



Oregon

Kate Brown, Governor



550 Capitol St. NE
Salem, OR 97301
Phone: 503-378-4040
Toll Free: 1-800-221-8035
FAX: 503-373-7806
www.oregon.gov/energy

AGENDA

Energy Advisory Work Group

Wednesday, October 24, 2018

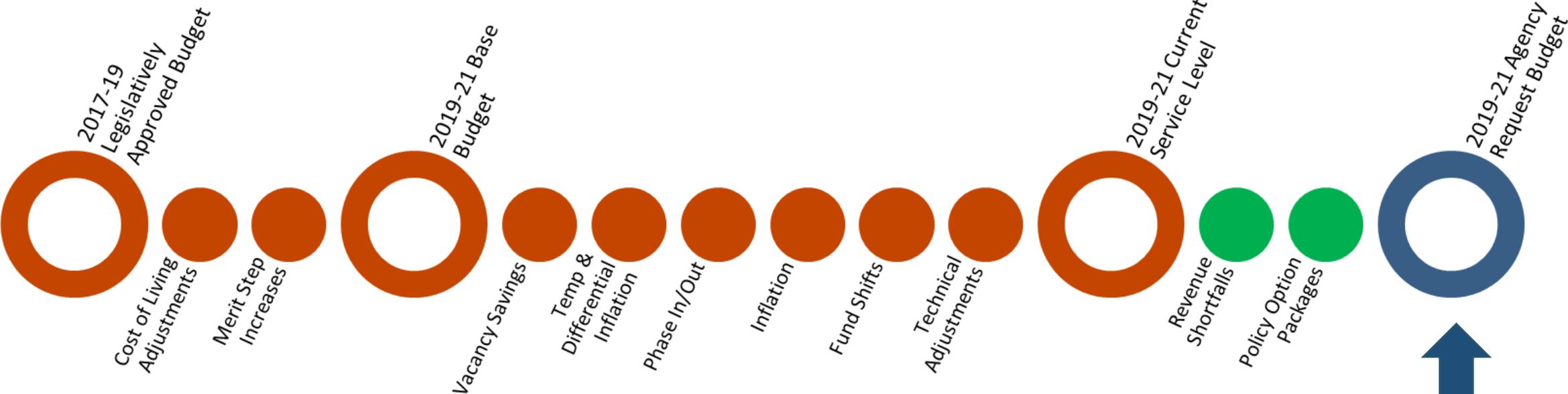
1:00 p.m. to 3:00 p.m.

Meitner Conference Room

Welcome and Agency Update	Janine Benner	5 min
Budget Update	Miriha Aglietti	5 min
Legislative Concepts Update	Robin Freeman	5 min
Work Group Charter	Ruchi Sadhir	30 min
Strategic Plan Update	Ruchi Sadhir	15 min
Comments and Questions	Janine Benner	15 min
Break		15 min
Biennial Energy Report Preview	ODOE Staff	30 min

Items and times listed on the agenda are approximate and may change.

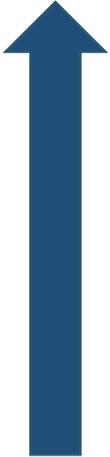
Developing a State Agency Request Budget



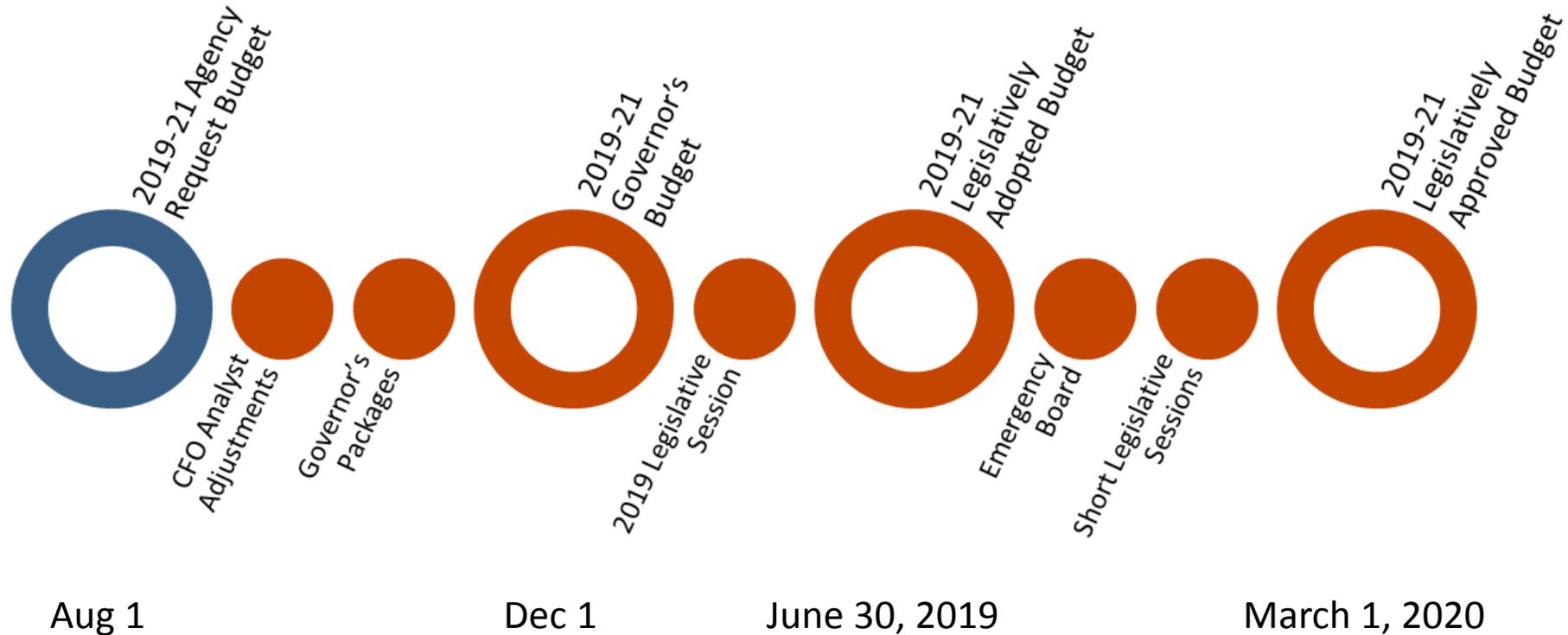
Submitted August 1:

Included is four Policy Option Packages – or POPs

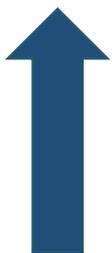
Internships * 2 FTE Siting Positions * 1 FTE P&I Position & Project-Specific Third-Party Studies * Bond Authority



