

Oregon Public Utility Commission

HB 2941

Solar Incentives Report



DRAFT

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Introduction

In 2015, the Oregon Legislature passed House Bill (HB) 2941 requiring the Public Utility Commission of Oregon (Commission) to evaluate Oregon programs that incent the development and use of solar photovoltaic (PV) energy systems. It also directs the Commission to recommend for each program evaluated, whether the program should be discontinued, continued without change, or continued with modification. In addition, HB 2941 specifies that in developing its recommendations, the Commission must consider the following factors:

- the resource value of solar energy;
- how to minimize confusion and transaction costs for persons who participate in programs that incentivize the development and use of solar photovoltaic energy systems;
- the costs borne by persons who do not participate in programs that incentivize the development and use of solar photovoltaic energy systems;
- the Commission's study of the effectiveness of programs that incentivize the development and use of solar photovoltaic energy systems prepared pursuant to section 4, chapter 244, Oregon Laws 2013;
- the costs and benefits of each program that incentivizes the development and use of solar photovoltaic energy systems; and
- any other factors deemed relevant by the Commission.

The Commission must submit a report with its recommendations to the 2017 Oregon Legislature.

This report is organized into three chapters.

Chapter one describes the current energy policy landscape in Oregon and how that landscape factored in to the Commission's evaluations and recommendations.

Chapter two describes and evaluates Oregon's solar PV programs.

Chapter three offers the Commission recommendations and how it applied the legislative factors to make those recommendations.

1.0 Chapter One: Oregon Energy Landscape

For more than 30 years, Oregon has provided incentive programs to encourage the development of solar PV systems. These programs, which were enacted at different times with different goals, offer an array of ratepayer- and taxpayer-funded incentives administered by various agencies and a third-party non-profit organization.¹

In this report, we make our evaluations and recommendations about these programs in the context of recent legislation and the current energy landscape.

In 2016, the Legislative Assembly adopted sweeping new energy legislation that makes renewable energy the generating resource of choice in Oregon. Most significantly, the Legislature doubled the Renewable Portfolio Standard (RPS) targets for the state's two largest utilities. By 2040, these utilities must meet 50 percent of their retail Oregon electric load with renewable resources, including solar. The Legislature also enacted other incentives and mandates to spur further renewable energy development including: establishing community-solar programs in the service areas of Portland General Electric Company (PGE) and PacifiCorp, creating incentives to support the development of qualifying solar PV systems sized between two and 10 megawatts (MW), and establishing a mandate that small-scale renewable and biomass combined heat and power projects must account for eight percent of the state's "total aggregate electrical capacity" by 2025.

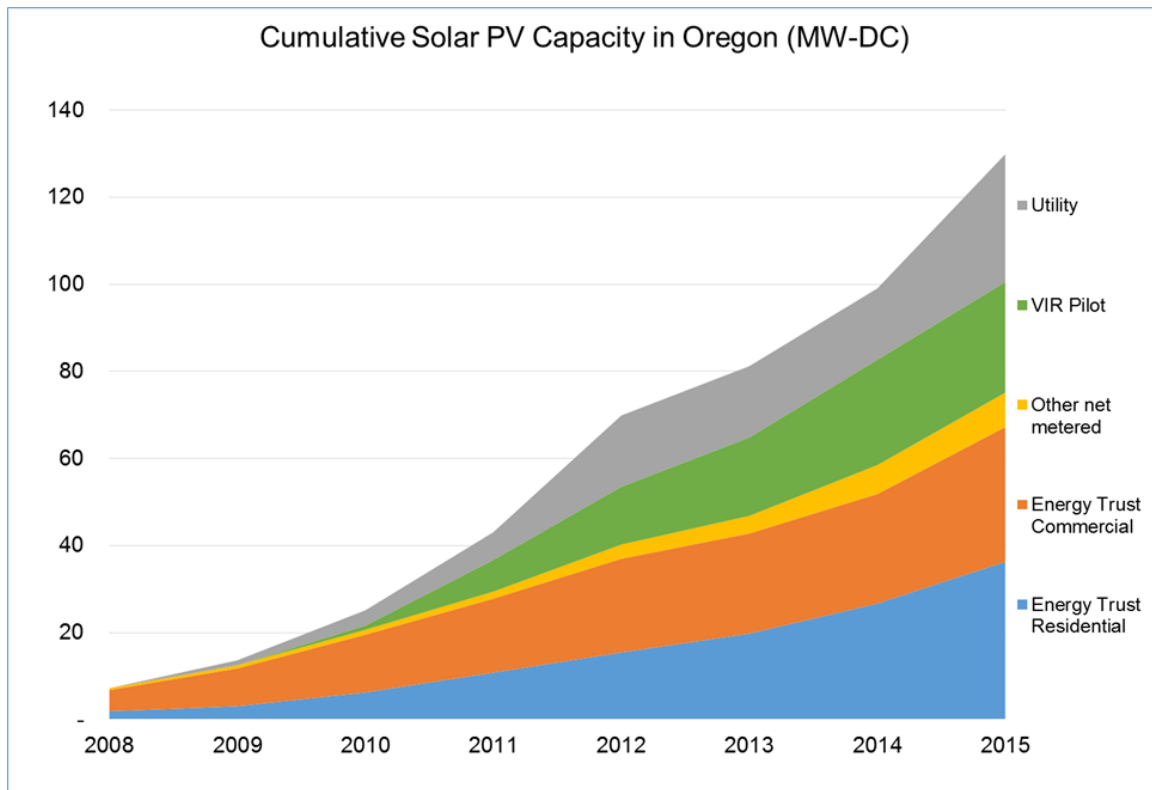
The increased RPS targets and incentives are in addition to Oregon's existing renewable hydropower resources,² which currently generate about 40 percent of the electricity used in the state. The recent legislation and significant existing hydropower resources will ensure that renewable resources will claim an ever-increasing share of Oregon's electricity supply mix.

In addition, today, solar has now become an established part of Oregon's supply mix. Since roughly 2008, solar energy generation in Oregon has grown rapidly. As of 2015, more than 10,000 solar PV systems have been installed with a combined capacity of 120 MW-dc (Figure 1).

¹ Federal tax credits are available for solar PV installations.

² ORS 469A.010(3) (finding that hydroelectric energy is an important renewable energy source that may be used to comply with the Oregon RPS under specified conditions.)

Figure 1: The growth in cumulative solar PV capacity in Oregon since 2008. *Source: Energy Trust of Oregon*



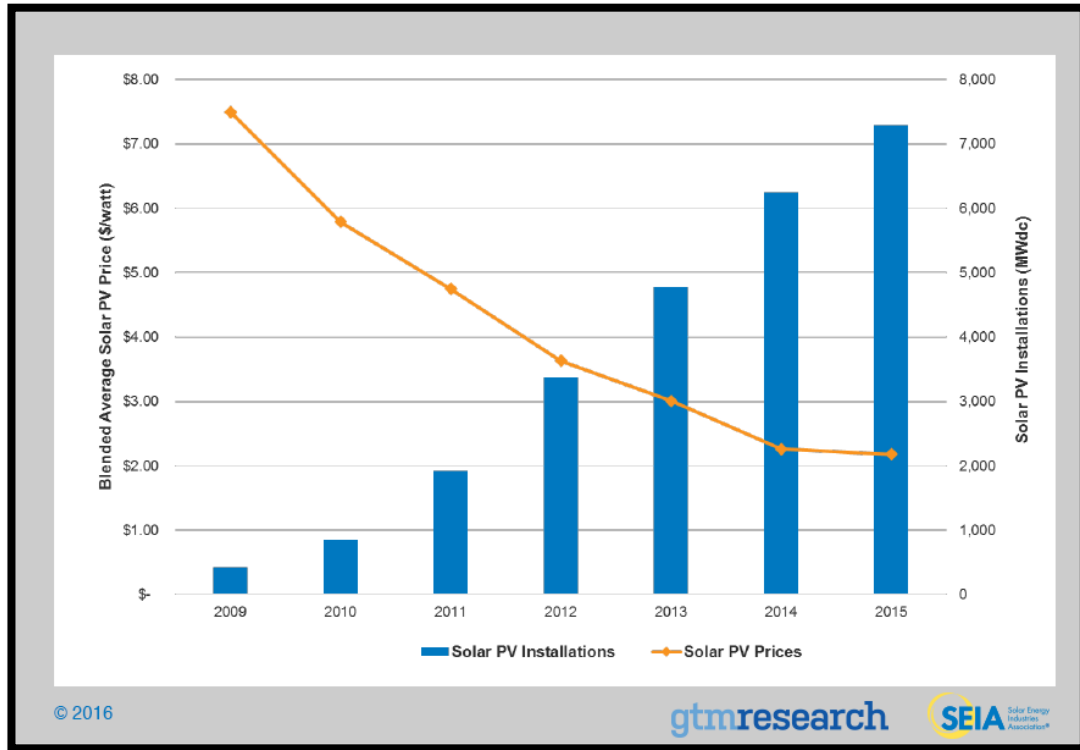
The outlook is for solar generation to continue to grow rapidly. PGE estimates that 125 to 223 MW of distributed solar will be developed by 2035.³ PacifiCorp projects that 232 to 568 MW of distributed solar will be developed in its service territory over the next 20 years.⁴

One of the driving forces for the growth in solar is the decline in costs. Figure 2 shows the average cost of all types of solar PV installations nationally from 2009 to 2015. During that period, the average cost of all types of solar PV installations fell from about \$7.50 per watt to about \$2.50 per watt.

