



**Portland General Electric Company**  
121 SW Salmon Street • Portland, Oregon 97204  
*PortlandGeneral.com*

October 31, 2014

Public Utility Commission of Oregon  
Attn: Filing Center  
3930 Fairview Industrial Drive SE  
P.O. Box 1088  
Salem, OR 97308-1088

**Re: OAR 860-084-0370(1), Solar Photovoltaic Pilot Program Resource Value Estimate and OAR 860-084-0380(2) Solar Photovoltaic Pilot Programs Rate Impact Estimate**

This informational filing provides estimates of PGE's 15-year levelized resource value as directed by OAR 860-084-0370(1) and PGE's estimates of the rate impact of the Solar Photovoltaic Pilot Programs for each customer class pursuant to OAR 860-084-0380(2).

OAR 860-084-0370(1), Solar Photovoltaic Pilot Program Resource Value Estimate

Per Commission Order No. 12-396, PGE estimates the Solar Photovoltaic Pilot Program resource value using three different methods.

1. Standard avoided cost method. The 15-year real levelized resource value is \$42.65/MWh and the 15-year nominal levelized resource value is \$48.78/MWh.
2. Renewable avoided cost method. The 15-year real levelized resource value is \$65.68/MWh and the 15-year nominal levelized resource value is \$74.69/MWh.

The resource value calculation uses PGE's on- and off-peak avoided costs from Schedule 201. The standard and renewable avoided cost methodologies use the standard and renewable avoided costs respectively. Though not yet approved by the Commission, both the standard and renewable avoided costs have undergone thorough stakeholder review necessitating significant revisions to the currently approved avoided costs. PGE anticipates it will file and receive approval on the updated avoided costs soon, as stakeholders have reached consensus on the pricing issues.

The monthly prices are shaped into an annual figure using the solar shape for a Portland PV system. NERC on-peak prices account for a 6/7<sup>th</sup> weighting and NERC off-peak prices account for a 1/7<sup>th</sup> weighting. These weightings assume solar production occurs during on-peak hours (6:00 AM to 10:00 PM), Monday through Saturday, while Sunday is off-peak. The annual prices are then levelized over 15 years starting January 1, 2015. To that levelized value, PGE adds our full internal line loss factor<sup>1</sup>, from transmission to secondary voltage.

3. An IRP methodology using the energy value of solar systems based on the incremental addition of 20 megawatts of solar capacity and the corresponding capacity value using the Effective Load Carrying Capability (ELCC) method.

In a supplemental compliance filing per Commission Order No. 12-396 on January 22, 2014, PGE provided the following information:

- The calculated energy value of Portland-area distributed solar systems based on the incremental addition of 20 megawatts of solar capacity (showing system cost differences hourly and monthly on- and off-peak), using our IRP methodology, and the corresponding capacity value using the ELCC method.
- The 15-year nominal levelized energy and capacity value of solar using the IRP methodology.

Since the time of this supplemental filing, the inputs used in the IRP methodology calculation of the 15-year nominal levelized energy and capacity value have not changed. For this reason, PGE is not providing an update using the IRP methodology.

Below are updated estimates of the solar resource value using standard and renewable avoided cost methodologies along with the IRP methodology estimate from the January 22, 2014 supplemental filing.

<b>15-year nominal levelized solar resource values</b>	
Standard Avoided Cost	\$48.78 in 2014\$
Renewable Avoided Cost	\$74.69 in 2014\$
IRP Methodology	\$55.19 in 2014\$

Work papers detailing the 15-year levelized resource value calculations using the first and second methodologies are provided as Attachment A.

---

<sup>1</sup> Line loss factor used from PGE's most recent Line Loss Study found in UE-283 Exhibit 1400 testimony.

OAR 860-084-0380(2) Solar Photovoltaic Pilot Programs Rate Impact Estimate

Pursuant to OAR 860-084-0380(2) PGE herein files its estimates of the rate impact of the solar photovoltaic pilot programs, for each customer class, along with supporting work papers.

In the 2013 regular session, The Oregon Legislature passed House Bill 2893 which amended ORS 757.365 to add an additional 2.5 MW nameplate capacity of individual solar systems between 5 and 100 kW. ORS 757.365(7) remained unchanged stating:

- The commission may establish total generator nameplate capacity limits for an electric company so that the rate impact of the pilot program for any customer class does not exceed 0.25 percent of the electric company's revenue requirement for the class in any year.

The following table shows PGE's estimated average rate impact across all program years for each customer class in its 2012 OAR 860-084-0380(2) filing and its current 2014 filing.

<b>Filing Year</b>	<b>Residential</b>	<b>Small and Medium</b>	<b>Large</b>	<b>Total</b>
2012	0.32%	0.29%	0.32%	0.26%
2014	0.33%	0.29%	0.33%	0.28%

The estimates indicate that the program's rate impact exceeds the 0.25 percent limit the Commission may set forth. The rate impact estimates have also increased with the additional 2.5 MW of nameplate capacity.

Attachment B provides an estimate of the rate impact by customer class.

Please direct any questions regarding this filing to Mihir Desu at (503) 464-2709.