2019-21 GOVERNOR'S BUDGET & BEYOND

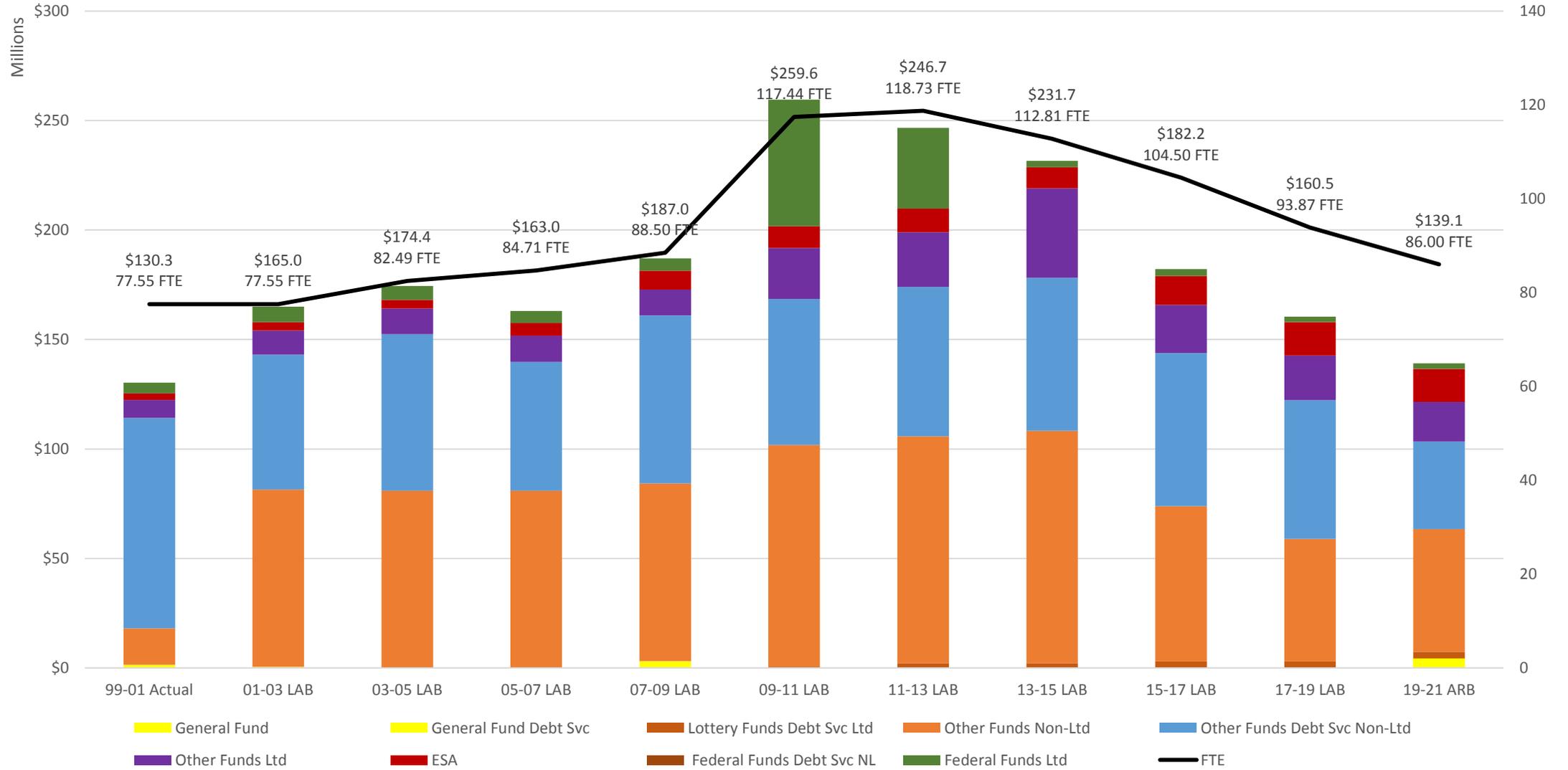


Aug 1



<https://www.oregon.gov/energy/About-Us/Documents/2019-21-Agency-Request-Budget.pdf>

HISTORICAL BUDGET





Oregon

Kate Brown, Governor



550 Capitol St. NE

Salem, OR 97301

Phone: 503-378-4040

Toll Free: 1-800-221-8035

FAX: 503-373-7806

www.oregon.gov/energy

MEMORANDUM

To: Energy Advisory Work Group

From: Robin Freeman, Associate Director, Government Relations

Date: Wednesday, October 24, 2018

Re: Legislative Concept 460 – Thermal Renewable Energy Certificates

Statement of Purpose

This concept clarifies that thermal renewable energy certificates issued to a facility that generates electricity using biomass and that also generates thermal energy for a secondary purpose, are eligible compliance instruments for the Oregon Renewable Portfolio Standard, and will be treated in the same manner and subject to the same conditions as renewable energy certificates from qualifying electricity. This concept adds new language to ORS 469A.132 that ensures:

- Thermals RECs are eligible compliance instruments for the Oregon RPS if they meet the statutory requirements for:
 - Age of generating facility (ORS 469A.020)
 - Geographic boundary for unbundled RECs (ORS 469A.135); and
 - Eligible biomass resources (ORS 469A.025 (3)).
- Thermal RECs are subject to the same terms of use and transfer applicability as other RECs issued as part of the REC system established by the Department of Energy (ORS 469A.130).

Statement of Need

The Department of Energy administers the system for renewable energy certificates that can be used by an electric utility or an electricity supplier to establish compliance with Oregon's Renewable Portfolio Standard. In 2016, SB 1547 directed ODOE to provide for the issuance of RECs for the generation of thermal energy.

Thermal energy is different from electricity generation in several ways. Thermal energy is not delivered to the electric grid, and thermal RECs cannot be generated from electricity. SB 1547

provided a conversion factor for thermal measurement (British thermal units or BTUs) to megawatt hours (MWhs) that allows ODOE to determine the number of thermal RECs to provide for a facility generating thermal energy from biomass.

Provisions in ORS related to the Renewable Portfolio Standard compliance eligibility and requirements refer to electricity, with no mention of thermal energy. Examples of phrases throughout this area of statute include: “qualifying electricity”, “electricity from a generating facility,” “renewable energy certificates is for the qualifying electricity,” and “renewable energy certificates derived from electricity.” Additionally, SB 1547 did not add thermal energy generated from electricity generation using biomass to the list of RPS-eligible generation sources listed in ORS 469A.025. This omission has raised questions as to the interchangeability of RECs associated with electricity generation and thermal RECs.

Fiscal Impact

There is no fiscal impact expected as a result of this legislative concept.



Oregon

Kate Brown, Governor



DRAFT ENERGY ADVISORY WORK GROUP CHARTER

1. **Authority.** The Energy Advisory Work Group (EAWG) is established under and operates in accordance with ORS 469.426 (see Appendix 1).

2. **Purpose.** This charter is intended to provide clarity and explain the processes for meetings and the responsibilities for the EAWG and the Oregon Department of Energy (Department).

To further the public interest, the Department has been working to increase transparency of its programs and activities and to foster close communication and collaboration with energy users and other stakeholders with an interest in the provision of energy. A broad purpose of the EAWG is to serve as a forum to further these objectives and to provide feedback on the strategic priorities and long-term vision for the Department.

The primary purpose of the EAWG is to review and make recommendations to the Department's proposals related to:

- a. Planning, policy, and technical analysis,
- b. Legislative concepts, and
- c. The department's requested budget.

3. **Membership.** The Director of the Department serves as the Chair of the EAWG. The EAWG is made up of no more than 20 members that are stakeholders representing:

- a. Energy resource suppliers,
- b. Customers who ultimately pay for the energy supplier assessment (ORS 469.421(8)) through their energy bills, and
- c. Other persons that have an interest in the provision and regulation of energy in the state.

EAWG members are individuals that are appointed by the Director of the Department to serve staggered four year terms. The Director will:

- a. Seek to ensure EAWG members come from a cross-section of individual stakeholders that are well-informed in energy, economic, or environmental issues and that reflect a diverse range of experiences.
- b. Provide information about the Department's policies, programs, and budget to orient new EAWG members to the Department's mission and work.
- c. Provide an opportunity for each appointed EAWG member to identify one designee from the individual member's organization to serve as an alternate.

Commented [RS1]: Draft for EAWG review and recommendations. Note that subsequent internal review needed as well.

Commented [RS2]: EAWG subcommittee had interest in helping the Department with its strategic priorities and long term vision.

Commented [RS3]: Note - from statute

Commented [RS4]: EAWG subcommittee had interest in staggered terms.

Commented [RS5]: EAWG subcommittee had interest in an agency 101 packet for new EAWG members.

The Director may seek out special advisors for the EAWG such as Tribes and Oregon members of the Northwest Power Planning and Conservation Council to participate in meetings and provide feedback to the Department.

Commented [RS6]: There was some EAWG subcommittee interest in Tribal and Council involvement.

If an EAWG member is unable to participate in EAWG meetings, that EAWG member may be asked by the Director to step down.

4. Activities and Duties

a. Strategic Priorities and Long-Term Vision

During the development of its strategic plan, the Department will provide EAWG members with an opportunity to review and provide recommendations on the plan's vision statement and strategic goals. In addition to seeking feedback on the development of the strategic plan, the Department will share information about progress of strategic plan actions to keep EAWG members informed of its implementation.

Commented [RS7]: EAWG subcommittee had interest in helping the Department with its strategic priorities and long term vision.

b. Planning, policy, and technical analysis

Both at the EAWG meetings and in other venues, the Department will share information about on-going energy planning, policy, and technical analysis activities, including activities with other state or federal agencies, to keep EAWG members informed.

Commented [RS8]: EAWG subcommittee had interest in staying informed outside of meetings.

Commented [RS9]: EAWG subcommittee had strong interest in transparency and sharing information.

Where possible, the Department will provide information about planned work in planning, policy, and technical analysis to the EAWG for review and recommendations.

Commented [RS10]: EAWG subcommittee had interest in hearing about ODOE's work with other agencies.

EAWG members are encouraged to share their priorities and areas of interest with the Department. In addition, EAWG members may request that the Department engage in specific research or analysis topics related to energy planning, policy, and technical analysis. The Department will consider these requests and determine if the request may be met within statutory authority and budgetary capacity or if another partner organization may have similar information that is responsive.

Commented [RS11]: EAWG subcommittee had interest in ensuring that this process doesn't add to workload, but that helping to point EAWG members to other resources could be helpful.

Commented [RS12]: EAWG subcommittee had interest in encouraging two-way communication.

Commented [RS13]: EAWG subcommittee discussed that this was dependent on the outcome of the current budgeting process.

If funds are available, the "Energy Research Fund" will be used to contract with an outside firm or firms for studies, research, and analysis services when necessary to supplement existing department resources. The department will seek review and recommendations from the EAWG on draft ideas for studies, research, and analysis based on the following criteria:

- i. Does the idea for studies, research, or analysis address a research need or does it further existing or outdated studies, research, or analysis?
- ii. Does the idea for studies, research, or analysis address a topic of strong relevance in Oregon or in the broader energy policy landscape?
- iii. Is the idea for studies, research, or analysis likely to result in an impartial, data-driven contribution to the body of existing research on this topic?

c. Legislative concepts

The Department will share relevant materials related to the legislative session to keep EAWG members informed. Note that the Department only takes positions on bills with approval of the Governor.

Commented [RS14]: EAWG subcommittee had interest in staying informed about the Department's work during session.

Prior to every legislative session that occurs in an odd-numbered year, the Department will present information about the Department's draft legislative concepts to the EAWG for review and recommendations.