³ <https://www.portlandgeneral.com/-/media/public/our-company/energy-strategy/documents/2015-08-13-solar-generation-market-research.pdf?la=en>

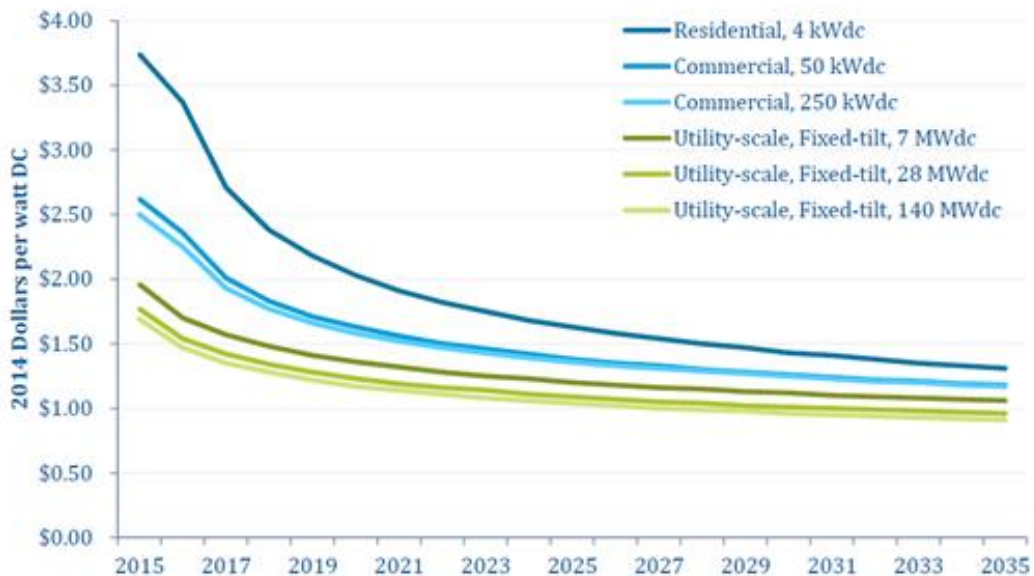
⁴ http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2017_IRP/PacifiCorp_IRP_DG_Resource_Assessment_Final.pdf

Figure 2: Solar installations nationwide from 2009 until 2015 and the average cost of those systems over the same period. *Source: Solar Energy Industries Association, Solar Industry Data*
<http://www.seia.org/research-resources/solar-industry-data>



The cost of solar is projected to follow this downward trend. Figure 3 shows the average cost of residential installations in the U.S. are projected to fall from just below \$4 per watt in 2015 to \$2 per watt in 2020 and \$1.50 per watt by 2035.

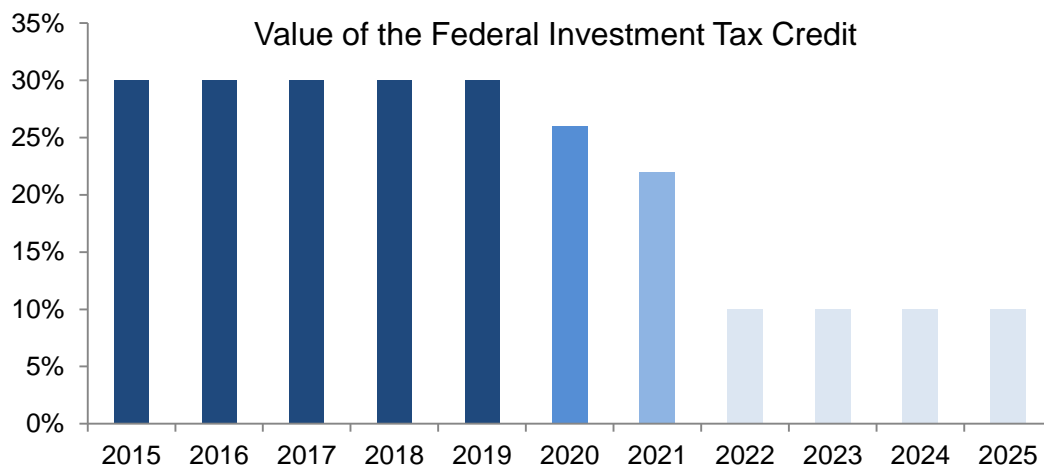
Figure 3: Solar Cost Projections (2014\$/Watt DC), *Source, Black & Veatch, "Solar Generation Market Research: Solar Market Assessment and Cost Projections" Sept. 24, 2015; Prepared for Portland General Electric*



The growth in solar is also linked to the growth in the third-party leasing model. Today a large portion of distributed solar PV projects are now being developed and financed by third-party companies. These companies buy, install, own, and operate the solar PV systems on their client's property and lease the equipment to the client for a fee. Under this arrangement, the customer does not have to pay upfront costs for solar PV and the third-party receives the incentive or tax benefit. This relatively new model increases access to solar PV by reducing the amount of upfront costs needed to install solar PV.

Finally, today, many Oregon households and businesses have access to multiple state, federal, and ratepayer-funded incentives for solar PV installations. However, state and federal incentives are being reduced or eliminated. Today, the federal investment tax credit (ITC) is a major solar PV incentive. It is a 30 percent credit claimed against the tax liability of residential and commercial properties. The credit is being reduced systematically each year until it reaches a floor of 10 percent in 2022. Figure 4 shows the change in credit over time.

Figure 4: The planned step-down in the Investment Tax Credit



Similarly the number and size of available state programs has fluctuated over time. At one time, Oregon offered a business tax credit for business investment in solar PV. That tax credit has expired.

The Oregon Department of Energy (ODOE), which houses several other state-run energy incentive programs, is undergoing programmatic review by the Legislature, and earlier this year was reviewed by the Governor's Office. In June 2016, the Governor's Office recommended allowing the current incentive programs to sunset at the end of

2017.⁵ The ODOE Legislative Oversight Committee will report its recommendations on the continuance, elimination or modification state incentive programs later this year.

This context impacts this report in several ways.

First, our evaluation recognizes that renewable energy has a strong presence in Oregon and will soon be the state's primary generating resource. Increased RPS mandates combined with the region's significant hydropower supply will ensure that renewable energy plays a dominant role in powering the homes and businesses of all Oregonians—regardless of what additional incentives are offered to promote solar energy.

Second, in determining the future landscape of solar incentives, we recognize the current landscape of solar energy development. Many of the incentives discussed in this report were created at a time when there was little solar energy development and solar PV systems were among the most expensive forms of generation. That is no longer the case today, as the installation of solar arrays continue to grow and costs of solar PV systems continue to decrease. In addition, third-party solar companies now provide access to solar under favorable terms for households. Further, once potential sites that hold the promise of offering large benefits to the utility system are identified and quantified,⁶ then there will be opportunities to strategically target the development of solar generation and compensate strategically placed solar generation accordingly. The structure of solar incentives should adapt and evolve with this changing landscape.

Third, in considering the state's incentive programs, we divided them into two groups: those funded by the ratepayers of regulated utilities, and those funded more broadly by state taxpayers. This distinction is important because programs funded by the ratepayers of regulated utilities are not available to all Oregonians; they are limited to customers of regulated utilities. These programs have a direct impact on the electricity rates paid by the customers of certain utilities.

In contrast, taxpayer-funded programs can be made available to all Oregonians, regardless of their energy provider. Additionally, solar system attributes that benefit the utility system are most appropriately funded by ratepayers; while those that benefit society as a whole are most appropriately funded by taxpayers.

⁵ http://media.oregonlive.com/politics_impact/other/ODOE%20Oversight.pdf

⁶ Solar benefits to the utility system include: The value of the energy that the utility would otherwise generate or purchase, avoided need for new capacity, savings in transmission line losses, avoided need for new transmission and distribution investments, and reduced cost of complying with environmental regulation.

2.0 Chapter Two: Oregon's Incentive Programs

Oregon began promoting the use of alternative energy through state-run incentive programs in the late 1970s and the 1980s with the Small-Scale Energy Loan (SELP) program, the Business Energy Tax Credit (BETC), and the Residential Energy Tax Credit (RETC). In 1999, the State required utilities to offer net energy metering to customer-generators. That same year, it also passed SB 1149, which placed a public purpose charge⁷ on the customer bills of PGE and PacifiCorp ratepayers to fund programs to save electricity, develop renewable resources, and benefit low-income Oregon households. In 2007, the State adopted a renewable portfolio standard which required Oregon utilities to serve specified percentages of their retail load with electricity generated by eligible renewable sources, including solar PV and solar thermal systems.

In 2009, the Oregon Legislature required the Commission to implement volumetric incentive rate pilot programs for PacifiCorp, PGE, and Idaho Power Company (Idaho Power). These pilot programs were designed to test the use and effectiveness of incentive power purchase rates to spur solar PV development. The 2009 Legislature also established the solar capacity standard requiring PacifiCorp, PGE, and Idaho Power to acquire a combined total of 20 MW of capacity from solar PV systems between 500 kilowatts (kW) and five megawatts in size by 2020.

In 2010, the Legislature created the Renewable Energy Development (RED) Grant to fund renewable energy projects. In 2011, the Legislature established a sunset date for the BETC program. In 2016, the Legislature adopted a bill (SB 1547) that doubled the RPS, established a community solar program, and directed the Oregon Business Development Department ("Business Oregon") to implement a new incentive program for mid-size solar PV power plants.

