

# HB 2941

## Solar Incentives Report



Report to the Legislative Assembly  
Public Utility Commission of Oregon  
October XX, 2016

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## Introduction

In 2015, the Oregon Legislature passed House Bill (HB) 2941 to require the Public Utility Commission of Oregon (PUC) to evaluate Oregon programs that incent the development and use of solar photovoltaic (PV) energy systems. HB 2941 directs the PUC to recommend whether each program should be discontinued, continued without change, or continued with modification. In addition, HB 2941 specifies that, in developing its recommendations, the PUC must consider factors outlined by the Legislature and set forth on page 22 of this report.

We must submit a report with our 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 into our evaluations and recommendations.

**Chapter Two** describes Oregon's solar PV programs.

**Chapter Three** offers our recommendations and the rationale for 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.<sup>1</sup>

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 Oregon Legislature 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,<sup>2</sup> 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, solar energy 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).

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<sup>1</sup> Federal tax credits are available for solar PV installations.

<sup>2</sup> 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.)

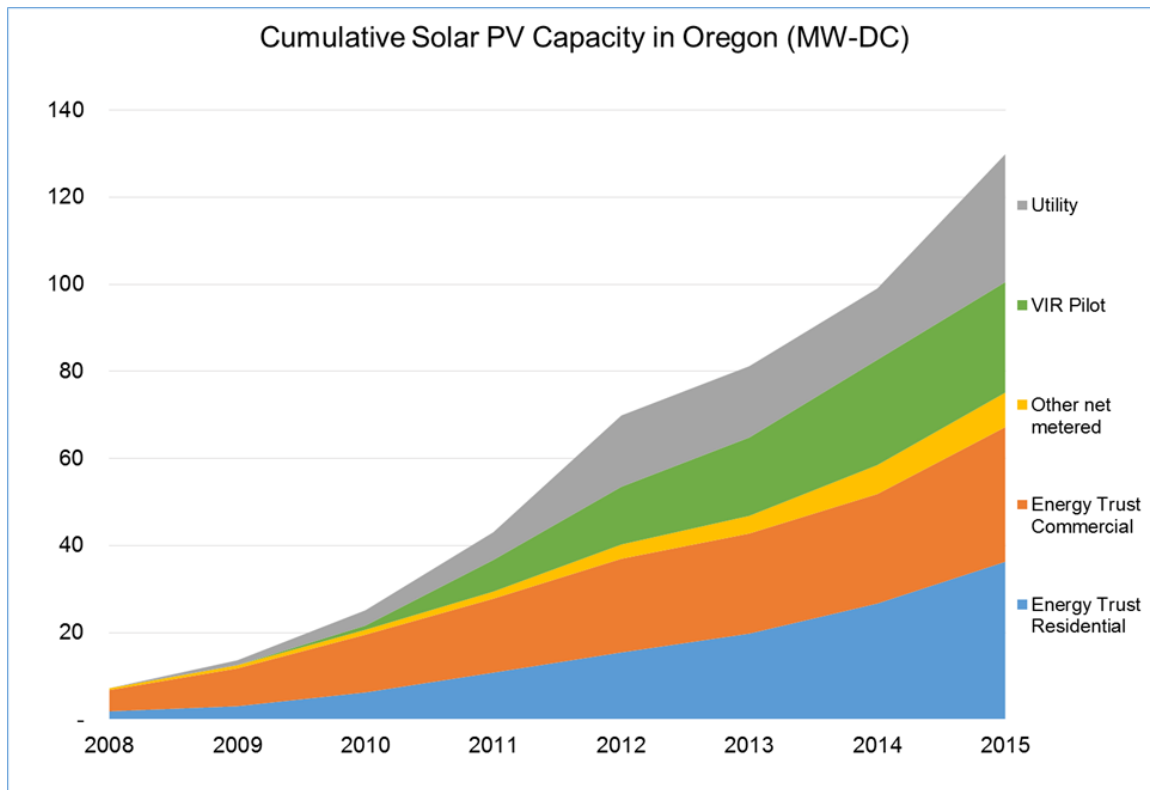


Figure 1: The growth in cumulative solar PV capacity in Oregon since 2008. *Source: Energy Trust of Oregon*

The growth in solar energy generation is expected to continue. PGE estimates that 125 to 223 MW of distributed solar will be developed in its service territory by 2035.<sup>3</sup> PacifiCorp projects that 232 to 568 MW of distributed solar will be developed in its Oregon service territory over the next 20 years.<sup>4</sup>

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.

