Washington State
SOLAR SUMMIT

The State of Solar in Washington (state)

David Nicol, President, Solar Washington

Washington Solar Summit
10/15/2016

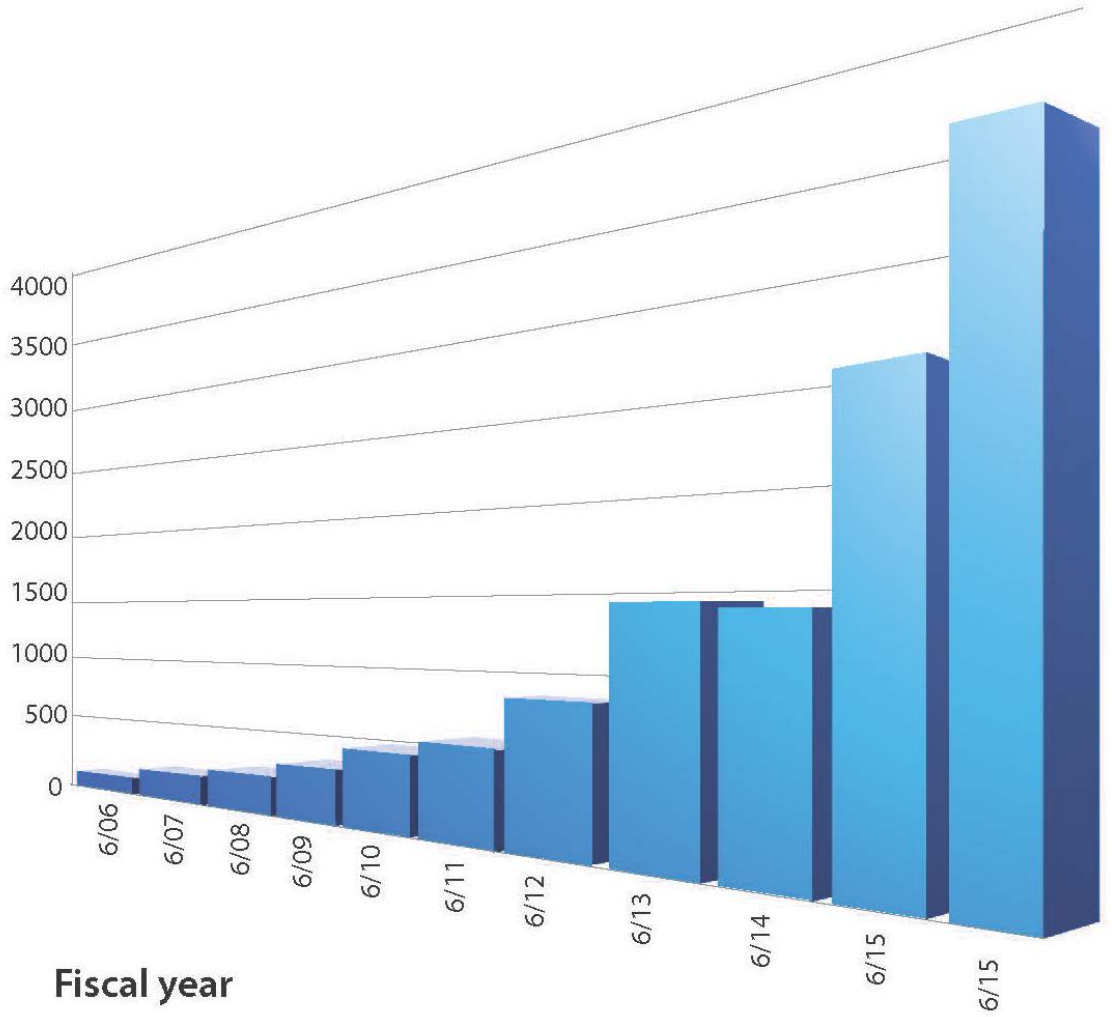
Growth from Renewable Energy Cost Recovery Program

Growth of the program

Total applications approved through 6/30/16 = **11,724**

Increase in total capacity from 6/30/15 through 6/30/16 = **26.3 MWdc**

Total renewables in program (PV, Wind, Digesters) as of 6/30/16 = **76 MWdc**



Source: http://dor.wa.gov/Docs/Pubs/Incentives/RenewableEnergyProgramProgress.pdf

Public Utility Tax (PUT) Credits taken by utilities for incentive payments made to participants under RCW 82.16.130

Fiscal year		
2016	$15,514,332	41
2015	$7,980,142	39
2014	$4,266,887	34
2013	$2,374,874	33
2012	$1,155,125	32
2011	$581,978	27
2010	$338,756	23
2009	$188,459	20
2008	$99,443	14
2007	$52,729	10
2006	No takers	No credit users