⁷ The public purpose expenditure standard (ORS 757.612) requires electric companies and Oregon Community Power to fund new cost-effective local energy conservation, new market transformation efforts, the above-market costs of new renewable energy resources, and new low-income housing weatherization. The standard is funded by a three percent public purpose charge on customers' electric bills. It is set to expire at the end of 2025.

2.1 Solar PV Programs

In this chapter, the Commission describes the following programs that stimulate the development of solar in Oregon:⁸

1. Residential Energy Tax Credit (RETC)
2. Renewable Energy Development Grant (RED)
3. Small-Scale Energy Loan Program (SELP)
4. Property Tax Exemption for Alternative Energy Systems
5. Fee in Lieu of Property Tax
6. Solar Incentive Program
7. Rural Renewable Energy Development Zone (RRED)
8. Public Utilities Regulatory Policy Act (PURPA)
9. Community Solar
10. Renewable Portfolio Standard
11. Net Energy Metering
12. Public Purpose Charge-Funded Renewable Resource Programs

Many incentives are offered in combination to Oregon households and businesses. Below we also describe and summarize the most common combinations of programs used by Oregonians.

2.2 Taxpayer Funded Programs

Taxpayer funded programs include tax credits, grants, and loans. Taxpayer funded programs are available to all Oregonians regardless of which utility's service territory they are located in and whether that utility is an investor-owned utility subject to the Commission's jurisdiction, or whether it is a publicly owned utility outside of the Commission's jurisdiction.

2.2.1 Residential Energy Tax Credit

In 1978, Oregon began offering energy tax credits for households to save energy and develop renewable energy resources. Administered by ODOE, Oregon homeowners,

⁸ Further description of each renewable incentive programs adopted between 1978 and 2016 can be found in Appendix A.

renters, and landlords receive personal income tax credits for buying energy efficient equipment and renewable energy systems for residences.

Tax credit amounts vary based on the alternative energy device and the amount of energy saved or produced; credits can range from about \$100 to \$6,000. The types of devices and appliances eligible for the tax credit are reviewed each year and have changed over time.

In 2005, the Legislature increased the solar electric tax credit to \$6,000. The credit can be taken over four years. The program is scheduled to sunset in 2018.

To date, Oregon households and landlords have received credits for more than 10,000 solar PV projects with a combined capacity of more than 30 MWs. The residential tax credit is typically combined with other incentives. Figure 5 shows tax credit program statistics since 2001.

Figure 5: RETC tax credits from 2001-2015. *Source: Oregon Department of Energy*

Year	Number of Projects	Capacity Installed kW	Annual Energy kWh	Installed Cost	Incentives
2001	4	12		\$ 28,934	\$ 5,922
2002	34	36		\$ 317,642	\$ 45,090
2003	149	274		\$ 1,905,539	\$ 216,264
2004	151	258		\$ 1,866,435	\$ 214,826
2005	119	233		\$ 1,591,532	\$ 206,251
2006	227	543		\$ 4,287,086	\$ 1,157,828
2007	244	633	Not Available	\$ 5,333,414	\$ 1,300,318
2008	220	653		\$ 4,893,750	\$ 1,197,668
2009	604	1,808		\$ 14,379,769	\$ 3,523,940
2010	1,173	3,520		\$ 22,279,420	\$ 6,783,192
2011	1,470	5,698		\$ 35,312,885	\$ 8,484,309
2012	1,036	4,157		\$ 20,954,878	\$ 6,021,268
2013	1,091	5,434		\$ 25,444,198	\$ 6,415,879
2014	1,366	6,938		\$ 34,924,358	\$ 8,089,819
2015	2,091	11,764		\$ 49,917,396	\$ 12,201,185
Total 2001-15	9,979	41,961		\$ 223,437,236	\$ 55,863,758

2.2.3 Renewable Energy Development Grant

The Renewable Energy Development (RED) grant is a competitive grant to promote investment in renewable energy development in Oregon. ODOE administers the grant which was first offered in 2012.

Eligible recipients include Oregon businesses, organizations, public bodies, nonprofits, tribes and residential rental properties that install and operate a renewable energy production system that produces electricity. Eligible projects include systems that use biomass, solar, geothermal, hydroelectric, wind, landfill gas, biogas or wave, tidal or ocean thermal energy technology to produce energy.

RED grants are awarded through a competitive selection process. Recipients can receive the lesser of 35 percent of eligible project costs or \$250,000 per project. Funding for the grants comes from tax credit auctions administered by the Oregon Department of Revenue.

RED grants have been given to 11 Solar PV projects with a combined capacity of 427 kW. Most of these projects were located in central and eastern Oregon. Usually, grants have been combined with other incentives. Figure 6 provides program statistics by year from 2013 through 2015.

Figure 6: RED Grants distributed 2013-2015. *Source: Oregon Department of Energy*

Year	Number of Projects	Capacity Installed kW	Annual Energy kWh	Total Installed Cost	One-Time Incentive
2013	4	92	108,300	\$ 373,327	\$ 117,103
2014	1	35	34,000	\$ 130,180	\$ 25,250
2015	6	299	384,383	\$ 834,492	\$ 159,420
Total 2013-15	11	427	526,683	\$ 1,337,999	\$ 301,773

2.2.4 Small-Scale Energy Loan

Since 1981, Oregon has offered long-term, low-interest loans for energy conservation and renewable energy projects through the Small-Scale Energy Loan Program (SELP). Loans are provided to individuals, businesses, non-profit organizations, schools, and

local, state, federal and tribal governments. The loan program is administered by the Oregon Department of Energy.

Since its inception, SELP has issued 874 loans totaling about \$612 million. SELP has loaned \$8.4 million for 45 solar PV projects (Figure 7).⁹

Figure 7: SELP Loans granted for solar PV from 1999-2015. *Source: Oregon Department of Energy*

Year	Number of Projects	Total Loaned
1999	4	\$ 97,307
2000	2	\$ 347,317
2001	1	\$ 18,000
2002	1	\$ 19,999
2003	1	\$ 400,000
2004	7	\$ 1,207,021
2005	3	\$ 159,200
2006	2	\$ 1,529,193
2007	5	\$ 824,383
2008	3	\$ 44,970
2009	2	\$ 191,800
2010	4	\$ 1,294,221
2011	5	\$ 1,930,380
2012	1	\$ 55,000
2013	1	\$ 20,000
2014	2	\$ 261,500
2015	1	\$ 40,560
Total 1999-2015	45	\$ 8,440,851

⁹ The data in the table does not represent the entirety of the program.

2.2.5 Property Tax Exemption for Alternative Energy Systems

In 2011, Oregon passed HB 2563 which provided a property tax exemption for any changes in the real market value of a property due to installing a qualifying renewable energy system. No increase in property value due to installing a solar PV system is counted in the property tax assessment. Projects must be net-metered or provide an offset to on-site electricity use.

Since 2011, the Oregon Department of Revenue has granted a tax exemption for more than 5,700 projects. The total value of the tax assessment exemptions exceeds \$236 million. The property tax exemption is scheduled to expire in 2018 (Figure 8). However, the Fee in Lieu of Property Tax program was designed as a replacement to the Alternative Energy Exemption.¹⁰

Figure 8: Alternative Tax Exemption Projects 2011-2016, *Source Oregon Department of Revenue*

Year	Number of Projects	Exemption Amounts
2011	430	\$ 14,725,863
2012	740	\$ 27,586,500
2013	840	\$ 33,969,199
2014	1,050	\$ 45,518,398
2015	1,280	\$ 53,457,810
2016	1,400	\$ 61,432,938
Total 2011-15	5,740	\$ 236,690,708

2.2.6 Fee in Lieu of Property Tax

The owner of a solar project may enter into an agreement with a county or city (if a project is within city limits) to pay a fee of \$7,000 per MW of nameplate capacity instead of paying property taxes for a period up to 20 years. Eligible projects can receive no other tax exemptions. The Oregon Legislature recently established this Fee in Lieu of Property Tax program to replace the property tax exemption for Alternative energy systems.¹¹

¹⁰ Correspondence with the Department of Revenue.

¹¹ Correspondence with the Department of Revenue.

No specific data about solar projects is available for this program.

2.2.7 Solar Incentive Program

The 2016 Legislature passed HB 4037 to incent the development of Solar PV projects with a nameplate capacity between two and ten megawatts. The Oregon Business Development Department will administer the program.

Qualifying projects will receive a monthly payment of one-half cent per kWh of electricity generated for a period of five years. Qualifying systems must be located in Oregon and start operation on January 1, 2016 or later. The program closes the earlier of January 2, 2017 or once 150 MWs of projects have been enrolled.

No data is yet available on program activity.

2.2.8 Rural Renewable Energy Development Zone

An Oregon city, county, or contiguous counties can establish a Rural Renewable Energy Development Zone (RRED Zone) to encourage new investments in wind, geothermal, solar, biomass or biofuels.

Eligible projects within a zone can receive a three to five year exemption on local property taxes. The project must create full-time employment unless the investment is \$5 million or more.

The total amount of property (among one or more projects) that can qualify for an exemption is subject to a cap set for each Zone designation. Also, the RRED Zone must have a designation that cannot exceed \$250 million in initial market value.

Information about solar projects is not available for this program.

2.3 Government Mandates and Ratepayer Funded Programs

This category of programs and policies includes ratepayer-funded incentives programs – such as net metering – and state and federal mandates that encourage investment in renewable resources.