Please direct all formal correspondence and requests to the following email address [pge.opuc.filing@pgn.com](mailto:pge.opuc.filing@pgn.com)

Sincerely,



Karla Wenzel  
Manager, Pricing & Tariffs

Cc: UM 1559 Service List

RE 97(1) e-FILING REPORT COVER SHEET

REPORT NAME: RE 97(1) OAR 860-084-0370(1), Solar Photovoltaic Pilot Program Resource Value Estimate and OAR 860-084-0380(2), Solar Photovoltaic Pilot Programs Rate Impact Estimate

COMPANY NAME: Portland General Electric

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION? No

If yes, please submit only the cover letter electronically.

Submit confidential information as directed OAR 860-001-0070 or the terms of an applicable PROTECTIVE ORDER.

If known, please select designation: X RE (Electric)

Report is required by: X OAR 860-084-0370(1)  
860-084-0380(2)

Statute

Order

Other

Is this report associated with a specific docket/case? Yes

If Yes, enter docket number: UM 1559

Key words: Solar Photovoltaic Pilot Program, Resource Value Estimate and Rate Impact Estimate

If known, please select the PUC Section to which the report should be directed:

X Electric and Natural Gas Revenue Requirements

Solar Photovoltaic Pilot Programs  
Preliminary Estimate of Rate Impact By Customer Class  
Estimated Rate Impact of Program

Year	SPO Estimated Program Costs	PERCENT IMPACT					
		Residential	Small and Medium	Large	Total		
					High	Low	
2014	\$ 6,762,120	0.39%	0.34%	0.39%	0.40%	-	0.39%
2015	\$ 7,171,087	0.42%	0.37%	0.42%	0.42%	-	0.40%
2016	\$ 7,231,727	0.42%	0.37%	0.42%	0.41%	-	0.39%
2017	\$ 7,169,630	0.39%	0.34%	0.39%	0.39%	-	0.36%
2018	\$ 7,116,193	0.41%	0.36%	0.41%	0.38%	-	0.37%
2019	\$ 7,090,396	0.41%	0.36%	0.41%	0.37%	-	0.35%
2020	\$ 7,063,862	0.41%	0.36%	0.41%	0.36%	-	0.34%
2021	\$ 7,036,590	0.41%	0.36%	0.41%	0.35%	-	0.33%
2022	\$ 7,008,398	0.41%	0.36%	0.41%	0.34%	-	0.32%
2023	\$ 6,979,284	0.40%	0.36%	0.40%	0.33%	-	0.31%
2024	\$ 6,949,433	0.40%	0.35%	0.40%	0.32%	-	0.30%
2025	\$ 6,918,477	0.40%	0.35%	0.40%	0.31%	-	0.29%
2026	\$ 4,305,270	0.25%	0.22%	0.25%	0.20%	-	0.17%
2027	\$ 2,491,487	0.14%	0.13%	0.14%	0.13%	-	0.10%
2028	\$ 859,620	0.05%	0.04%	0.05%	0.07%	-	0.03%
2029	\$ (496,310)	-0.03%	-0.03%	-0.03%	0.18%	-	-0.02%

Note: Assumes 3% annual revenue growth. Apportioned the estimated pilot program costs based on projected revenues by rate class.

**Solar Photovoltaic Pilot Program Costs  
PGE Solar Payment Option Pilot Program  
Estimated Rate Impact of Program**

<b>Year</b>	<b>Total Revenue</b>	<b>SPO Estimated Program Payments</b> * does not include offsets to deferral	<b>Percent of Impact</b>
2014	\$ 1,725,966,729	\$ 6,965,211	0.40%
2015	\$ 1,777,745,731	\$ 7,423,192	0.42%
2016	\$ 1,831,078,103	\$ 7,423,192	0.41%
2017	\$ 1,886,010,446	\$ 7,423,192	0.39%
2018	\$ 1,942,590,759	\$ 7,423,192	0.38%
2019	\$ 2,000,868,482	\$ 7,423,192	0.37%
2020	\$ 2,060,894,536	\$ 7,423,192	0.36%
2021	\$ 2,122,721,373	\$ 7,423,192	0.35%
2022	\$ 2,186,403,014	\$ 7,423,192	0.34%
2023	\$ 2,251,995,104	\$ 7,423,192	0.33%
2024	\$ 2,319,554,957	\$ 7,423,192	0.32%
2025	\$ 2,389,141,606	\$ 7,423,192	0.31%
2026	\$ 2,460,815,854	\$ 4,959,533	0.20%
2027	\$ 2,534,640,330	\$ 3,295,713	0.13%
2028	\$ 2,610,679,540	\$ 1,813,912	0.07%
2029	\$ 2,688,999,926	\$ 4,959,533	0.18%

\*Assumes 3% annual revenue growth.

0.3105%

Percent of Impact is the estimated program costs divided by total revenue.

