Oregon Department of **ENERGY**

Drafting the 2020 Biennial Energy Report

OREGON DEPARTMENT OF ENERGY

Overview: Oregon Department of Energy

- Oregon Department of Energy (ODOE) is Oregon's dedicated state energy agency **created in 1975**
- ODOE employs **about 80 full-time staff** in four core divisions:
  - Nuclear Safety & Emergency Preparedness
  - Energy Planning & Innovation
  - Energy Facility Siting
  - Energy Development Services
- **Update!** ODOE currently in development of 2020-2025 strategic plan.
  - **Vision:** A safe, equitable, clean, and sustainable future
  - **Mission:** ODOE helps Oregonians make informed energy 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.
  - **Values, Position, & More info:** https://www.oregon.gov/energy/About-Us/Pages/Mission-Values.aspx

OREGON DEPARTMENT OF ENERGY

Biennial Energy Report ("BER")

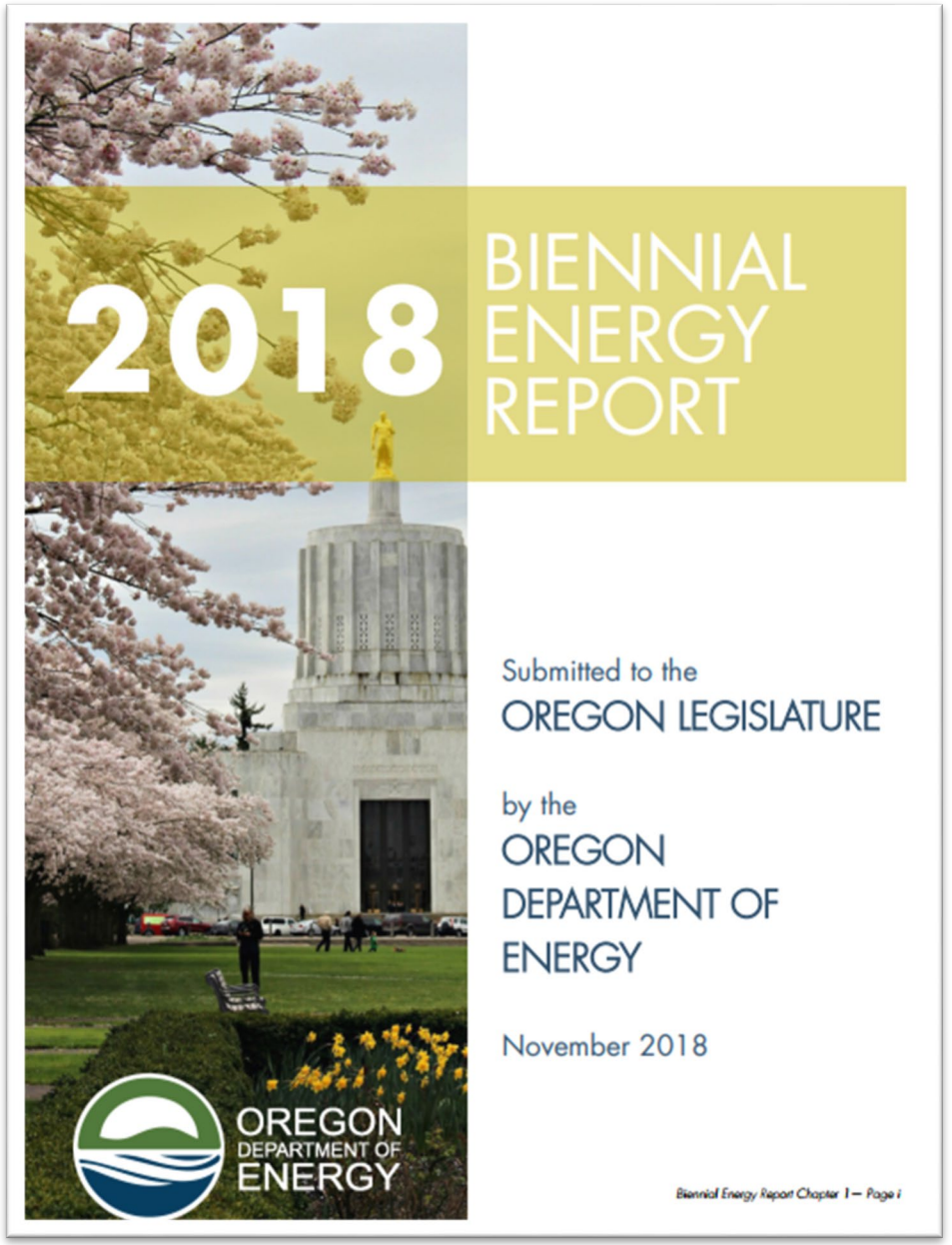
- Statutory Reference + Background
  - ORS 469.059 (2017) requires ODOE to develop a BER to inform local, state, regional, and federal energy policy development and energy planning and investments.
  - In 2018, the inaugural BER provided foundational energy data, existing policy landscape, and identified options for continued progress toward meeting energy goals.

- Topics Required in ORS 469.059
  - Consumption, generation, transmission and production of energy, including fuel energy,
  - Energy costs
  - Energy sectors, markets, technologies, resources and facilities
  - Energy efficiency and conservation
  - The effects of energy use, including effects related to greenhouse gases
  - Local, state, regional and federal regulations, policies and planning activities
  - Emerging opportunities, challenges, and impacts

- ORS 469.059 states BER may include Recommendations for:
  - Development and maximum use of cost-effective conservation methods and renewable resources, consistent with the energy policies stated in ORS 469.010/469.310, and the Northwest Power and Conservation Council
  - Proposed research, development and demonstration projects and programs necessary to further the energy policies stated in ORS 469.010 and 469.310.