2.3.1 Public Utilities Regulatory Policy Act

In 1978, Congress adopted the Public Utilities Regulatory Policy Act (PURPA) to encourage resource competition and the development of renewable resource technologies by non-utility power producers. Qualifying Facilities, or QFs, include generating facilities up to 80 MWs that use biomass, waste, or renewable resources.

The prices for purchases from QFs are set at the purchasing utility's avoided cost. PURPA defined avoided cost as the cost at which the utility would have paid to acquire the energy absent the purchase from the QF. Although PURPA is a federal program, implementation is left largely to the states through Public Utility Commission orders and administrative rules.

To date, in Oregon, three solar PV QFs with a combined capacity of 2.6 MWs are operating. As of April 2016, 59 more solar QF projects in Oregon had contracts but had yet to be built. These projects have a combined capacity of more than 430 MWs. While these facilities have contracts, it is unknown how many reach the construction phase.

2.3.2 SB 1547 Community Solar Program

As part of SB 1547, the Oregon Legislature established a community solar program for PGE and PacifiCorp customers. Under community solar programs, the output and benefits of a single solar project can be shared by a group of customers.

As specified by SB 1547, the design features of a community solar program include:

- Eligible projects must have a capacity of at least 25 kW.
- An eligible customer can only subscribe up their average yearly load.
- Solar customers will be compensated based on the value of solar to the grid or another price set by the Commission.
- Projects can be located anywhere in Oregon.
- Utilities can own and operate community solar projects subject to conditions set by the Commission.

- All risks and benefits of a project will be borne by the project owner, developer, and subscribers; and

Additionally, 10 percent of total program capacity must be made available to low-income customers.

The Commission is currently developing rules to implement the program.

2.3.4 Renewable Portfolio Standard

The 2007 Oregon Legislature enacted a Renewable Portfolio Standard, or RPS, to require Oregon utilities to meet a certain percentage of their load with eligible renewable generation. The 2016 Oregon Legislature modified the requirements of the RPS.

Under the current standards, PGE and PacifiCorp must meet 50 percent of their Oregon load with renewable resources by 2040. They have interim targets of 27 percent by 2025, 35 percent by 2030, and 45 percent by 2035.

Other utilities that supply more than three percent of Oregon's loads, such as the Eugene Water and Electric Board, must meet 25 percent of their load with renewables by 2025. Oregon's smallest utilities must meet either 5 or 10 percent of their load in 2025, depending on the share of load served.

Other features of the RPS include:

- Eligible generation must come from a facility located in the Western Electricity Coordinating Council. Except in some cases, facilities cannot have been operating before 1995.
- Utilities can meet the standard by building or buying electricity from an eligible generating facility with the associated renewable energy certificate, buying unbundled renewable energy certificates, and/or making alternative compliance payments.
- Utilities do not have to comply if the incremental cost of comply is above four percent of the utility's revenue requirement.
- After a request by a utility and an investigation, the PUC can temporarily exempt a utility from complying with the RPS targets if meeting the standard compromises their ability to meet reliability standards or if it threatens the reliability of the system

PacifiCorp and PGE have complied with the RPS using eligible generation and banked renewable energy certificates since 2011 and are on schedule to meet their 2020 targets.

2.3.5 Net Energy Metering

The 1999 Oregon Legislature established net energy metering for customers of consumer- and investor-owned electric utilities.

Net metering allows distributed energy systems to connect to utility's distribution system. Under net metering, solar customers can offset the energy bought from their utility with their own on-site generation. Effectively, the customer is compensated at the retail rate for the electricity produced by their project. However, the customer is not allowed to sell excess generation (generation exceeding the customer's electric load) back to the utility. If any excess generation remains at the end of a year, the utility values the unused kilowatt-hours at the avoided cost rate and transfers an equivalent amount of revenue to customers in low-income assistance programs.

Residential systems cannot exceed 25 kW. Commercial systems cannot exceed two megawatts.

Under ORS 757.300(6), the obligation to provide net metering may be limited by the Commission once cumulative generating capacity of net metering facilities reaches one half of one percent of a utility's historic single-hour peak-load. As of the end of 2015, PGE net metering customers account for 1.05 percent and PacifiCorp net metering customers account for 1.36 percent of their respective historic single-hour peak-load.¹²

Under the program, nearly 10,000 solar PV projects with a combined capacity of more than 80 MW have been installed in PacifiCorp, Idaho Power, and PGE service territory. Figure 9 shows yearly statistics and total enrollment. Most of these projects also received funding from state, federal, and ratepayer sources.

¹² Data is from Reports (RE) filed by PGE and PacifiCorp to Oregon Public Utility Commission as RE 39 and RE 45.

Figure 9: The number and size of solar net energy metering facilities installed by Oregon utility.

Year	PacifiCorp		PGE		Idaho Power		Total	
	Number of Projects	kW	Number of Projects	kW	Number of Projects	kW	Number of Projects	kW
To 2008	592	2,627	321	4,158	2	11	915	6,796
2009	251	1,530	269	4,019	1	2	521	5,551
2010	559	3,103	748	5,304	1	13	1,308	8,420
2011	609	5,152	780	4,673	1	100	1,390	9,925
2012	780	5,293	784	5,090	2	19	1,566	10,402
2013	559	8,123	516	3,913	2	13	1,077	12,049
2014	546	7,663	856	5,231	4	208	1,406	13,102
2015	599	5,027	1,885	11,406	9	178	2,493	16,610
Total 2002-15	4,495	38,516	6,159	43,794	22	544	10,676	82,855

2.3.6 Public Purpose Charge-Funded Renewable Resource Programs

In 1999, the Oregon Legislature enacted SB 1149 to introduce competition into the service areas of PGE and PacifiCorp. The 2001 Legislation delayed implementation to March 2002.

Under the bill, PGE and PacifiCorp began collecting a three percent charge on customer bills in 2002 to go for energy conservation, renewable resource, and low income energy programs. About 17 percent of the funds collected go for buying down the above-market costs of eligible renewable resource projects including solar PV projects. The Energy Trust of Oregon (Energy Trust) administers these programs.

Energy Trust has developed its solar incentive program to fund a portion of the above-market cost of solar projects. Energy Trust has also developed programs aimed at reducing solar soft costs. Soft costs can include permit fees, permitting, transaction costs, installer/developer profit, indirect corporate costs, customer acquisition, installation labor, and supply chain costs. The Energy Trust has developed a network of solar professionals – Trade Allies – who are approved to install projects under the Energy Trust program.

Energy Trust regularly adjusts its standard residential and commercial solar incentives it offers to reflect market trends in total installation costs and any changes to state or federal tax credits. Energy Trust also offers customized incentives for special projects.

Figure 10 below shows the average level of incentives offered by Energy Trust (and through other sources) from 2010 to 2016 for residential solar projects.

Figure 10: Average Oregon Residential Solar PV lifecycle costs 2010-2016. The white space under the above-market cost line represents the customer's share of the above-market costs. *Source: Energy Trust of Oregon*

Average Oregon Residential Solar PV Lifecycle Cost and Revenues from 2010 to 2016 (\$/kW)

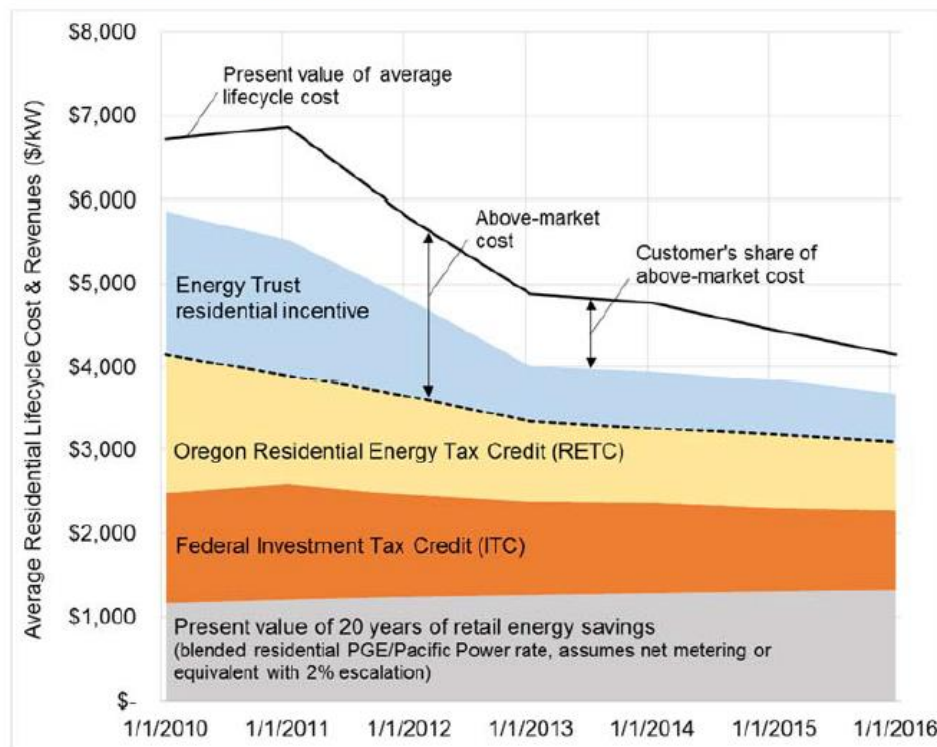
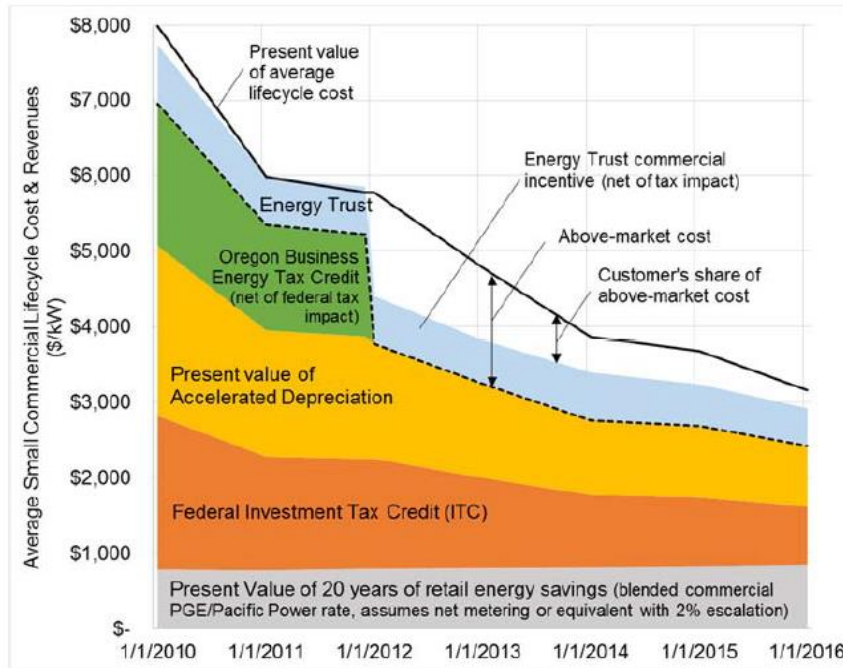