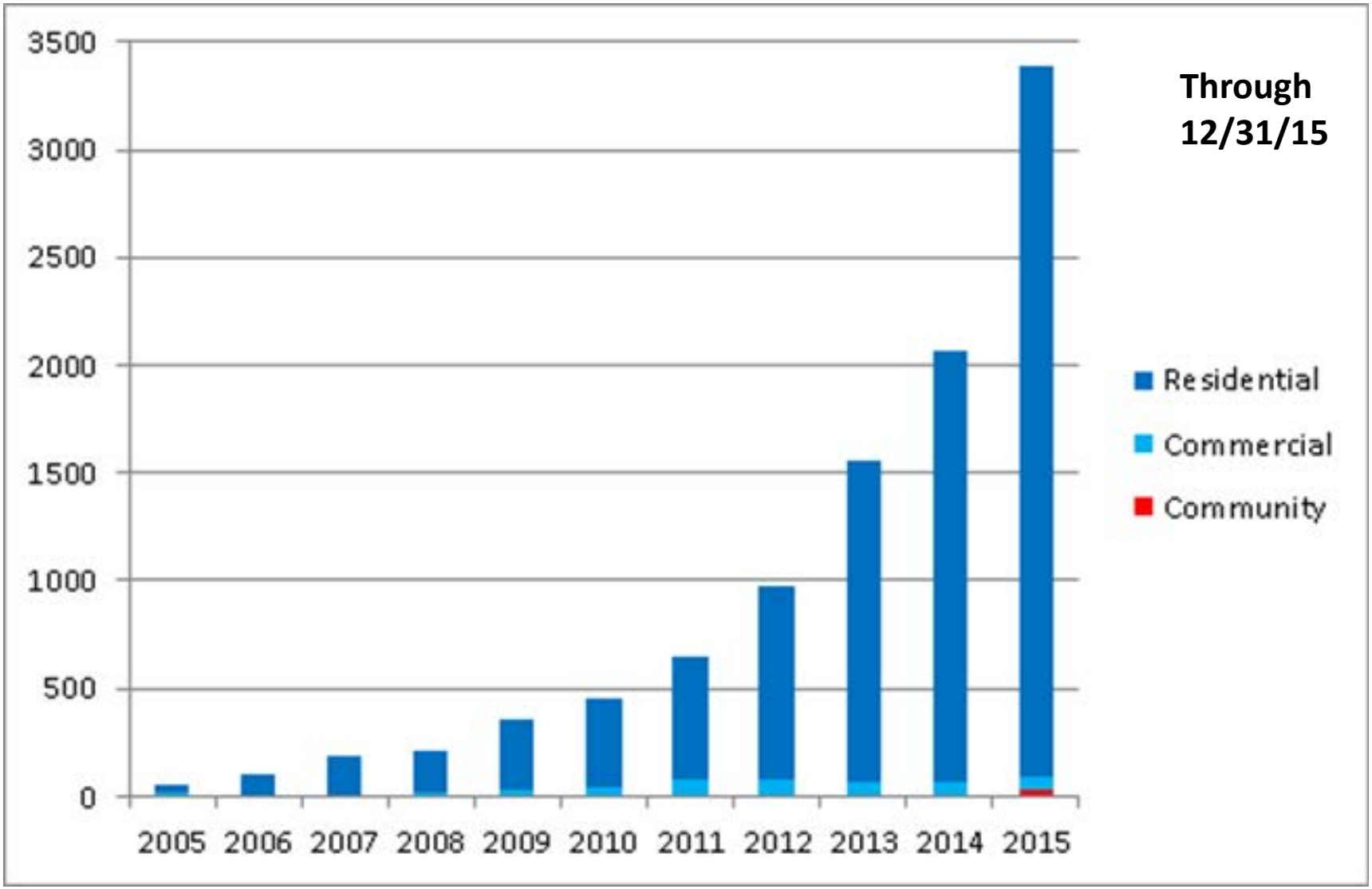
Source: http://dor.wa.gov/Docs/Pubs/Incentives/RenewableEnergyProgramProgress.pdf

Public Utility Tax (PUT) Credits taken by utilities for incentive payments made to participants under RCW 82.16.130

Calendar year	PUT Credits claimed	No. of utilities
2015	$17,072,234	41
2014	$6,822,345	39
2013	$3,831,735	34
2012	$1,929,196	32
2011	$1,145,081	29
2010	$559,412	24
2009	$336,304	23
2008	$187,901	20
2007	$103,946	15
2006	$48,226	8
2005	No takers	