The Director may solicit ideas for policies from the EAWG that inform the Department's legislative concept process within the timelines set by the Governor and the Department of Administrative Services (DAS).

d. The Department's requested budget

The Department will share information about on-going activities related to its budget to keep EAWG members informed.

The Department will present information about its draft agency request budget and any policy option packages under consideration to the EAWG for review and recommendations within the timelines set by the Governor and DAS.

Commented [RS15]: Note that this is different from and in addition to process described in ORS 469.421 8(b).

5. **Meetings and Procedures**

a. EAWG will meet approximately four times per year and at times that align with activities related to Department deadlines such as budget instructions and timeline, legislative calendar, the department's strategic planning processes, and the Department's Biennial Energy Report. The Director may call additional meetings of the EAWG as needed.

Commented [RS16]: EAWG subcommittee had interest in more frequent meetings, only two meetings per year did not feel meaningful.

b. The Department will provide materials to EAWG members prior to meetings to allow time for review. In addition, the Department may provide information in between EAWG meetings to keep members informed of the Department's activities.

Commented [RS17]: EAWG subcommittee had interest in information in between meetings to stay informed.

c. To encourage communication and collaboration, EAWG members will have the opportunity to share their priorities and areas of interest at EAWG meetings. In addition, EAWG members may provide ideas for future agenda items for consideration by the Director.

Commented [RS18]: EAWG subcommittee had interest in encouraging two-way communication.

d. When the Department shares information with the EAWG at a meeting for review and recommendations, the Director will survey EAWG members present for their perspectives and questions to be captured on the record. EAWG members may provide written feedback to the Director for one week following the EAWG meeting, unless a deadline is otherwise specified.

Commented [RS19]: EAWG members had questions about being on the record.

e. This charter will be re-affirmed annually at the first meeting of the EAWG in the calendar year to ensure that it remains relevant and continues to fulfill the purposes listed in Section 2. If there is interest by a majority of EAWG members for revisions, the Director will consider recommendations for revisions to this charter.

Commented [RS20]: EAWG subcommittee had interest in potentially revising the charter after a year of it being in place.

Approved by the Director: _____

Appendix 1

ORS 469.426

(1) The Director of the State Department of Energy shall convene an advisory work group composed of stakeholders representing energy resource suppliers, the customers who ultimately pay for the energy supplier assessment imposed under ORS 469.421(8) through their energy bills and other groups that have an interest in the provision and regulation of energy in this state.

(2) The advisory work group shall review and make recommendations on the State Department of Energy's proposals related to:

(a) Planning, policy and technical analysis;

(b) Legislative concepts; and

(c) The department's requested budget.

(3) The work group shall meet at least two times per year at the call of the director.

Project Schedule

The chart below reflects Coraggio's anticipated delivery schedule for Oregon Department of Energy Strategic Planning Project. The orange triangles represent opportunities for the EAWG to provide feedback.

Phase of Work	Tasks/Deliverables	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Phase I	• Data Collection and Background	■	■									
	• Immersion Session		■									
	• Internal and External Survey		▲	▲								
	• External Interviews & Group Interviews		▲	▲								
	• Internal Interviews		■	■								
	• Insight Report				■							
	• Session 1: Vision, Mission, Values					■						
	• Session 2: Imperatives/Key Measures					■						
	• Session 3: Initiatives/Key Measures						■					
	• Session 4: Revision Workshop and Approval						■					
	• Draft One-Page Strategic Plan Document							■				
Phase II	• Operational Internal/External Survey							▲				
	• Operational Planning Internal Group Interviews and External Interviews							▲	▲			
	• External Research							■	■			
	• Operational Insights Report								■			
	• Operational Planning Session 1 (Initial Insights and Strategy Review)									■		
	• Operational Planning Session 2 (Tactics and Milestones)									■		
	• Operational Planning Session 3 (Identify Milestones, Priorities, Budget Implications)										■	
	• Draft Final Report											■
	• Revision Survey											
• Revision Session and Operational Guidance												■



2018

BIENNIAL ENERGY REPORT

Submitted to the
OREGON LEGISLATURE

by the
OREGON
DEPARTMENT OF
ENERGY

November 2018



OREGON
DEPARTMENT OF
ENERGY



TABLE OF CONTENTS

3	Executive Summary
5	Letter from the Director
6	About the Report
7	Energy By the Numbers
49	Policy Timeline
50	Climate Change
70	Energy Efficiency
90	Renewable Energy
120	Transportation
170	Protecting Consumers
190	Resiliency
200	Recommendations
204	Appendices

CHAPTER 2.1: GREENHOUSE GAS REDUCTION PATHWAYS FOR OREGON

Key Takeaways

- In recent years, Oregon has been able to meet more of its growing population's energy needs with low carbon resources that contribute to meeting the state's climate and greenhouse gas reduction goals. Despite this, Oregon is not yet on a pathway to fully transition its energy systems to a deeply decarbonized, clean energy future.
- Climate scientists have identified a two degree (Celsius) threshold on global temperature rise beyond which there are significant and unprecedented risks to society and the environment. Oregon's current greenhouse gas emissions trajectory is far above its fair share contribution to that global limit. In Oregon, projected climate effects to health, livelihoods, and ways of life are avoided or substantially reduced in a lower global emissions scenario vs. the current path the world is on.
- Further actions are necessary to complete Oregon's low carbon energy transition, and looking across the experiences of other states and jurisdictions provides a menu of some potential actions. Selecting appropriate further action will require policymakers to examine costs and benefits of action—including the costs of climate change itself—and to consider multiple perspectives and issues, such as social and intergenerational equity and environmental and health tradeoffs.
- Oregon has an opportunity to capitalize on advancements and falling costs of low carbon technologies, as well as the state's unique position in how energy is made and used in the state, to make a deep decarbonization pathway feasible across all sectors of the economy. To achieve this, Oregon would benefit from a comprehensive, coordinated, and systematic planning process to guide prioritization and long-term, sustained implementation of climate actions.
- Early action would allow Oregon to gain a first-mover competitive advantage in a global clean energy economy, increase its energy independence through development of local energy resources, and realize the substantial health and environmental co-benefits of reduced pollution.

1. Oregon's GHG Reduction Goals and Climate Commitments

2. Overview of Oregon's Greenhouse Gas Emissions

3. Where Oregon Stands Today: Business-As-Usual vs. GHG Reduction Goals

4. Local, Regional, and Tribal Government Climate Action in Oregon

- Cities and Counties
- Metropolitan Planning Organizations
- Tribal Governments

5. Comparing Risks and Impacts under High and Low Emissions Scenarios

- Warming and Extreme Heat in Oregon

- Water Resources in Oregon
- Implications for Oregon’s Economy and Natural Resources
- Human Health Threats
- Oregon Ways of Life and Heritage Resources at Risk
- Climate Risks Not Distributed Evenly

6. Exploring Deep Decarbonization Pathways for Oregon

- Economy-Wide Climate Policies
- Carbon Pricing to Reduce GHG Emissions
 - How does a cap-and-trade program work?
 - How does cap-and-trade differ from a carbon tax?
- Beneficial Electrification
- Sectoral Strategies that Support Deep Decarbonization
 - Electricity
 - Electricity supply decarbonization
 - Improved energy efficiency across sectors
 - Increased electrification as a share of total energy consumption
 - Natural Gas
 - Renewable Natural Gas
 - Power-To-Gas
 - Buildings
 - Benchmarking and Transparency: Understanding and Communicating Building Performance
 - Retrofit Existing Buildings at Key Trigger Points
 - Integrating Net-Zero Design and Performance into New Buildings
 - Fueling buildings with low carbon electricity while also providing decarbonized gas
 - Increasing efficiency throughout the refrigeration lifecycle
 - Transportation
 - Integrated approaches for passenger transportation
 - Decarbonized natural gas for medium- or heavy-duty fleets
 - Industrial
 - Increase energy efficiency
 - Fueling equipment with low-carbon electricity while also providing decarbonized gas

7. Deep Decarbonization Considerations and Potential Tradeoffs

- Timing of Action
- Cost and Benefits
- Equity and Justice Perspectives on Climate Change
- Policy Interactions and Potential Tradeoffs
 - Land Use and Natural and Working Lands
 - Energy Cost, Energy Independence, and Economic Growth Potential
 - Air Quality and Human Health

8. Conclusions

CHAPTER 2.2: ENERGY EFFICIENCY IN OREGON

Key Takeaways

- Oregon is a national leader in electric and natural gas efficiency programs and results.
- Energy efficiency has been the least cost and most environmentally benign electricity resource for the region and Oregon, making it our second largest electricity resource behind hydroelectricity. In most cases electric energy efficiency costs less than wind, solar, coal, nuclear and natural gas electricity generation, and is relied on heavily in utility integrated resource planning.
- Addressing climate change through energy efficiency may add a new value consideration for energy efficiency. Adding this greenhouse gas reduction value to the current resource acquisition cost-effectiveness threshold could enable the expansion of energy efficiency efforts.
- Efficiency technologies and conservation practices continue to evolve. New methods and technologies for retrofits, standards, codes, products, behavior, and load shaping will continue to provide new opportunities for capturing additional energy efficiency for the foreseeable future.