Figure 11 below shows the level of average Energy Trust incentives for commercial solar PV projects.

Figure 11: Average Oregon Small Commercial Solar PV lifecycle costs 2010-2016. The white space under the above-market cost line represents the customer's share of the above-market costs. *Source: Energy Trust of Oregon*

Average Oregon Small Commercial (<300 kW) Solar PV Lifecycle Cost and Revenues from 2010 to 2016 (\$/kW)



Since 2002, Energy Trust has funded more than 9,000 solar PV projects with a combined capacity of more than 83 MW. Most of these projects also receive other funds. Figure 12 shows year by year statistics.

Figure 12: Energy Trust of Oregon Solar Incentives from 2002-2015. *Source: Energy Trust of Oregon*

Year	Number of Projects	Capacity Installed kW	Annual Energy kWh	Total Installed Cost	One-Time Incentive
2002	1	22	21,500	\$ 267,000	\$ 167,000
2003	76	315	353,228	\$ 2,035,050	\$ 917,865
2004	119	539	665,244	\$ 3,303,913	\$ 1,498,064
2005	95	351	416,576	\$ 2,319,232	\$ 917,720
2006	141	590	685,486	\$ 4,628,210	\$ 1,022,429
2007	220	1,094	1,210,216	\$ 9,389,182	\$ 1,929,047
2008	255	3,915	4,122,661	\$ 31,884,936	\$ 5,415,626
2009	481	6,095	6,190,416	\$ 44,307,115	\$ 8,293,774
2010	1,205	9,780	10,440,234	\$ 64,520,465	\$ 12,855,988
2011	1,331	11,112	11,540,975	\$ 69,109,492	\$ 14,221,714
2012	1,244	19,186	26,168,608	\$ 93,702,699	\$ 17,383,141
2013	881	5,806	5,717,209	\$ 27,120,915	\$ 4,219,049
2014	1,292	9,065	9,145,152	\$ 39,453,174	\$ 6,965,474
2015	1,802	15,378	15,252,452	\$ 60,111,724	\$ 11,441,810
Residential Total	8,179	36,308	35,976,347	\$ 194,887,363	\$ 39,978,962
Commercial Total	949	30,558	31,608,300	\$ 176,509,359	\$ 33,296,317
Utility-Scale Total	15	16,382	24,345,311	\$ 80,756,387	\$ 13,973,424
Total 2002-15	9,143	83,247	91,929,957	\$ 452,153,109	\$ 87,248,703

2.4 Combined Incentive Programs

Several of the reviewed incentive programs are typically combined to bring down the out-of-pocket costs of solar PV projects. For example, a residential customer (or a third-party leasing company) could receive the federal solar investment tax credit, the state residential energy tax credit, an Energy Trust incentive, and enroll as a net-metering customer of their utility. Figure 13 demonstrates which Oregon programs can be combined. All solar PV projects can also receive the federal investment tax credit.

Figure 13: Allowed Program Combinations

	Net Metering (NM)	Energy Trust of Oregon Incentives (ETO Solar)	Oregon Residential Energy Tax Credit (RETC)	Renewable Energy Development (RED) Grant
Net Metering (NM)		Yes	Yes	Yes
Energy Trust of Oregon Incentives (ETO Solar)	Yes		Yes	Yes
Oregon Residential Energy Tax Credit (RETC)	Yes	Yes		No
Renewable Energy Development Grant (RED)	Yes	Yes	No	

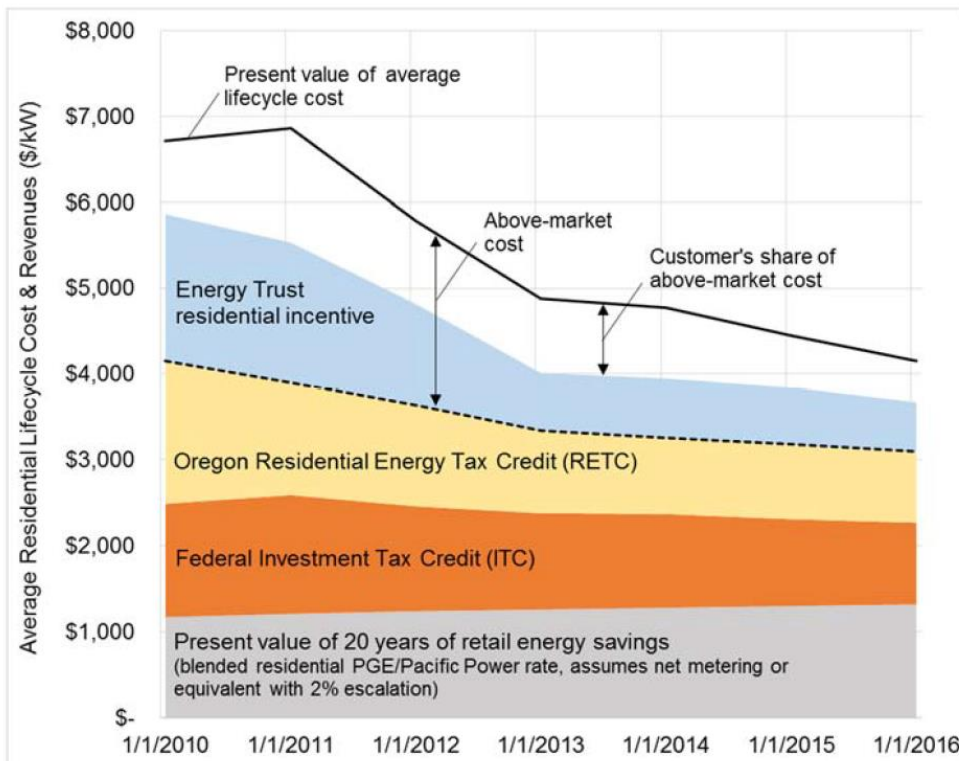
All are eligible for the federal Investment Tax Credit

Figure 14 shows the share of costs covered by the available range of incentives for an average solar PV system installed from 2010 to 2016. If a customer took advantage of all of the incentives, about two-thirds of the costs of the system would be covered. This provided a significant incentive for those potential solar PV customers who could pay the out-of-pocket costs or enter into a lease agreement with a third-party installer.

The Commission offers three observations on combined incentive. **First**, because multiple sources of funds often help pay for solar PV systems, it is difficult to isolate the effect of a single incentive on solar development in Oregon.

FIGURE 14: This chart illustrates how incentives are combined to bring down the above-market cost of residential solar projects in Oregon. *Source: Energy Trust of Oregon*

Average Oregon Residential Solar PV Lifecycle Cost and Revenues from 2010 to 2016 (\$/kW)



Second, at the same time, access to these programs across the state and by household varies. For example, Oregonians outside of PGE and PacifiCorp's service area have no access to Energy Trust programs. Or, Oregonians without tax liability may have no access to the residential energy tax credit. As a result, in some areas, there may be ample access to all programs; in others, less so.

Third, many projects may still have gone forward if one or more of the incentives did not exist or if the Solar PV customer had paid a higher share of the costs of the system. We cannot identify the level of "free ridership" in Oregon's programs.

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3.0 Chapter Three: Factors and Recommendations

HB 2941 directed the Commission to consider the following factors in making its recommendations:

- the resource value of solar energy;
- how to minimize confusion and transaction costs for persons who participate in programs that incentivize the development and use of solar photovoltaic energy systems;
- the costs borne by persons who do not participate in programs that incentivize the development and use of solar photovoltaic energy systems;
- the Commission's study of the effectiveness of programs that incentivize the development and use of solar photovoltaic energy systems prepared pursuant to section 4, chapter 244, Oregon Laws 2013;
- the costs and benefits of each program that incentivizes the development and use of solar photovoltaic energy systems; and
- any other factors deemed relevant by the Commission.