**Solar Photovoltaic Pilot Programs**  
**Estimated Forecast of Photovoltaic Pilot Programs**  
**Base Scenario**

	1	2	3	4	Total = 1 + 2
Year	Incremental Pilot Program Implementation Costs	VIR Payments	Avoided Energy Value	Other Fees	Total
2014	\$ 660,750	\$ 6,965,211	\$ 655,614	\$208,227	\$ 6,762,120
2015	\$ 660,750	\$ 7,423,192	\$ 704,629	\$208,227	\$ 7,171,087
2016	\$ 660,750	\$ 7,423,192	\$ 744,614	\$107,601	\$ 7,231,727
2017	\$ 660,750	\$ 7,423,192	\$ 806,712	\$107,601	\$ 7,169,630
2018	\$ 660,750	\$ 7,423,192	\$ 860,148	\$107,601	\$ 7,116,193
2019	\$ 660,750	\$ 7,423,192	\$ 885,945	\$107,601	\$ 7,090,396
2020	\$ 660,750	\$ 7,423,192	\$ 912,480	\$107,601	\$ 7,063,862
2021	\$ 660,750	\$ 7,423,192	\$ 939,751	\$107,601	\$ 7,036,590
2022	\$ 660,750	\$ 7,423,192	\$ 967,943	\$107,601	\$ 7,008,398
2023	\$ 660,750	\$ 7,423,192	\$ 997,057	\$107,601	\$ 6,979,284
2024	\$ 660,750	\$ 7,423,192	\$ 1,026,908	\$107,601	\$ 6,949,433
2025	\$ 660,750	\$ 7,423,192	\$ 1,057,864	\$107,601	\$ 6,918,477
2026	\$ 542,896	\$ 4,959,533	\$ 1,089,558	\$107,601	\$ 4,305,270
2027	\$ 425,549	\$ 3,295,713	\$ 1,122,173	\$107,601	\$ 2,491,487
2028	\$ 309,203	\$ 1,813,912	\$ 1,155,893	\$107,601	\$ 859,620
2029	\$ 309,203	\$ 457,982	\$ 1,155,893	\$107,601	\$ (496,310)

Pilot Program implementation costs include estimated incremental labor, vendor and Paypal fees.

VIR payments include estimated generation payments.

Offsets to the deferral include an estimate of the customer monthly charge, interconnection application fee, forfeited deposits, and the avoided

This a preliminary estimate of the photovoltaic pilot program costs.



**Solar Photovoltaic Pilot Programs**  
**PGE Solar Payment Option Pilot Program**  
**Estimated Volumetric Incentive Rate Payments by System Size**

**Assumptions:**

Annual Capacity Factor	0.12	
kWh	8760	
Years of Payments	15	
Change in VIR:		
Small and Medium size	0.10	0.20
Large size	0.20	
PGE Capacity	18.962	

**Small-Sized System (0-10 kW)**

			KW *8760*.12	Auto 10% Drop	Est. Ann kWh * VIR		
Capacity Enrollment Periods	Capacity Enrollment Window	Capacity Allotment in MW DC	Estimated Annual kWh	VIR	Annual Payments	Payment over 15 years	
1	July 1 2010	0.701	736,891	0.650	\$ 478,979	\$ 7,184,689	
2	October 1, 2010	1.402	1,473,782	0.585	\$ 862,163	\$ 12,932,441	
3	April 1, 2011	1.052	1,105,862	0.468	\$ 517,544	\$ 7,763,154	
4	October 1, 2011	1.052	1,105,862	0.374	\$ 413,593	\$ 6,203,888	
5	April 1, 2012	1.052	1,105,862	0.411	\$ 454,509	\$ 6,817,642	
6	October 1, 2012	1.052	1,105,862	0.411	\$ 454,509	\$ 6,817,642	
7	April 1, 2013	1.052	1,105,862	0.390	\$ 431,286	\$ 6,469,295	
8	October 1, 2013	1.051	1,104,811	0.390	\$ 430,876	\$ 6,463,146	
9	April 1, 2014	0.860	904,032	0.390	\$ 352,572	\$ 5,288,587	
		<u>9.274</u>				<u>\$ 65,940,483</u>	

**Medium-Sized System (10-100 kW)**

			KW *8760*.12	Auto 10% Drop	Est. Ann kWh * VIR		
Capacity Enrollment Periods	Capacity Enrollment Window	Capacity Allotment in MW DC	Estimated Annual kWh	VIR	Annual Payments	Payment over 15 years	
1	July 1 2010	0.467	490910	0.550	\$ 270,001	\$ 4,050,011	
2	October 1, 2010	0.935	982872	0.495	\$ 486,522	\$ 7,297,825	
3	April 1, 2011	0.701	736891	0.396	\$ 291,809	\$ 4,377,134	
4	October 1, 2011	0.701	736891	0.317	\$ 233,447	\$ 3,501,707	
5	April 1, 2012	0.701	736891	0.285	\$ 210,102	\$ 3,151,536	
6	October 1, 2012	0.701	736891	0.230	\$ 169,485	\$ 2,542,275	
7	April 1, 2013	0.701	736891	0.230	\$ 169,485	\$ 2,542,275	
8	October 1, 2013	0.702	737942	0.230	\$ 169,727	\$ 2,545,901	
9	April 1, 2014	0.573	602338	0.175	\$ 105,409	\$ 1,581,136	
		<u>6.182</u>				<u>\$ 31,589,799</u>	

**Large-Sized System >100 kW**

Assumed Rates  
15% Drop

KW \*8760\*.12      Est. Ann kWh \* VIR      Payment over 15 years

Capacity Enrollment Periods	Capacity Enrollment Window	Capacity Allotment in MW DC	Estimated Annual kWh	VIR	Annual Payments -	
					Low Case	Low Case
1	July 1 2010	0.877	921902	0.3970	\$ 365,995	\$ 5,489,929
2	April 1, 2011	0.877	921902	0.2250	\$ 207,428	\$ 3,111,421
3	April 1, 2012	0.876	920851	0.2098	\$ 193,195	\$ 2,897,919
4	April 1, 2013	0.876	920851	0.1678	\$ 154,556	\$ 2,318,335
		<u>3.506</u>				<u>\$ 13,817,603</u>
<u>All Systems Total</u>						<u>\$ 111,347,885</u>

