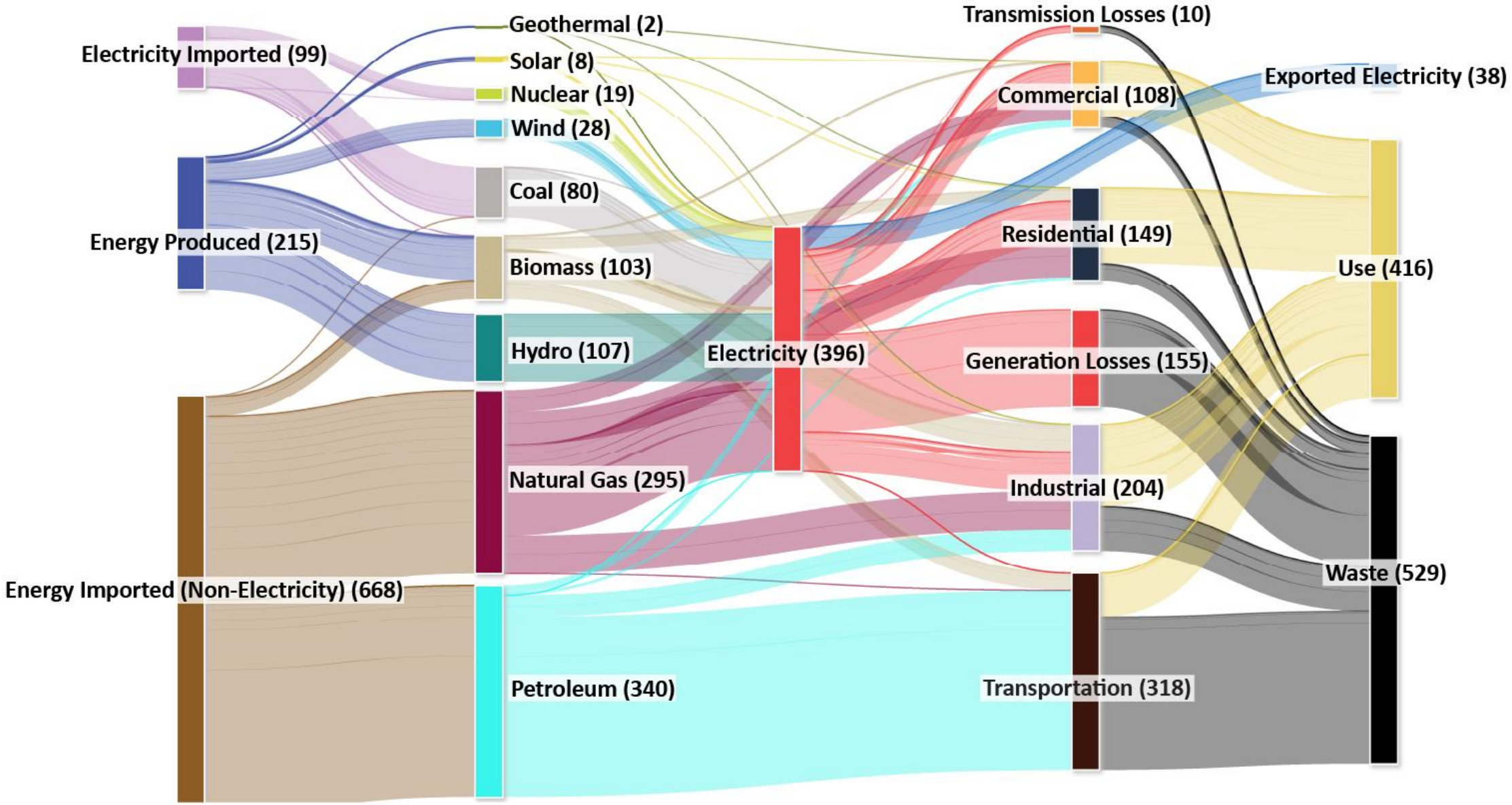
Oregon's overall and sector-based energy use, energy production and generation, and energy expenditures.

Data and metrics track how Oregon produces, purchases, and uses various types of energy.

TABLE OF CONTENTS

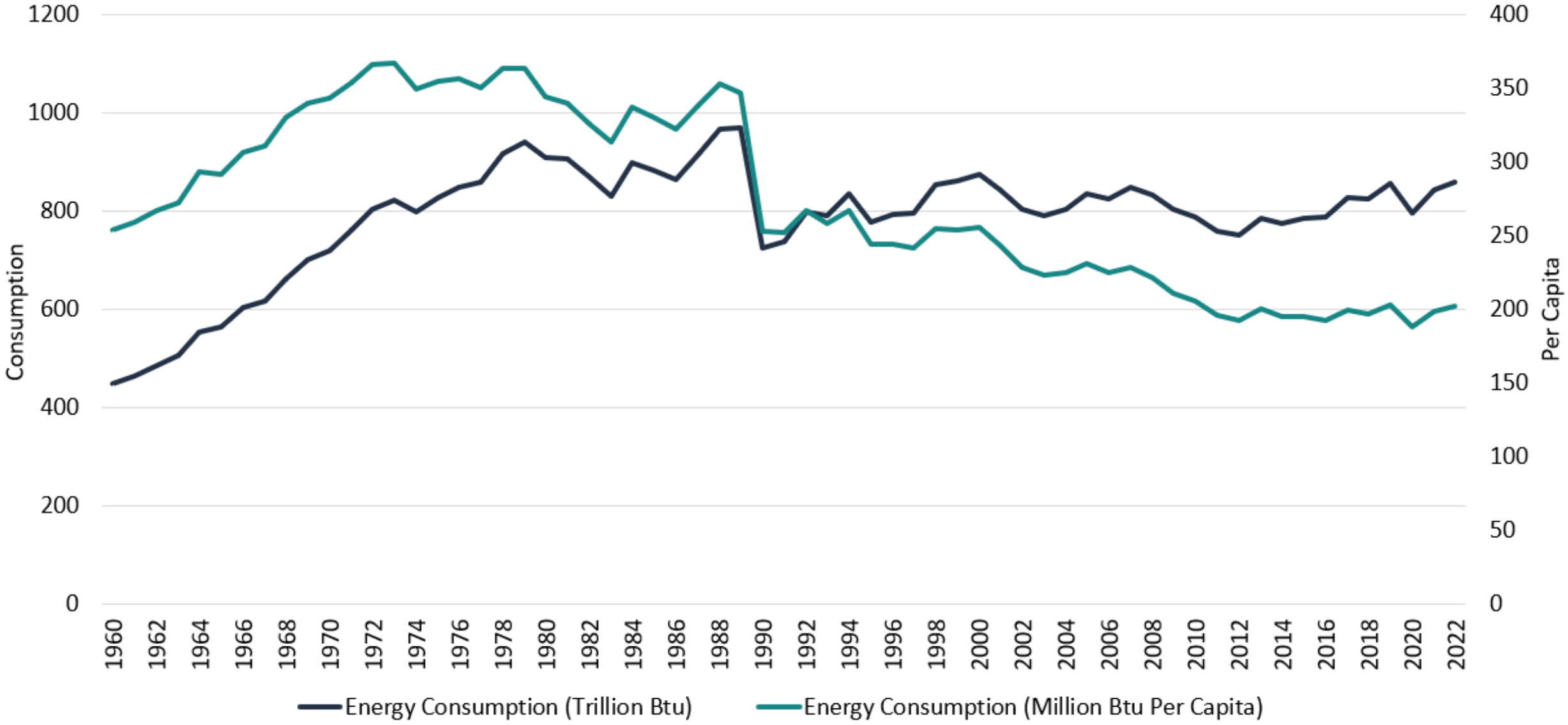
50 YEARS of SERVICE OREGON DEPARTMENT OF ENERGY