Other factors considered by the Commission include equity, efficiency, and effectiveness as defined below:

Efficiency: we define efficiency as the amount input required (as defined by costs) to generate a unit of output. We compare the relative cost of a resource to other generating resources to generate the same level of output.

Equity turns on two factors: one is the availability of programs to similarly situated individuals. The other is a fair sharing of the costs of the output of a project.

Effectiveness: we define effectiveness on the extent to which a program stimulates the development of solar generation that would not have otherwise occurred.

Before we offer our interpretation of these factors and how we applied them to produce our recommendations, we narrowed the scope of our recommendations in two ways.

First, we offer no recommendations on the programs recently adopted or revised by the 2016 Oregon legislature. These programs include the RPS, the community solar program, or the Business Oregon incentive program (HB 4037). **Second**, in light of the programmatic review of the ODOE administered incentive programs, the Commission offers no recommendations on the specific design of taxpayer-funded incentives for solar PV installations.

3.1 Application of legislative factors

Below is our discussion of the use of the legislative factors.

1. The most appropriate measure of the value of solar PV generation is the value it provides to the utility system and ratepayers.

A solar project should be treated as a system resource. A solar PV project should be valued based on the measurable benefits to the utility system.

The resource value of solar refers to the benefits that accrue to the utility system and its ratepayers from the integration of solar as a resource.¹³

These potential benefits of solar generation include:

- the value of the energy that the utility would otherwise generate or purchase,
- avoided need for new capacity,
- savings in transmission line losses,
- avoided need for new transmission and distribution investments, and
- reduced cost of complying with environmental regulation.

A resource value of solar rate compensates the participant for the value to the utility system and the non-participating customer only pays for the value the resource provides to the utility system.

2. To minimize confusion the number of programs that have different design features, compensation schemes, geographic restrictions, and requirements should be limited. More programs increase transaction costs and create confusion.

3. Any solar program should be simple, clear to participants, and user-friendly.

4. Similar solar PV programs should be made available to all Oregonians regardless of utility service territory.

Programs that are offered widely throughout the state reduce confusion and maximize the impact of the program. Consistency of programs across the state is the best way to further state policy goals.

¹³ These benefits captured by the RVOS do not include society-wide benefits such as economic development and improvements in environmental quality. We recommend these types of society-wide benefits be incentivized by taxpayer funded programs rather than through ratepayer programs.

5. Solar PV programs should be consistent and stable over time.

New programs give the state the opportunity to test new design elements. However, pilot or temporary programs have led to confusion among participants. Therefore, moving forward, consistency, and stability are important to the growth of solar PV.

6. Ratepayers should pay no more than the value of solar PV generation to the utility system.

Non-participants ratepayers paying no more than the benefits received is consistent with treating a solar PV project as a resource and minimizes the possibility of shifting costs onto non-participating customers.

7. Incentives should yield the greatest market stimulation relative to the amount of investment while minimizing free-ridership.

Incentive structures that yield more benefits per dollar of incentives should be favored over incentive structures that yield fewer benefits. Free-ridership is the situation in which an incentive is given to a project that would have happened in absence of that incentive. The presence of high-levels of free-ridership decreases the impact of the incentive.

8. Given the number of overlapping programs, the impact of a given program cannot be accurately quantified and is no guide for recommendations.

Due to the ability of solar incentives to be combined, it is difficult, if not impossible, to accurately calculate the cost and benefits of each program. For example, it is unclear which program moved the participant to action and consequently it is difficult to allocate the relative benefit to individual incentive programs. Therefore, traditional cost-benefit analysis does not provide an accurate evaluation upon which the Commission can determine the relative merits of individual programs.

9. Incentives that provide social benefits should be funded by society as a whole (or taxpayers).

3.2 Recommendations

Based on these statutory factors, the Commission makes the following recommendations:

- 1. If the Legislature wants to capture the full social and economic development benefits of solar PV, it should adopt taxpayer-funded incentive programs.***

If the Legislature sees value in promoting the development of solar PV in Oregon for social and economic development reasons, it should consider adopting incentives available to all Oregonians. Because wider social benefits are shared by all Oregonians, the costs of programs to capture those benefits should be borne by all Oregonians and all Oregonians should have access to those programs.

Because of the current program review, the Commission offers no specific recommendations on the form of taxpayer funded incentives to be offered. The Commission does recommend that the Legislative should examine extending the property tax exemption and creating taxpayer-supported programs that spur residential and small commercial solar PV developments.

- 2. Modify the solar net metering program¹⁴ so that the compensation method used is the same as the compensation method used for Oregon's Community Solar program under SB 1547.***

SB 1547 requires that an electric company credit owners or subscribers of a Community Solar project with a rate that reflects the resource value of solar. Alternatively, for good cause, the Commission can set another rate.¹⁵ The Commission is currently engaged in a process to determine the resource value of solar and whether that value should be used to compensate solar PV generation in a Community Solar program.

Compensation for solar generation should be consistent across programs on a going forward basis. A consistent compensation methodology takes into account several of the factors outlined HB 2941. It minimizes confusion and transaction costs by using one method for both programs. It also establishes one compensation method that could be used statewide by all utilities.

¹⁴ This report is limited to making recommendations on incentives for solar PV. Therefore, these recommendations do not extend to other resources that utilize net metering such as biogas.

¹⁵ SB 1547, Sect. 22, (6)(a)

In addition, it minimizes shifting costs to non-participating customers unless the impact is de minimis or there is a compensating benefit to those ratepayers for doing so.

After the value of solar docket ends, the Commission plans to open a proceeding to implement the use of value of solar rates for utility customers with solar generation. Among other issues, the docket will examine the costs and benefits of such a switch in how solar project owners are compensated.

3. Target Energy Trust of Oregon's Solar Electricity Program to support applications that yield high-value benefits to the utility system or to help bring down the "soft costs" of solar projects.

The Energy Trust's use of public purpose charges should be modified to target solar PV applications that provide unique benefits to the utility system or help to reduce the "soft costs" of solar energy.

Currently, Energy Trust uses a portion of the public purposed charge collected from PGE and PacifiCorp ratepayers to fund its Solar Electric Program. The program is designed to help promote solar energy by offering rebates to customers that install solar PV systems.

Energy Trust's use of public purpose charge funds should be earmarked to promote high-value applications to support and improve the utility's electric system and for efforts to reduce the resource cost of solar. The Commission believes this will be the most efficient and effective use of public purpose charge funds for solar projects.

High-value applications include – but are not limited to - the selective placement of solar arrays to improve system reliability, provide system services such as voltage regulation, and defer or eliminate the need for system upgrades. The Commission will be calling on utilities to identify all such sites in their service areas.

The public purpose charge funds dedicated to solar projects should also be used to bring down the "soft costs" of solar generation. These soft costs include labor, permitting, financing and legal fees, and costs other than PV arrays and inverters. Reducing such costs could significantly lower the overall cost of solar generation to the benefit of customers.

In its 2017-18 Program Action Plan, the Energy Trust signaled changes which may impact its solar program. It outlined work including aligning its strategic focus to support innovative solar projects which provide additional utility benefits.

The Commission will examine the use of public purpose charge funds to promote high-value applications of solar-PV.

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Appendix

Program Summaries

Results provided through 12/31/2015

Current Programs

- Net Energy Metering (NEM)
- Residential Energy Tax Credit (RETC)
- Renewable Energy Development Grant (RED)
- Small-Scale Energy Loan (SELP)
- Renewable Portfolio Standard (RPS)
- Public Utilities Regulatory Policy Act (PURPA)
- Public Purpose Charge-Funded Renewable Resource Program
- Rural Renewable Energy Development Zone (RRED)
- Property Tax Exemption for Alternative Energy Systems
- Fee In Lieu Of Property Taxes

Pending Programs

- Resource Value of Solar Tariff
- Community Solar (SB 1547)
- Solar Incentive Program (HB 4137)

Expired or Expiring Programs

- Business Energy Tax Credit (BETC)
- Volumetric Incentive Rate Pilot Program (VIR)

Solar Net Energy Metering

Oregon's net energy metering program began in 1999 and requires that investor-owned utilities, people's utility districts, municipal utilities, and electric cooperatives allow customers to install renewable generation facilities on their property and offset the energy purchased from the utility with their own generation ("net meter").

Net energy metering means measuring the difference between the electricity supplied by a utility and the electricity generated by a customer and fed back to the utility over the applicable billing period. Net energy metering uses a bi-directional meter to measure the net kilowatt hours (kWh) delivered to and received from the customer.

In a billing period in which the utility delivers more kWh than it receives, the customer receives a bill for each kWh-based charge in addition to the standard monthly charges. If the customer sends more kWh to the utility than it receives, the kWh credit is carried over to a future billing period.

The customer is not allowed to sell excess generation back to the utility. If any excess remains at the end of the 12-month will be transferred to customers enrolled in the public utility's low-income assistance programs. The public utility will value any unused kWh credit at the applicable average annual avoided cost rate.

Projects



Capacity Installed kW



NEM Quick Facts

Funding Source:
Participants fund installations

Participants:
Limited to 25 kW residential, 2 MW nonresidential

Lead Organizations:
OPUC, customer-owned utility governing bodies

Created: 1999

Years Active: 17

Expiration: None; optional cap (0.5% of peak load) has been exceeded

Service Territories: All

Related Policy:

- ORS 757.300
- OAR 860-039-0005 to 860-039-0080

Residential Energy Tax Credit

The Residential Energy Tax Credit (RETC) program launched in 1978 and is administered by the Oregon Department of Energy (ODOE) to promote energy conservation and renewable energy resource development. Under the RETC program, ODOE issues personal income tax credits to Oregon homeowners, renters, and landlords who purchase energy efficient equipment/devices and renewable energy systems for their homes.