1. Introduction

2. Meeting Load Growth with Efficiency

- Northwest Power and Conservation Act
- Integrated Resource Planning

3. How We Acquire Energy Efficiency

- Cost-Effectiveness
 - Achievable Potential and Avoided Cost
- National Energy Efficiency Screening & Practice Manual
- Incentives and Consumer Education
- Equity of Energy Efficiency in the Residential Sector

4. Energy Efficiency Achievements

- Regional savings and Oregon's share
- Utility and BPA Programs (3,918 aMW)
- Northwest Energy Efficiency Alliance (885 aMW)
- State Building Codes (808 aMW)
- Federal and State Standards (963 aMW)
 - Federal Standards and Lighting
- Market Momentum (52 aMW)

5. State of Oregon Programs and Initiatives

- Statewide Building Code and Energy Code
- State Energy Efficient Design Program
- Benchmarking Building Energy Performance
- Home Energy Scores
- Energy Efficient Schools (Public Purpose Charge)
- Large Energy Customer Self Direct Program (Public Purpose Charge)
- State Incentive and Loan Programs
- Business Energy Tax Credit
- Residential Energy Tax Credit
- State Home Oil Weatherization
- Energy Savings Performance Contracting
- Research and Development in Oregon

6. Executive Order 17-20: Accelerating Energy Efficiency in Oregon's Built Environment to Reduce Greenhouse Gas Emissions and Address Climate Change

- Energy Efficiency Leadership in State Buildings
- Increasing Energy and Water Efficiency in New Construction
- Increasing Energy Efficiency Through Retrofits of Existing Buildings
- Cost Analysis
- Implementation

7. Oregon's National Standing in Energy Efficiency

- ACEEE National Scoring and Ranking (Oregon is ranked 7th)

8. Energy Efficiency Jobs in Oregon

- Nearly 42,000 jobs in 2017

9. Conclusions

CHAPTER 2.3: RENEWABLE ELECTRICITY IN OREGON: CHANGING DRIVERS, NEW CHALLENGES

Key Takeaways

- Installed capacity and consumption of renewable electricity in Oregon have grown over the years. The growth in renewable electricity capacity and consumption in Oregon is thanks to policies such as the Renewable Portfolio Standard (RPS); federal and state incentives; growing interest from consumers and businesses to purchase renewable energy voluntarily; and significant decreases in the costs of renewable energy technology.
- Meeting the 50 percent RPS by 2040 requirement will mean understanding and addressing a wide web of interrelated issues and making choices on how to meet our state energy goals.
- To meet the challenge of efficiently and cost-effectively integrating increasing amounts of variable renewable electricity onto the grid, Oregon should investigate how to leverage and combine flexible electricity resources and technologies, flexible control over demand through innovative new rate structures and demand response programs, and access to more flexible markets, such as the Energy Imbalance Market.

1. Renewable Electricity in Oregon – A Brief Background:

- Introduction
- Renewable Energy 101
- Renewable Electricity Installations in Oregon

2. Required Renewable Energy Procurement

- PURPA
- The Oregon Renewable Portfolio Standard (RPS)
 - Eligibility
 - RPS Exemptions
 - Cost Cap, Excess Load, BPA Tier 1 Power, and Older Renewables
 - RPS Tracking – Renewable Energy Credits
 - RPS Compliance
- The Small-Scale Community-Based Renewable Target
- 1.5 Percent for Green Energy Technology

3. Voluntary Renewable Energy Purchases

- Green Power Programs – Residential and Small Commercial Customers
- Large Customer Options
- Direct Access
- Utility Green Power Programs for Large Customers
- Green Tariffs

4. Financial Incentives for Renewable Energy Development

- Oregon Incentives
- Federal Incentives

5. Falling Technology Costs

6. What's Next for Renewable Energy in Oregon

- Integrating a Potential Cap-and-Trade Program with the Oregon RPS
- Balancing State Land Use and Natural Resource Demand
 - Renewable Energy Project Development and Land Use
 - Communities' Experiences with Wind Energy in Oregon
- Balancing Interests: The Many Purposes of the Columbia River Basin
 - A Little More About Fish ...
 - Looking to the Future: The Role of the FCRPS and a Low-Carbon Regional Grid
- Integration Challenges: Adding More Variable Renewable Resources to the Grid
 - Flexible Supply
 - Flexible Demand
 - In Between Supply and Demand: Energy Storage and Distributed Energy Resources
 - Energy Markets

7. Conclusions

8. Advances in Solar Energy: A Case Study of Renewable Energy Market Transformation

- Technology Overview
- Trends in Solar
 - Increasing Capacity and Investments
 - Cost, Size, and Efficiency
 - PV Module Efficiency
 - Integration Challenges
- Where Does Oregon Stand?
- Federal Tariffs
- Policies Impacting Solar in Oregon
 - Community Solar
 - Resource Value of Solar
 - Incentives for Residential PV Systems
 - Land Use
 - Net Metering
 - PURPA Contracts
 - Property Taxes
- Conclusions

CHAPTER 2.4: TRANSITIONING TO A CLEANER TRANSPORTATION SYSTEM

Key Takeaways

- Improved fuel efficiency and increased adoption of alternative fuels have reduced per vehicle fuel consumption and GHG emissions in Oregon and continued efforts in these areas is needed.
- Overall transportation fuel consumption and vehicle miles travelled (VMT) are rising in Oregon mainly due to population growth and a robust economy, which is causing an increase in GHG emissions from the transportation sector.
- Oregon will need to adopt additional transportation policies, strategies, and programs to reduce overall GHG emissions and meet the state's climate goals.
- Increased electric vehicle adoption can reduce GHG emissions and help the state achieve other goals, including air quality and public health.
- Increased support for mobility options such as walking, biking, and multiple-occupancy modes of transportation as well as support for flexible public transit options are necessary to reduce VMT and conserve transportation fuels.

1. Introduction

- Transportation Sector Fuel Mix and Greenhouse Gas Emissions

2. Transportation Sector Trends: Energy Information Administration Annual Energy Outlook 2018

3. Oregon Transportation Trends

4. Strategies to Reduce Fuel Consumption and GHG Emissions

- Cleaner Vehicles: Transition to Vehicle Technologies That Are More Fuel Efficient.
 - Increased Vehicle Efficiency
 - Federal Corporate Average Fuel Economy Standards (CAFE)
 - Future Strategies for Vehicle Fuel Efficiency
- Cleaner Fuels: Transition to No-Emission or Low-Emission Fuels.
 - Federal and State Renewable Fuel Standards
 - Oregon Clean Fuels Program
 - Alternative Fuel Vehicles
 - Oregon Zero Emission Vehicle Program
 - Electric Vehicle Purchase Incentives
 - Federal EV Tax Credit Program
 - Oregon Clean Vehicle Rebate and Charge Ahead Rebate.
 - Utility-Specific Incentives.
 - VW Environmental Mitigation Trust
 - Charging Infrastructure and Public Education
- Reduce Vehicle Miles Traveled: Walking, Biking, Transit, and Shared Travel Options

5. Statewide Transportation Strategy

6. Why EVs Now and How Do They Reduce Fuel Consumption and GHG Emissions?

- The Technology
- The Fuel – Electricity
- Emissions
- The Role For EVs In Achieving Oregon’s Climate Goals
- EVs and The Future Of The Grid
- EV Trends
- EV Model Availability
- Cost Parity With ICE Vehicles
- EV Charging
 - Charging At Home
 - Charging On The Road

7. Conclusion

DRAFT

CHAPTER 2.5: ENERGY BURDEN, CONSUMER PROTECTION, AND EQUITY

Key Takeaways

- The concept of consumer protection has been a part of the provision of energy for almost a century, but there continue to be challenges faced by energy burdened consumers and interest in striving for equity in energy-related benefits and burdens.
- Energy burden is calculated using household income and bills from electricity and natural gas utilities, however energy-burdened households can also incur other energy-related expenses, such as transportation fuel and wood pellets for heating, not accounted for in most studies about energy burden.
- Better understanding the benefits to and burdens of electricity, heating, and transportation programs/options on subsets of Oregon consumers could inform pathways to achieve the state's environmental and climate change goals and better address energy burden and equity. There is a need to collect more data for a comprehensive analysis about equity – in particular the benefits and burdens of energy to Oregon households – including demographic, public health, energy emissions, and energy cost and expenditure data.