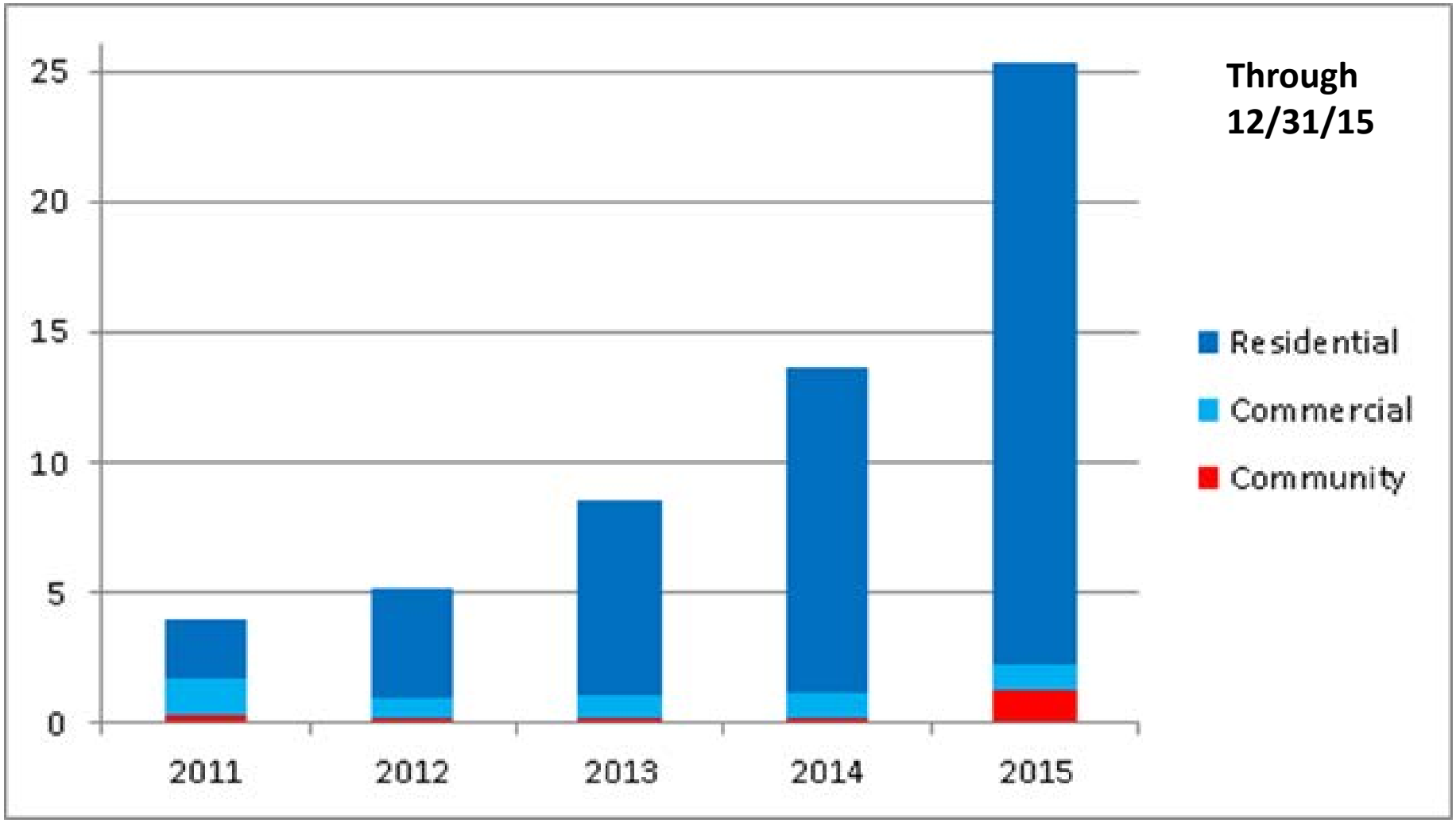
Source: http://dor.wa.gov/Docs/Pubs/Incentives/RenewableEnergyProgramProgress.pdf