<sup>3</sup> Black and Veatch, "Solar Generation Market Research: Solar Market Assessment and Cost Projections", <https://www.portlandgeneral.com/-/media/public/our-company/energy-strategy/documents/2015-08-13-solar-generation-market-research.pdf?la=en>, September 24, 2015, p. 1-1

<sup>4</sup> Navigant, "Private Generation Long-Term Resource Assessment (2017-2036)", [http://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Integrated\\_Resource\\_Plan/2017\\_IRP/PacifiCorp\\_IRP\\_DG\\_Resource\\_Assessment\\_Final.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2017_IRP/PacifiCorp_IRP_DG_Resource_Assessment_Final.pdf), July 29, 2016, p. 24-26

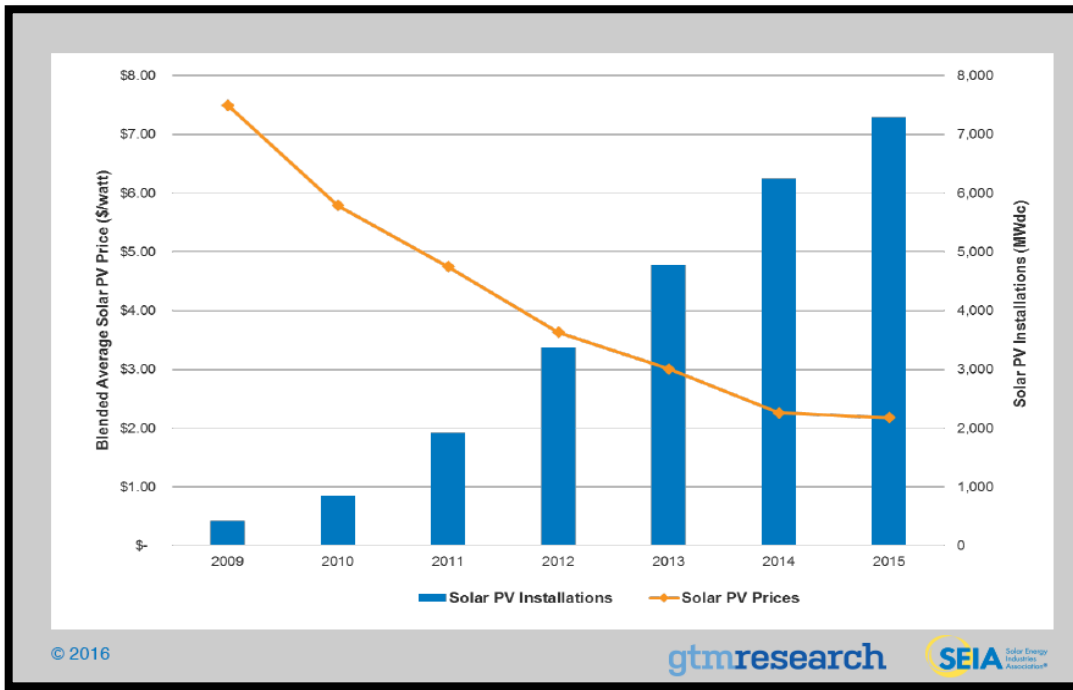


Figure 2: Solar installations nationwide and the average cost of those systems from 2009 to 2015. Solar Energy Industries Association, Solar Industry Data <http://www.seia.org/research-resources/solar-industry-data>

The cost of solar energy is projected to follow this downward trend. Figure 3 shows that the average cost of residential installations 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.