**Solar Photovoltaic Pilot Programs  
PGE Solar Payment Option Pilot Programs  
Estimated Avoided Energy Value Based on Mid-C Index**

Energy Value Years	Capacity Enrollment Period						Total
	2010	2011	2012	2013	2014		
2011	\$ 143,027						\$ 143,027
2012	\$ 141,093	\$ 141,125					\$ 282,218
2013	\$ 142,797	\$ 142,830	\$ 142,797				\$ 428,424
2014	\$ 163,894	\$ 163,932	\$ 163,894	\$ 163,894			\$ 655,614
2015	\$ 176,147	\$ 176,187	\$ 176,147	\$ 176,147	\$ 57,604		\$ 704,629
2016	\$ 186,143	\$ 186,185	\$ 186,143	\$ 186,143	\$ 60,872		\$ 744,614
2017	\$ 201,666	\$ 201,712	\$ 201,666	\$ 201,666	\$ 65,949		\$ 806,712
2018	\$ 215,025	\$ 215,074	\$ 215,025	\$ 215,025	\$ 70,317		\$ 860,148
2019	\$ 221,474	\$ 221,524	\$ 221,474	\$ 221,474	\$ 72,426		\$ 885,945
2020	\$ 228,107	\$ 228,159	\$ 228,107	\$ 228,107	\$ 74,595		\$ 912,480
2021	\$ 234,924	\$ 234,978	\$ 234,924	\$ 234,924	\$ 76,825		\$ 939,751
2022	\$ 241,972	\$ 242,027	\$ 241,972	\$ 241,972	\$ 79,130		\$ 967,943
2023	\$ 249,250	\$ 249,307	\$ 249,250	\$ 249,250	\$ 81,510		\$ 997,057
2024	\$ 256,712	\$ 256,771	\$ 256,712	\$ 256,712	\$ 83,950		\$ 1,026,908
2025	\$ 264,451	\$ 264,511	\$ 264,451	\$ 264,451	\$ 86,481		\$ 1,057,864
2026	\$ 272,374	\$ 272,436	\$ 272,374	\$ 272,374	\$ 89,072		\$ 1,089,558
2027	\$ 280,527	\$ 280,591	\$ 280,527	\$ 280,527	\$ 91,738		\$ 1,122,173
2028	\$ 288,957	\$ 289,023	\$ 288,957	\$ 288,957	\$ 94,495		\$ 1,155,893
2029	\$ 288,957	\$ 289,023	\$ 288,957	\$ 288,957	\$ 94,495		\$ 1,155,893
	<u>\$ 3,908,541</u>	<u>\$ 3,766,373</u>	<u>\$ 3,624,421</u>	<u>\$ 3,481,624</u>	<u>\$ 1,084,963</u>		<u>\$ 15,936,852</u>

The 2012 estimated avoided energy values are based on Mid-C peak forward prices from the 11-15-2011 Monet model .  
The 2013-2028 avoided energy values are based on a Mid-C forward curve dated 5/14/12.  
NREL solar data was used for shaping.

## Portland General Electric

### FINANCIAL PARAMETERS

Income Tax Rate			39.94%
Inflation Rate			1.93%
Capitalization:			
Preferred	0.00%	0.00%	0.00%
Common	50.00%	9.75%	4.88%
All Equity	50.00%		4.88%
Debt	50.00%	5.19%	2.60%
Cost of Capital			7.47%
After-Tax Nominal Cost of Capital			6.43%
After-Tax Real Cost of Capital			4.42%

**Portland General Electric**

**15-Year Levelized Resource Value Estimate from PGE's 2014 Avoided Cost Filing with Sufficiency Period Price Upd**

Year	On-peak Prices (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	50.13	47.79	42.72	36.07	30.77	28.80	44.64	50.90	45.10	43.25	44.68	48.21
2016	49.77	47.46	42.45	35.88	30.65	28.70	44.34	50.53	44.80	42.97	44.38	47.87
2017	52.43	49.99	44.70	37.76	32.23	30.17	46.70	53.23	47.18	45.25	46.74	50.42
2018	56.37	53.74	48.04	40.57	34.61	32.40	50.20	57.24	50.72	48.64	50.25	54.21
2019	59.33	56.56	50.56	42.69	36.42	34.09	52.83	60.24	53.38	51.19	52.88	57.06
2020	61.12	58.27	52.09	43.99	37.53	35.13	54.43	62.06	55.00	52.74	54.48	58.78
2021	45.68	45.33	43.84	41.81	41.88	41.92	41.71	41.75	41.93	42.40	46.42	48.15
2022	48.53	47.91	46.21	44.19	44.34	44.39	44.59	44.60	44.80	45.30	49.96	52.18
2023	52.21	51.42	49.77	47.87	47.35	47.37	47.67	47.50	47.86	48.38	53.39	56.37
2024	57.37	56.32	53.87	51.91	51.22	51.30	51.68	51.60	52.00	52.66	55.82	59.22
2025	59.32	57.10	53.72	51.74	51.72	51.80	52.18	52.10	52.47	53.15	56.17	59.70
2026	59.31	58.23	54.85	52.67	52.17	52.25	52.64	52.56	52.97	53.52	57.09	60.75
2027	59.07	57.34	54.20	51.31	51.27	51.34	51.71	51.61	52.02	52.60	57.50	60.76
2028	58.34	56.73	53.09	50.63	50.55	50.61	50.82	50.88	51.11	51.82	59.80	62.82
2029	64.40	63.64	59.71	56.46	56.49	56.41	56.95	57.05	57.32	57.91	63.62	67.21
2030	68.16	64.69	59.64	55.39	55.13	55.15	55.66	55.76	56.02	56.87	65.61	69.38
2031	69.98	65.86	61.59	57.80	57.94	57.94	58.76	58.86	59.13	59.77	66.40	69.81
2032	71.31	67.11	62.76	58.90	59.04	59.04	59.87	59.97	60.25	60.90	67.66	71.14