From WSU Energy Office - by # of Installations



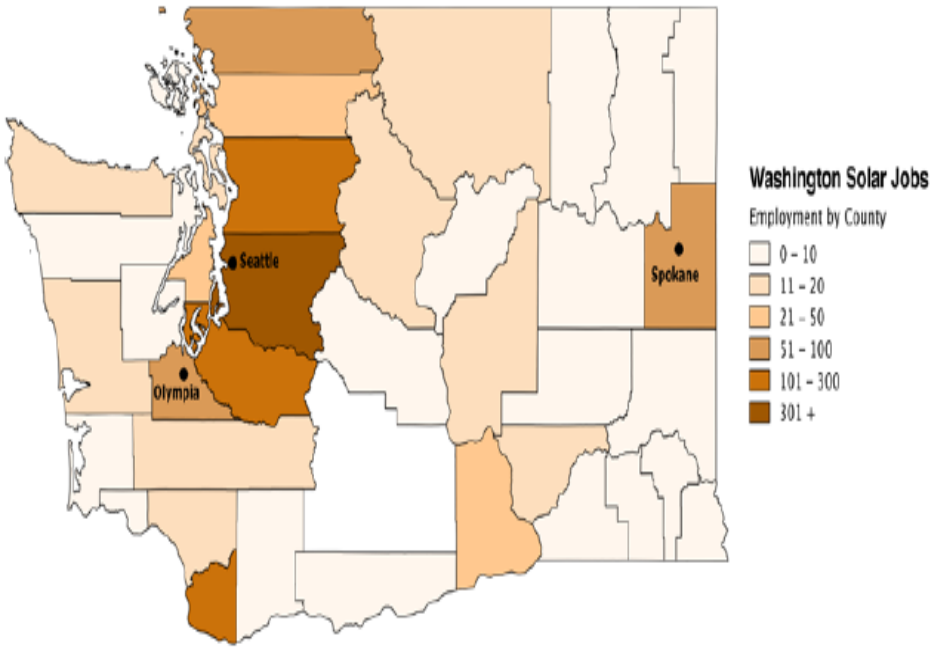
Courtesy of Phil Lou, Solar Energy Specialist, Washington State University