Oregon's Energy Flow

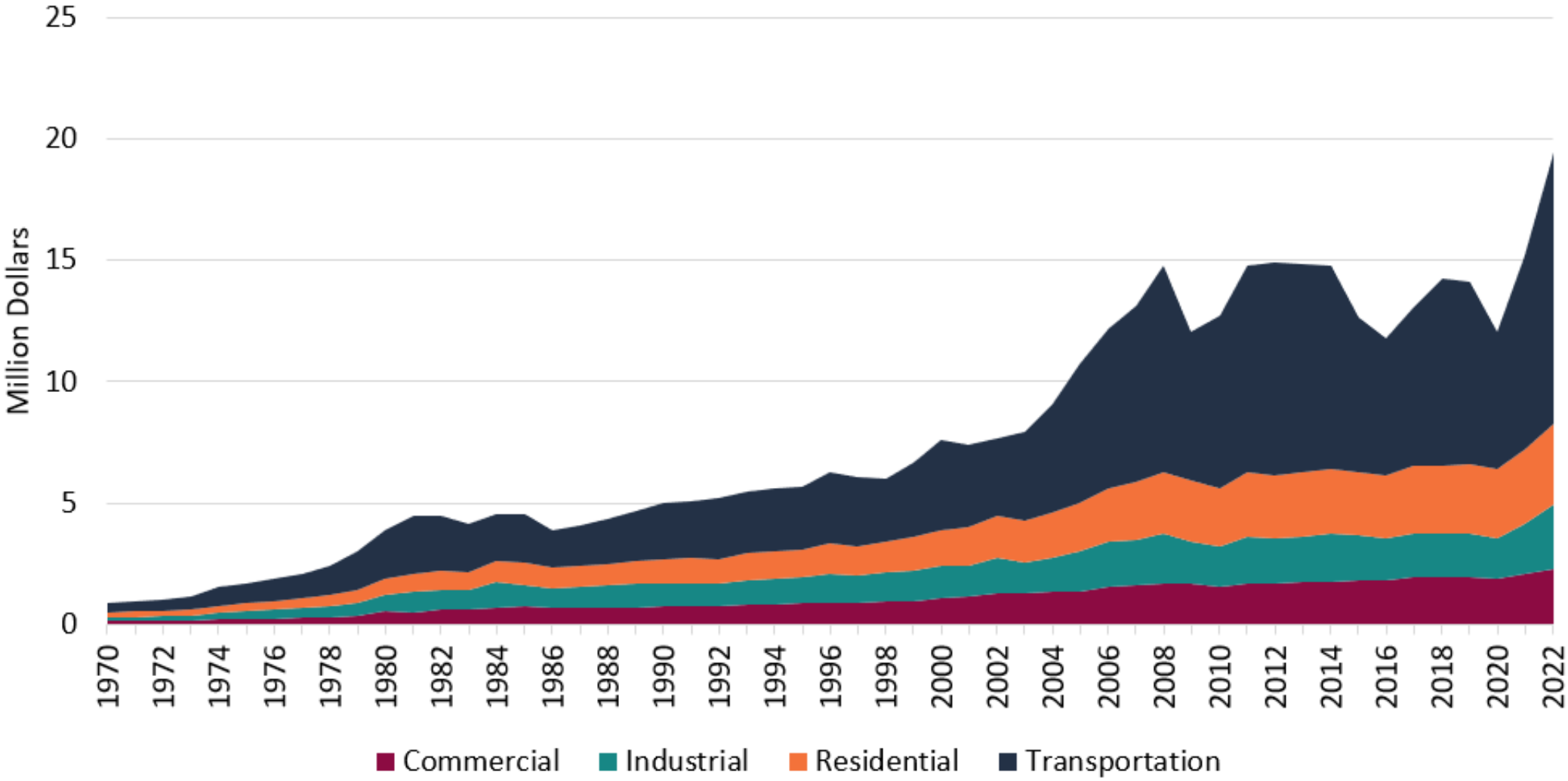


Numbers are in trillions of British thermal units (Btus)

