

2020

BIENNIAL
ENERGY
REPORT

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2020 BIENNIAL ENERGY REPORT

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Executive Summary

In 2017, the Oregon Department of Energy, recognizing that the energy world has changed dramatically since the 1970s, introduced House Bill 2343 to the Legislature. The bill charged the department with developing a new Biennial Energy Report to inform local, state, regional, and federal energy policy development and energy planning and investments. The report – based on analysis of data and information collected and compiled by the Oregon Department of Energy – provides a comprehensive review of energy resources, policies, trends, and forecasts, and what they mean for Oregon.

What You Can Expect to See in the 2020 Biennial Energy Report

The 2020 report takes a different approach than the inaugural 2018 Biennial Energy Report, which provided deep policy dives on a handful of important energy topics — including climate change, renewable energy, transportation, energy resilience, energy efficiency, and consumer protection. This 2020 report follows recommendations by energy stakeholders to provide shorter briefs on a wider array of energy topics — from energy in the agriculture sector to what’s next for alternative fuels to the effects of the COVID-19 pandemic on energy, and more.

Many sections show that Oregon is on a path toward transitioning to a cleaner, low carbon future. Data and examples included in the report illustrate sustained investments in energy efficiency, affordability, renewable energy, and resource conservation. These efforts have positioned Oregon to successfully tackle today’s energy challenges, which are driven by growing adoption from consumers for cleaner energy, economic innovation, and emerging technologies.

The report begins by looking at **Energy by the Numbers**—detailed information on Oregon’s overall and sector-based energy use, energy production and generation, energy expenditures, and the strategies Oregon has employed to meet growing energy needs. New in 2020 is an energy flow diagram, illustrating energy production and imports to eventual end-use.

Next up is a **Timeline of Energy History in Oregon**, starting with the Missoula Floods that formed our state and ending with 2020’s latest events — including the closure of Oregon’s only coal power plant and new actions to tackle climate change.

The **Energy 101** section aims to help readers understand the first part of the energy story: how energy is produced, used, and transformed. Information is meant to provide a

foundation for those new to energy and those who are already steeped in the sector.

The **Resource and Technology Reviews** section highlights 23 energy resources and technologies — they cover the spectrum of tradition to innovative, from renewable resources to emerging technologies like microgrids and power-to-gas. The topics covered are prevalent in Oregon or of interest to ODOE’s various stakeholders. Many of the technologies offer opportunities to invest in Oregon’s economy by creating energy-related jobs, including those focused on restoring our energy systems when disruptions occur.

The final section includes more detailed **Policy Briefs** that cover decarbonization, the transition of the electric grid, innovation in the natural gas system, cleaner transportation options, and the built environment and Oregon’s communities. The primary purpose of the report — and these policy briefs — is to inform energy policy development, energy planning and energy investments, and to identify opportunities to further Oregon’s energy policies.

The Biennial Energy Report wraps up with a new summary of the process used to develop the report and **closing thoughts** on what’s next. ODOE will kick off discussions in 2021 and reach out to hear new voices on recommendations for energy policy in Oregon over the next two years — and beyond.

The Biennial Energy Report may be found in its entirety at

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

or

www.oregon.gov/energy/Data-and-Reports/Pages/Reports-to-the-Legislature.aspx

The Department of Energy welcomes your comments and questions. Please contact our agency at askenergy@oregon.gov.



The primary purpose of the Biennial Energy Report is to inform local, state, regional, and federal energy policy development, energy planning, and energy investments, and to identify opportunities to further the state's energy policies.

In service of ODOE's role as the central repository within state government for the collection of data on energy resources, the report collects and analyzes critical data and information to provide a comprehensive and state-wide view of the energy sector. The term "energy" includes many intersecting systems that generate and distribute electricity to end-users, and that store and distribute fuels for home-heating, industrial processes, and transportation. It also includes the critical infrastructure, facilities, planning, and energy management that support these systems. A key consideration in analyzing the energy system is effects that it has on public health, the environment, and communities across the state. It is long past time to examine and address where our energy choices do not provide equitable distribution of benefits and burdens to Oregonians.