**Portland General Electric**

**15-Year Levelized Resource Value Estimate from PGE's 2014 Avoided Cost Filing with Sufficiency Period Price Upd**

Year	Off-peak Prices (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	43.19	41.41	36.99	23.85	16.69	12.34	24.12	36.59	34.18	37.49	38.44	41.46
2016	43.43	41.65	37.23	24.08	16.92	12.57	24.35	36.83	34.42	37.73	38.68	41.70
2017	45.56	43.69	39.04	25.21	17.67	13.09	25.49	38.61	36.08	39.56	40.56	43.74
2018	48.40	46.40	41.45	26.74	18.73	13.86	27.05	41.01	38.31	42.01	43.08	46.46
2019	51.44	49.32	44.06	28.40	19.87	14.69	28.72	43.58	40.71	44.65	45.79	49.38
2020	53.92	51.66	46.15	31.05	22.57	17.61	32.64	46.96	43.50	46.77	48.01	51.78
2021	43.71	43.36	41.88	39.84	39.91	39.95	39.74	39.78	39.97	40.43	44.45	46.18
2022	46.52	45.90	44.20	42.18	42.33	42.38	42.58	42.60	42.80	43.29	47.95	50.18
2023	50.16	49.37	47.72	45.82	45.30	45.32	45.62	45.44	45.81	46.33	51.34	54.32
2024	55.29	54.25	51.79	49.83	49.14	49.22	49.60	49.52	49.92	50.59	53.74	57.15
2025	57.19	54.98	51.60	49.62	49.59	49.67	50.06	49.98	50.35	51.02	54.04	57.58
2026	57.15	56.06	52.68	50.51	50.00	50.08	50.48	50.40	50.80	51.36	54.93	58.58
2027	56.86	55.13	51.99	49.10	49.07	49.13	49.50	49.41	49.81	50.39	55.29	58.55
2028	56.09	54.48	50.84	48.38	48.30	48.36	48.57	48.63	48.86	49.57	57.55	60.57
2029	62.10	61.34	57.41	54.16	54.20	54.12	54.66	54.76	55.02	55.62	61.33	64.92
2030	65.82	62.35	57.31	53.05	52.79	52.82	53.33	53.42	53.68	54.53	63.27	67.05
2031	67.60	63.48	59.21	55.42	55.56	55.56	56.37	56.47	56.75	57.39	64.02	67.43
2032	68.90	64.70	60.35	56.48	56.63	56.63	57.46	57.56	57.84	58.49	65.24	68.73

**Portland General Electric**

**15-Year Levelized Resource Value Estimate from PGE's 2014 Avoided Cost Filing with Sufficiency Period Price Upd**

Year	Weighted (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	49.14	46.88	41.90	34.32	28.76	26.45	41.71	48.86	43.54	42.43	43.79	47.25
2016	48.86	46.63	41.70	34.19	28.69	26.40	41.48	48.57	43.32	42.22	43.57	46.99
2017	51.45	49.09	43.89	35.97	30.15	27.73	43.67	51.14	45.59	44.44	45.86	49.47
2018	55.23	52.69	47.10	38.59	32.34	29.75	46.89	54.92	48.95	47.69	49.23	53.10
2019	58.20	55.53	49.63	40.65	34.06	31.32	49.39	57.86	51.57	50.26	51.87	55.96
2020	60.09	57.33	51.24	42.14	35.39	32.63	51.32	59.90	53.36	51.89	53.56	57.78
2021	45.40	45.05	43.56	41.53	41.60	41.64	41.43	41.47	41.65	42.12	46.14	47.87
2022	48.24	47.62	45.92	43.90	44.05	44.10	44.30	44.31	44.51	45.01	49.67	51.89
2023	51.92	51.13	49.48	47.58	47.06	47.08	47.38	47.21	47.57	48.09	53.10	56.08
2024	57.07	56.02	53.57	51.61	50.92	51.00	51.38	51.30	51.70	52.36	55.52	58.92
2025	59.02	56.80	53.42	51.44	51.42	51.50	51.88	51.80	52.17	52.85	55.87	59.40
2026	59.00	57.92	54.54	52.36	51.86	51.94	52.33	52.25	52.66	53.21	56.78	60.44
2027	58.75	57.02	53.88	50.99	50.96	51.02	51.39	51.30	51.70	52.28	57.18	60.44
2028	58.02	56.41	52.77	50.31	50.23	50.29	50.50	50.56	50.79	51.50	59.48	62.50
2029	64.07	63.31	59.38	56.13	56.16	56.08	56.62	56.72	56.99	57.58	63.29	66.88
2030	67.83	64.36	59.31	55.06	54.80	54.82	55.33	55.43	55.69	56.54	65.28	69.05
2031	69.64	65.52	61.25	57.46	57.60	57.60	58.42	58.52	58.79	59.43	66.06	69.47
2032	70.97	66.77	62.42	58.55	58.70	58.70	59.53	59.63	59.91	60.56	67.31	70.80