Oregon's Total Energy Consumption and Per Capital Energy Consumption Over Time

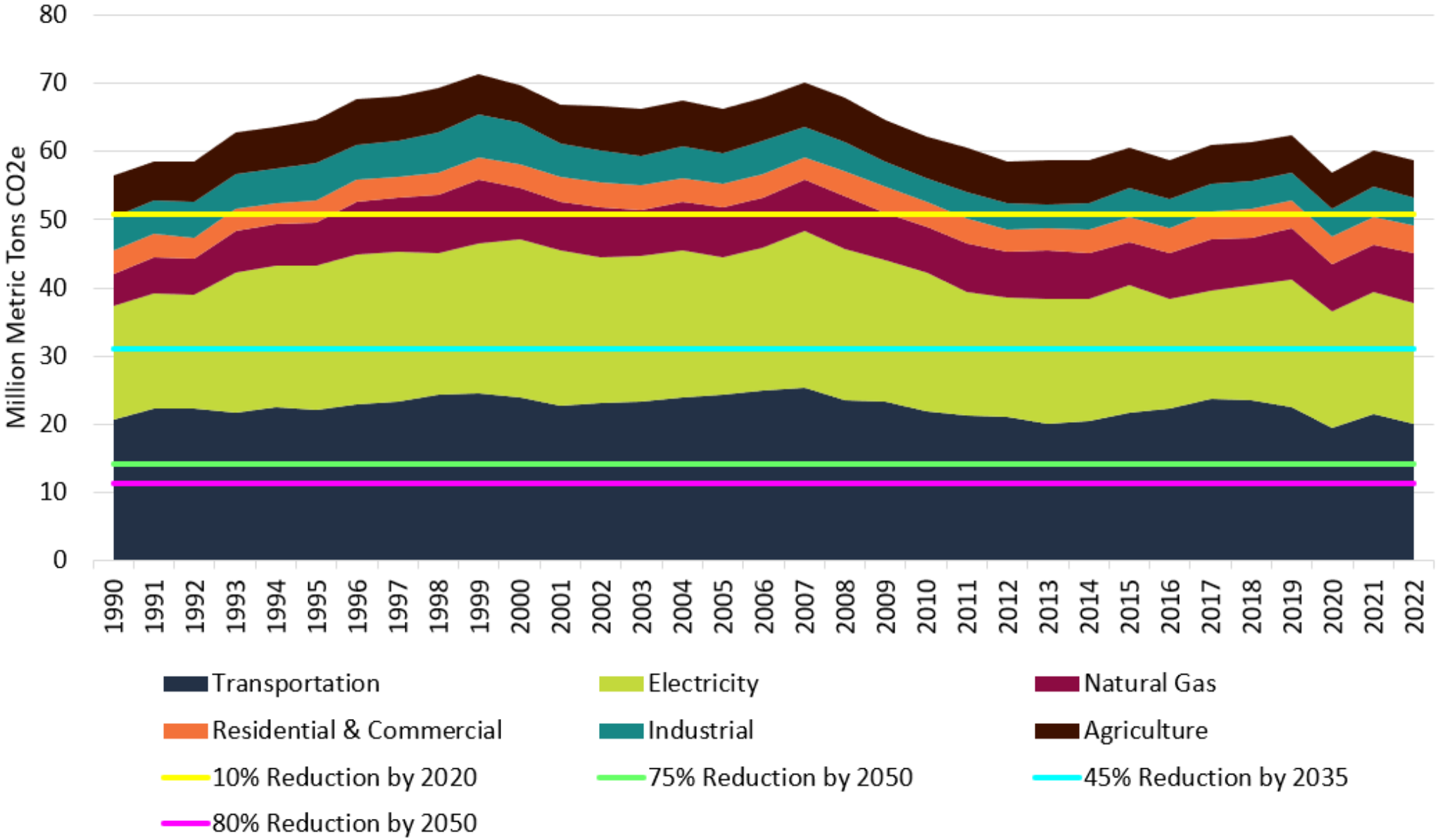


Oregon's Total Energy Expenditures by Sector Over Time



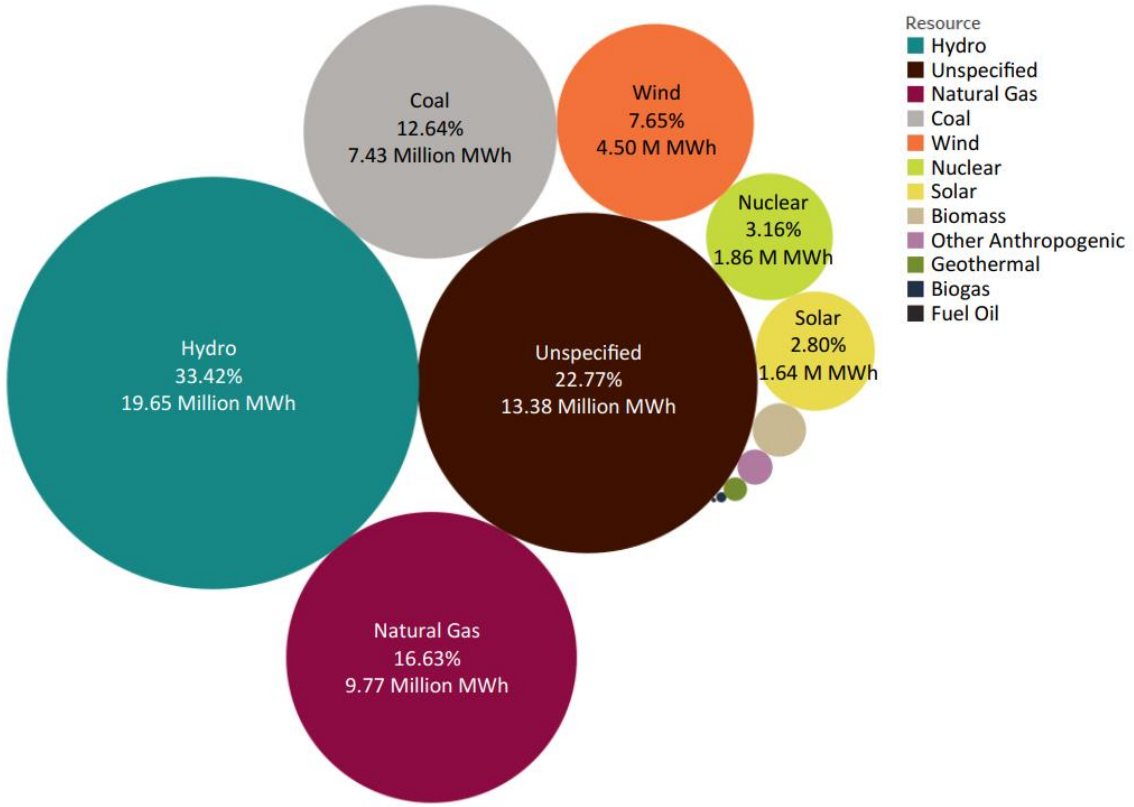
U.S. EIA reports prices in current dollars per million Btu. Chart is not adjusted for inflation.

Oregon Greenhouse Gas Emissions Over Time

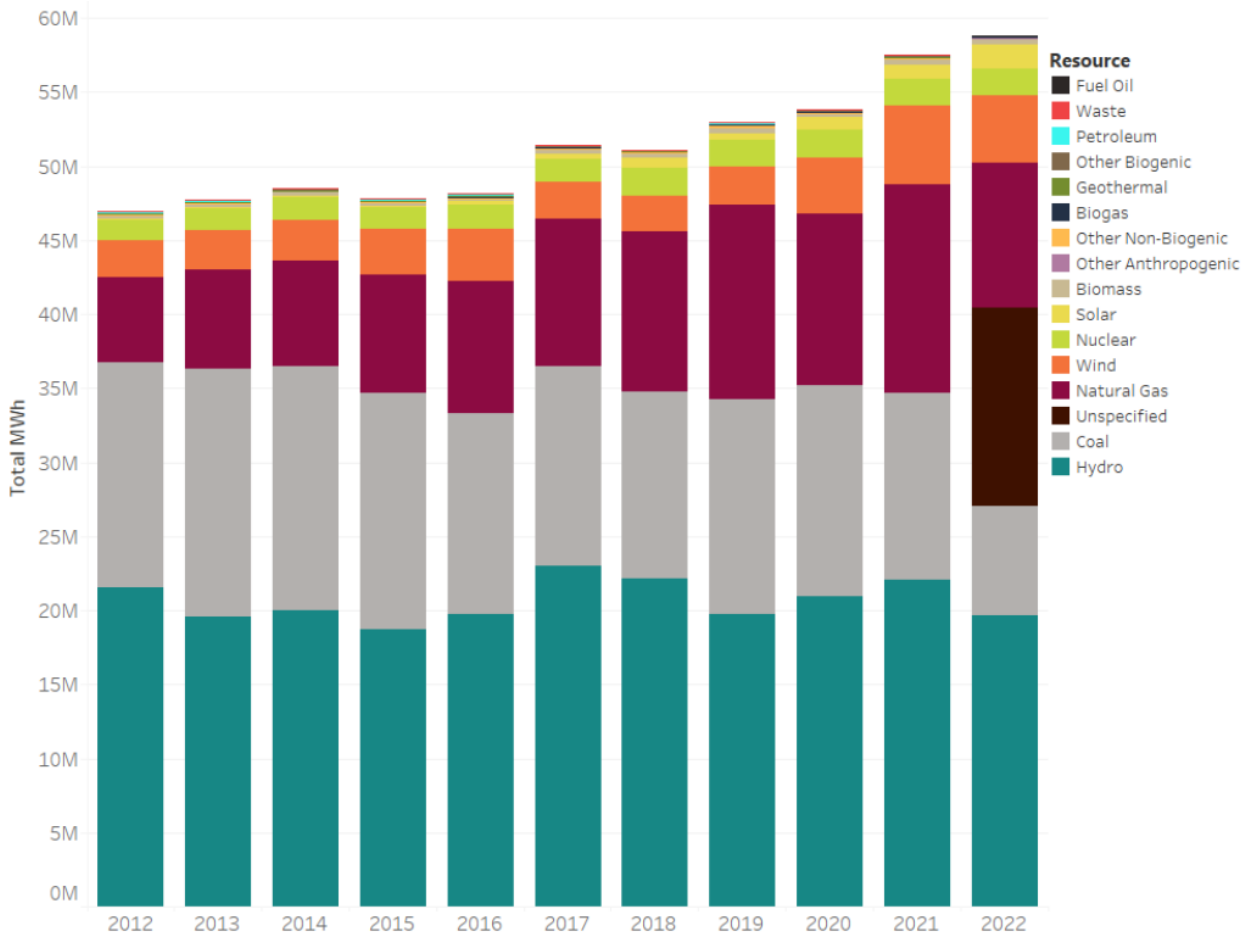


Energy by the Numbers | Page 65

Resources Used to Generate Oregon's Electricity (2022)