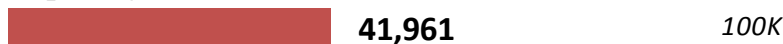
Tax credit amounts vary based on the alternative energy device and the amount of energy saved or produced; credits can range from about \$100 to \$6000. The types of devices and appliances eligible for the tax credit are reviewed each year and have changed over time. In 2005, the Legislature increased the solar electric tax credit to \$3.00 per watt up to \$6,000, which is equal to \$1,500 taken over four years. ODOE has periodically reduced the tax credit rate based on market conditions. By 2015 the rate had been reduced to \$1.50 per watt.

RETC continues to be well utilized, contributing to meeting Oregon's energy efficiency and renewable energy goals. Over the years, ODOE issued nearly 600,000 tax credits to Oregonians for eligible projects.

Projects



Capacity Installed kW



Installed Cost



Incentives



RETC Quick Facts

Funding Source:
Taxpayers

Participants:
Homeowners, renters,
rental property owners

Lead Organization: ODOE

Created: 1977

Years Active: 38

Expiration: 2018

Incentives Provided: \$59M

Service Territories: All

Related Policy:

- OAR 330-070-0022
- ORS 316.116

This includes installed costs covered not just by RETC but also by Energy Trust, grants, and/or Federal tax credits.

Renewable Energy Development Grant

The Renewable Energy Development (RED) Grant program began in 2012 and is administered by the Oregon Department of Energy. Eligible recipients include Oregon businesses, organizations, public bodies, nonprofits, tribes and residential rental properties that install and operate a renewable energy system that produces electricity.

RED grants are awarded through a competitive selection process and can total up to 35 percent of eligible project costs, with a cap of \$250,000 per project. Funding for the grants comes from tax credit auctions administered by the Oregon Department of Revenue.

Eligible projects include systems that use biomass, solar, geothermal, hydroelectric, wind, landfill gas, biogas or wave, tidal or ocean thermal energy technology to produce energy.

Projects

11	20K
----	-----

Capacity Installed kW

427	100K
-----	------

Annual Energy kWh

526,683	100M
---------	------

Installed Cost

\$1,337,999	\$500M
-------------	--------

Incentives

\$301,773	\$100M
-----------	--------

RED Quick Facts

Funding Source:
Taxpayers

Participants:
Businesses, public bodies, nonprofits, tribes, residential rental properties

Lead Organization:
ODOE

Created: 2012

Years Active: 4

Expiration: 2018

Service Territories: All

Related Policy:
OAR 330-200-0000

Small Scale Energy Loan Program

ODOE's Small-Scale Energy Loan Program (SELP) provides loans for conservation, renewable energy, and other energy projects. It is one of the nation's oldest green-lending programs. SELP provides access to funding for eligible energy projects, from installing photovoltaic and hydropower systems to more efficient furnaces and lighting systems. SELP serves individuals, businesses, non-profit organizations, schools, and local, state, federal and tribal governments.

SELP has issued over 900 loans – more than \$612 million – over its 30-plus year history. The program has about \$175 million in its active portfolio. SELP made its first loan in 1981.

The program operates as an enterprise fund and relies on fees and loan interest to sustain operations. Loans are funded with the proceeds of state general obligation bond sales. The program has the authority to issue taxable, tax-exempt and private activity bonds.

The SELP data below reflects solar PV projects only, exclusive of solar thermal and passive solar projects.

PV Projects

45

20K

Total Loaned

\$8,440,851

\$100M

SELP Quick Facts

Funding Source:
General Obligation Bonds

Participants:
Individuals, businesses,
non-profits, schools,
governments

Lead Organization:
ODOE

Created: 1979

Years Active: 35

Expiration: None

Service Territories: All

Related Policy:

- OAR 330-070-0022
- ORS 470.050

Renewable Portfolio Standard

As part of the Oregon Renewable Energy Act of 2007 (SB 838), the State of Oregon established a renewable portfolio standard (RPS) for electric utilities and retail electricity suppliers. The RPS was updated by SB 1547 in 2016 to raise the target to 50 percent eligible renewable electricity by 2040.

Different RPS targets apply depending on the utility's size. Electricity service suppliers must meet the requirements applicable to the electric utilities that serve the territories in which the electricity service supplier sells electricity to retail consumers. Large investor-owned utilities -- those with three percent or more of the state's load -- must ensure that a percentage of the electricity sold to retail customers in-state be derived from eligible renewable energy resources according to

- **5% by 2011**
- **15% by 2015**
- **20% by 2020**
- **27% by 2025**
- **35% by 2030**
- **45% by 2035**
- **50% by 2040**

Smaller utilities are subject to smaller standards. Utilities with less than 1.5 percent of state load must meet a five percent RPS by 2025. Utilities with more than 1.5 percent, but less than three percent of state load must meet a ten percent RPS by 2025.

RPS compliance must be demonstrated through the purchase of renewable energy certificates (RECs) through the Western Renewable Energy Generation Information System (WREGIS). RECs may be either bundled with, or purchased separately from, electricity contracts. RECs must come from a facility located within the Western Electricity Coordinating Council (WECC).

RPS Quick Facts

Funding Source:
Ratepayers

Participants:
All utilities, at varying compliance levels

Lead Organizations:
OPUC and ODOE

Created: 2007

Years Active: 9

Expiration: Ongoing

Service Territories: All

Related Policy:

- ORS 469A
- SB 1547
- SB 838

Public Utilities Regulatory Policy Act

Congress adopted the Public Utilities Regulatory Policy Act (PURPA) in 1978 in response to the 1973 energy crisis. PURPA was designed to promote energy conservation through reduced electricity demand and promote greater use of domestic energy and renewable energy.

Under PURPA both publicly- and investor-owned utilities must purchase energy generated and offered for sale by qualifying facilities (QFs), which include renewable energy facilities of up to 80 MW. The prices for purchases from QFs are set at the purchasing utility's avoided cost (the cost at which the utility would have paid to acquire the energy absent the purchase from the QF). Although PURPA is a federal program, implementation is left largely to the states.

The Commission has adopted policies intended to encourage QF development while protecting ratepayers from paying QFs more than the utilities' avoided costs for energy.

Three solar PV QFs were operating as of early 2016 with a total 2.6 MW of capacity, and the output purchased by PGE. However, as of that same time, 59 additional QF projects were under contract: 27 with PacifiCorp (230 MW); 26 with PGE (147 MW); and six with Idaho Power (60 MW).

PURPA Quick Facts

Funding Source:
Ratepayers, at utility avoided cost

Participants:
Project Developers

Lead Organization:
OPUC

Created: 1978

Years Active: 38

Expiration: None

Incentives: None

Service Territories: All

Related Policy:

- OAR 860-029-001
to
860-029-100

Public Purpose Charge-Funded Renewable Resource Program

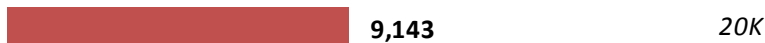
Senate Bill (SB) 1149, directed that 17.1 percent of all funds collected under the public purpose charge be directed toward renewable resource development, by specifically offsetting a portion of project costs that exceeds the market cost of electricity, commonly referred to as the above-market cost.

Since 2002 Energy Trust of Oregon (Energy Trust) has overseen and managed the expenditures of these PPC funds, which has ranged between \$7.2 million in 2002 to \$14.9 million in 2015 for all eligible renewable technologies.

Customers receiving a standard solar program incentive must also have a net metering agreement with their utility, and were not eligible for the VIR program when it was operational.

In 2007, through SB 838 the focus of the Energy Trust Renewables Program was narrowed to funding projects of 20 MW or smaller in size. In effect this separation kept the PPC's ratepayer funds focused on developing the market for small-scale, distributed renewable resources.

Projects



Capacity Installed kW



Annual Energy kWh



Installed Cost



Incentives



Energy Trust Solar Program Quick Facts

Funding Source: Portland General Electric and PacifiCorp ratepayers

Participants: Customers of Portland General Electric and PacifiCorp

Lead Organizations: Energy Trust with OPUC oversight

Created: 1999, launched 2002

Years Active: 14

Expiration: 2025

Incentives Provided: \$87.2M

Service Territories: Portland General Electric and PacifiCorp

Related Policy:

- ORS 757.612
- OAR 860-038-0480
- SB 1149
- SB 838

This includes installed costs covered not just by the Energy Trust Incentive Program but also by RETC, BETC, grants, and/or Federal Tax credits.

Rural Renewable Energy Development Zones

Rural Renewable Energy Development Zones (RRED Zones) offer an incentive to encourage new investments that either: harness wind, geothermal, solar, biomass, or other unconventional forms of energy in Oregon to generate electricity; or produce, distribute or store any of a wide variety of biofuels.

Throughout Oregon, a city, county, or several contiguous counties can set up a RRED Zone that covers all the territory in the jurisdiction(s) outside the urban growth boundary (UGB) of any large city or metropolitan area.

The abatement is the standard (three to five year) exemption from local taxes on qualified property available in any enterprise zone, the tax reduction is available for eligible renewable energy activities in that enterprise zone. Also, the total amount of property that can qualify for the abatement is subject to a cap set by the local jurisdiction within each RRED Zone and the RRED Zone must have a designation of \$250 million or less in initial market value.