1. Introduction

2. Energy Burden

- Ratepayer Funded Energy Efficiency Programs to Reduce Usage and Utility Bills
- Weatherization to Reduce Energy Usage and Costs for Households in Poverty
- Financial Assistance for Unaffordable Energy Bills
- Cost of Heating Fuels Outside of Regulated Electric and Natural Gas Utilities
- Cost of Transportation Fuels as Additional Energy Burden
- Location Dependent Transportation Options
- Transportation Challenges for People that are Low-Income or living in Poverty
- Vehicle Fuel Efficiency to Reduce Transportation Fuel Costs
- Electric Vehicles to use Electricity as a Cheaper Transportation Fuel

3. Consumer Protection

- Universal Electricity Service
- Oversight of Electric and Natural Gas Utility Rates
 - Electric Utility Rates 101

4. Equity

- Equity Considerations
- PUC 978 Process and Report

5. Potential Options to Further Address Consumer Protection, Energy Burden, and Equity

6. Conclusions

DRAFT

CHAPTER 2.6: PREPARING FOR AN INEVITABLE FUTURE: RESILIENCY AND CLIMATE ADAPTATION IN OREGON'S ENERGY SYSTEMS

Key Takeaways

- An increased awareness of the threats (e.g., Cascadia Subduction Zone earthquake, climate change, cyber and physical attacks) to Oregon's energy systems combined with advances in distributed energy resources (e.g., distributed solar and batteries) is creating new interest in community energy resilience solutions.
- Entities across Oregon—from state government, to local communities, and individual energy providers—have been taking steps to improve the resilience of the energy sector.
- Oregon can take advantage of technology advancements to make systematic improvements to community energy resilience to threats like the Cascadia earthquake and climate change. For example, the state can support the development of community microgrids that can provide emergency back-up power to support critical public services following a major disruption to the state's energy systems.
- The state has the opportunity to engage communities to identify mechanisms for funding and deploying community energy resilience and climate adaptation solutions that deliver the maximum benefit to those communities.

1. Defining Energy Resiliency: What It is and What it Isn't

2. Identifying Threats to Oregon's Energy Systems

- Cascadia Subduction Zone
- Climate Change: Redefining Normal
- Cyber and Physical Attacks

3. Understanding Current Actions

- State Level Action
 - Energy Assurance Plan
 - Fuel Action Plan
 - Oregon Resilience Plan
- Critical Energy Infrastructure Hub
- Community and Utility Level Actions
 - Assessing and Hardening Infrastructure
 - Enhancing Local Energy Resilience in the Consumer-Owned Utility Sector
 - Deploying Distributed Energy Resources

4. Climate Adaptation for Oregon's Energy Systems

- Climate Vulnerabilities Related to Electricity Generation
- Highlighting Tribal Energy Vulnerabilities
- Climate Vulnerabilities Related to Electricity Demand

- Climate Vulnerabilities Related to Energy Supply Chains and Infrastructure
- Current Status of Statewide Climate Vulnerability Assessment and Adaptation Planning

5. Resiliency Options for Oregon

- Comprehensive Vulnerability and Risk Assessment of Oregon's Energy Infrastructure
- Developing a Vision for Community Energy Resilience
- Technology Advancements Creating Opportunities for Community Energy Resiliency Solutions
- Financing Energy Resiliency and Climate Adaptation Investments
 - Mechanisms for Funding Resilient Microgrid Projects Around the Country
- Prioritizing Energy Resiliency and Climate Adaptation Investments
 - Vulnerability and Risk Assessment
 - Critical Facilities or Infrastructure
 - Identification of High-Value Resiliency Nodes
 - Equity and Environmental Justice
 - Community Engagement

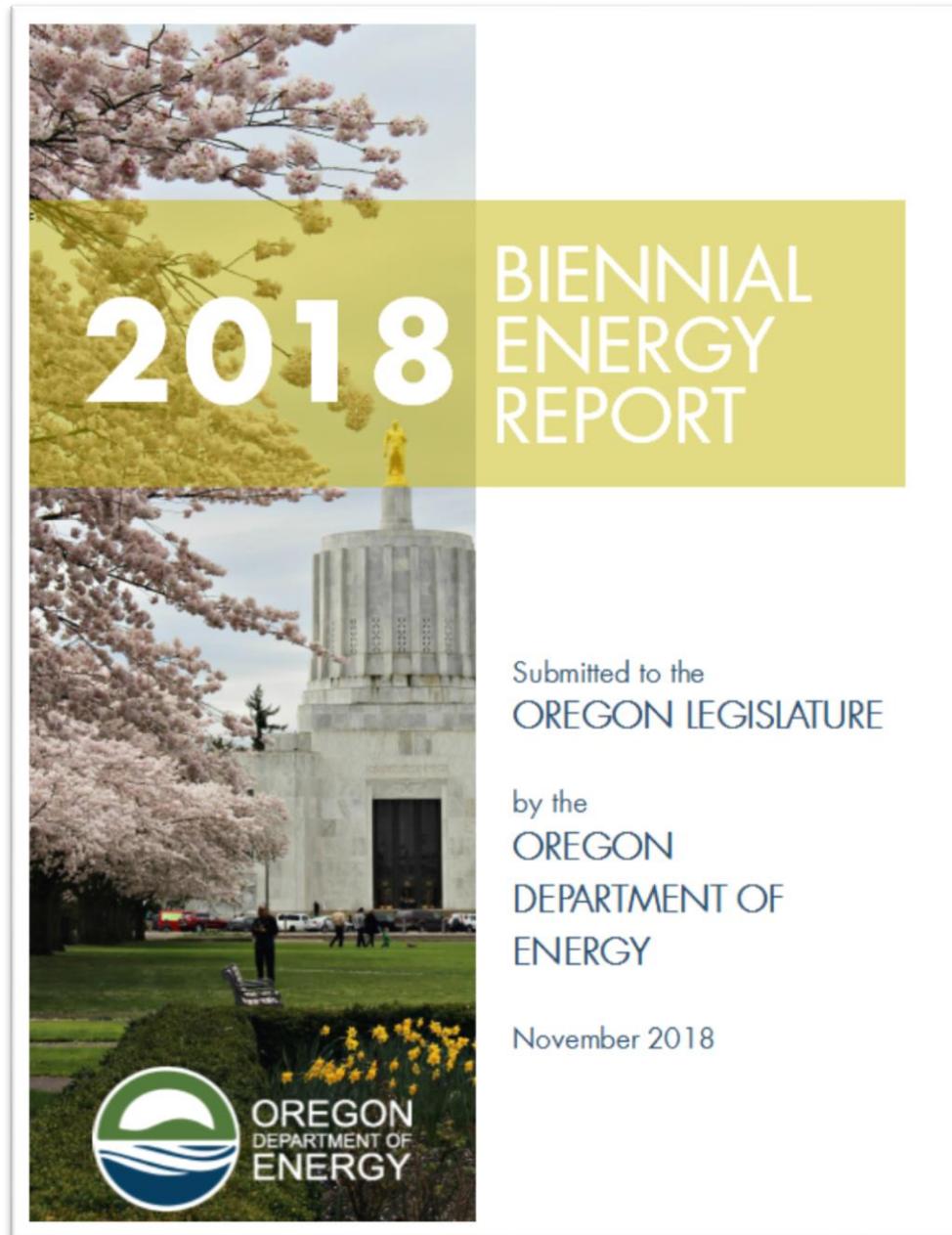
6. Conclusions

DRAFT

Oregon Department of Energy

Preview of ODOE's 2018
Biennial Energy Report

October 24, 2018



HB 2343 (2017)

- A comprehensive report with data and information on energy resources, policies, trends, and forecasts in Oregon.
- The purposes of the report shall be to inform local, state, regional, and federal energy policy development, energy planning, and energy investments, and to identify opportunities to further state energy policies.

90th OREGON LEGISLATIVE ASSEMBLY—2017 Regular Session

Enrolled
House Bill 2343

Introduced and printed pursuant to House Rule 12.00. Pre-session filed (at the request of Governor Kate Brown for State Department of Energy)

CHAPTER _____

AN ACT

Relating to comprehensive energy reporting; creating new provisions; and repealing ORS 469.060 and 469.070.

Be It Enacted by the People of the State of Oregon:

SECTION 1. ORS 469.060 and 469.070 are repealed.

SECTION 2. Section 3 of this 2017 Act is added to and made a part of ORS 469.010 to read:

SECTION 3. (1) No later than November 1 of every even-numbered year, the State Department of Energy shall transmit to the Governor and the Legislative Assembly a comprehensive report on energy resources, policies, trends and forecasts in Oregon. The purposes of the report shall be to inform local, state, regional and federal energy policy development, energy planning and energy investments, and to identify opportunities to further the energy policies stated in ORS 469.010 and 469.310.

(2) Consistent with the legislatively approved budget, the report shall include, but need not be limited to, data and information on:

- (a) The consumption, generation, transmission and production of energy, including fuel energy;
- (b) Energy costs;
- (c) Energy sectors, markets, technologies, resources and facilities;
- (d) Energy efficiency and conservation;
- (e) The effects of energy use, including effects related to greenhouse gas emissions;
- (f) Local, state, regional and federal regulations, policies and planning activities related to energy; and
- (g) Emerging energy opportunities, challenges and impacts.

(3) The report may include, but need not be limited to:

- (a) Recommendations for the development and maximum use of cost-effective conservation methods and renewable resources, consistent with the energy policies stated in ORS 469.010 and 469.310 and, where appropriate, the energy plan and fish and wildlife program adopted by the Pacific Northwest Electric Power and Conservation Planning Council pursuant to P.L. 96-501; and
- (b) Recommendations for proposed research, development and demonstration projects and programs necessary to further the energy policies stated in ORS 469.010 and 469.310.

Enrolled House Bill 2343 (HB 2343-A) Page 1

(4) The report shall be compiled by collecting, organizing and refining data and information acquired by the department in the performance of its existing duties and under its existing authority.