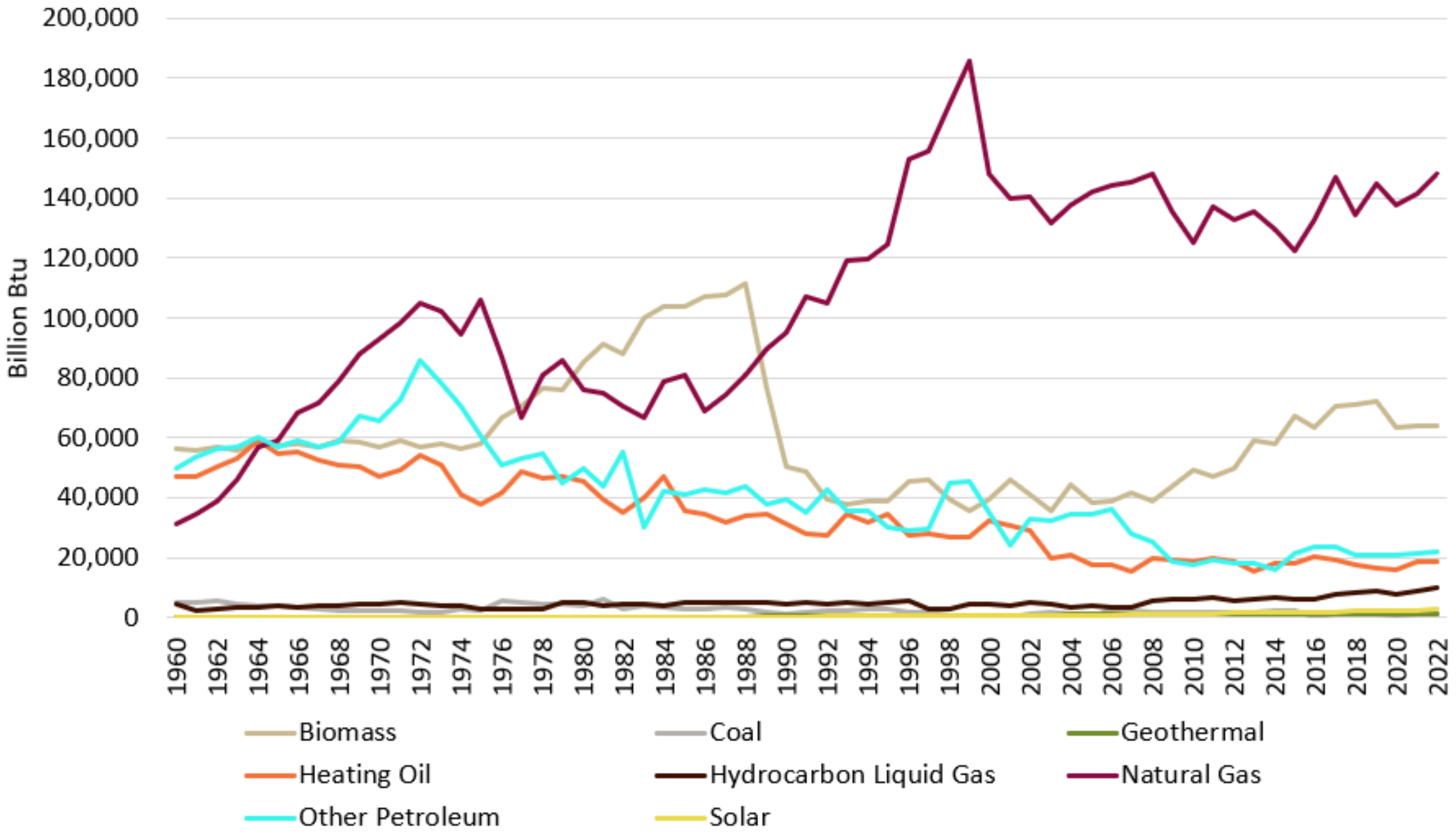


Resources Used to Generate Oregon's Electricity Over Time

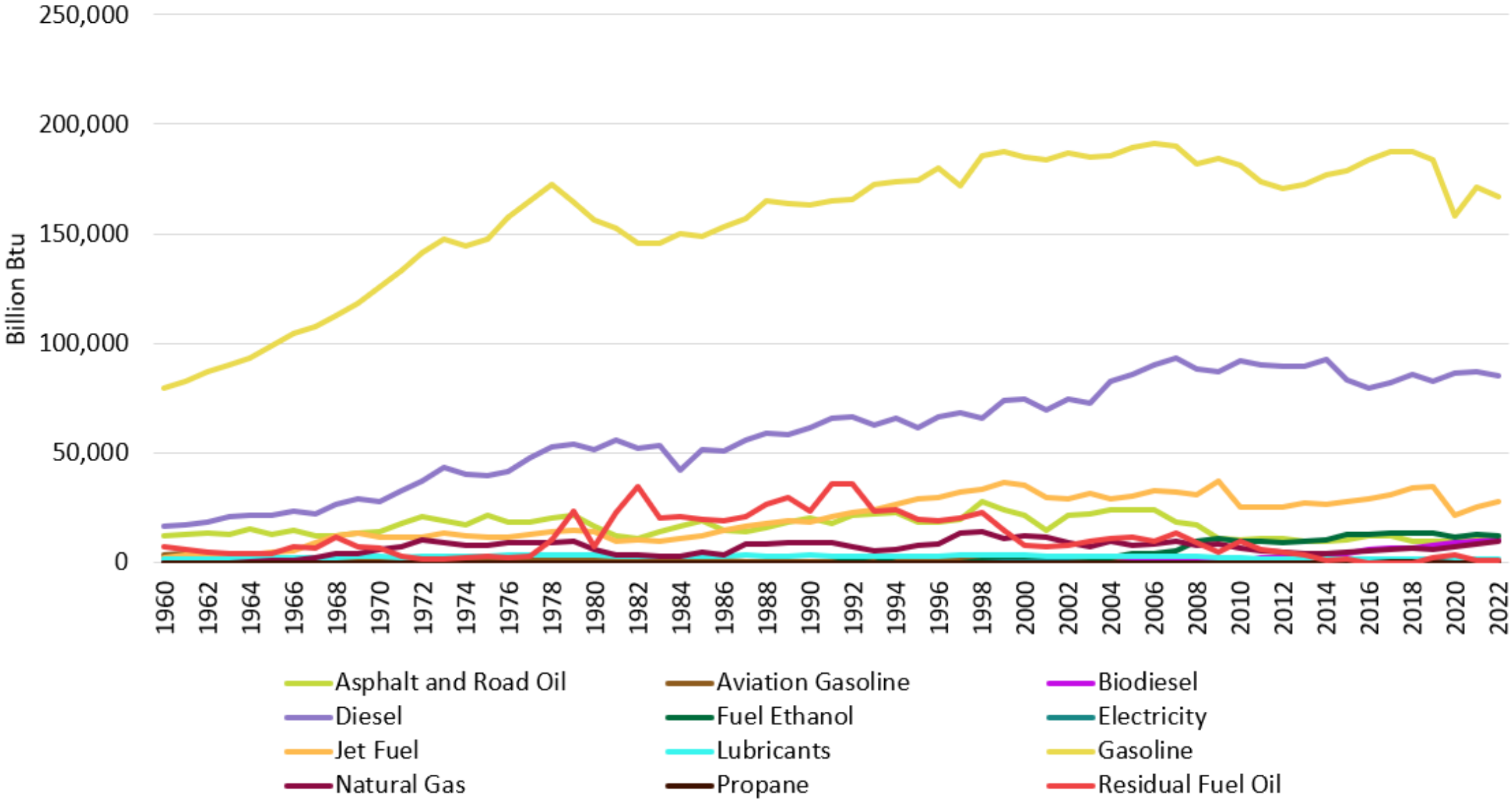


Energy by the Numbers | Pages 11, 13

Oregon Direct Use Fuels Consumption Over Time

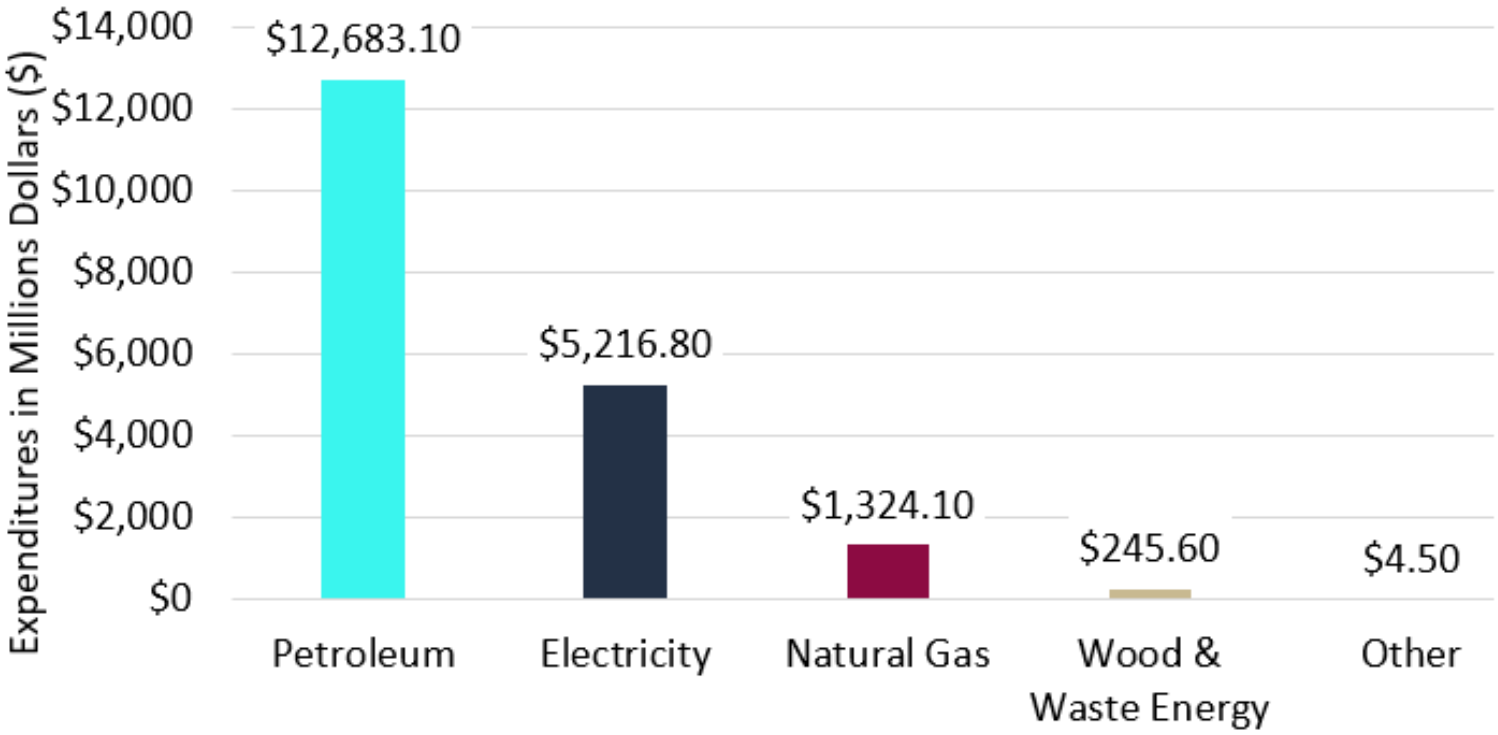


Oregon Transportation Fuel Consumption Over Time

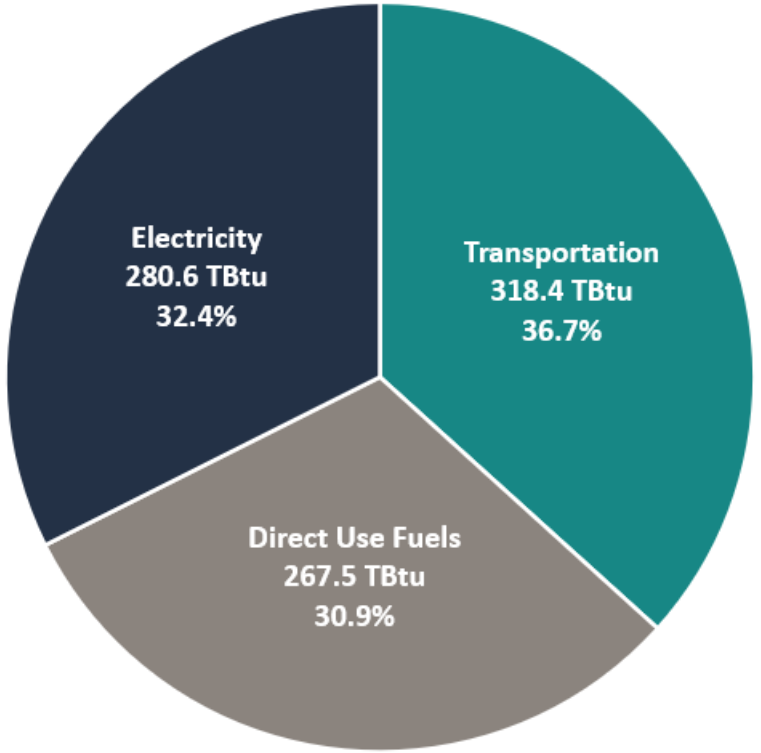


Energy by the Numbers | Page 28