This section of the report provides insights on emerging energy trends, opportunities, and barriers in the energy sector. ODOE began the development of this portion of the report by listening – and then identifying the critical energy questions and issues that we heard from stakeholders, policy makers, and the public. ODOE applied a data and equity lens in determining topics for this policy briefs section of the report – are these questions being asked by people or entities that have historically not been at the table? Do we have the data and information to help answer these questions? The topics covered in the following pages also seek to answer some of the questions frequently heard by multiple people or entities; many energy stakeholders confirmed to ODOE that they were hearing similar questions and about similar information gaps: *How is the state addressing climate change and what can be done to improve the resilience of the energy sector? How are Oregon's farmers and ranchers reducing energy use and greenhouse gas emissions? What types of opportunities exist to reduce fuel use and fuel costs for the freight sector? What are the trends and potential for offshore wind and power-to-gas in Oregon? How can the state address equitable access to renewable energy for all Oregonians? How has COVID-19 affected the energy sector?*

These policy briefs can be read as standalone documents, and there are cues in each discussion to point the reader to information and data found in other parts of the report that can provide additional background and insight. This collection of policy briefs is not comprehensive – it is a snapshot of analysis for key questions in the lead up to the publication of this report. Staff at ODOE are engaged in research and analysis on other topics that are not covered in this section, and energy expertise exists in other agencies and outside state government as well. As ODOE wraps up production on the 2020 Biennial Energy Report we continue to listen, and new topics are already beginning to emerge as potential questions to address for the 2022 Biennial Energy Report.

Policy Brief: Wildfire Mitigation Planning

Despite Oregon’s reputation for having a lot of precipitation, much of the state often experiences arid conditions, especially during summer months.¹ Even the Willamette Valley and coastal areas of the state can experience drought conditions, despite having relatively high average annual precipitation levels.² As a result, no area of Oregon is immune to wildfires, as Oregonians were unfortunately reminded in September 2020. A combination of widespread drought conditions, high temperatures, and low humidity levels across much of western Oregon were met by anomalous east winds from September 7 through September 9, 2020.³ These conditions led the National Weather Service to designate areas around Salem and the northern Willamette Valley as having “extremely critical fire weather” – the first time that such a designation has ever been declared in western Oregon.⁴ The result was several catastrophic wildfires stretching from the Rogue Valley to the central Oregon Coast to the greater Portland metro area; the fires severely affected Oregon communities, including loss of life, destruction of built structures, large-scale evacuations, damage to electric system infrastructure, significant disruptions of electric service, and hazardous air quality.ⁱ While the degree to which the severity of these particular fires can be attributed to climate change is unknown, the frequency and the severity of wildfires in Oregon and across the American West are expected to increase as a result of climate change in the years ahead (see Climate Vulnerability Assessment section).

“This is truly the bellwether for climate change on the West Coast. And this is a wake-up call for all of us that we have got to do everything in our power to tackle climate change.”

**Governor Kate Brown
September 13, 2020⁵**

The relevance of this climate reality to the electric utility sector has come sharply into focus in the last



Wildfire on Highway 97 near Chiloquin, September 2020. *Photo courtesy of Oregon Department of Transportation.*

several years, predominantly driven by events in California and affirmed by the catastrophic fires in Oregon in 2020. In 2007, several catastrophic wildfires in Southern California were found by the California Public Utilities Commission to have been ignited by electric infrastructure owned and operated by San Diego Gas & Electric.⁶ More recently, the Camp Fire in 2018 resulted in most of the town of Paradise, CA being destroyed, and 85 of the town’s residents perished. Subsequent investigations found that the tragic fire was caused by a poorly maintained 115-kV transmission line owned and operated by Pacific Gas & Electric.⁷

ⁱ Note that a full investigation of the cause(s) and impacts of the September 2020 wildfires has not yet occurred. The State Fire Marshall, law enforcement agencies, and other relevant local and state authorities will be involved in this effort.