(5)(a) This section is not intended to allow disclosure of records exempt from disclosure under ORS 192.410 to 192.505.

(b) The department shall establish procedures for the development and compilation of the report.

request the exclusion from the report of specific data or information to the department and to provide, in the request, reformation is exempt from disclosure under ORS 192.410 to 192.505.

ize data and information that is exempt from disclosure un- amplification or analysis that is included in the report, provided information is not disclosed in a manner that is individually iden-

Department, other agencies shall assist the department in the report. This section.

request public input and provide opportunities for public comment report.

Received by Governor: _____ M., _____, 2017

Approved: _____ M., _____, 2017

Filed in Office of Secretary of State: _____ M., _____, 2017

Dennis Richardson, Secretary of State

Page 2

How We Got Here

- 2017: House Bill 2343 passes Oregon Legislature
- Fall 2017-Winter 2018: Stakeholder outreach
- Winter 2018: Develop outline, gather data and research
- Spring 2018: Public roll-out of outline, incorporate feedback
- Summer-Fall 2018: Draft and internal review of report
- November 2018: Submit final report to Legislature

What's in "The BER"



TABLE OF CONTENTS

3	Executive Summary
5	Letter from the Director
6	About the Report
7	Energy By the Numbers
49	Policy Timeline
50	Climate Change
70	Energy Efficiency
90	Renewable Energy
120	Transportation
170	Protecting Consumers
190	Resiliency
200	Recommendations
204	Appendices

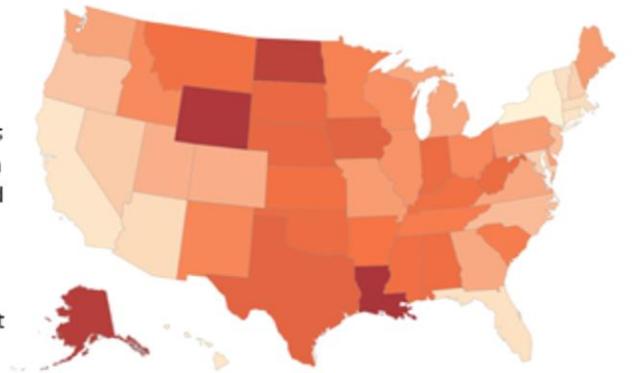
- Energy data about Oregon's consumption, production, and generation
- Deep dives into some of the most pressing energy topics affecting the state – climate change, energy resilience, renewable energy, and more
- Identification of areas where more research, focus, and/or data are needed to help inform decision-makers and program implementers

Energy By the Numbers: Data snapshots that help us understand Oregon's energy landscape.

Energy Use in Oregon

Per Capita Energy Use

Per capita energy consumption in Oregon is at the lowest ever recorded. After a peak in 1972, per capita consumption had declined by 37 percent by 2016. That same year, Oregon consumed 31 percent less energy than the U.S. average and 19 percent less than the U.S. median. Our use is also lowest in the Pacific Northwest.



176 million Btu — — 897 million Btu

2016 Per Capita Consumption — U.S.

301 Million Btu

2016 Per Capita Consumption — Oregon

239 Million Btu

Energy Use in Oregon

Energy Use and Economic and Population Growth

Between 1960 and 1999, economic and population growth in the U.S. generally corresponded with growth in energy use. Starting in the early 2000s, in Oregon and the country as a whole, energy consumption is no longer directly correlated with growth factors like population and GDP.

Energy efficiency is a significant reason Oregon's total and per capita energy use has gone down. As discussed on page xxx and in Chapter 2, Oregon's emphasis on energy efficiency has helped reduce both total and per capita energy use despite an increasing population and avoid the need to build new electricity generation plants.

Between 2000 and 2016:
Oregon Population

19%

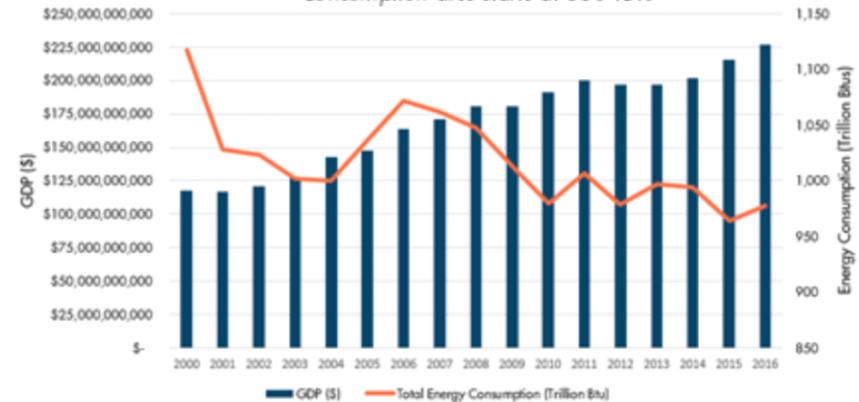
Oregon GDP

93%

Oregon Energy Use

12.5%

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



Energy By the Numbers: Useful information designed for readers across Oregon.

Electricity Use

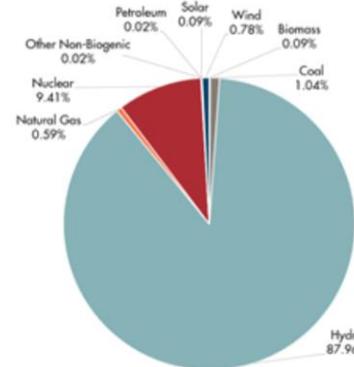
Electricity Use By Investor-owned Utility

The sources of electricity used by Oregon households vary depending on the utility provider. The electricity resource mixes for Oregon's three investor-owned utilities are shown below. One year of data is shown for each utility; mixes will fluctuate year to year depending on the availability of certain resources. Oregon Department of Energy's online Electricity Resource Mix tool uses a three-year average of data to account for variability in the hydroelectric system. The information below does not include real-time supplemental market purchases of electricity that utilities make to meet demand.

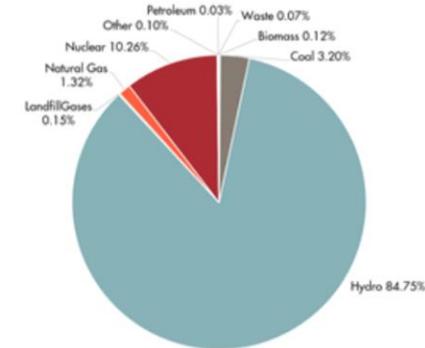
Electricity Use

Electricity Use By Consumer-owned Utility

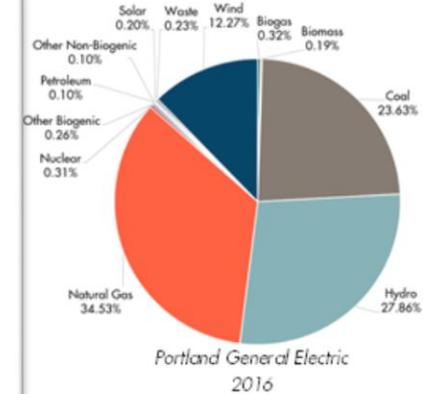
The electricity resource mixes for the Eugene Water & Electric Board and a composite of other consumer-owned utilities operating in Oregon are below. One year of data is shown for each utility; mixes will fluctuate year to year depending on the availability of certain resources. Oregon Department of Energy's online Electricity Resource Mix tool uses a three-year average of data to account for variability in the hydroelectric system. The information below does not include real-time supplemental market purchases of electricity that utilities make to meet demand.



Eugene Water & Electric Board
2016



Average Oregon Consumer-Owned Utility
2014



Portland General Electric
2016



LTP Other
2017

Bonneville Power Administration

Consumer-owned utilities in Oregon get most of their electricity from the Bonneville Power Administration, which markets wholesale electrical power from 31 federal hydroelectric facilities in the Northwest, a nuclear power plant, and several other small power plants. The dams for hydroelectric power are operated by the U.S. Army Corps of Engineers and the Bureau of Reclamation. BPA provides about 28 percent of the electric power used in the Northwest.



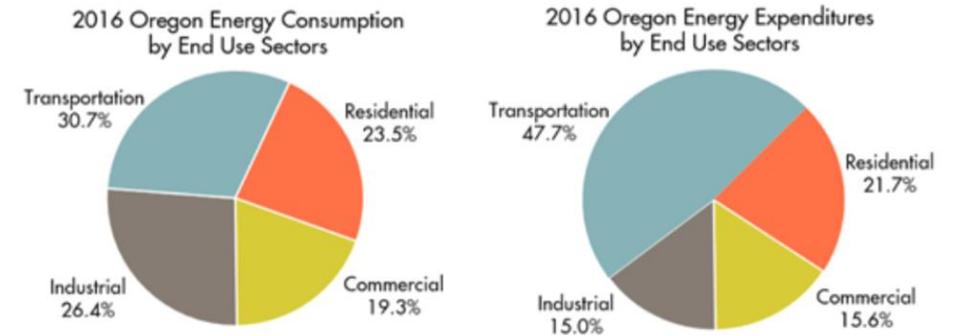
The Dalles Dam in the Columbia River Gorge produces up to 2,000 MW of power.