2018 Biennial Energy Report (BER) *Highlights*

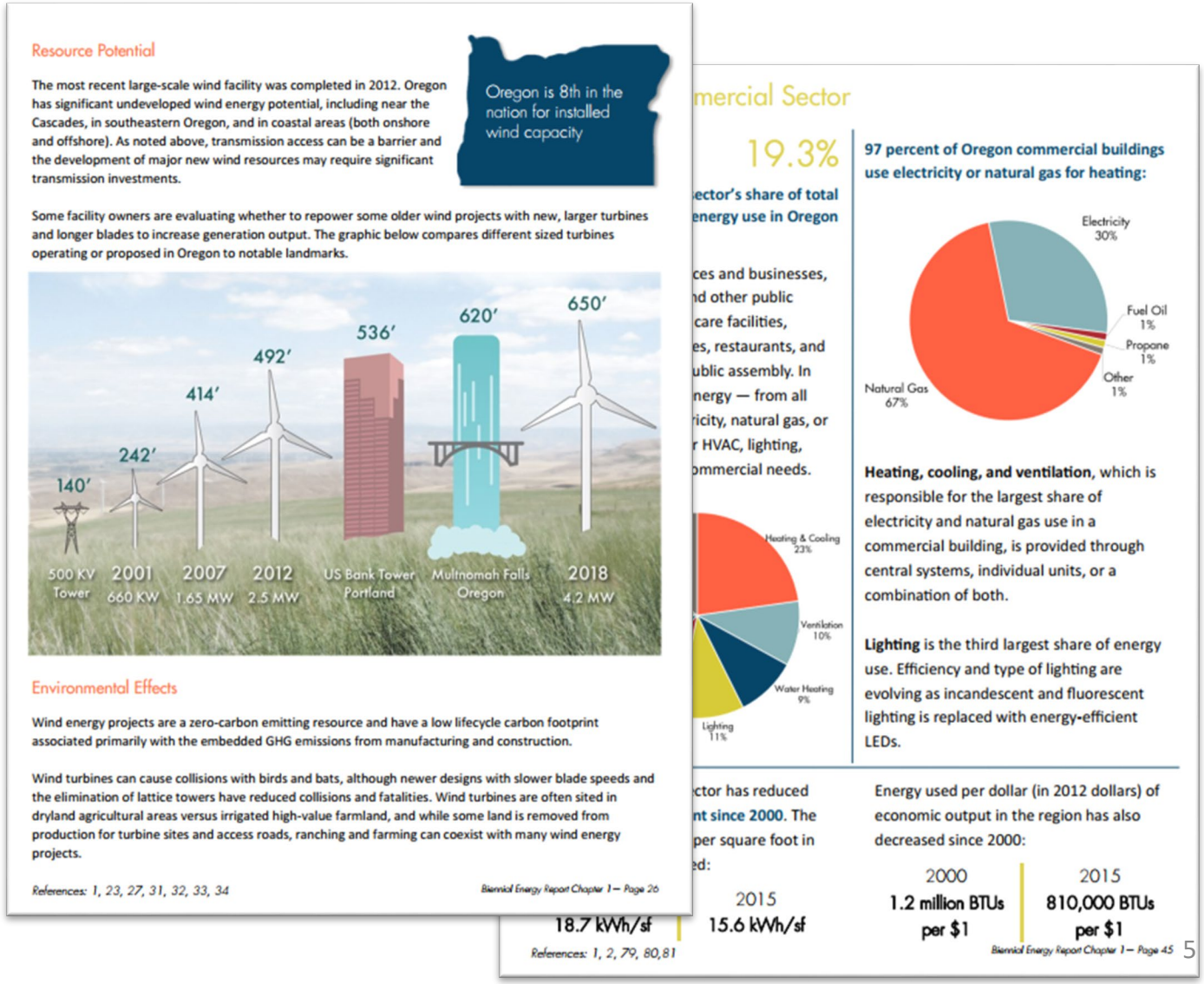
https://energyinfo.oregon.gov/ber



OREGON DEPARTMENT OF ENERGY

Chapter 1: Energy by the Numbers

- Data and information on Oregon's energy resources and consumption
- Details on energy production and generation
- Trends and information on end-use sectors
- Understanding your energy bill, state expenditures



Resource Potential

The most recent large-scale wind facility was completed in 2012. Oregon has significant undeveloped wind energy potential, including near the Cascades, in southeastern Oregon, and in coastal areas (both onshore and offshore). As noted above, transmission access can be a barrier and the development of major new wind resources may require significant transmission investments.

Oregon is 8th in the nation for installed wind capacity

Some facility owners are evaluating whether to repower some older wind projects with new, larger turbines and longer blades to increase generation output. The graphic below compares different sized turbines operating or proposed in Oregon to notable landmarks.

Environmental Effects

Wind energy projects are a zero-carbon emitting resource and have a low lifecycle carbon footprint associated primarily with the embedded GHG emissions from manufacturing and construction.

Wind turbines can cause collisions with birds and bats, although newer designs with slower blade speeds and the elimination of lattice towers have reduced collisions and fatalities. Wind turbines are often sited in dryland agricultural areas versus irrigated high-value farmland, and while some land is removed from production for turbine sites and access roads, ranching and farming can coexist with many wind energy projects.

References: 1, 23, 27, 31, 32, 33, 34

Biennial Energy Report Chapter 1 – Page 26

mercial Sector

19.3%

ector's share of total energy use in Oregon

ces and businesses, nd other public care facilities, es, restaurants, and ublic assembly. In nergy — from all icity, natural gas, or r HVAC, lighting, ommercial needs.

97 percent of Oregon commercial buildings use electricity or natural gas for heating:

Heating, cooling, and ventilation, which is responsible for the largest share of electricity and natural gas use in a commercial building, is provided through central systems, individual units, or a combination of both.

Lighting is the third largest share of energy use. Efficiency and type of lighting are evolving as incandescent and fluorescent lighting is replaced with energy-efficient LEDs.

ctor has reduced nt since 2000. The per square foot in ed:

2015
15.6 kWh/sf

18.7 kWh/sf

Energy used per dollar (in 2012 dollars) of economic output in the region has also decreased since 2000:

2000	2015
1.2 million BTUs per $1	810,000 BTUs per $1

References: 1, 2, 79, 80,81

Biennial Energy Report Chapter 1 – Page 45

OREGON DEPARTMENT OF ENERGY

Chapter 2: Climate Change

- Overview of current literature and strategies for deep decarbonization
- Considerations in policy design
- Overview of greenhouse gas emissions mitigation options
- Opportunities across Oregon's energy sectors