From WSU Energy Office - by capacity

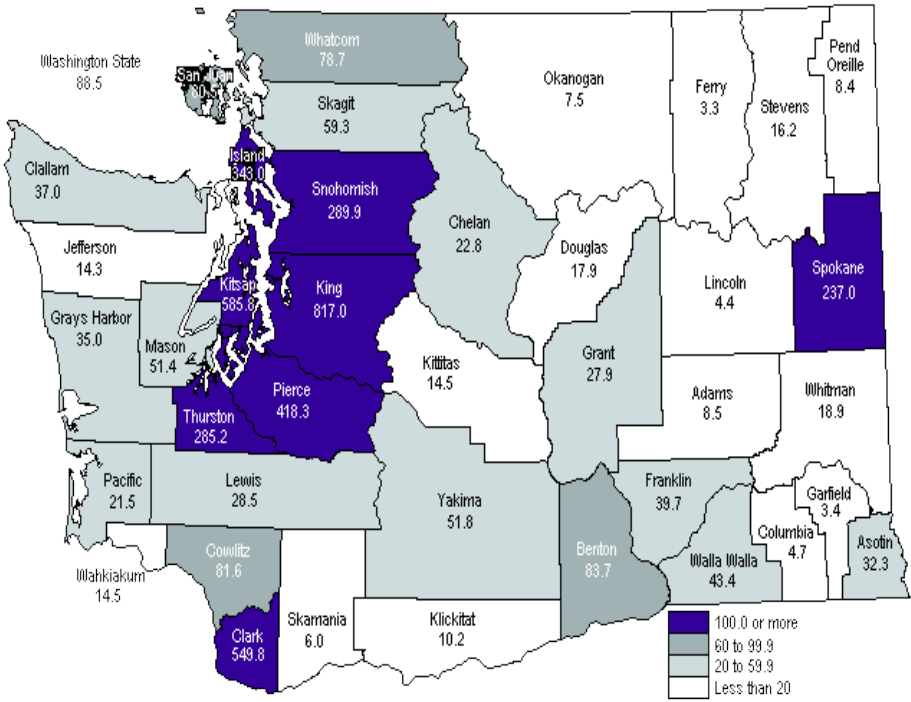


Courtesy of Phil Lou, Solar Energy Specialist, Washington State University

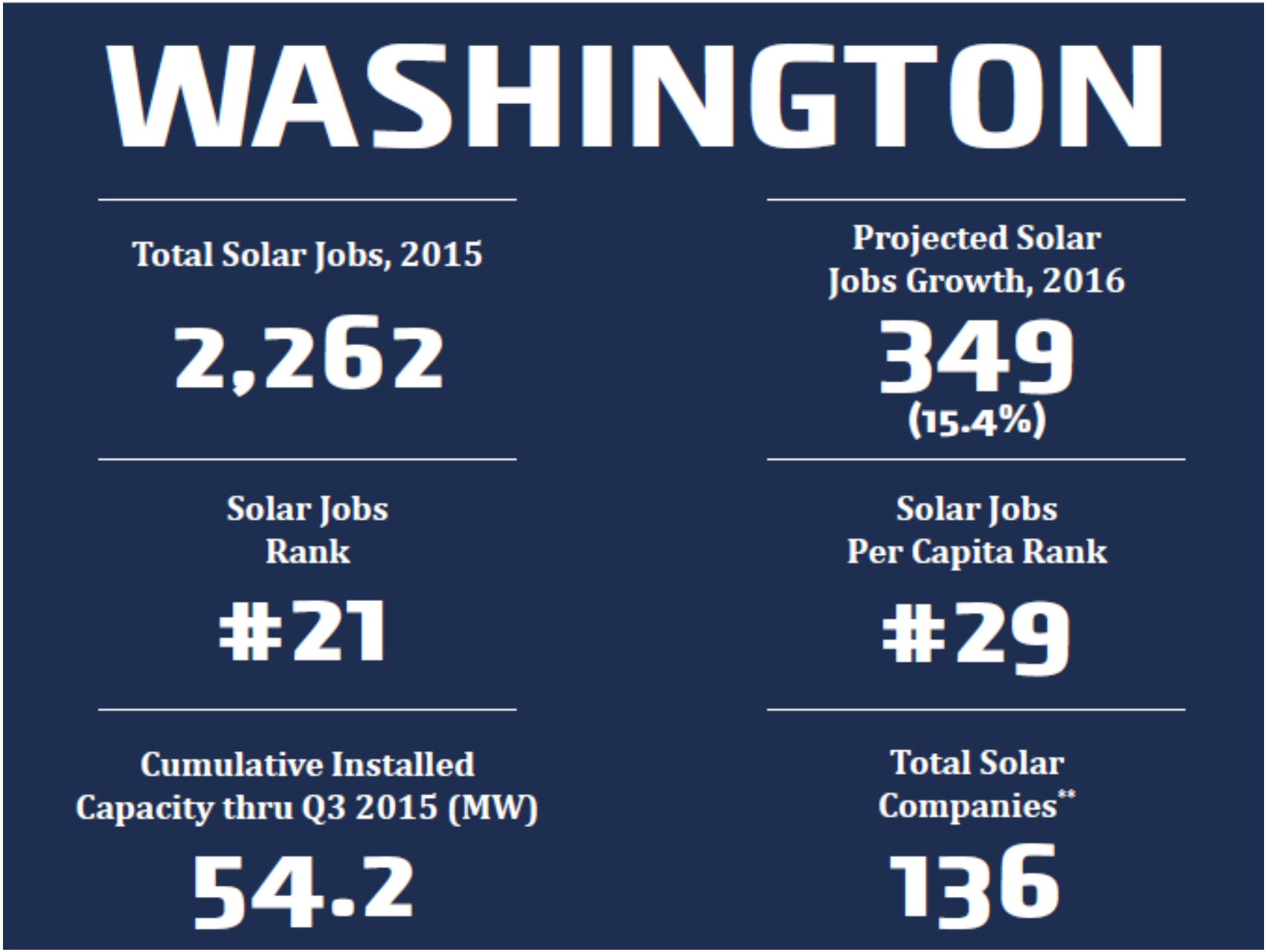
There are approximately 2000 solar jobs in WA largely a result of the State Incentive program. It cost the state roughly $7,300/job based upon the WWU Solar Economic Impact Study. By comparison, it cost the state $450,000/job at Boeing.



Density of Solar Jobs in WA



Population Density in WA



Solar Jobs Census from The Solar Foundation

Solar Jobs Census from The Solar Foundation

Washington

One of few states that saw minor contraction in solar jobs in 2015, Washington now has 2,262 solar workers, which is slightly lower than the previous year. An estimated 15.5 megawatts (MW) of new solar photovoltaic (PV) capacity were installed in 2015 through Q3, about 10% more than the previous year, which brings Washington's total to 54.2 MW cumulative installed solar PV capacity.[554]

Under Initiative 937, the Energy Independence Act, electric utilities that serve more than 25,000 customers must obtain 15% of their electricity from new renewable resources by 2020 and must undertake cost-effective energy conservation measures. Distributed generation in Washington receives a two times credit multiplier under the state's RPS requirements.[555] Washington has received a grade of "B" from Freeing the Grid for its net metering policy, which apply to all utilities and credit net excess generation at the retail rate. Its comparatively low cap on aggregate capacity (0.5% of peak demand from a base year) keeps it from receiving the highest grade.[556] Washington is also one of the few states to have taken steps at the state-level to address solar "soft costs" (e.g., local administrative or business process costs) – through allowing local jurisdictions to exempt solar energy systems from certain requirements of the state building code. This effectively allows jurisdictions to establish expedited permitting processes for qualifying residential solar energy systems.[557]