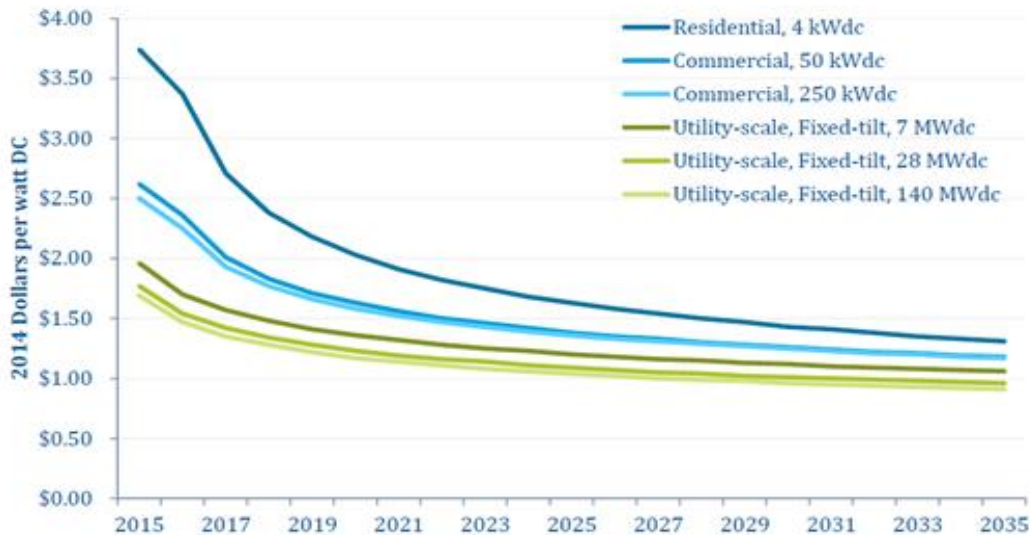


Figure 3: Solar Cost Projections (2014\$/Watt DC), Source, Black & Veatch, "Solar Generation Market Research: Solar Market Assessment and Cost Projections" Sept. 24, 2015; Prepared for PGE

Other driving forces in the growth of solar energy generation have been the availability of numerous incentives and solar-specific financing models to help reduce the costs and barriers of solar PV installations. As further detailed in this report, multiple taxpayer- and ratepayer-funded incentives have been enacted over the years to help offset the costs of solar PV installations. In addition, the creation of third-party leasing programs and solar-specific loans has helped reduce the amount of upfront costs needed to install a solar PV system.<sup>5</sup> Under both the loan and lease model, the customer does not have to pay the total cost for solar PV upfront.

The continued availability of these incentives and financing options, however, is uncertain. Today, the federal investment tax credit (ITC) is a major solar PV incentive and provides a 30 percent credit claimed against the tax liability of residential and commercial properties. As shown in Figure 4, this federal credit is being reduced systematically each year until expires for residential projects placed in service after Dec. 31, 2021 and continues at 10 percent for commercial projects placed in service after Jan. 1, 2022.

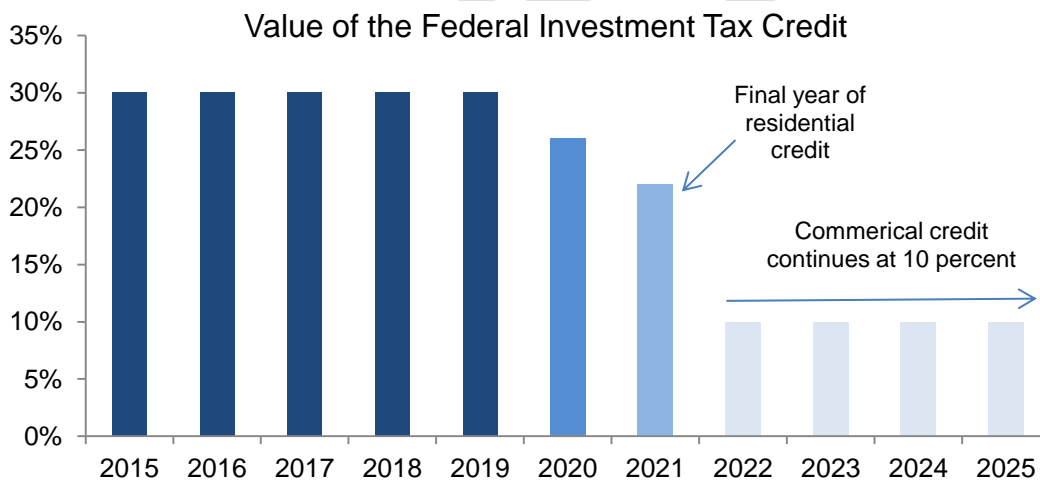


Figure 4: The planned step-down in the Investment Tax Credit

Similarly, Oregon incentives are being reduced or eliminated. The Oregon business tax credit for business investment in solar PV ended in July 2014. The Oregon Department of Energy (ODOE), which houses several other state-run energy incentive programs, is

<sup>5</sup> Under the lease model, third-party companies buy, install, own, and operate the solar PV systems on the customer's property and lease the equipment to the customer for a fee.