\* Weighted for expected monthly solar output for Portland, OR from NREL

15-year Real Levelized (2015-2029; 2014\$)  
Avoided T&D  
Line Losses from PGE Trans. System to Meter  
Grossed-up for Line Losses

15-year Nominal Levelized (2015-2029; 2014\$)  
Avoided T&D  
Line Losses from PGE Trans. System to Meter  
Grossed-up for Line Losses

late

---

Annual*
41.28
41.03
43.20
46.43
48.86
50.34
42.72
45.44
48.67
52.70
53.15
53.75
52.91
52.31
58.30
57.69
60.24
61.38



late

---

Annual*
29.02
29.25
30.65
32.53
34.56
37.39
40.75
43.44
46.62
50.63
51.03
51.59
50.71
50.06
56.01
55.35
57.85
58.97

late

Annual\*  
39.53  
39.35  
41.41  
44.44  
46.82  
48.49  
42.43  
45.16  
48.37  
52.41  
52.85  
53.44  
52.60  
51.99  
57.97  
57.36  
59.90  
61.03

\$40.63  
N/A  
4.74%  
\$42.65

\$46.47  
N/A  
4.74%  
\$48.78

**Portland General Electric**

**15-Year Levelized Resource Value Estimate from PGE's 2014 Renewable Avoided Cost Filing**

Year	On-peak Prices (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	50.13	47.79	42.72	36.07	30.77	28.80	44.64	50.90	45.10	43.25	44.68	48.21
2016	49.77	47.46	42.45	35.88	30.65	28.70	44.34	50.53	44.80	42.97	44.38	47.87
2017	52.43	49.99	44.70	37.76	32.23	30.17	46.70	53.23	47.18	45.25	46.74	50.42
2018	56.37	53.74	48.04	40.57	34.61	32.40	50.20	57.24	50.72	48.64	50.25	54.21
2019	59.33	56.56	50.56	42.69	36.42	34.09	52.83	60.24	53.38	51.19	52.88	57.06
2020	97.99	97.97	97.07	97.61	101.39	100.33	99.96	99.82	98.30	97.15	98.14	96.94
2021	100.19	100.46	98.69	99.96	103.31	102.42	101.74	102.34	100.56	99.37	100.90	99.34
2022	102.43	102.28	100.04	102.09	105.60	104.39	103.85	103.81	102.51	101.33	103.01	101.30
2023	104.79	104.28	101.95	104.39	107.28	106.42	106.01	105.57	104.58	103.21	105.23	103.93
2024	106.19	106.37	104.06	106.44	109.65	108.45	108.32	108.01	107.79	104.97	106.15	106.31
2025	108.63	109.01	106.43	109.20	113.27	111.88	110.75	110.91	109.94	107.29	108.67	108.25
2026	111.57	111.18	109.46	112.04	117.30	113.19	113.19	113.67	113.33	109.72	111.88	110.77
2027	113.77	113.25	111.30	113.80	120.86	115.43	114.99	116.70	115.33	111.99	113.52	112.96
2028	115.85	114.62	112.23	116.19	122.73	117.00	117.84	117.85	116.82	114.45	115.72	114.80
2029	118.35	118.07	114.93	118.92	130.74	120.64	120.73	120.73	120.78	116.82	117.78	117.65
2030	120.88	120.53	117.84	121.25	134.44	125.03	122.49	122.35	123.98	119.11	119.77	119.83
2031	123.06	122.48	120.56	124.51	136.99	128.94	124.74	125.85	126.10	121.59	122.90	122.38
2032	125.10	124.50	122.55	126.57	139.26	131.08	126.80	127.93	128.19	123.60	124.93	124.41