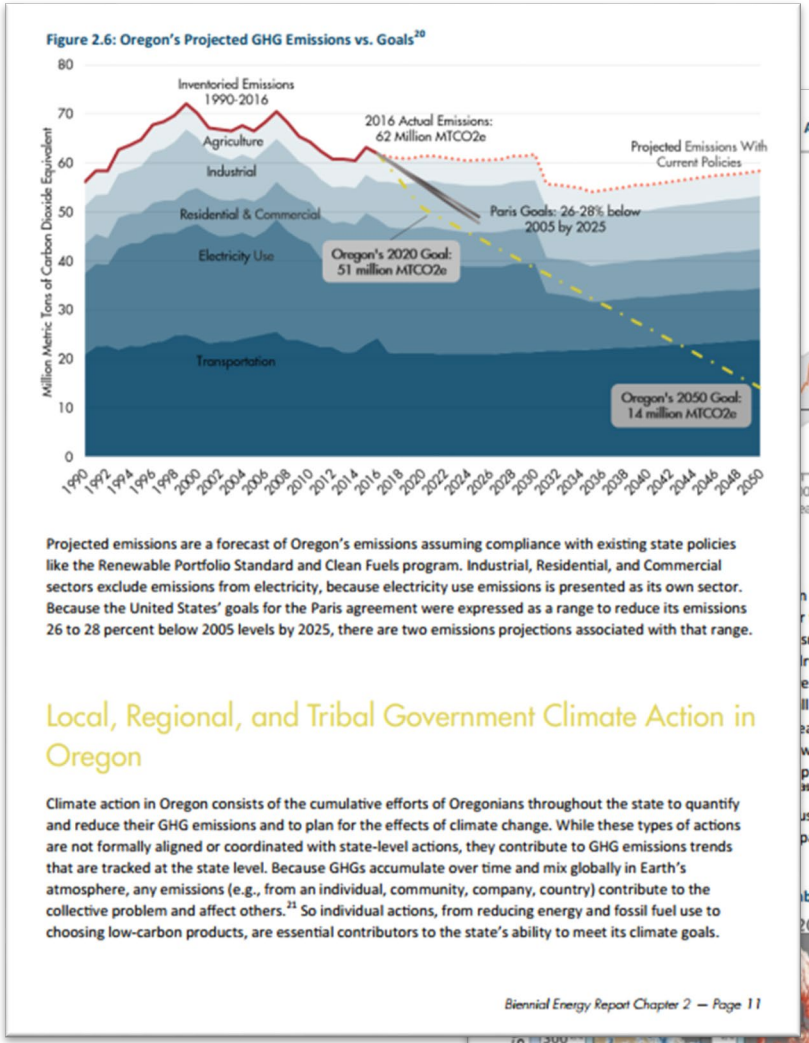


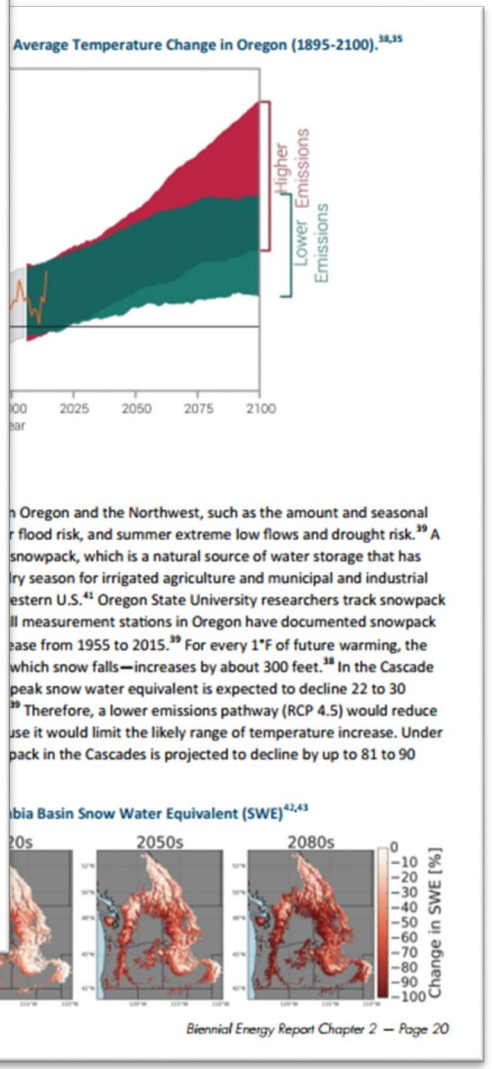
Figure 2.6: Oregon's Projected GHG Emissions vs. Goals[20]

Projected emissions are a forecast of Oregon's emissions assuming compliance with existing state policies like the Renewable Portfolio Standard and Clean Fuels program. Industrial, Residential, and Commercial sectors exclude emissions from electricity, because electricity use emissions is presented as its own sector. Because the United States' goals for the Paris agreement were expressed as a range to reduce its emissions 26 to 28 percent below 2005 levels by 2025, there are two emissions projections associated with that range.

Local, Regional, and Tribal Government Climate Action in Oregon

Climate action in Oregon consists of the cumulative efforts of Oregonians throughout the state to quantify and reduce their GHG emissions and to plan for the effects of climate change. While these types of actions are not formally aligned or coordinated with state-level actions, they contribute to GHG emissions trends that are tracked at the state level. Because GHGs accumulate over time and mix globally in Earth's atmosphere, any emissions (e.g., from an individual, community, company, country) contribute to the collective problem and affect others.[21] So individual actions, from reducing energy and fossil fuel use to choosing low-carbon products, are essential contributors to the state's ability to meet its climate goals.

Biennial Energy Report Chapter 2 — Page 11



Average Temperature Change in Oregon (1895-2100).[38,35]

n Oregon and the Northwest, such as the amount and seasonal r flood risk, and summer extreme low flows and drought risk.[39] A snowpack, which is a natural source of water storage that has ry season for irrigated agriculture and municipal and industrial estern U.S.[41] Oregon State University researchers track snowpack ll measurement stations in Oregon have documented snowpack ease from 1955 to 2015.[39] For every 1°F of future warming, the which snow falls—increases by about 300 feet.[38] In the Cascade peak snow water equivalent is expected to decline 22 to 30 [39] Therefore, a lower emissions pathway (RCP 4.5) would reduce se it would limit the likely range of temperature increase. Under pack in the Cascades is projected to decline by up to 81 to 90

bia Basin Snow Water Equivalent (SWE)[42,43]

Biennial Energy Report Chapter 2 — Page 20

OREGON DEPARTMENT OF ENERGY

Chapter 3: Renewable Energy

- Understanding the growth of renewable energy capacity in Oregon
- Review of policies, growing demand, and reductions in cost
- Challenges and opportunities as Oregon integrates more variable renewable electricity onto the grid
- Case study on solar energy

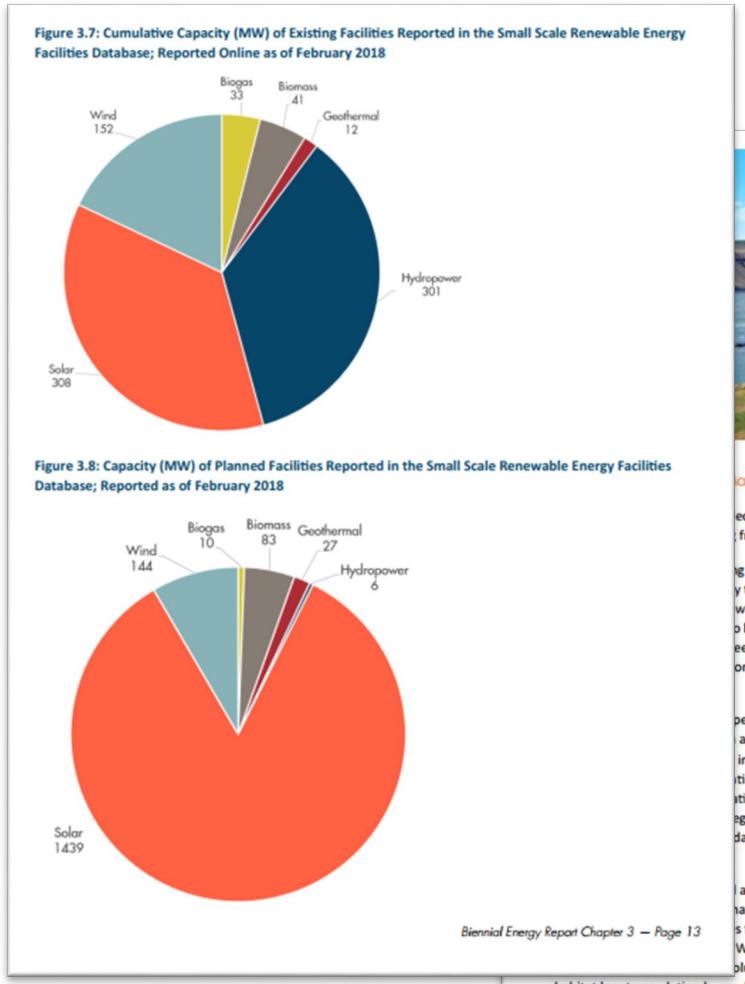


Figure 3.7: Cumulative Capacity (MW) of Existing Facilities Reported in the Small Scale Renewable Energy Facilities Database; Reported Online as of February 2018

Figure 3.8: Capacity (MW) of Planned Facilities Reported in the Small Scale Renewable Energy Facilities Database; Reported as of February 2018

Biennial Energy Report Chapter 3 — Page 13

...any Uses of the Columbia River Basin

...ectric power is the single largest source of electricity in Oregon, with the ... from the Federal Columbia River Power System (FCRPS).

...g before construction of the first hydroelectric project, and the operation of ...y to accommodate its many uses. Important among historic uses are those of ...whose ancestral homelands are located within the Columbia River Basin – ...o be protected today under tribal treaty rights. The Federal Action Agencies ...eers, and the Bureau of Reclamation) have a trust responsibility established in ...on of their government-to-government relationship with these federally

...perate the FCRPS to meet core purposes like flood control, fish and wildlife ... as shown Figure 3.13.[51] ...into conflict, as they often ...ting the river. One ...tions for energy prices and ...egrate variable renewable ...dams and the threatened

...and threatened fish ...abitat within the Columbia ...s for Oregon and the other ...While there are numerous ...olumbia River Basin, from habitat loss to predation by sea lions to climate change, this section focuses on the conflict with dams and the modifications made to hydropower in an effort to improve fish survival.