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<sup>6</sup> to meet their legislatively established sunset at the end of 2017.<sup>7</sup> The ODOE Legislative Oversight Committee will report its recommendations on the continuance, elimination or modification state incentive programs later this year.

Financing models are also evolving. In 2013, third-party systems accounted for nearly 60 percent of total installations by the Energy Trust of Oregon (Energy Trust). However, the availability and popularity of third-party lease programs has fallen, accounting for 34 percent of Energy Trust installations in 2016.<sup>8</sup> SolarCity, one of the largest integrated solar companies operating in Oregon, has ceased to offer a third-party leasing option to new residential customers in Oregon, and has now transitioned to only offering a loan for residential systems.

This context of the recent legislation and the current energy landscape 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. The structure of solar incentives should adapt and evolve with this changing landscape.

**Third**, we recognize the differing funding sources that support the state's incentive programs and divide them into two groups: those funded by the ratepayers of regulated

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<sup>6</sup> Those programs include the Residential Energy Tax Credit and the Renewable Energy Development Grant.

<sup>7</sup> [http://media.oregonlive.com/politics\\_impact/other/ODOE%20Oversight.pdf](http://media.oregonlive.com/politics_impact/other/ODOE%20Oversight.pdf)

<sup>8</sup> Year to date, Jan. 1, 2016-October 4, 2016



utilities and government mandates<sup>9</sup>; and those funded by state taxpayers. This distinction is important because ratepayer funded programs are available only to customers of regulated utilities and directly impact the rates paid by these customers. In contrast, taxpayer-funded programs are available to all Oregonians, regardless of their electricity provider. Additionally, we evaluate these programs separately because 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.

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<sup>9</sup> The government mandates highlighted in this report are funded by ratepayers and in our discussion of ratepayer funded programs.

## 2.0 Chapter Two: Oregon's Incentive Programs

In this chapter, we describe the following solar PV incentive programs:<sup>10</sup>

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 of these incentives are offered in combination to Oregon households and businesses, and are frequently bundled to provide a combined incentive. Below we also describe and summarize the most common combinations of programs used by Oregonians.

### 2.1 Taxpayer Funded Programs

Taxpayer funded programs include tax credits, grants, and loans. Taxpayer funded programs are available to all Oregonians regardless of their utility provider.

#### 2.1.1 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, the program provides Oregon homeowners, renters, and landlords personal income tax credits for buying energy efficient equipment and renewable energy systems for residences, including solar PV systems.

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<sup>10</sup> Further description of each renewable incentive programs adopted between 1978 and 2016 can be found in Appendix A.

Tax credits range from \$100 to \$6,000 and vary based on the alternative energy device and the amount of energy saved or produced. The types of devices and appliances eligible for the tax credit are reviewed each year and have changed over time. The credit can be taken over four years. The program is scheduled to sunset in 2018.

To date, Oregonians have received credits for more than 10,000 solar PV projects with a combined capacity of more than 30 MWs. Figure 5 shows tax credit program statistics since 2001.

Year	Number of Projects	Capacity Installed kW	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	\$ 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
<b>Total 2001-15</b>	<b>9,979</b>	<b>41,961</b>	<b>\$ 223,437,236</b>	<b>\$ 55,863,758</b>

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

### 2.1.2 Renewable Energy Development Grant

Since 2012, Oregon has offered Renewable Energy Development (RED) grants to promote investment in renewable energy development in Oregon. ODOE awards the grants using funds generated by tax auctions administered by the Oregon Department of Revenue.

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.

ODOE awards RED grants through a competitive selection process. Recipients receive up to \$250,000 per project, but not more than 35 percent of eligible project costs.

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. Figure 6 provides program statistics by year from 2013 through 2015.

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
<b>Total 2013-15</b>	<b>11</b>	<b>427</b>	<b>526,683</b>	<b>\$ 1,337,999</b>	<b>\$ 301,773</b>

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

### 2.1.3 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 ODOE.

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).<sup>11</sup>

<sup>11</sup> The data in the table does not represent the entirety of the program.