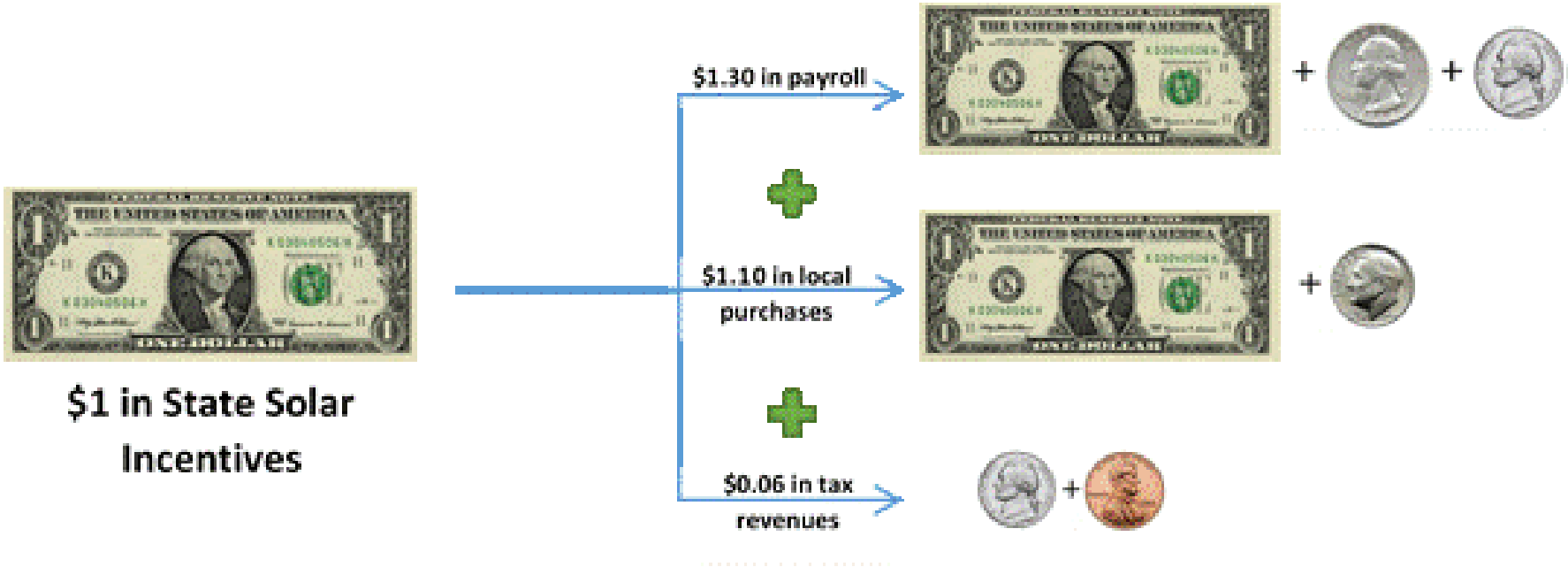
Last summer, Governor Jay Inslee directed the state's Department of Ecology to more strictly enforce an emissions target set in 2008, imposing a binding cap on carbon emissions under the authority of the state's Clean Air Act.[558]

The state's installed capacity in 2016 is expected to significantly exceed the previous year's total. As such, employers are projecting that Washington's solar workforce to grow approximately 15% in 2016.

Sector	WA Solar Jobs	% WA Solar Jobs	% U.S. Solar Jobs
Installation	1,429	63.2%	57.4%
Manufacturing	274	12.1%	14.5%
Sales & Distribution	37	1.6%	11.7%
Project Development	297	13.1%	10.8%
Other	225	9.9%	5.7%

Demographic	% WA Solar Jobs	% WA Overall Jobs†	% U.S. Solar Jobs
Women	26.5%	46.7%	23.8%
African-American	2.5%	3.3%	5.1%
Asian or Pacific Islander	4.3%	8.1%	8.6%
Latino or Hispanic	3.6%	10.8%	11.3%
Older Workers (55+)	16.0%	22.6%	18.6%
Union Members	6.8%	-	5.5%
Veterans of the U.S. Armed Forces	6.0%	9.3%	8.1%

Solar WA's study in 2014 showed that for every $1 spent on our State Solar Incentive program, $2.46 was injected back into the local economy.



Customer-Generated Power

JULY 2016

Stated Objectives	Results
Increase use of WA renewable energy technology	Achieved
Support WA renewable energy industry	Achieved, but growth concentrated in solar and a few businesses

Credit creates incentive to install renewable energy systems

A different program (net metering) pays customers for power sold to the system.