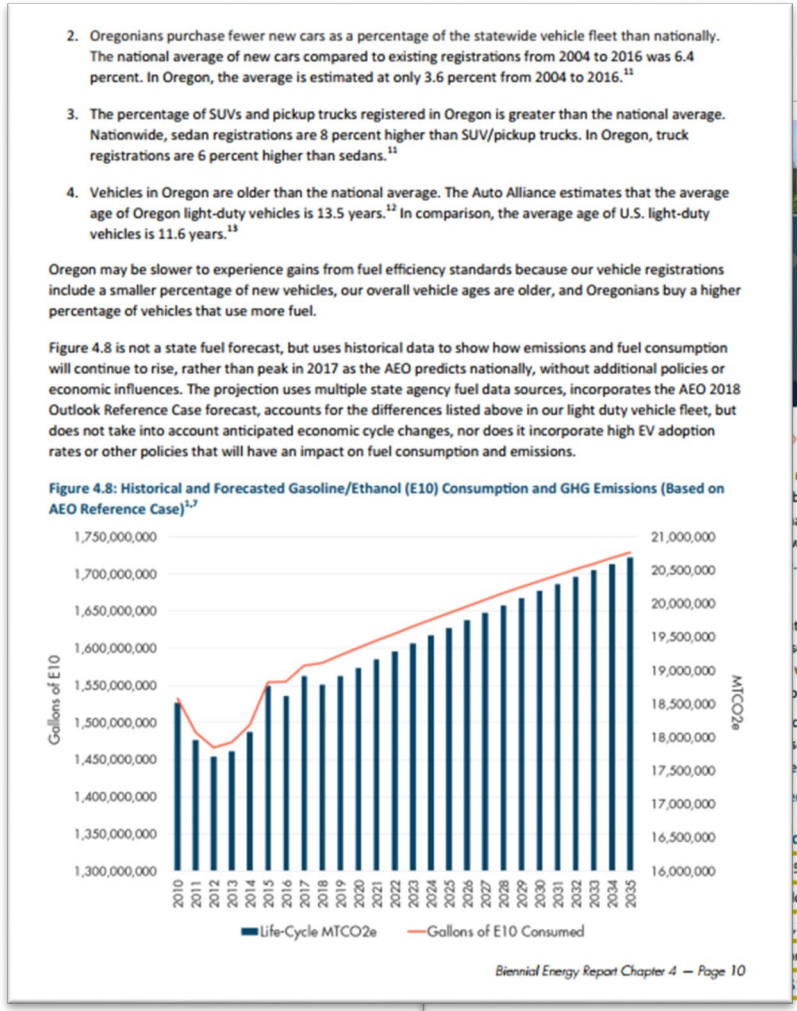
Figure 3.13: Columbia River Uses[52]

Biennial Energy Report Chapter 3 — Page 31

OREGON DEPARTMENT OF ENERGY

Chapter 4: Transportation

- Focus on fuels used and emissions from vehicles, which represent the bulk of Oregon's transportation-related fuel costs and sector emissions
- Overview of national and state trends, policies, and strategies to address Oregon's GHG reduction goals
- Discusses the adoption of electric vehicles in Oregon



2. Oregonians purchase fewer new cars as a percentage of the statewide vehicle fleet than nationally. The national average of new cars compared to existing registrations from 2004 to 2016 was 6.4 percent. In Oregon, the average is estimated at only 3.6 percent from 2004 to 2016.[11]

3. The percentage of SUVs and pickup trucks registered in Oregon is greater than the national average. Nationwide, sedan registrations are 8 percent higher than SUV/pickup trucks. In Oregon, truck registrations are 6 percent higher than sedans.[11]

4. Vehicles in Oregon are older than the national average. The Auto Alliance estimates that the average age of Oregon light-duty vehicles is 13.5 years.[12] In comparison, the average age of U.S. light-duty vehicles is 11.6 years.[13]

Oregon may be slower to experience gains from fuel efficiency standards because our vehicle registrations include a smaller percentage of new vehicles, our overall vehicle ages are older, and Oregonians buy a higher percentage of vehicles that use more fuel.

Figure 4.8 is not a state fuel forecast, but uses historical data to show how emissions and fuel consumption will continue to rise, rather than peak in 2017 as the AEO predicts nationally, without additional policies or economic influences. The projection uses multiple state agency fuel data sources, incorporates the AEO 2018 Outlook Reference Case forecast, accounts for the differences listed above in our light duty vehicle fleet, but does not take into account anticipated economic cycle changes, nor does it incorporate high EV adoption rates or other policies that will have an impact on fuel consumption and emissions.

Figure 4.8: Historical and Forecasted Gasoline/Ethanol (E10) Consumption and GHG Emissions (Based on AEO Reference Case)[1,7]

Biennial Energy Report Chapter 4 — Page 10

u Saw Just A Few Years Ago

Electric Vehicle Trends

	2015	2020
Typical EV (model year)		
Total Range in Miles	80	300+
DC Fast Charge: Miles Charged in 15 Minutes	44	134

t than their ICE counterparts, meaning an EV can go the
ed in an ICE vehicle. EVs convert about 59 to 62 percent of
wheels. Conventional gasoline vehicles only convert about
power at the wheels.[58]

cal gasoline-powered vehicle and an electric vehicle.
es far less energy – with an equivalent savings of 373
EV is 28 percent of the cost to fuel the ICE.

red Vehicle vs. Electric Vehicle[5]

owered Vehicle	Electric Vehicle
5 mpg	3.33 miles/kWh
ons gasoline	3,600 kWh
,200 kWh	▪ 107 gallons gasoline
r $0.12 per mile	$0.11/kWh[59] or $0.03 per mile
1,440	$396
Annual Savings	373 gallons gasoline $1,044

Biennial Energy Report Chapter 4 — Page 33

OREGON DEPARTMENT OF ENERGY

Chapter 5: Resiliency

- 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 focus on community energy resilience
- Includes how energy resilience factors into climate change discussions

oversight mechanisms, nor does it have metrics or standards against which a system can be evaluated for compliance.

As this chapter will explore in greater detail, lack of definitions and regulatory oversight notwithstanding, entities across Oregon have been starting to take steps to enhance the resilience of the energy sector. For example, state government has called attention to the need to improve the resilience of the Critical Energy Infrastructure Hub in the Portland metro area. Meanwhile, both investor-owned and consumer-owned electric utilities have been taking proactive steps to reinforce and move infrastructure to make it more resilient to anticipated threats. And lastly, local governments are increasingly thinking about the concept of community energy resilience and the interdependencies of many of their communities' critical public services on the continued delivery of energy following a major disruption to the state's broader energy systems. These efforts will be detailed below in addition to identifying a need to build upon these efforts through a collaborative process to define a community energy resilience vision for the state.

Identifying Resilience Threats to Oregon's Energy Systems

While reliability standards are focused on how energy systems operate under reasonably expected conditions, energy resilience concerns the ability of energy systems to maintain operation during and recover following an acute non-routine event, typically one of severe impact and/or duration. This section identifies three resilience threats — a Cascadia Subduction Zone earthquake, cyber and physical attacks, and climate change — to consider as the state continues working toward building more resilient energy systems in Oregon.

Cascadia Subduction Zone

In recent decades, geologists have learned more about the risk to the Pacific Northwest from the Cascadia Subduction Zone (CSZ) — an active seismic fault that parallels the coast of the Northwest approximately 100 miles offshore.[5] By investigating the geologic record, scientists have found that a rupture of the CSZ occurs approximately every 300 to 400 years, with the last rupture occurring on January 26, 1700 — or 318 years ago as of the publication of this report.[5] The chance of a significant rupture of the CSZ occurring within the next 50 years is expected to be between 15 and 20 percent.[6,7,8] The CSZ is capable of producing a megathrust earthquake registering a magnitude of 9.0+ on the Richter Scale with a devastating tsunami to follow.[5] This type of an event has the potential to be similar to the Tohoku earthquake and resulting tsunami that devastated the Sendai region, including the Fukushima nuclear plant, off coastal Japan in March 2011.[5]

The Oregon Resilience Plan (ORP), published in 2013, evaluated the expected effects to different sectors of the economy from a 9.0 earthquake along the CSZ. Chapter 6 of that plan evaluated the expected impacts to the energy sector. The plan identified significant vulnerabilities to the state's Critical Energy Infrastructure

DEBOOK

t of Energy plans to publish
e in the Consumer-Owned
of two years of work by
s Office and Central Lincoln
ssible by the support of the
Practices, through its Policy

More information about ODOE's resiliency work is available on its website:
www.oregon.gov/energy/safety-resiliency

working at the state's
d with developing plans to enhance the resilience of their
ook:

within the context of the field of emergency management at

ities can take to enhance resilience based on the examples
ation; and

tilize to prioritize investments in distributed energy

buted energy resources (DERs) as part of projects that
the extent that these projects have the ability to operate
n provide some improvement to community energy resilience
larger energy systems.