Energy By the Numbers: Focus on what we use and how we use it, plus what we make, and how each have changed over time.

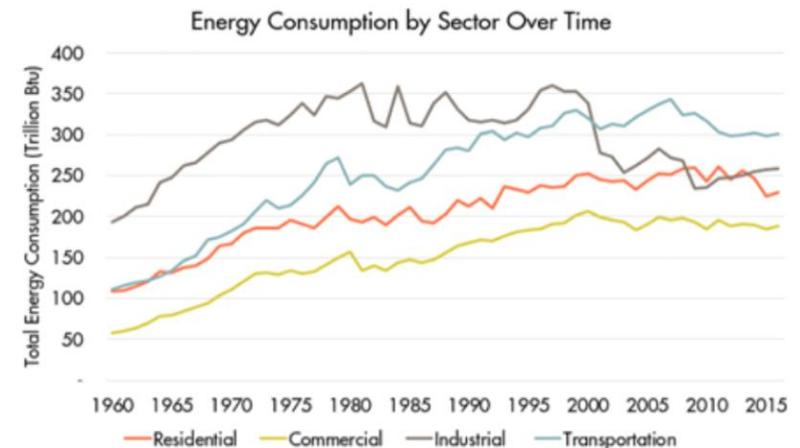
Energy Sector Profiles

Energy is commonly divided into four end-use sectors: Residential, Commercial, Industrial, and Transportation.

Consumption and cost of energy for each sector varies. For example, while Transportation represents about 31 percent of energy consumption, it accounts for almost half the expenditures due to higher per-unit cost of transportation fuels.



Sector energy consumption for residential, commercial, and transportation has remained fairly steady over time. The industrial sector saw a large dip in Oregon around 1999. Learn more on the following pages.



Climate Change and Energy: reducing greenhouse gas emissions in the energy sector.



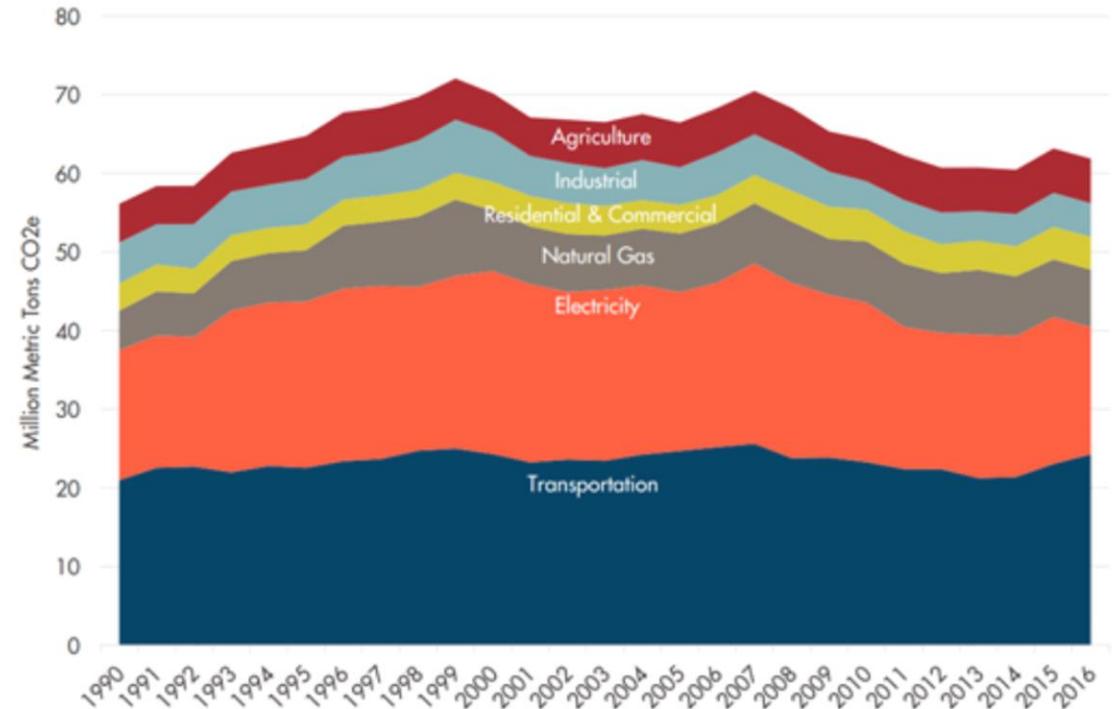
KEY TAKEAWAYS

- More to do to transition Oregon to a deeply decarbonized, clean energy future.
- Our current path will affect public health, livelihoods, and ways of life.
- Further action must include analysis of costs and benefits and better understanding environmental and health tradeoffs.
- Oregon has opportunities to capitalize on low-carbon technologies to boost renewable energy use and production and make deep decarbonization feasible.

GHG Reduction Goals: Oregon's Progress

Oregon's statewide sector-based GHG Inventory⁴ provides GHG emissions going back to 1990 for four main sectors of economy—Transportation, Residential and Commercial, Industrial, and Agriculture—and can also break out emissions associated with the state's two largest energy sources, electricity and natural gas. For Oregon, this includes GHG emissions associated with electricity used in the state, regardless of where it is produced, but not emissions associated with electricity produced in Oregon but used out of the state.

Figure 2.1: Sector-Based Emissions with an Energy Lens: 1990-2016



As seen in Figure 2.1 above, statewide sector-based GHG emissions peaked in 1999 and almost rose to the same level in 2007, after which they generally declined or stayed flat through 2013. Within the state's largest

Energy Efficiency: how Oregon has maintained our long-time leadership, and how we'll continue to lead in the future.



KEY TAKEAWAYS

- Oregon is a national leader in energy efficiency, which is the second largest electricity resource behind hydroelectricity.
- Addressing climate change through energy efficiency may add a new value consideration for energy efficiency.
- Efficiency technologies and conservation practices continue to evolve and will provide opportunities in the future.

Electricity Use

Energy Efficiency

No discussion of Oregon's energy use overall and electricity use specifically would be complete without focusing on the role energy efficiency has played in our state. Energy efficiency is the second largest resource in Oregon after hydropower, and Oregon has consistently met increased demand for electricity by implementing energy efficiency strategies. The Northwest Power & Conservation Council reports that since 1978, the Pacific Northwest has produced nearly 6,000 average megawatts of savings through efficiency programs improvements. That's more electricity than the whole state of Oregon uses in a year.

Over the past decade, Oregon reduced per capita energy use across our residential, commercial, and industrial sectors despite our state population growing. In 2018, Oregon scored in the top ten states for energy efficiency in national rankings—the twelfth year in a row making this list.

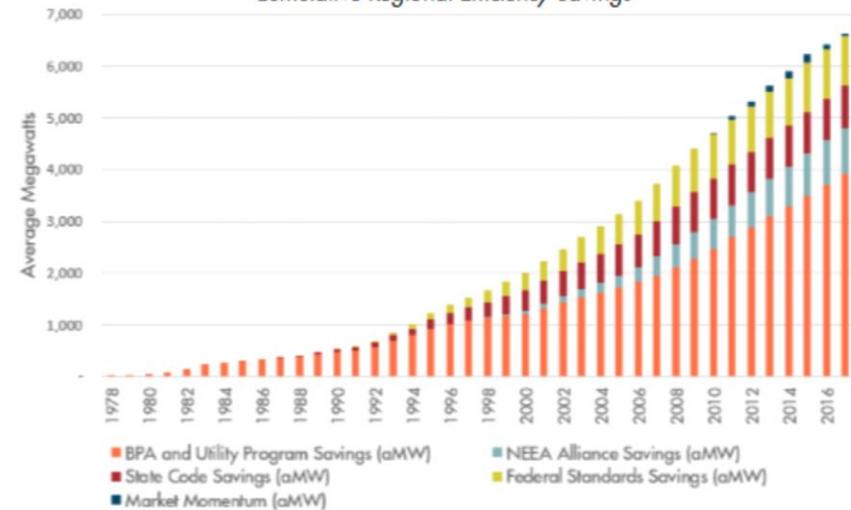
6,600

Average megawatts of regional electricity savings due to energy efficiency from 1980 to 2017

1,900

Average megawatts of electricity savings in Oregon thanks to energy efficiency over that same time period