Customer installs system, generates power

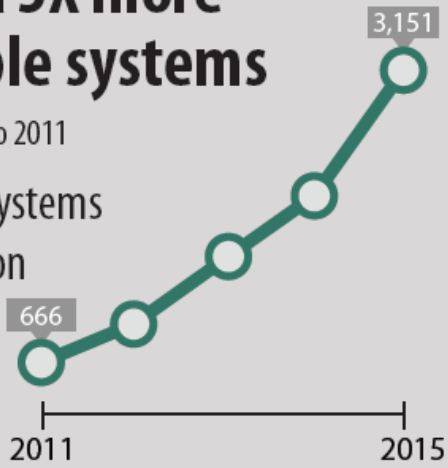
Utility pays customer based on the power generated

State gives utility a tax credit equal to its payments to customers, up to a limit set in law.

Consumers installed 5X more renewable systems

in 2015 compared to 2011

79% of new systems are Washington made



99.6% of new systems are solar, and made by a few businesses

4 Businesses with parts certified as "Made in WA" since 2010

3 Still offering "Made in WA" elements in 2016

Utilities are reaching the limits set by state for providing incentives

16 utilities – serving 71% of WA utility customers – reached the statutory limit

6 reduced payments, 10 closed program to new participants

RECOMMENDATION: The Legislature should review and clarify the preference, including targets for how much power capacity and the number of systems it hopes to create, whether targets may be impacted by caps on utilities' use of the credit, and which local industries it wants to support.

For more information, contact:
Keenan Konopaski, Washington State Legislative Auditor • (360) 786-5187 • keenan.konopaski@leg.wa.gov
The complete report is at citizentaxpref.wa.gov.

JLARC, Joint Legislative Audit & Review Committee, **data is current as of 12-31-2015**

source:

leg.wa.gov/jlarc/taxReports/2016/CustomerGeneratedPower/documents/overview.pdf

Utilities expecting to reach their caps by 2016

Utilities reducing incentives:

Puget Sound Energy
Seattle City Light
Snohomish County PUD
Jefferson County PUD
Orcas Power & Light Cooperative
Clallam County PUD

Utilities not accepting new solar incentive applications:

Okanogan County Electric Co-Op
Klickitat County PUD
Kittitas County PUD
City of Ellensburg
Benton Rural Electric Association
Inland Power and Light
Peninsula Light Company
Clark County PUD
Benton County PUD
Cowlitz County PUD

Map prepared by JLARC based on fiscal year-end 6/30/2015

See www.citizentaxpref.wa.gov

JLARC - Joint Legislative Audit Review Committee

seeks YOUR input

regarding how well tax incentives & preferences have served their purposes

http://leg.wa.gov/jlarc/taxReports/2016/CustomerGeneratedPower/p/default.htm

Public Policy Objective
The Legislature stated its intent for this preference was to provide incentives for: • The greater use of locally created renewable energy technologies; and • Supporting and retaining existing local industries, and creating new opportunities for renewable energy industries to develop in Washington.

source

http://leg.wa.gov/jlarc/taxReports/2016/CustomerGeneratedPower/p/default.htm

What evidence exists to show that the tax preference has contributed to the achievement of any of these public policy objectives?

The number of renewable energy systems certified by the Department of Revenue (DOR) each year and the number of systems with Made in Washington components has increased. However, this growth is largely due to solar technologies with no increase in wind or anerobic digesters.

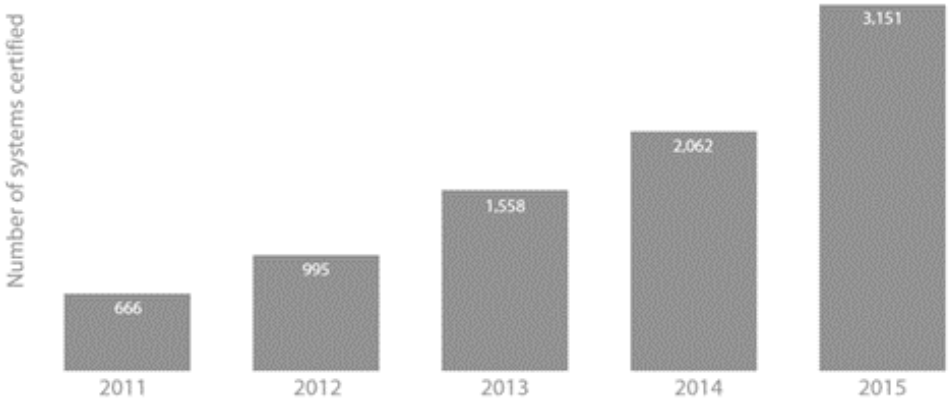
In addition, since the credit began, four businesses have had their products certified as Made in Washington and one of those has discontinued its production.

1. **Greater use of locally created renewable energy technologies**

There has been an increase in the use of some types of locally created renewable energy technologies since the preference began.