2022 Oregon Energy Expenditures by Source

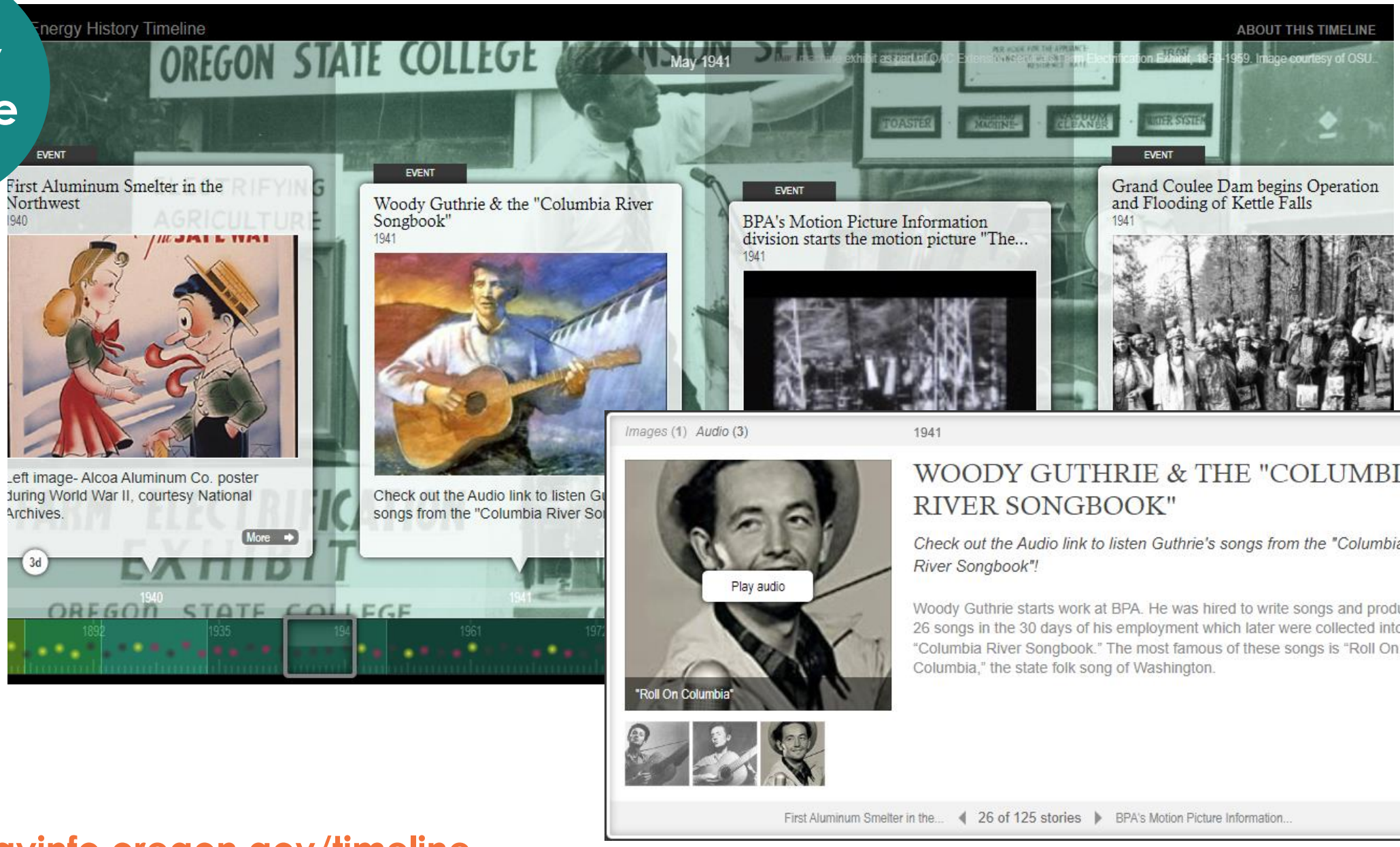


2022 Oregon Consumption by Source



Energy by the Numbers | Pages 43, 5

History Timeline



https://energyinfo.oregon.gov/timeline

Energy 101

This section is intended to help the reader understand the first part of the energy story: how energy is produced, used, and transformed.