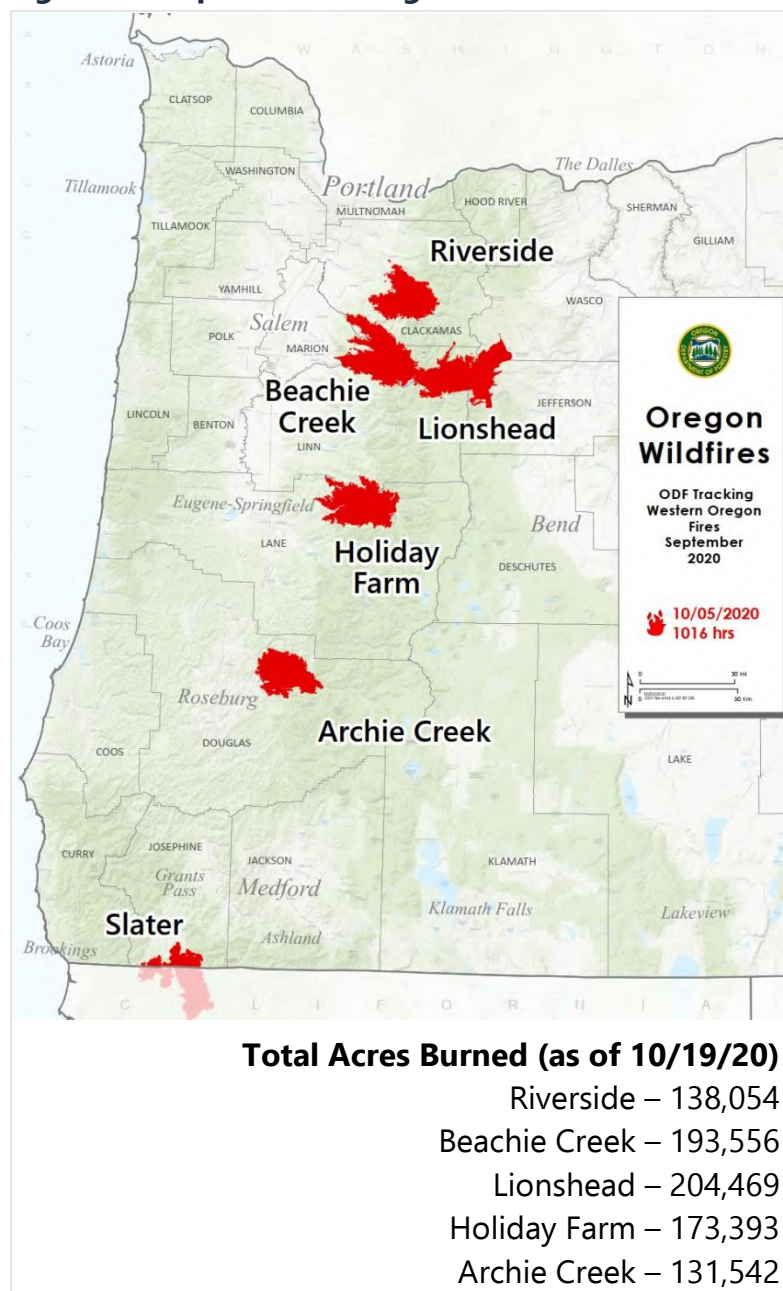
What it Means for Oregon

While the risk of wildfire in any given year can vary significantly across different areas of the state and utility service territories, major fires can occur in almost any part of the state. The large fires in September 2020 along the west slope of the Cascade Range demonstrate this and are an example of the widespread damage that can occur from these increasingly severe wildfires in Oregon. According to data from the Oregon Department of Forestry, the total acreage burned by wildfires in Oregon has been increasing at an alarming rate in recent decades, from an average of approximately 150,000 acres annually in the 1990s, to 350,000 acres annually in the 2000s, to more than 500,000 acres annually in the last decade.⁸ ODF's Final Fire Report for the 2020 fire season reported that more than 1,200,000 acres burned in the state this year, a large share of that from the fires that started in the days following Labor Day.^{9 10}

Oregon had already been anticipating an increased potential for major wildfire events driven by a changing climate. Several major wildfires in Oregon in 2017 (notably the Chetco Bar Fire that burned nearly 200,000 acres in the Coast Range of Curry County¹¹ and the Eagle Creek Fire that burned nearly 50,000 acres in the Columbia River Gorge¹²), and recent catastrophic fires in California,

contributed to Governor Kate Brown establishing the Governor's Council on Wildfire Response in January 2019.¹³ The Council—consisting of thirteen members appointed by the Governor including one representative from the electric utility sector—was charged with reviewing the state's current model for wildfire preparedness and response and developing recommendations to strengthen or improve those processes.¹⁴ The Council reported its findings and recommendations in a report to the Governor in November 2019.¹⁵

Figure 1: Map of 2020 Oregon Wildfires¹⁰



The report identified a need for electric utility companies to “take additional measures to reduce the risk of transmission-related fire events.”¹⁶ It continued:

Due to the often remote location, power line fires have the potential to be larger than fires from other causes. Suppression of these fires during extreme weather conditions has become less effective. Reducing the risk of transmission-caused wildfire will have a direct and positive benefit to Oregon’s effort to reduce human-caused wildfires.

To address this problem, the Council’s first overall report recommendation called for the development of electric transmission system wildfire plans, which it categorized as being of the “highest” priority. The Council made the following specific recommendations:¹⁷

- Oregon legislature pass legislation requiring both investor- and consumer-owned utilities to prepare risk-based, wildfire standards and procedures inclusive of criteria for initiating power outages.
- The Oregon Public Utility Commission (PUC) use workshops to develop these risk-based standards and procedures.
- All utilities and transmission and distribution system owners participate in these workshops.