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
<b>Total 1999-2015</b>	<b>45</b>	<b>\$ 8,440,851</b>

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

### **2.1.4 Property Tax Exemption for Alternative Energy Systems**

In 2011, Oregon passed HB 2563 to provide a property tax exemption for any changes in the real market value of a property due to installing a qualifying renewable energy system. To accomplish this, no increase in property value resulting from the installation of a solar PV system is counted in the property tax assessment. To qualify for this exemption, 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 alternative energy projects. The total value of the tax assessment exemptions exceeds \$236 million. The property tax exemption is scheduled to expire in 2018 (Figure 8).

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
<b>Total 2011-15</b>	<b>5,740</b>	<b>\$ 236,690,708</b>

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

### **2.1.5 Fee in Lieu of Property Tax**

In 2015, the Legislature established a Fee in Lieu of Property Tax program. Under this program, 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 may not receive other tax exemptions.

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

### **2.1.6 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 administers 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.

### **2.1.7 Rural Renewable Energy Development Zone**

Since 2003 an Oregon city, county, or contiguous counties may 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 participating in this program is not available.

## **2.2 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.

### **2.2.1 Public Utilities Regulatory Policy Act**

In 1979, the Legislature implemented the federal Public Utilities Regulatory Policy Act (PURPA) to help 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.

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.

### **2.2.2 SB 1547 Community Solar Program**

As part of SB 1547, the 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 PUC;
- Projects can be located anywhere in Oregon;
- Utilities can own and operate community solar projects subject to conditions set by the PUC; and
- All risks and benefits of a project will be borne by the project owner, developer, and subscribers

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

We are currently developing rules to implement the program.

#### ***2.2.4 Renewable Portfolio Standard***

The 2007 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 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 must meet 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 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 may 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. The customer is not, however, 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 may not exceed 25 kW. Commercial systems may not exceed two megawatts.

Under ORS 757.300(6), the obligation to provide net metering may be limited by the PUC 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's

and PacifiCorp’s net metering customers account for 1.05 percent and 1.36 percent of the utility’s respective historic single-hour peak-load.<sup>12</sup>

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.

Year	PacifiCorp		PGE		Idaho Power		Total	
	Projects	kW	Projects	kW	Projects	kW	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
<b>Total 2002-15</b>	<b>4,495</b>	<b>38,516</b>	<b>6,159</b>	<b>43,794</b>	<b>22</b>	<b>544</b>	<b>10,676</b>	<b>82,855</b>

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

### 2.2.6 Public Purpose Charge-Funded Renewable Resource Programs

In 2002, the Legislature enacted a public purpose charge to help fund energy conservation, renewable resource, and low income energy programs. Under this program, PGE and PacifiCorp collect a three percent charge on customer bills. About 17 percent of the funds collected are used to buy down the above-market costs of eligible renewable resource projects including solar PV projects. The Energy Trust of Oregon (Energy Trust) administers these programs.

In addition to help address the above-market cost of solar PV systems, the Energy Trust has also developed programs aimed at reducing solar soft costs. Soft costs include permit fees, permitting, transaction costs, installer/developer profit, indirect corporate costs, customer acquisition, installation labor, and supply chain costs. The Energy