How We Got Here:
Cumulative Regional Efficiency Savings



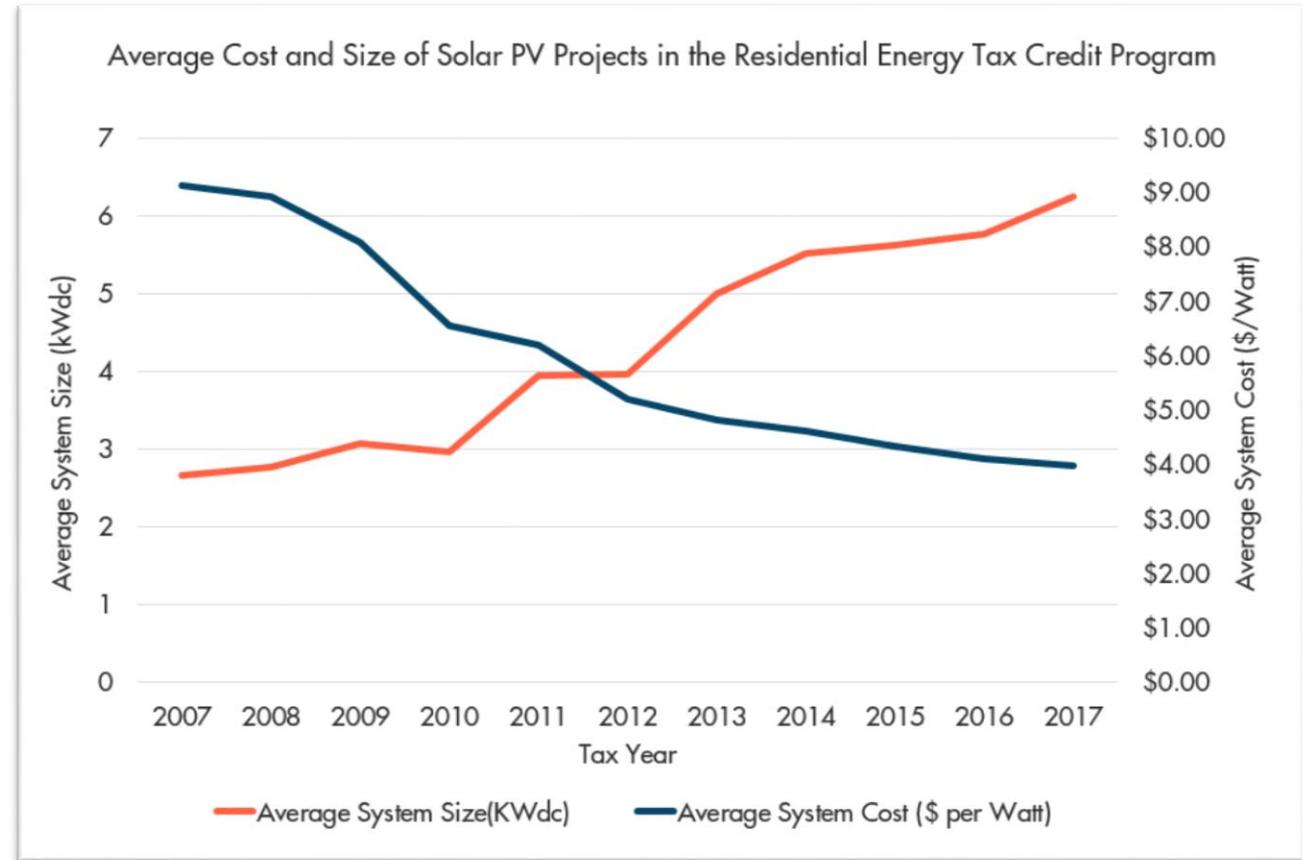
Oregon's gains in energy efficiency have been helped by federal standards, state policies and programs, utility programs, and nongovernmental organizations. For the region's cumulative savings, 60 percent comes from utility and BPA programs. Energy efficiency gains are cumulative and continue paying dividends for the region over time.

Renewable Energy: comprehensive look at renewables in Oregon, with special emphasis on rise in solar.



KEY TAKEAWAYS

- Renewable electricity in Oregon has grown due to key drivers such as RPS, incentives, customer demand, and falling costs.
- Meeting the 50 percent RPS by 2040 requirement relies on understanding and addressing various issues and choices on how to meet our state energy goals.
- Flexibility is key to integrating increasing amounts of variable renewable electricity onto the grid.

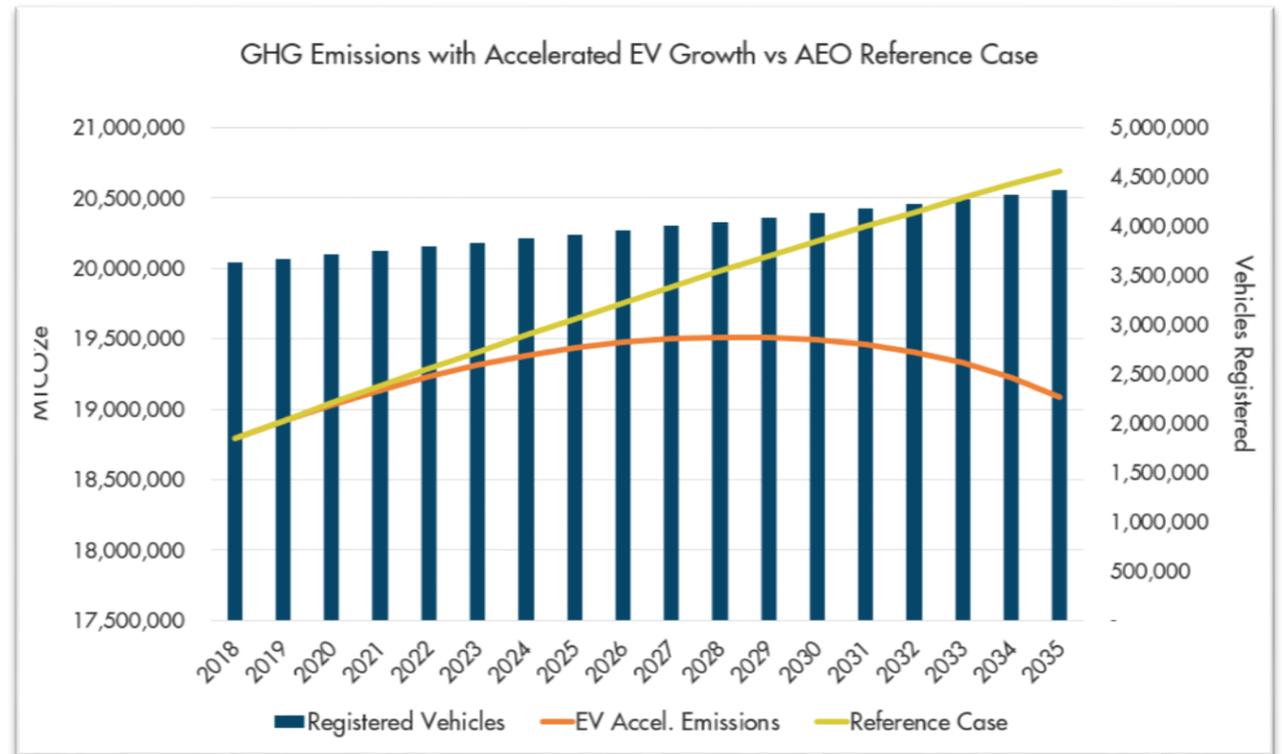


Transportation: understanding our largest share of energy use and looking ahead to an electrified transportation system.



KEY TAKEAWAYS

- Improved fuel efficiency and increased adoption of alternative fuels have reduced per vehicle fuel consumption and GHG emissions in Oregon, but continued efforts are needed.
- Oregon will need to adopt additional transportation policies, strategies, and programs to reduce overall GHG emissions and meet the state's climate goals.
- Increased electric vehicle adoption can reduce GHG emissions and help the state achieve other goals, including air quality and public health.



Consumer Protection and Equity: understanding energy burden and strengthening our focus on improved equity.



KEY TAKEAWAYS

- Consumer protection more important than ever, especially since many consumers are still energy burdened.
- Energy-burdened households can also incur other energy-related expenses, such as transportation fuel and wood pellets for heating, not accounted for in most studies about energy burden.
- Better understanding energy burden and equity depends on more data – including demographic, public health, energy emissions, and energy cost and expenditure data.

	For a Family of 4		
U.S. Median Household Income	\$60,336		200% of FPL: \$49,200
80% of U.S. Median Household Income	\$48,269		<i>The income threshold for many energy burden programs</i>
70% of U.S. Median Household Income	\$42,235		
60% of U.S. Median Household Income	\$36,202		
50% of U.S. Median Household Income	\$30,168		
40% of U.S. Median Household Income	\$24,600	Federal Poverty Level	
30% of U.S. Median Household Income	\$12,301 - \$24,599		99%-50% of Federal Poverty Level
20% of U.S. Median Household Income	\$9,841 - \$12,300		50% of Federal Poverty Level
	\$7,381 - \$9,840		40% of Federal Poverty Level
	Less than \$7,380		30% of Federal Poverty Level

Energy Resiliency: building up our energy systems to perform better every day and recover faster after catastrophe.



KEY TAKEAWAYS

- Increased awareness of threats to Oregon’s energy systems, plus advances in distributed energy resources, are creating new interest in community energy resilience.
- Entities across Oregon are taking steps to improve the resilience of the energy sector.
- Technology advancements can improve energy resilience to threats like the Cascadia earthquake and climate change.
- The state has the opportunity to engage communities to identify funding sources and deploy community energy resilience and climate adaptation solutions.

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.⁶ 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.⁹ 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, of coastal Japan in March 2011.⁹



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

Conclusions



RECOMMENDATIONS

Next Steps

- Due to the Legislature on November 1
- Work will begin immediately on an interactive web-based version
- Staff will continue refining recommendations and include in conversations about agency strategic planning
- We'd love your feedback for the next version of the report on content and process