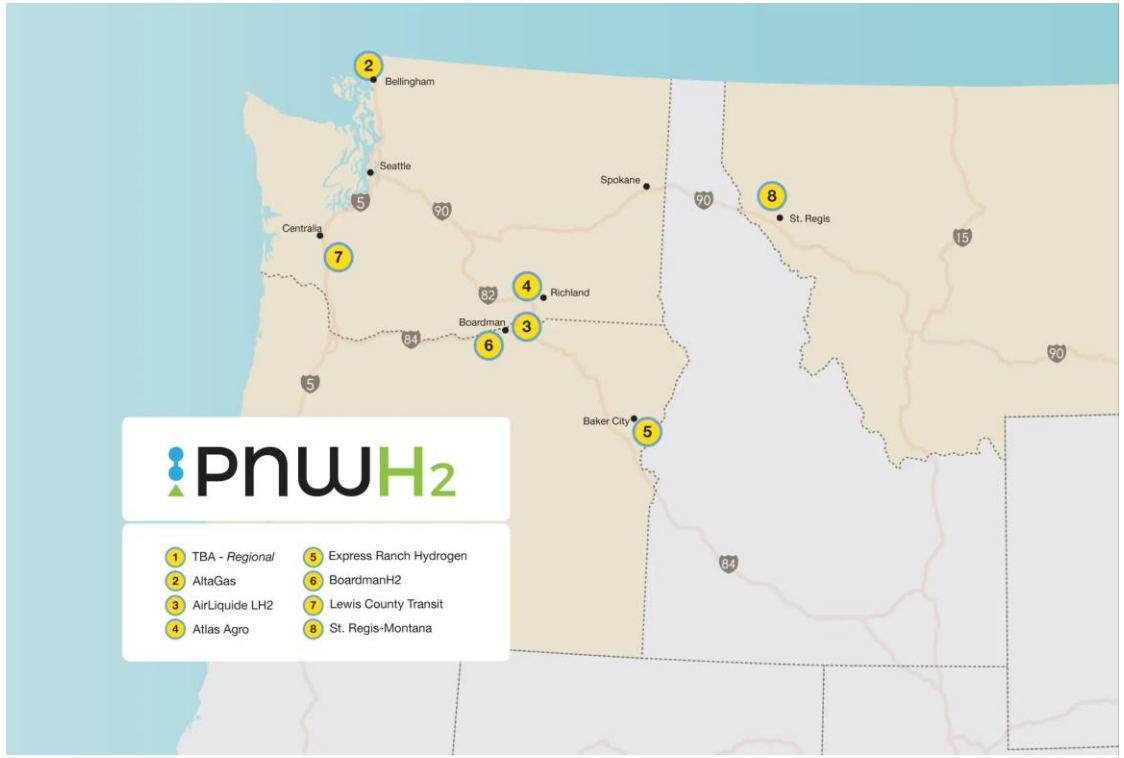
TABLE OF CONTENTS

Advancements in a Clean Hydrogen Economy

Clean hydrogen has the potential to play a critical role in helping the world decarbonize over the coming decades, particularly in hard to electrify sectors. With continued policy and financial support, clean hydrogen is poised to scale in the Pacific Northwest, creating job and economic development opportunities for the region.

The PNW H2 Hubs program will jumpstart the hydrogen economy in the PNW:

- **$8 billion program:** $1 billion in federal funding leveraged with $7 billion in private and other investments
- **17 projects** organized into 8 nodes across Oregon, Washington, and Montana
- Projects demonstrate **all aspects of the hydrogen value chain**, from production, storage, transport, and end use.
- Will produce **400 metric tons of clean hydrogen per day**, using 100% renewable energy
- Will create over **10,000 jobs** for the region

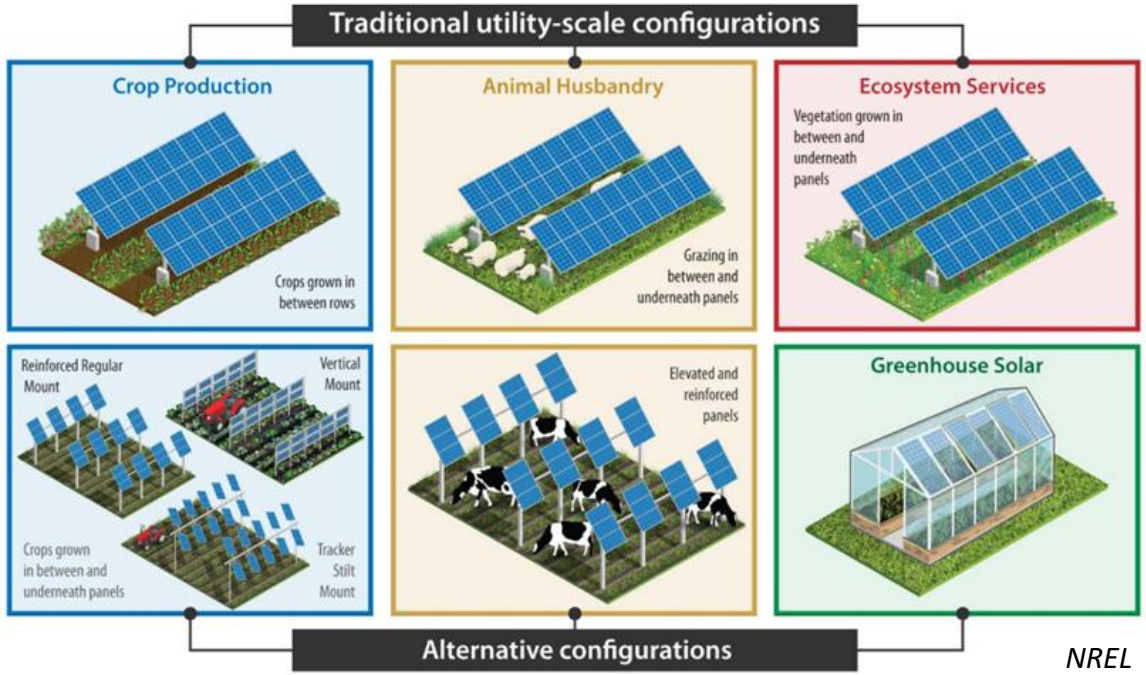


Location of hydrogen projects in the PNW H2 Hub program.

Agrivoltaics in Oregon

Land that is productive for farming is highly likely to be attractive for solar energy generation as well. This Energy 101 highlights the current state of research, development, and incentives regarding agrivoltaics which is the practice of producing both food and electricity from solar panels on the same parcel of land.