EWEB is investigating several possible back-up power sources, and is installing a microgrid back-up battery power source at Howard Elementary school in 2018 and a new water

EWEB contractor installs back-up battery power system.

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Chapter 6: Energy Efficiency

- Discusses energy efficiency 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

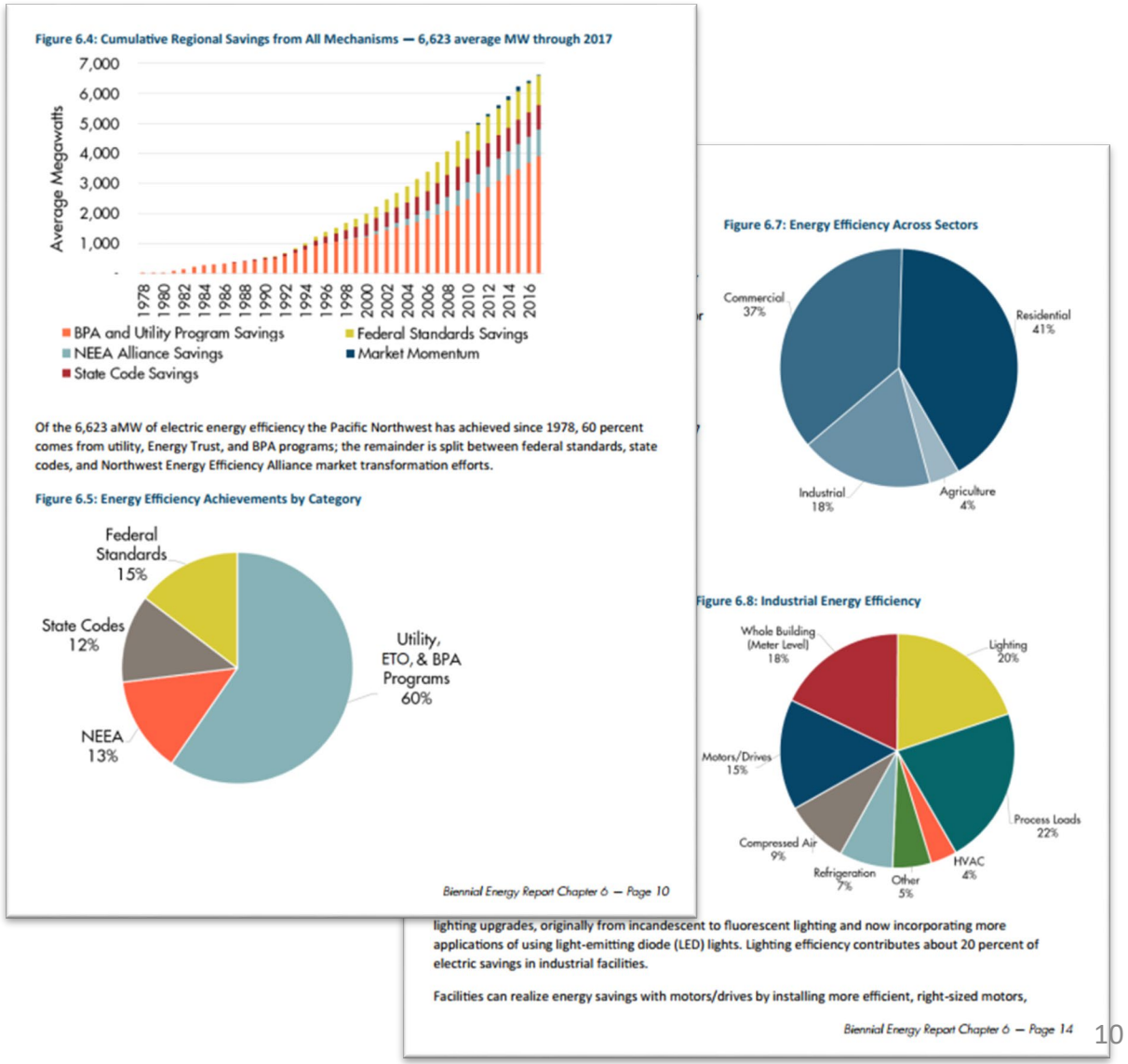

Figure 6.4: Cumulative Regional Savings from All Mechanisms — 6,623 average MW through 2017

Of the 6,623 aMW of electric energy efficiency the Pacific Northwest has achieved since 1978, 60 percent comes from utility, Energy Trust, and BPA programs; the remainder is split between federal standards, state codes, and Northwest Energy Efficiency Alliance market transformation efforts.

Figure 6.5: Energy Efficiency Achievements by Category

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Figure 6.7: Energy Efficiency Across Sectors

Figure 6.8: Industrial Energy Efficiency

lighting upgrades, originally from incandescent to fluorescent lighting and now incorporating more applications of using light-emitting diode (LED) lights. Lighting efficiency contributes about 20 percent of electric savings in industrial facilities.

Facilities can realize energy savings with motors/drives by installing more efficient, right-sized motors,

Biennial Energy Report Chapter 6 — Page 14

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Chapter 7: Protecting Consumers

- Explores energy burden, consumer protection, and equity
- Discusses the effects of and uncertainties from a rapidly changing energy sector
- Notes increasing interest and need for securing more equitable outcomes for all Oregonians

A household can be energy-burdened when their energy-related expenditures exceed six percent of their income.[1] In this case, energy burden is calculated by using the percentage of household income spent on home energy, such as utility bills and other heating costs.

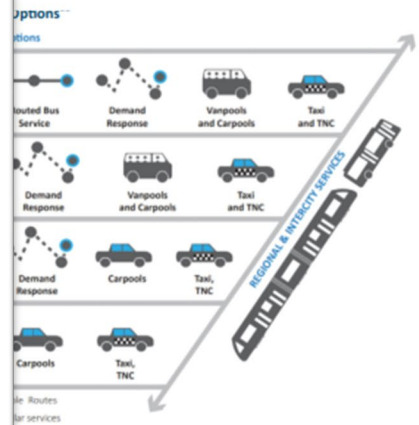
Energy burden involves two key components: energy costs and income. Programs to alleviate energy burden commonly use income thresholds based upon state median income and federal poverty level to determine eligibility. Table 7.1 uses Oregon Housing and Community Services Department (OHCS) income eligibility guidelines and shows when households may be eligible for both energy and weatherization assistance programs.

Table 7.1: U.S. Median Household Income and Poverty Levels[2]

Weatherization Assistance Program		Energy Assistance Programs
At or below 200% of Federal Poverty Level		At or below 60% of State Median Income
Annual Income	**Household Size**	**Annual Gross Income**
$24,280	1	$24,550
$32,920	2	$32,103
$41,560	3	$39,657
$50,200	4	$47,210
$58,840	5	$54,764
$67,480	6	$62,317
$76,120	7	$63,734
$84,760	8	$65,150
$93,400	9	$66,566
$102,040	10	$67,983
$110,680	11	$69,399
$119,320	12	$70,815
$8,640	Each additional family member	$1,416

There are 1,603,635 total households in Oregon.[3] According to OHCS, approximately 396,182, or about 25 percent of all households, are considered energy-burdened because of their energy-related expenditures. Figure 7.1, a map of Oregon counties, compares electricity, natural gas, and other home energy costs with household income. It shows the percentage of households in each county with income at or below 200 percent of the federal poverty level. A household is considered energy burdened if six percent or more of its gross income is consumed by energy-related expenses.