**Portland General Electric  
15-Year Levelized Resource Value Estimate from PGE's 2014 Renewable Avoided Cost Filing**

Year	Off-peak Prices (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	43.19	41.41	36.99	23.85	16.69	12.34	24.12	36.59	34.18	37.49	38.44	41.46
2016	43.43	41.65	37.23	24.08	16.92	12.57	24.35	36.83	34.42	37.73	38.68	41.70
2017	45.56	43.69	39.04	25.21	17.67	13.09	25.49	38.61	36.08	39.56	40.56	43.74
2018	48.40	46.40	41.45	26.74	18.73	13.86	27.05	41.01	38.31	42.01	43.08	46.46
2019	51.44	49.32	44.06	28.40	19.87	14.69	28.72	43.58	40.71	44.65	45.79	49.38
2020	78.20	78.50	80.33	78.85	74.85	75.13	75.47	76.85	77.91	79.36	79.13	79.65
2021	80.84	79.92	81.93	80.31	76.88	76.94	77.71	78.11	79.48	81.89	79.01	81.03
2022	82.01	81.62	84.27	81.58	77.99	78.43	80.21	79.05	81.00	83.41	80.31	82.52
2023	83.09	83.15	85.92	83.77	78.53	79.92	81.56	80.90	82.43	85.10	81.53	84.19
2024	83.82	83.89	87.61	83.63	79.02	82.25	80.87	81.30	83.08	85.50	84.02	84.76
2025	85.52	85.50	89.44	84.89	79.10	82.76	82.58	83.75	83.88	87.37	86.77	86.04
2026	86.00	87.07	89.93	85.54	79.99	83.96	83.76	84.59	83.77	88.56	87.06	87.12
2027	88.88	88.85	91.02	87.73	79.89	85.51	85.90	85.17	85.64	91.13	88.12	88.73
2028	90.12	90.84	93.80	89.90	79.26	87.40	87.59	86.02	87.66	91.89	89.16	91.45
2029	90.79	91.76	95.53	91.64	73.65	87.85	89.13	87.51	89.31	92.92	91.77	93.04
2030	92.23	93.30	97.48	91.91	73.45	88.66	90.00	90.19	89.97	94.68	93.93	94.96
2031	94.22	95.62	98.81	92.44	74.93	88.50	91.90	92.09	90.26	96.26	96.05	95.16
2032	95.78	97.21	100.44	93.97	76.18	89.96	93.42	93.62	91.75	97.85	97.65	96.74

**Portland General Electric  
15-Year Levelized Resource Value Estimate from PGE's 2014 Renewable Avoided Cost Filing**

Year	Weighted (nominal)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	49.14	46.88	41.90	34.32	28.76	26.45	41.71	48.86	43.54	42.43	43.79	47.25
2016	48.86	46.63	41.70	34.19	28.69	26.40	41.48	48.57	43.32	42.22	43.57	46.99
2017	51.45	49.09	43.89	35.97	30.15	27.73	43.67	51.14	45.59	44.44	45.86	49.47
2018	55.23	52.69	47.10	38.59	32.34	29.75	46.89	54.92	48.95	47.69	49.23	53.10
2019	58.20	55.53	49.63	40.65	34.06	31.32	49.39	57.86	51.57	50.26	51.87	55.96
2020	95.16	95.19	94.68	94.93	97.60	96.73	96.46	96.54	95.39	94.61	95.42	94.47
2021	97.43	97.53	96.30	97.15	99.53	98.78	98.31	98.88	97.55	96.87	97.77	96.72
2022	99.51	99.33	97.79	99.16	101.66	100.68	100.47	100.27	99.44	98.77	99.77	98.62
2023	101.69	101.26	99.66	101.44	103.17	102.63	102.52	102.05	101.42	100.62	101.84	101.11
2024	102.99	103.16	101.71	103.18	105.27	104.71	104.40	104.19	104.26	102.19	102.99	103.23
2025	105.33	105.65	104.00	105.73	108.39	107.72	106.73	107.03	106.22	104.44	105.54	105.08
2026	107.92	107.74	106.67	108.25	111.97	109.01	108.99	109.52	109.11	106.70	108.33	107.39
2027	110.21	109.76	108.40	110.08	115.01	111.16	110.83	112.20	111.09	109.01	109.89	109.50
2028	112.17	111.22	109.60	112.43	116.52	112.77	113.52	113.30	112.65	111.23	111.93	111.46
2029	114.41	114.31	112.16	115.02	122.58	115.96	116.22	115.98	116.28	113.41	114.06	114.13
2030	116.79	116.64	114.93	117.06	125.73	119.83	117.85	117.76	119.12	115.62	116.08	116.28
2031	118.94	118.64	117.45	119.93	128.12	123.16	120.05	121.03	120.98	117.97	119.06	118.49
2032	120.91	120.60	119.39	121.91	130.25	125.21	122.03	123.03	122.98	119.92	121.03	120.46

\* Weighted for expected monthly solar output for Portland, OR from NREL

15-year Real Levelized (2015-2029; 2014\$)  
Avoided T&D  
Line Losses from PGE Trans. System to Meter  
Grossed-up for Line Losses

15-year Nominal Levelized (2015-2029; 2014\$)  
Avoided T&D  
Line Losses from PGE Trans. System to Meter  
Grossed-up for Line Losses

---

Annual\*

41.28
41.03
43.20
46.43
48.86
98.99
101.14
103.08
105.09
107.30
110.04
112.80
115.10
116.95
120.57
123.27
126.07
128.15

Annual\*

29.02  
29.25  
30.65  
32.53  
34.56  
77.29  
79.04  
80.59  
82.06  
82.75  
84.12  
84.94  
86.44  
87.87  
88.39  
89.55  
90.78  
92.28

Annual\*

39.53  
39.35  
41.41  
44.44  
46.82  
95.89  
97.98  
99.86  
101.80  
103.79  
106.34  
108.82  
111.00  
112.80  
115.97  
118.45  
121.02  
123.03