Since 2013, the local government sponsor (county) may waive the requirement to create full-time employment with a new project, if the cost of the investment is \$5 million or more.

RRED Quick Facts

Funding Source:
Taxpayers

Who Participates:
Businesses

Lead Organization:
Business Oregon

Created: 2003

Years Active: 15

Expiration: Zones
terminate after 10 years

Incentives Provided:
Assessed value of property
exempted is \$100M for
2015-16

Projects: 2 for 2015-16

Service Territories: All

Property Tax Exemption for Alternative Energy Systems

The property tax exemption for Alternative Energy Systems exempts the additional taxable value of equipping a property with net metering or with alternative systems for onsite electricity or climate control as compared to a conventional system until 2017. This exemption means that any increase in a property value due to the installation of solar photovoltaics would be exempt from the property's tax assessment.

In 2011, the Oregon Legislature passed HB 2563 which provided a property tax exemption for any changes in the real market value of a property due to installing a qualifying renewable energy system. The governing body of a county and the owner or person in possession or control of a solar project located within the county and outside the boundaries of any incorporated city may enter into an agreement that exempts from property taxes the property constituting the solar project and allows the payment of a fee in lieu of property taxes imposed on the property. An agreement may not be entered into for a term longer than 20 consecutive years.

This exemption means that any increase in a property value due to the installation of solar photovoltaics would be exempt from the property's tax assessment. Projects must be net-metered or provide an offset to on-site electricity use. The property tax exemption will expire in 2018.

Property Tax Exemption Quick Facts

Funding Source:
Taxpayers

Who Participates:
Property Owners

Lead Organizations:
Counties, Department of Revenue

Created: 2011

Years Active: 6

Expiration: 2018

Service Territories: All

Fee In Lieu of Property Tax for Solar Projects

Pursuant to executing an agreement with the county (and city, if inside one), any solar project may be exempt for up to 20 years, contingent on annual payment to the county/city of a fee equal to \$7,000 per MW of the project's nameplate capacity, and provided that the project is or was not subject to any other exemption.

The governing body of a county and the owner or person in possession or control of a solar project located within the county and outside the boundaries of any incorporated city may enter into an agreement that exempts from property taxes the property constituting the solar project and allows the payment of a fee in lieu of property taxes imposed on the property. An agreement may not be entered into for a term longer than 20 consecutive years.

The developer will get agreement from the relevant county and pay \$7,000 per MW instead of property taxes.

Fee In Lieu of Property Tax Quick Facts

Funding Source:
Taxpayers

Participants:
Solar system owners

Lead Organizations:
Local jurisdictions

Created: 2015

Years Active: 1

Expiration: 2022

Related Policy:

- Oregon Law 2015, Chapter 571
- HB 3492

Resource Value of Solar Tariff

Oregon's resource value of solar (RVOS) will define a methodology to determine the market value of distributed solar photovoltaic projects for Oregon. Oregon is in the process of defining this methodology.

In 2013, the Oregon Legislature enacted HB 2893 which added reporting and study requirements to ORS 757.365. The Public Utility Commission (Commission) prepared and submitted to the Legislature a comprehensive "investigation into the Effectiveness of Solar Programs in Oregon" on July 1, 2014. In that report, the Commission committed to opening a formal proceeding to determine the RVOS. The Commission opened this docket, UM 1716, on January 27, 2015, to address those issues.

PUC staff began holding workshops in 2015 to discuss the attributes of solar generation that should be considered in the determination of RVOS. All parties filed comments on the list of elements, making recommendations to the Commission as to those that should be included. The Commission clarified that it would consider only those elements that could directly impact the cost of service to utility customers.

The Commission adopted a two-phase contested case process to complete its investigation of RVOS. The first phase addresses elements and methodologies for RVOS, and the second phase will examine the values for each utility using those adopted methodologies. PUC Staff hired consulting firm E3 to create a methodology for the RVOS and developed a model. Parties are reviewing the model and methodology and submitting testimony to the Commission. Hearings will begin in August 2016.

RVOS Quick Facts

Funding Source:
PacifiCorp, PGE and
Idaho Power ratepayers

Who Participates:
To be determined

Lead Organization: OPUC

Created: 2013

Years Active: N/A

Expiration: N/A

Incentives Provided: N/A

Service Territories:
To be determined

Related Policy:

- ORS 757.365(13)
- Order No. 12-396
- Order No. 15-296
- HB 2893
- HB 2941

SB 1547 Community Solar

Community solar programs provide electric customers the opportunity to buy solar energy from a shared solar resource as opposed to installing solar capacity on their own property. Community solar customers share in the costs, risks, and benefits of solar projects through their utility bill.

House Bill 2941 (2015) directed the Public Utility Commission of Oregon (OPUC) to hold proceedings and recommend a set of preferred attributes for the design of a community solar program and to report back to the Legislature by November 1, 2015. The PUC recommended a definition of community solar, attributes, and features of the program to incorporate into any proposed legislation.

SB1547 passed in early 2016 and this created a new and altered policy framework for Community Solar. The legislation allows for utility ownership of community solar projects, and requires that 10% be allocated to low-income customers.

A rulemaking was opened in July 2016 to determine the attributes of the community solar program.

Community Solar Quick Facts

Funding Source:
Program participants

Participants:
Residential and small commercial PGE, PacifiCorp and Idaho Power customers

Lead Organization:
OPUC

Created: 2016

Years Active: N/A

Expiration: N/A

Incentives Provided:
To be determined

Service Territories:
PGE, PacifiCorp and Idaho Power

Related Policy:
• HB 2941 (2015)
• SB 1547 (2016)

Note: Consumer-owned utilities may also provide community solar programs to their members. This fact sheet refers to the requirement for the OPUC to write administrative rules to implement community solar programs for regulated utilities.

Solar Incentive Program

The 2016 Legislature passed HB 4037 which created a new clean technology program to provide incentives to owners of photovoltaic energy systems that collect solar energy and distribute electricity. The Oregon Business Development Department will establish this program to encourage the development of solar energy projects in Oregon with a nameplate capacity between two and ten megawatts.

The Solar Incentive Program is a production incentive, qualifying projects will receive a monthly payment of one-half cent per kWh of electricity generated for a period of five years.

Qualifying systems must be located in Oregon, be between 2 and 10 MW, and have to have a commercial operation date of January 1, 2016 or later. This program is closed to new applicants once 150MW of cumulative capacity has been enrolled or January 2, 2017.

The program sunsets on January 2, 2023.

Solar Incentive Program Quick Facts

Funding Source:
Taxpayers

Participants:
Developers of utility-scale projects (2 to 10 MW)

Lead Organization:
Business Oregon

Created: 2016

Years Active: N/A

Expiration: January 2023

Incentives Provided:
None to date

Service Territories: All

Related Policy:
• HB 4037

Business Energy Tax Credits

BETC operated for 35 years and provided incentives that helped thousands of businesses, schools, nonprofits, tribal governments, and others save money and energy.

BETC led to investments in renewable energy resources, both large and small and supported the development and use of alternative modes of transportation, which lowered energy costs and reduced emissions.

BETC reached its final sunset on July 1, 2014. As of that date, 24,743 business energy tax credits had been issued for projects that leveraged nearly \$6 billion in total investments in Oregon. Of that total, 802 BETC incentives were for solar PV installations.

The vast majority of BETC solar installations have occurred within the past ten years (~95 percent). The credit was 35 percent of the total installed cost until 2007 when it was raised to 50 percent. The credit is available to all Oregon taxpayers, whether their electric utility is consumer or investor owned.

Projects



Annual Energy kWh



Installed Cost



Incentives



BETC Quick Facts

Funding Source:
Taxpayers

Eligible:
Business taxpayers

Lead Organization:
ODOE

Created: 1979

Years Active: 35

Expired: July 2014

Incentives Provided:
\$116M

Service Territories: All

Related Policy:

- OAR 330-090-0105 to 330-090-0350
- ORS 315.354
- HB 3672

Volumetric Incentive Rate

In 2009, the Oregon legislature adopted HB 3039 requiring the Commission to implement Volumetric Incentive Rate (VIR) Pilot Programs for Idaho Power Company, PacifiCorp, and Portland General Electric Company.

Under the VIR Pilot Program, customers are allowed to install solar photovoltaic production facilities on their property and are paid a VIR for the electricity they generate and consume themselves. Customer generation that exceeds the customer's usage in a billing period is rolled into the next billing period, and any net generation at the end of a 12-month period is donated. The VIR Pilot Program was available to all customers.

Oregon's VIR program is a production-based (per kWh) incentive, under which the customer is paid for the power they generate over time. Under the program, residential and other small customers enter a 15-year agreement with their utility, and receive a fixed incentive price for the energy they generate.

This incentive is paid through a combination of cash payments and electric bill credits. Larger commercial- and industrial-sized systems receive an incentive rate determined through a competitive bid rather than a fixed rate, resulting in lower incentive rates for these larger systems.

Projects



Capacity Installed kW



Annual Energy kWh



Installed Cost



VIR Quick Facts

Funding Source:
Ratepayers

Participants:
PGE, PacifiCorp and Idaho Power customers

Lead Organization:
OPUC

Created: 2009

Years Active: 7

Expired: March 2016

Incentives Provided:
Rate paid for 15 years

Service Territories:
PGE, PacifiCorp and Idaho Power

Related Policy:

- ORS 757.365
- OAR 860-084-0000 to OAR 860-084-0450