Biennial Energy Report Chapter 7 — Page 3



-income and/or senior citizen transit fare programs in place to help reduce
r example, TriMet has a low-income fare, for which more than 5,000
months,[36] in addition to other programs to improve access to transit.[37]
sible in all suburban or rural communities, creating greater reliance on

People that are Low-Income or Living in Poverty

have experienced an increase in the number of residents living in
00 and 2012, the number of suburban poor living in distressed
nt.[38] There is some indication that these trends are visible in Oregon as

n published a Poverty Brief using National Household Survey data that
tions used by people at a range of income levels – with the vast majority
cy vehicles or multi-occupancy vehicles.[40] While this national data is from
n an increase in vehicle miles traveled between 2009 and 2017,[41]
occur mostly in cars. With cars serving as the primary mode of transport –
ncy in the case of lower-income people – expenditures for vehicle, fuel,
ese households can be high and unpredictable.

Even as reliance on cars for transportation expanded, this may not be an option for many consumers. Table 7.3 shows that people in poverty or low income households are less likely to have access to a vehicle, with little change over ten years.

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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
  - Evaluate 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

OREGON DEPARTMENT OF ENERGY

2020 Biennial Energy Report (BER)

Drafting Update

OREGON DEPARTMENT OF ENERGY

Developing the 2020 BER

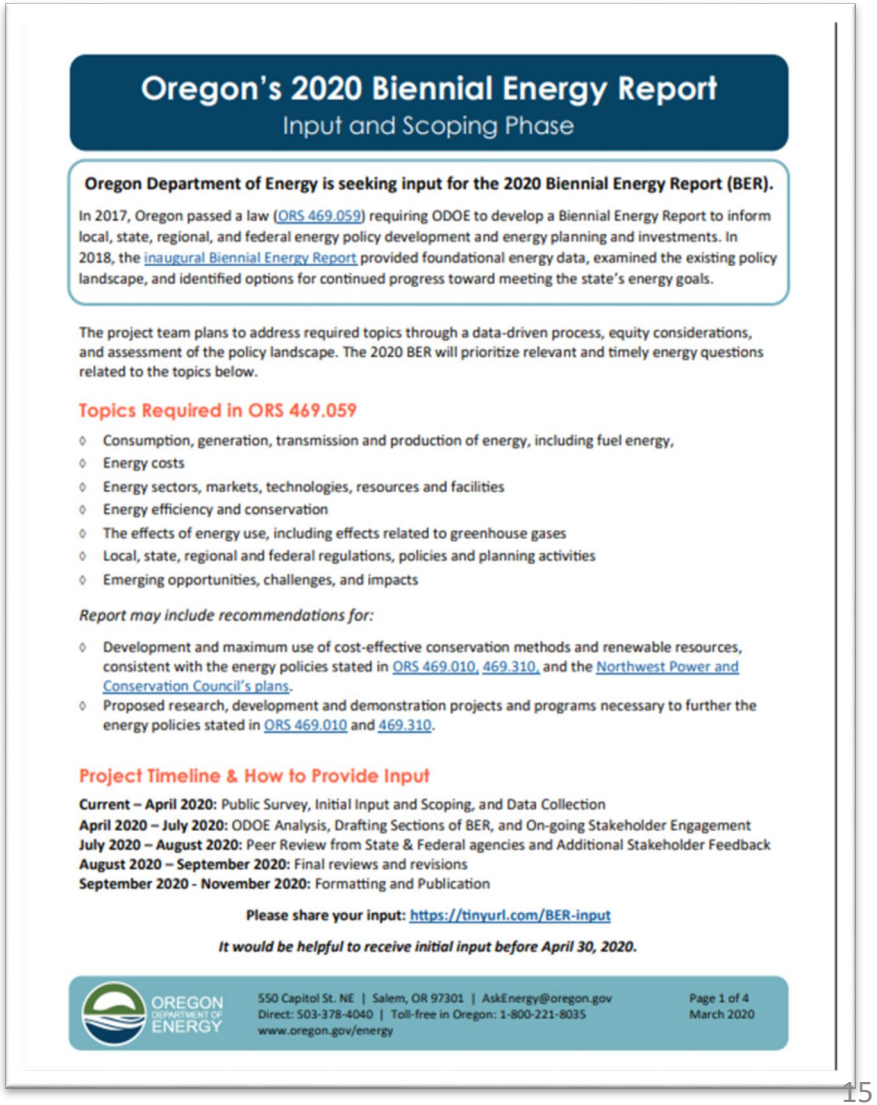
- Address required topics through a **data-driven** process, **equity considerations**, and **assessment of the policy landscape**.
- Prioritize **relevant and timely energy questions** related to required topics.

- **Project Timeline**
  - January – April 2020: Public Survey, Initial Input and Scoping, and Data Collection
  - **May – July 2020: ODOE Analysis, Drafting Sections of BER, and Ongoing External Engagement**
  - August – September 2020: Peer Review from State & Federal agencies and External Stakeholder Feedback
  - August – September 2020: Final reviews and revisions
  - October – November 1, 2020: Formatting and Publication

Scoping & Input Process

- Objective: Assessment of the data and policy landscape to identify and prioritize relevant and timely energy topics and questions to be included in the BER.
  - +100 people ranging from members of the public to NGOs to energy industry experts
  - Survey, website comment portal, 1:1 scoping discussions

- Themes and examples of what we heard:
  - Greater access to clean energy resources for diverse communities across Oregon
  - Maintaining reliable and low-cost energy systems while the state gets closer to 100% clean energy
  - Status of new and emerging energy technologies in Oregon
  - Impact of the COVID-19 pandemic
  - Key historical energy decisions in Oregon
  - Developing new energy resources while protecting natural and cultural resources
  - Cost and affordability of energy
  - Energy options available to different types of energy consumers



Oregon's 2020 Biennial Energy Report
Input and Scoping Phase

Oregon Department of Energy is seeking input for the 2020 Biennial Energy Report (BER).

In 2017, Oregon passed a law (ORS 469.059) requiring ODOE to develop a Biennial Energy Report to inform local, state, regional, and federal energy policy development and energy planning and investments. In 2018, the inaugural Biennial Energy Report provided foundational energy data, examined the existing policy landscape, and identified options for continued progress toward meeting the state's energy goals.

The project team plans to address required topics through a data-driven process, equity considerations, and assessment of the policy landscape. The 2020 BER will prioritize relevant and timely energy questions related to the topics below.

Topics Required in ORS 469.059

- Consumption, generation, transmission and production of energy, including fuel energy,
- Energy costs
- Energy sectors, markets, technologies, resources and facilities
- Energy efficiency and conservation
- The effects of energy use, including effects related to greenhouse gases
- Local, state, regional and federal regulations, policies and planning activities
- Emerging opportunities, challenges, and impacts

Report may include recommendations for:

- Development and maximum use of cost-effective conservation methods and renewable resources, consistent with the energy policies stated in ORS 469.010, 469.310, and the Northwest Power and Conservation Council's plans.
- Proposed research, development and demonstration projects and programs necessary to further the energy policies stated in ORS 469.010 and 469.310.

Project Timeline & How to Provide Input

Current – April 2020: Public Survey, Initial Input and Scoping, and Data Collection
April 2020 – July 2020: ODOE Analysis, Drafting Sections of BER, and On-going Stakeholder Engagement
July 2020 – August 2020: Peer Review from State & Federal agencies and Additional Stakeholder Feedback
August 2020 – September 2020: Final reviews and revisions
September 2020 - November 2020: Formatting and Publication

Please share your input: https://tinyurl.com/BER-input

It would be helpful to receive initial input before April 30, 2020.