- Agrivoltaics allows farmers to **manage sunlight as a resource**, reducing stress on crops
- Most currently operational utility-scale agrivoltaics installations in the U.S. are combinations of **solar generation with sheep grazing**
- Researchers are **exploring combinations** of crops, growing methods, and solar configurations that work best in specific growing conditions
- Several states have invested in state-specific agrivoltaics **research and demonstration projects** and incentive programs
- Oregon **land use law** treats the siting of agrivoltaics projects that generate electricity for sale in the same manner as other solar PV generation



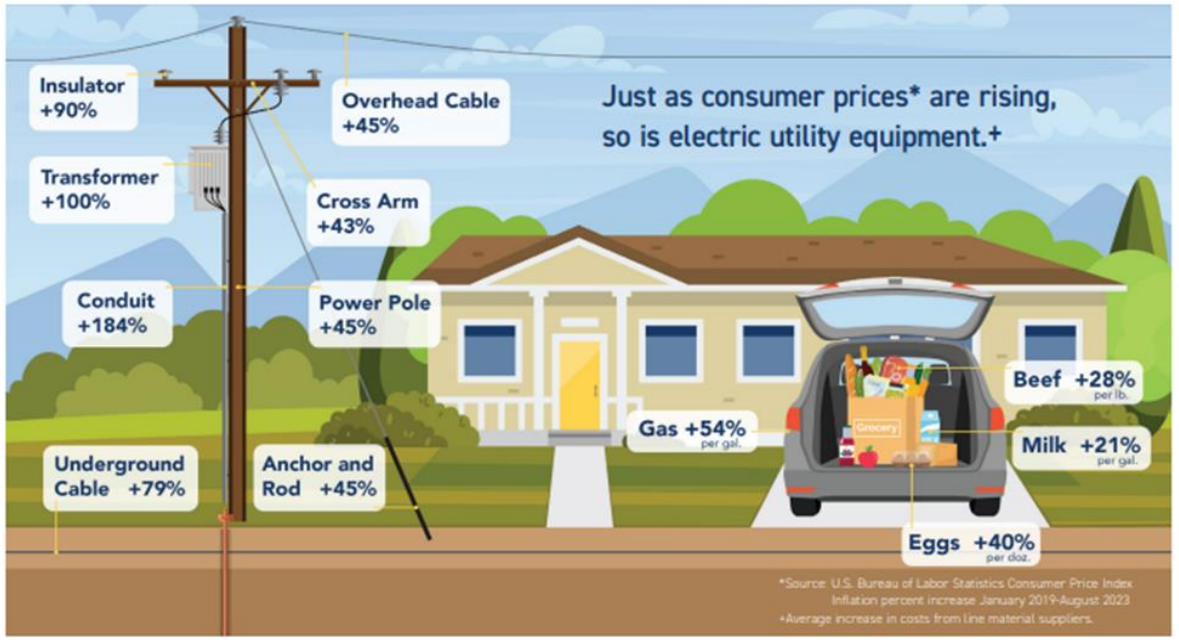
NREL

Electricity Rate Increase Drivers

For many Oregonians, electricity prices have increased in the past few years. This Energy 101 explains some major cost drivers for electricity in Oregon. While prices for other goods and services have increased in recent years as well, electricity is used by virtually every household and business in Oregon, making electricity prices a topic of statewide interest.

- Not every utility in Oregon has **raised rates** in recent years, but many have
- Three common **cost drivers**:
  - Rising power costs
  - Ongoing infrastructure needs, compounded with inflationary pressures
  - Costs to mitigate the increasing prevalence and risks of wildfires and extreme weather
- HB 2021 is <u>not</u> a direct driver of recent rate increases, but it will likely have **future cost impacts** for Portland General Electric, PacifiCorp, and electricity service suppliers

Inflationary and Supply Chain Cost Pressures (2019-2023)

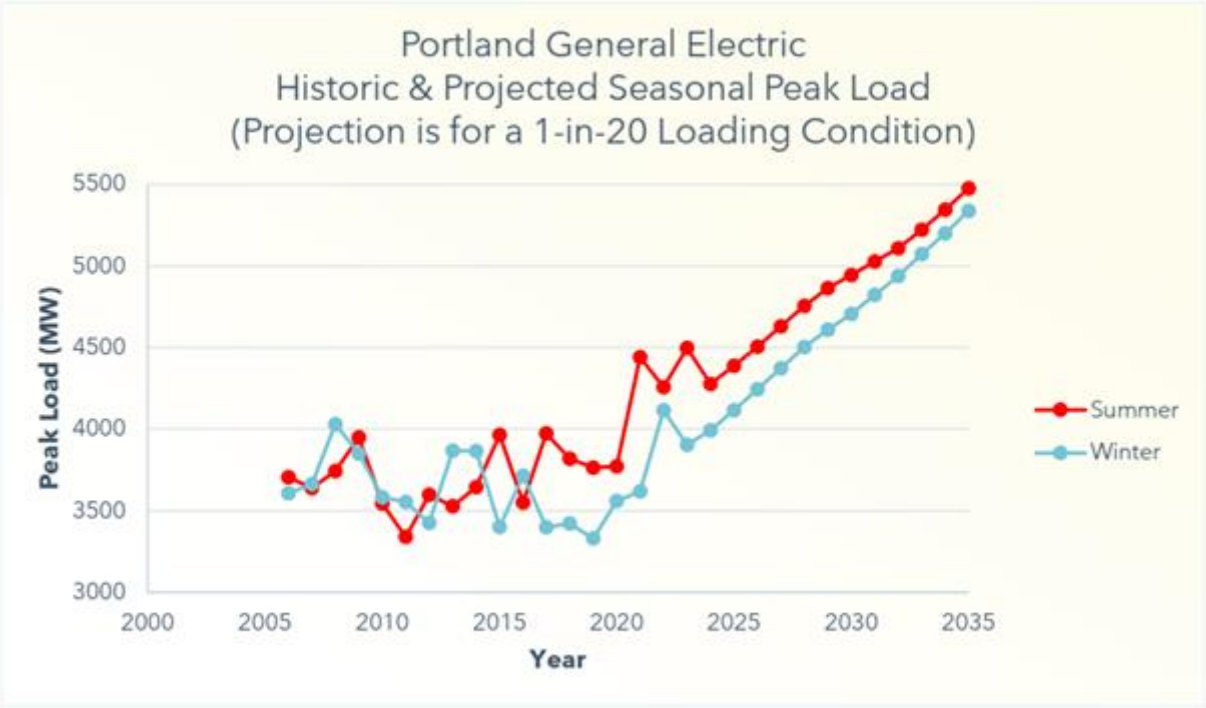


Graphic from Central Electric Cooperative

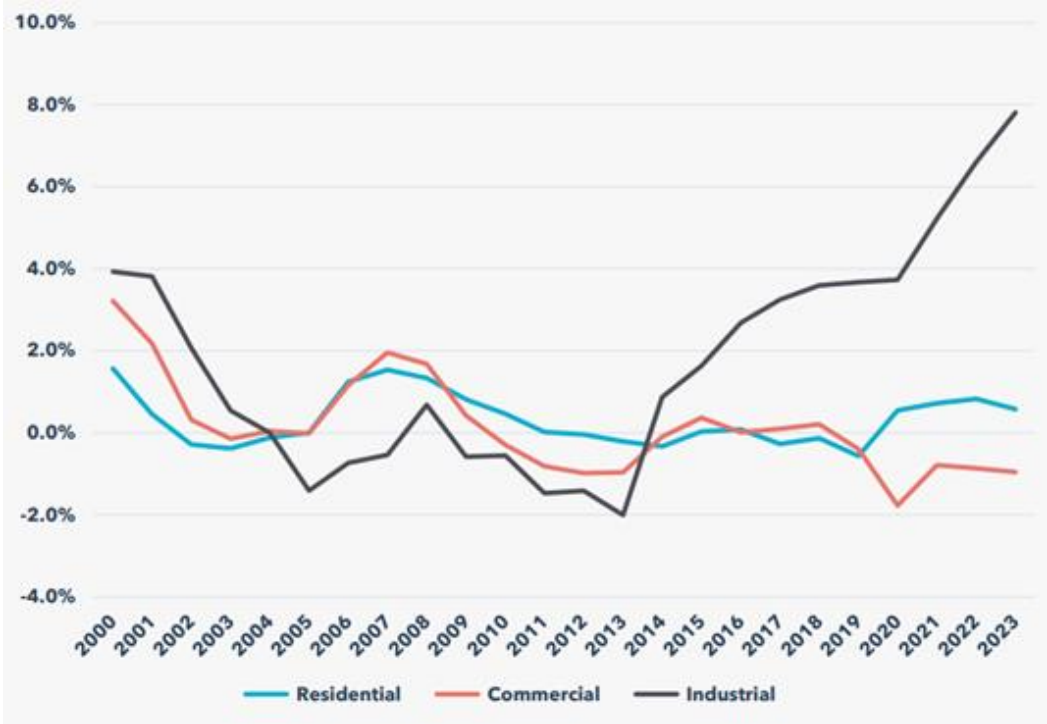
Peak Electricity Demand

Peak electricity demand, or peak load, is the highest demand for electricity from all customers across a specific service area during a specified period of time. Utilities and transmission providers track and forecast peaks in demand to assess future electricity demand — and plan for adequate levels of generating resources needed to keep the lights on.