\$62.57  
N/A  
4.74%  
\$65.68

\$71.15  
N/A  
4.74%  
\$74.69



## Portland General Electric

Solar Shape for Portland, OR

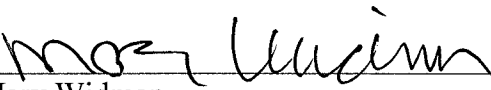
Month	DC Output	AC Output (kWh), Monthly	
1	198.69496	172.96595	4.16%
2	230.25108	201.85077	4.86%
3	386.22699	346.29173	8.33%
4	436.6914	393.51255	9.47%
5	555.99448	505.28047	12.16%
6	539.30944	488.08163	11.75%
7	611.80126	557.08714	13.41%
8	541.89672	493.21059	11.87%
9	453.0611	410.31072	9.87%
10	353.12772	317.03498	7.63%
11	181.72081	155.40176	3.74%
12	137.27418	114.15397	2.75%
	35040	4155.1823	100.00%

Source: NREL

## CERTIFICATE OF SERVICE

I hereby certify that I have this day caused PORTLAND GENERAL ELECTRIC COMPANY'S INFORMATIONAL FILING OAR 860-084-0370(1), SOLAR PHOTOVOLTAIC PILOT PROGRAM RESOURCE VALUE ESTIMATE AND OAR 860-084-0380(2) SOLAR PHOTOVOLTAIC PILOT PROGRAMS RATE IMPACT ESTIMATE to be served by electronic mail to those parties whose email addresses appear on the attached service list from OPUC Docket No. UM 1559.

Dated at Portland, Oregon, this 31<sup>st</sup> day of October, 2014.

  
\_\_\_\_\_  
Mary Widman  
Specialist, Rates and Regulatory Affairs  
Portland General Electric Company  
121 SW Salmon St., 1WTC0702  
Portland, OR 97204  
(503) 464-8223 (Telephone)  
(503) 464-7651 (Fax)  
[mary.widman@pgn.com](mailto:mary.widman@pgn.com)

**SERVICE LIST**  
**OPUC DOCKET NO. UM 1559**

OPUC DOCKETS CITIZENS' UTILITY BOARD OF OREGON 610 SW BROADWAY, STE 400 PORTLAND OR 97205	REGULATORY DOCKETS IDAHO POWER COMPANY PO BOX 70 BOISE ID 83707-0070
OSEIA DOCKETS OREGON SOLAR ENERGY INDUSTRIES ASSOC. PO BOX 14927 PORTLAND OR 97293-0927	OREGON DOCKETS PACIFICORP, DBA PACIFIC POWER 825 NE MULTNOMAH ST, STE 2000 PORTLAND OR 97232
STEPHANIE S ANDRUS -- CONFIDENTIAL PUC STAFF--DEPARTMENT OF JUSTICE BUSINESS ACTIVITIES SECTION 1162 COURT ST NE SALEM OR 97301-4096	JUDY BARNES OREGONIANS FOR RENEWABLE ENERGY POLICY 1425 SE 37TH PORTLAND OR 97214
KACIA BROCKMAN *OREGON DEPARTMENT OF ENERGY 625 MARION ST NE SALEM OR 97301-3737	PHILIP H CARVER *OREGON DEPARTMENT OF ENERGY 625 MARION ST NE STE 1 SALEM OR 97301-3742
JOHN CRIDER PUBLIC UTILITY COMMISSION OF OREGON PO BOX 1088 SALEM OR 97308-1088	MEGAN DECKER -- CONFIDENTIAL RENEWABLE NORTHWEST 421 SW 6TH AVE #1125 PORTLAND OR 97204-1629
RYAN FLYNN PACIFICORP DBA PACIFIC POWER 825 NE MULTNOMAH, SUITE 1800 PORTLAND OR 97232	RENEE M FRANCE -- CONFIDENTIAL *OREGON DEPARTMENT OF JUSTICE NATURAL RESOURCES SECTION 1162 COURT ST NE SALEM OR 97301-4096
J RICHARD GEORGE -- CONFIDENTIAL PORTLAND GENERAL ELECTRIC COMPANY 121 SW SALMON ST 1WTC1301 PORTLAND OR 97204	BRUCE GRISWOLD PACIFIC POWER 825 NE MULTNOMAH STE 600 PORTLAND OR 07232
ROBERT JENKS -- CONFIDENTIAL CITIZENS' UTILITY BOARD OF OREGON 610 SW BROADWAY, STE 400 PORTLAND OR 97205	ADAM LOWNY MCDOWELL RACKNER & GIBSON PC 419 SW 11TH AVE, STE 400 PORTLAND OR 97205
G. CATRIONA MCCrackEN -- CONFIDENTIAL CITIZENS' UTILITY BOARD OF OREGON 610 SW BROADWAY, STE 400 PORTLAND OR 97205	KATHLEEN NEWMAN OREGONIANS FOR RENEWABLE ENERGY POLICY 1553 NE GREENSWORD DR HILLSBORO OR 97214
LISA D NORDSTROM IDAHO POWER COMPANY PO BOX 70 BOISE ID 83707-0070	MARK PETE PENGILLY OREGONIANS FOR RENEWABLE ENERGY POLICY PO BOX 10221 PORTLAND OR 97296
JOHN W STEPHENS -- CONFIDENTIAL ESLER STEPHENS & BUCKLEY 888 SW FIFTH AVE STE 700 PORTLAND OR 97204-2021	JAY TINKER -- CONFIDENTIAL PORTLAND GENERAL ELECTRIC 121 SW SALMON ST 1WTC-0702 PORTLAND OR 97204