To implement these recommendations, Senate Bill 1536 (2020) was introduced at the request of Governor Brown, but did not pass during the 2020 Legislative Session.¹⁸ Following that session, Governor Brown issued Executive Order 20-04: Directing State Agencies to Take Actions to Reduce and Regulate Greenhouse Gas Emissions, which recognized that climate change is increasing the frequency and severity of wildfires in Oregon, and identified a need for the state’s utility sector to improve the resilience of the energy system in light of these increasing risks.¹⁹ Specifically, the order’s directives to the PUC requires the agency to evaluate risk-based wildfire program plans for investor-owned utilities and convene periodic workshops to develop and share best practices for mitigating wildfire risk in the utility sector.²⁰ The Commission initiated its implementation of these two directives with kickoff meetings in May 2020 with PacifiCorp, Portland General Electric, and Idaho Power, and by convening a conversation with operators of electric distribution systems across the state (including consumer-owned utilities).²¹

Bonneville Power Administration, the owner and operator of the most line miles of electric transmission in the state, is not subject to the jurisdiction of EO 20-04 (nor would SB 1536 have applied to them) on account of its status as a federal agency. Nevertheless, BPA is taking action to mitigate against wildfire risks and published a wildfire mitigation plan in 2020.²² BPA staff have also been active participants in the workshops and meetings hosted by the Oregon PUC that are intended to share wildfire mitigation best practices among electricity service providers in the state.²³



The Latest: Utility Wildfire Planning

Electric service in Oregon is nearly universal, which requires the electric grid to stretch over thousands of miles of terrain to reach every corner of the state. Electric service providers have a long history of managing this vast system to mitigate against a range of risks, from the potential to overload lines during hot weather, to managing encroaching vegetation, to routine repair and replacement of aging infrastructure. As the changing risks posed by climate change become better understood, utility wildfire mitigation plans are likely to continue evolving in the years ahead. ODOE is not aware of any universally accepted guidance related to the

development of utility wildfire mitigation plans. Most of the actions found in these emerging plans, however, are focused on mitigating against one or both of two related risks: the potential for utility infrastructure to ignite a wildfire and the potential for a wildfire, irrespective of its source, to damage utility infrastructure.²⁴ (See the Climate Vulnerability Assessment Policy Brief.)

Utility presentations to the Oregon PUC in July 2020,²⁵ regulatory filings from PGE and PacifiCorp,^{26 27} and BPA's published wildfire mitigation plan,²⁸ included a number of measures that utilities can take to evolve their approach to wildfire through improved risk assessments, mitigation strategies, and operational changes.

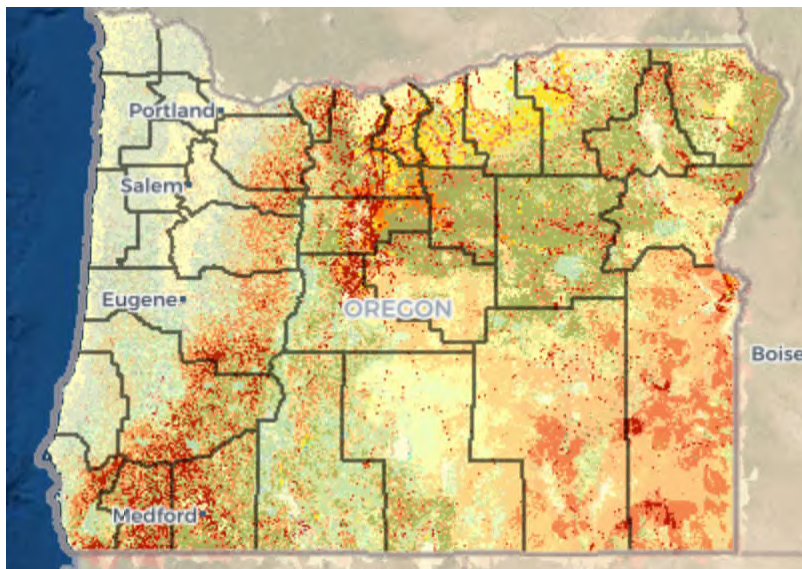
Oregon PUC Rulemaking

The PUC recently opened a rulemaking focused on the development of risk-based wildfire mitigation plans consistent with Gov. Brown's EO 20-04 (see PUC Docket AR 638²⁹ for more information). For more details on the wildfire mitigation efforts currently underway by the largest electric system operators in Oregon, see the following:

- [PacifiCorp's 2020 Wildfire Plan](#) (as filed in California)
- [Portland General Electric: Wildfire Planning](#)
- [BPA Wildfire Mitigation Plan](#)

Figure 2: Map of Oregon Showing Overall Wildfire Risk and Threat²⁴

(darker colors = higher risk/threat)



“As the climate crisis creates hotter and drier summers with longer wildfire seasons, the overall risk of climate fires is increasing.” – Eugene Water and Electric Board ³⁰

“Past practices are not enough in an era of changing climate conditions. PGE is continuing to enhance its Wildfire Mitigation program based on learnings from peers in the energy and forestry industries.” – Portland General Electric³¹

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