Portland General Electric Historic and Projected Seasonal Peak Load



Average Five-Year Load Growth Rate by Sector for Portland General Electric



Energy Resilience

Energy resilience refers to the ability to withstand and rapidly restore energy delivery following non-routine disruptions of severe impact or duration. Governments, communities, and energy providers are increasingly interested in options to improve energy resilience.

- Resilience can focus on bolstering **larger energy systems and** fortifying **communities' resilience**
- Strengthening energy resilience **protects vulnerable groups**
- **Tribal, federal, state, utility, and community** entities are engaged in energy resilience efforts

Alternatives to New Transmission

There are many ways to reduce the transmission expansion needed to meet increasing electricity demand and clean energy and climate goals, while improving electricity reliability and resilience.

Leveraging diverse loads & resources to use existing transmission system more efficiently

- Centralized power markets & transmission planning for a West-wide footprint

Repurposing & expanding capacity of existing transmission corridors

- Building wind/solar/storage projects same location as retiring coal plants
- Reconductoring existing lines, adding new lines adjacent to existing lines

Leveraging the use of local energy resources

- Energy efficiency measures, batteries, rooftop & small-scale solar, etc.

Using grid enhancing technologies

- Modern electronic sensor & control technologies that can boost line capacity during certain times of the year
  - Dynamic ratings for power lines & transformers
  - Power flow controllers

Resource & Technology Reviews

The reviews in this section cover the spectrum of traditional to innovative – and demonstrate the breadth of technology that is integral to the production and management of our energy system.

TABLE OF CONTENTS

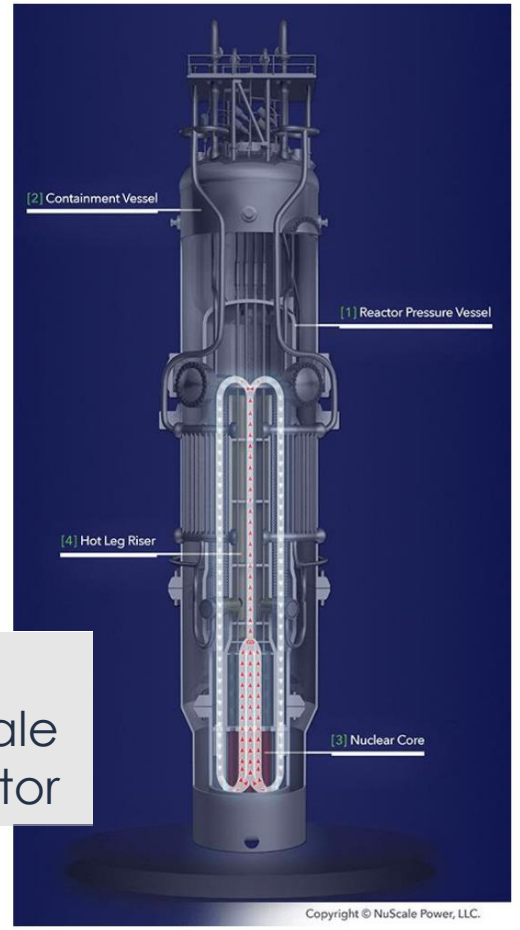
These reviews build on the 2020 and 2022 Biennial Energy Reports, which also included resource and technology reviews covering a range of technologies.

Small Modular Reactors and Advanced Reactors

Advanced reactor technology and small modular reactor technology is rapidly advancing. There is growing interest and investment in 'new nuclear' facilities, for carbon-emission free baseload power generation. The private sector and US DOE are investing many billions of dollars. Questions remain regarding cost, schedule, and other factors.

Oregon has statutory barriers to siting nuclear power plants in the state:

1. **A national permanent repository for spent-nuclear fuel must exist**
2. **Any facility approved by EFSC is subject to a statewide vote**



Design Illustration of Oregon-based NuScale Power Modular Reactor

Technology & Resource Reviews (2020) | Pages 54-56

State Energy Project Updates

This section provides updates on energy-related studies recently released or in development at ODOE.

TABLE OF CONTENTS

OREGON DEPARTMENT OF ENERGY
50 YEARS of SERVICE

Oregon Energy Security Plan

The Oregon Energy Security Plan presents an overview of the state's energy infrastructure, quantifies the threats and hazards that could cause energy insecurity, and proposes mitigation measures that the state and its partners can implement to reduce risk.

Summary

- Required by federal and state legislatures; statewide in scope
- Assessment of natural hazards, physical and cybersecurity risks; organized by geographic regions
- Inclusive of electricity, natural gas, and liquid fuels sectors
- Outreach and data collection effort
- Mitigation analysis to address risks

Take-aways

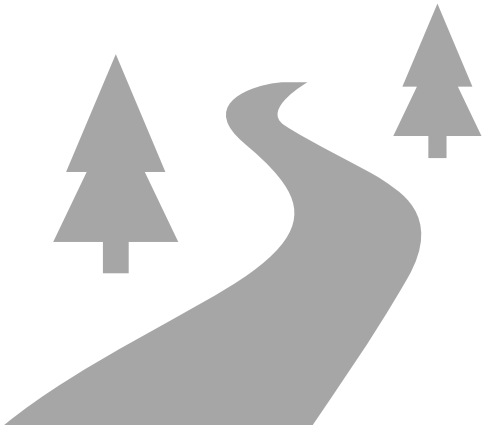
- Hazard vulnerability varies by region: earthquake, winter storms, wildfire. Cybersecurity risk across state.
- Specific liquid fuel analysis; GIS mapping of fuel storage facilities with hazard analysis

https://www.oregon.gov/energy/safety-resiliency/Pages/Energy-Security-Plan.aspx

Oregon Energy Strategy

The Oregon Department of Energy's 2022 Biennial Energy Report included a Policy Brief about charting a course for Oregon's energy future. That brief led to an overall report recommendation that the state could benefit from an energy strategy that would identify pathways to meet the state's energy and climate goals. ODOE is now leading development of that strategy, due to the Legislature November 1, 2025.

- The Strategy will evaluate benefits and challenges of different pathways, present policy recommendations, and reflect input from Oregonians who informed the Strategy.
- ODOE is following a process that combines data gathering, technical analysis, and policy discussions anchored in engagement with Oregonians with diverse backgrounds and perspectives from across the state.
- ODOE is presenting modeling results on January 31, which will inform policy discussions this spring and summer.
- Following public comment on the draft report, the Oregon Energy Strategy will be presented to the Governor and Legislature by November 2025.



https://www.oregon.gov/energy/Data-and-Reports/Pages/Energy-Strategy.aspx

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50 YEARS of SERVICE

Questions/Comments?

RESOURCES:

Report online: energyinfo.oregon.gov/ber

Contact: Christy.Splitt@energy.Oregon.gov