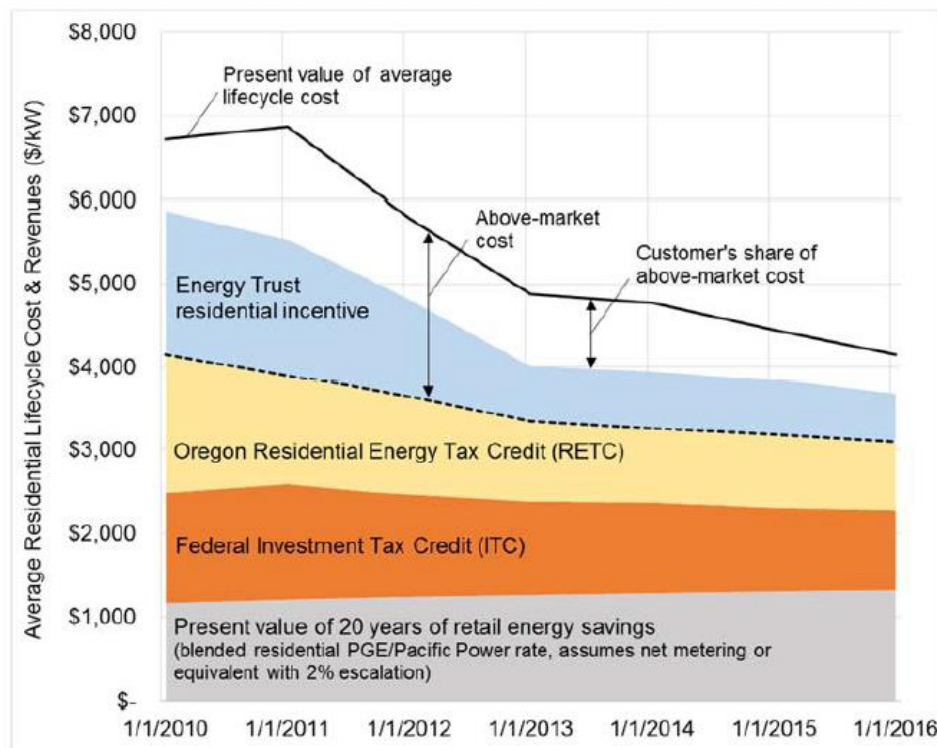
<sup>12</sup> Data is from Reports (RE) filed by PGE and PacifiCorp to Oregon Public Utility Commission as RE 39 and RE 45.

Trust has developed a network of solar professionals – Trade Allies – who are approved to install projects under the Energy Trust program.

The Energy Trust regularly adjusts its standard residential and commercial solar incentives 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.

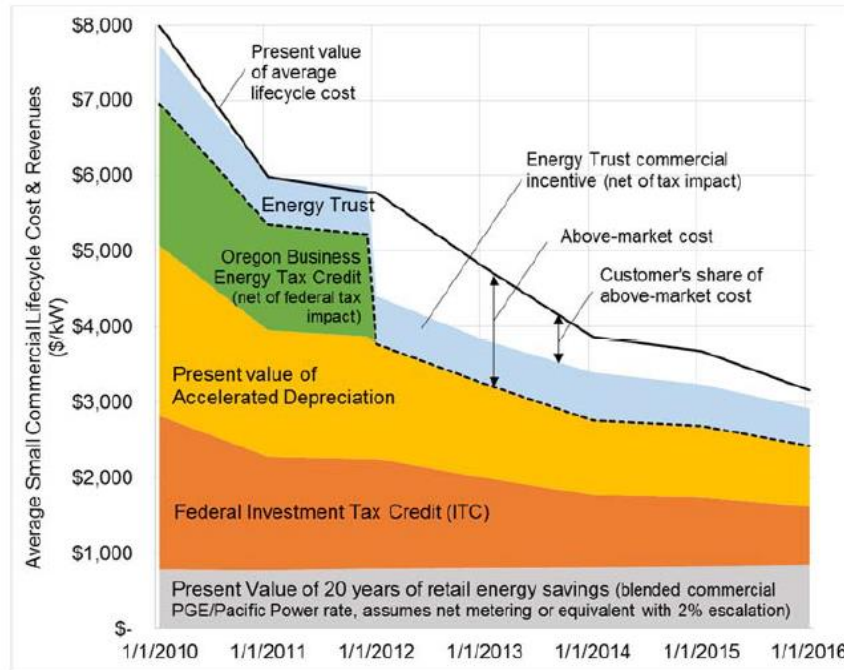
**Average Oregon Residential Solar PV Lifecycle Cost and Revenues from 2010 to 2016 (\$/kW)**



**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*

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

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



**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*

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

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
<b>Residential Total</b>	<b>8,179</b>	<b>36,308</b>	<b>35,976,347</b>	<b>\$ 194,887,363</b>	<b>\$ 39,978,962</b>
<b>Commercial Total</b>	<b>949</b>	<b>30,558</b>	<b>31,608,300</b>	<b>\$ 176,509,359</b>	<b>\$ 33,296,317</b>
<b>Utility-Scale Total</b>	<b>15</b>	<b>16,382</b>	<b>24,345,311</b>	<b>\$ 80,756,387</b>	<b>\$ 13,973,424</b>
<b>Total 2002-15</b>	<b>9,143</b>	<b>83,247</b>	<b>91,929,957</b>	<b>\$ 452,153,109</b>	<b>\$ 87,248,703</b>

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

### 2.3 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 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 may also receive the federal investment tax credit.