OREGON DEPARTMENT OF ENERGY
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www.oregon.gov/energy
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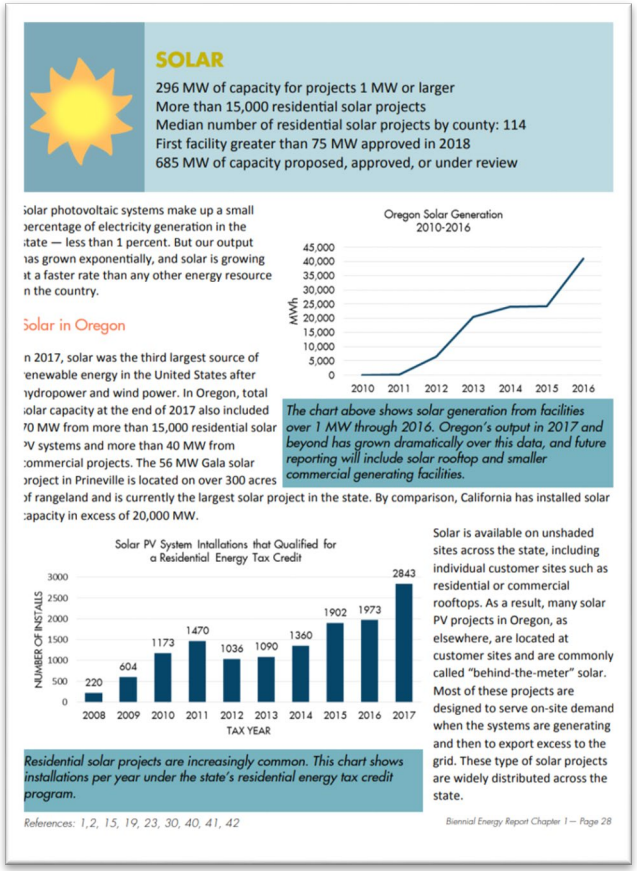
March 2020

2020 BER Framework

- **Energy By the Numbers** – Quick-reference with energy facts and infographics; concise explanations about energy resources, energy sectors, and electricity, direct fuel, and transportation use in Oregon.
- **Energy Resources and Technologies** – Profile of various energy resources and technologies, including information about facilities, resource potential, capacity, and potential in Oregon (example shown here).
- **Energy 101/Key Questions** – Concise explanations on how the energy system in Oregon works and information on commonly asked and currently-relevant energy questions
- **Policy Briefings** – Information and considerations on key energy questions and ongoing discussions that have been or are likely to be discussed over the next two years in Oregon.
- **History and Policy Landscape** – Summary of relevant energy history and milestones in Oregon, foundation for ongoing policy discussions and educate those new to energy policy in Oregon.



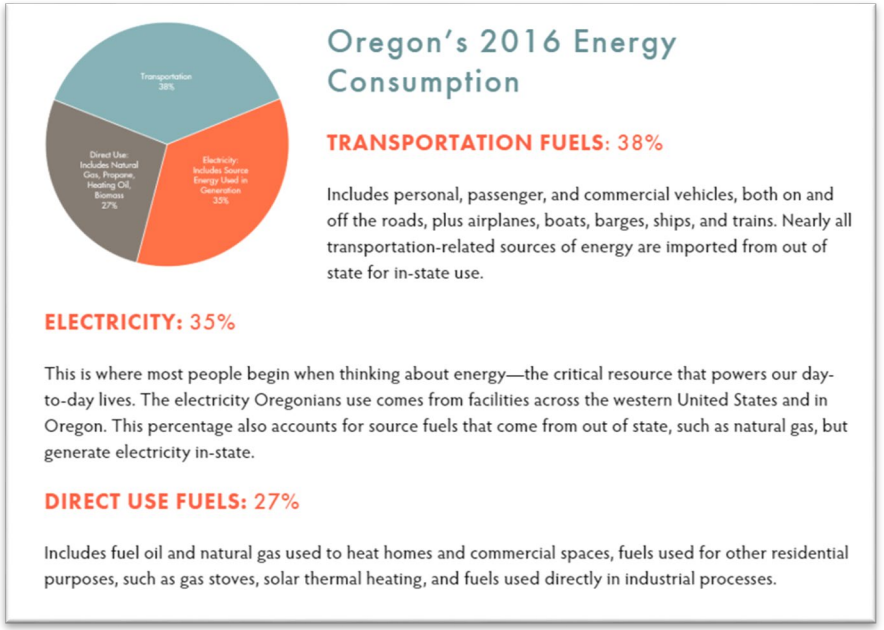
Example of Solar Energy Resource & Technology Section in 2018 BER

Data Collection & Drafting

Energy By the Numbers

Format: Visualizations and data focused

- Electricity, Direct Fuels, and Transportation
  - What we use and how much, uses, trends
- Statewide energy consumption and expenditures
  - Energy burden and insecurity
- Locations of energy facilities – new resource dashboard
- Energy sectors (Residential, Commercial, Industrial/Ag)
  - GHG emissions related to energy use by sector
- Energy efficiency spending and savings



Energy Resources and Technologies

Format: Quick facts banner, Resource in Oregon, Resource Potential, Non-Energy Implications

- Hydropower, natural gas, wind, coal, solar, biomass, biogas and renewable natural gas, geothermal, storage, marine, CHP
- Distributed Energy Resources, Demand Response, Microgrids, EV charging
- Efficiency technologies: heat pumps, smart thermostats, triple pane windows
- Transportation Fuels: Electricity, hydrogen, RNG, gas/diesel (standard and renew)

Data Collection & Drafting

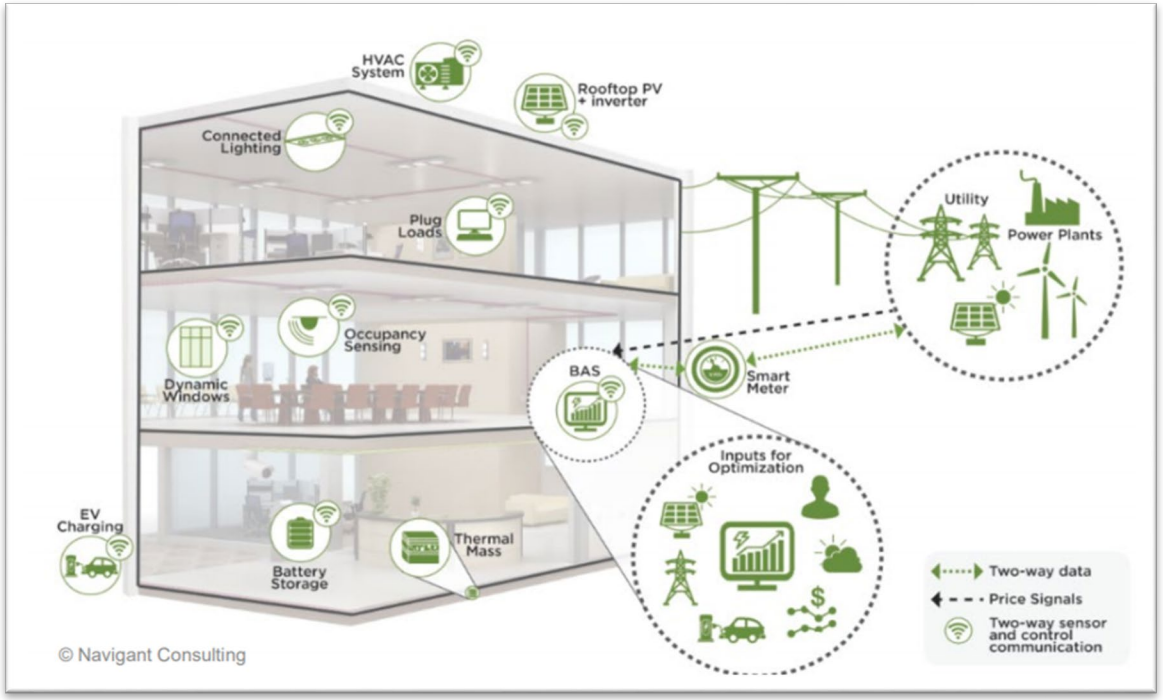
Energy 101/Key Questions

Format: Background, What does this mean for OR?, and Now What?