	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 13:** Allowed Program Combinations

Figure 10 on page 18 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 loan agreement with a solar PV installer.

## 2.4 Observations on Programs

We offer three observations on solar incentives.

**First**, because various incentives funded by multiple sources often help pay for solar PV systems, it is difficult to isolate the effect of a single incentive on solar development in Oregon.

**Second**, access to solar incentive programs across the state and by household varies. For example, Oregonians outside of PGE’s and PacifiCorp’s service areas have no access to Energy Trust programs. Similarly, 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. Consequently, we cannot identify the level of “free ridership” in Oregon’s programs.

## 3.0 Chapter Three: Factors and Recommendations

HB 2941 directed us to consider the following factors in making our 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;
- Our 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 we deemed relevant.

Other factors considered 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 as 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, we offer 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. Rooftop solar PV should be treated as a system resource.**

A solar PV project should be valued based on the measurable benefits to the utility system and compared to other resources during utility resource planning.

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.<sup>13</sup>

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 incentive program should be simple, clear to participants, and user-friendly.**

#### **4. Similar solar PV programs should be made available to all Oregonians regardless of their utility service provider.**

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.

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<sup>13</sup> 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 we can determine the relative merits of individual programs.

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

## 3.2 Recommendations

Based on these statutory factors, we make 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, we offer no specific recommendations on the form of taxpayer funded incentives to be offered. We do recommend that the Legislature should examine extending the property tax exemption and creating taxpayer-supported programs that spur residential and small commercial solar PV developments.

- 2. Align the solar net metering program<sup>14</sup> 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 PUC can set another rate.<sup>15</sup> We are 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. The use of a consistent compensation methodology is beneficial for various reasons. First, it takes into account several of the factors outlined HB 2941 and minimizes confusion and transaction costs by using one method for both programs. Second, a consistent methodology establishes one compensation method that could be used statewide by any or all utilities. Finally, a consistent methodology minimizes

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<sup>14</sup> 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.

<sup>15</sup> SB 1547, Sect. 22, (6)(a)

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, we plan to open a proceeding to evaluate the cost and benefits of utilization of resource value of solar rate. This proceeding will include consideration of the outcomes of the cost-shifting examination completed as part of the value of solar docket. Depending on the outcome of this proceeding, we may open a subsequent proceeding to implement the use of value of solar rates for utility customers with solar generation. Among other issues, this docket would 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 charge funds should be modified to target solar PV applications that provide unique benefits to the utility system.

This modification would to integrate the aspects of a resource value of solar rate into Energy Trust's incentive calculation methodology. Energy Trust should continue its work reducing the "soft costs" of solar energy.

Currently, Energy Trust uses a portion of the public purpose 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. Those rebates are for a portion of the above-market cost associated with solar PV.

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. We believe 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, the provision of system services such as voltage regulation, and the ability to defer or eliminate the need for system upgrades. We will be calling on utilities to identify all such sites in their service areas. Once potential sites are identified and quantified,<sup>16</sup> then there will be opportunities to strategically target the

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<sup>16</sup> 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

development of solar generation and compensate strategically placed solar generation accordingly.

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.

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

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for new transmission and distribution investments, and reduced cost of complying with environmental regulation.

# 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.

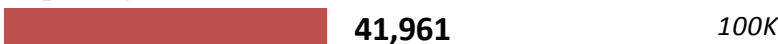
Tax credit amounts vary based on the alternative energy device and the amount of energy saved or produced; credits can range from about \$100 to \$6000. The types of devices and appliances eligible for the tax credit are reviewed each year and have changed over time. In 2005, the Legislature increased 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
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## Installed Cost

\$1,337,999	\$500M
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## Incentives

\$301,773	\$100M
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## 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

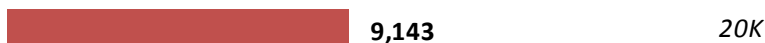
Senate Bill (SB) 1149, directed that 17.1 percent of all funds collected under the public purpose charge be directed toward renewable resource development, by specifically offsetting a portion of project costs that exceeds the market cost of electricity, commonly referred to as the above-market cost.

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