- How the energy system and markets work
- Grid-interactive Efficient Buildings and Net Zero Buildings
- Impacts of COVID19 on energy sector and consumers
- Codes and standards, contribution to GHG goals
- DERs at scale for climate and resiliency goals
- Efficiencies and GHG reductions in Agriculture
- Alternative fuels for medium/heavy duty vehicles
- Advances in medium/heavy duty vehicles
- How utilities are managing EVs and system change

Policy Briefings

- Climate vulnerability assessment
- Resource adequacy
- Distribution system planning
- Utility scale energy storage
- 100% clean policies and standards
- Improving access to renewable energy



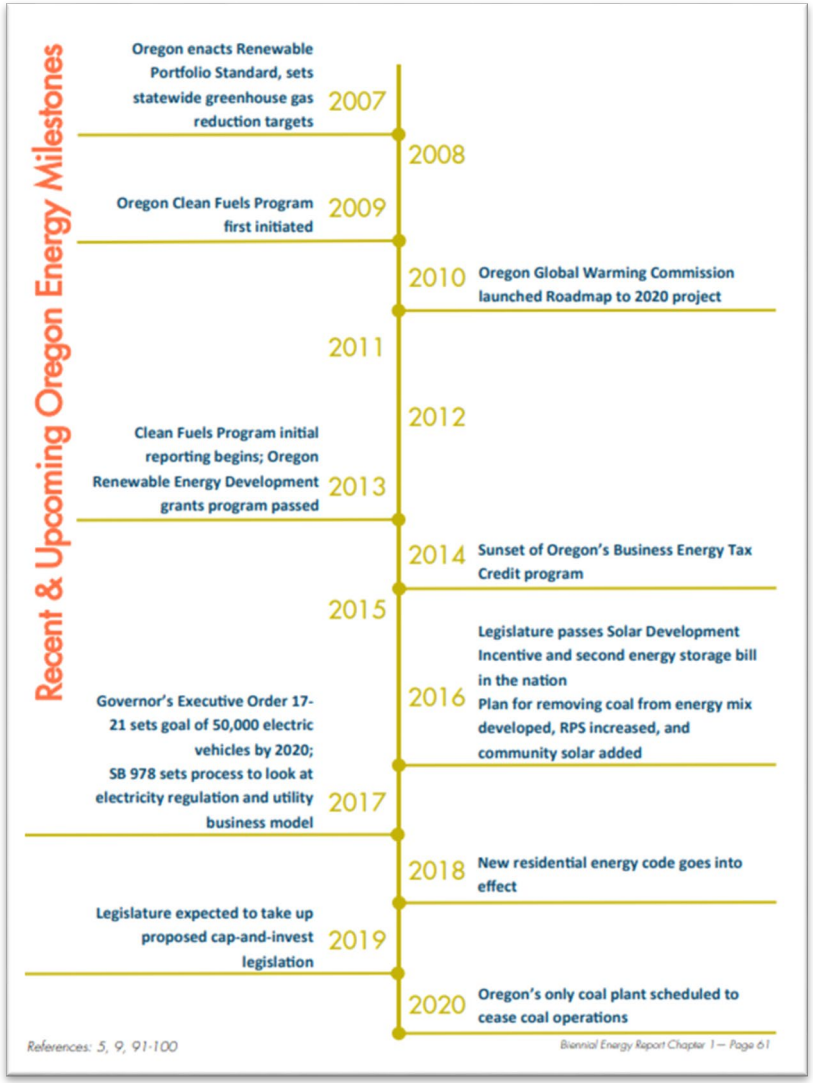
Data Collection & Drafting

History & Policy Landscape

- Oregon's natural resources and legacy of hydropower
- Getting energy to people: Electrification of the west, utility structures, markets
- Energy crisis and emergence of EE
- Environmental Protection: Natural resources, nuclear, air pollution and GHGs
- Energy milestones and timeline – interactive functions

Other Resources

- Recommendations
- Website and data explorer
- *Summary of data sources, new reports*
- *BER Lite and other presentation materials*



Data Sources for 2020 BER

Input and Scoping Guidance Handout has examples of data sources that were used or referenced in the 2018 BER: *State agencies • Regional governmental entities • Federal agencies • Utilities • National Labs*

- *ACEEE*
- *EPA*
- *US Census*
- *IOU, COU, ESS*
- *Energy association reports*
- *IEA and EIA*
- *NREL, PNNL, Sandia*
- *NEEA*
- *NWPCC*
- *DAS, OHCS, DEQ, ODOT, PUC*

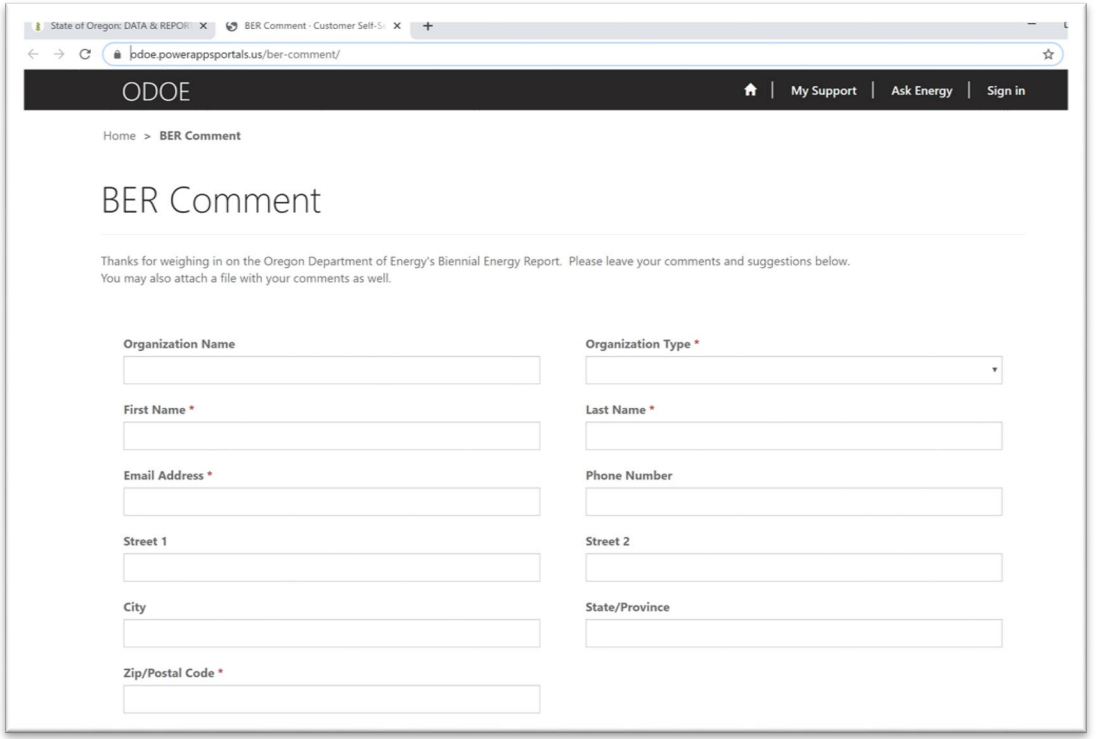
Are you aware of improved, different, or additional sources of data that ODOE should consider for the 2020 BER to help inform topics for the BER?

Next Steps

- Ongoing invitation for additional input through the online comment form
- Sign up for email updates

Focus Areas

- Data Collection & Analysis
- Peer Review
- Avenues for additional external engagement and outreach for presentations and sharing with new audiences



Online comment form

BER Homepage

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