The number of renewable energy systems installed annually by utility customers and community solar project participants has increased nearly five times in the last five years, from 666 in 2011 to 3,151 in 2015. In addition, the average capacity of systems has increased, meaning more power is generated from each system. For residential systems, the average capacity size increased from 4.5 kilowatts in 2011 to 7.1 kilowatts in 2015.

The number of renewable systems installed annually has increased each year since 2011



Source: JLARC staff analysis of DOR system certification application data.

Utilities that Have Not Reached the Cap

- Avista
- City of Centralia
- Chelan County PUD
- Clearwater Power
- Douglas County PUD
- Elmhurst Power & Light Co
- Ferry County PUD
- Franklin County PUD
- Grant County PUD
- Grays Harbor County PUD
- Mason County PUD #1
- Lewis County PUD
- Ohop Mutual Light Co
- Okanogan PUD
- Pacific County PUD
- Parkland Light & Power
- Pend Oreille PUD
- Port Angeles City Light
- Skamania PUD
- Tacoma Power
- Town of Steilacoom
- Wahkiakum County PUD

Have Reached the Cap,

Reducing Incentives

- Clallam County PUD
- Jefferson County PUD
- Puget Sound Energy
- Seattle City Light
- Snohomish PUD
- Orcas Power and Light

Program Suspension

- Benton County PUD
- Benton Rural Electric Association
- City of Ellensburg
- City of Richland
- Columbia REA
- Cowlitz County PUD
- Inland Power & Light
- Kittitas County PUD
- Klickitat County PUD
- Peninsula Light Company
- Tanner Electric Cooperative

NEXT:
Examples from specific utilities

including:
PUDs,
Municipal,
Inventor Owned

Washington Net Metering

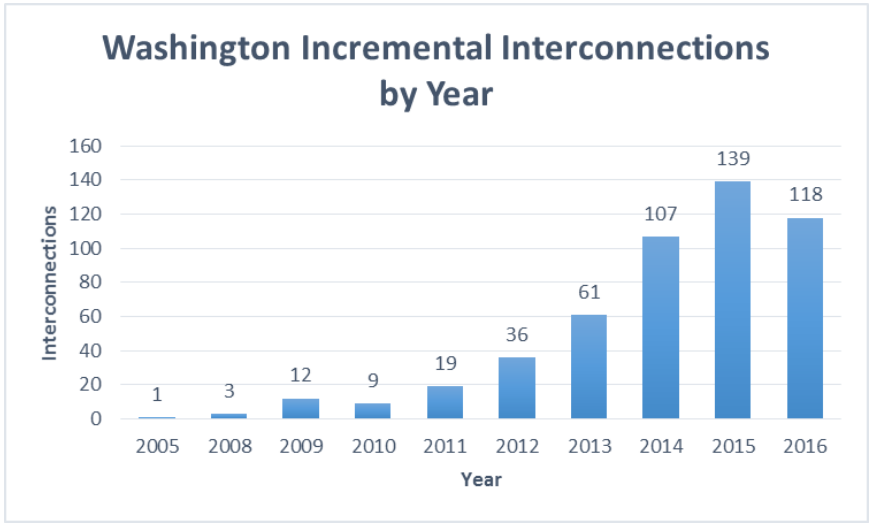
Jason Zappe

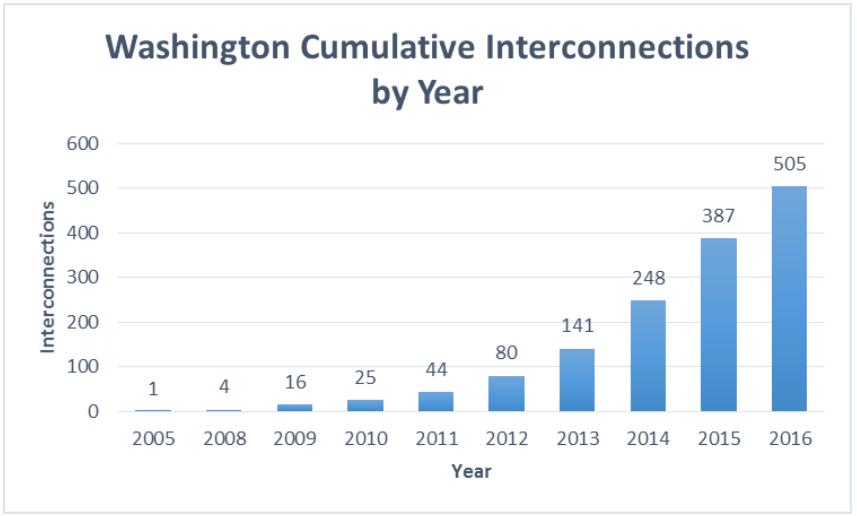
Customer Generation Manager

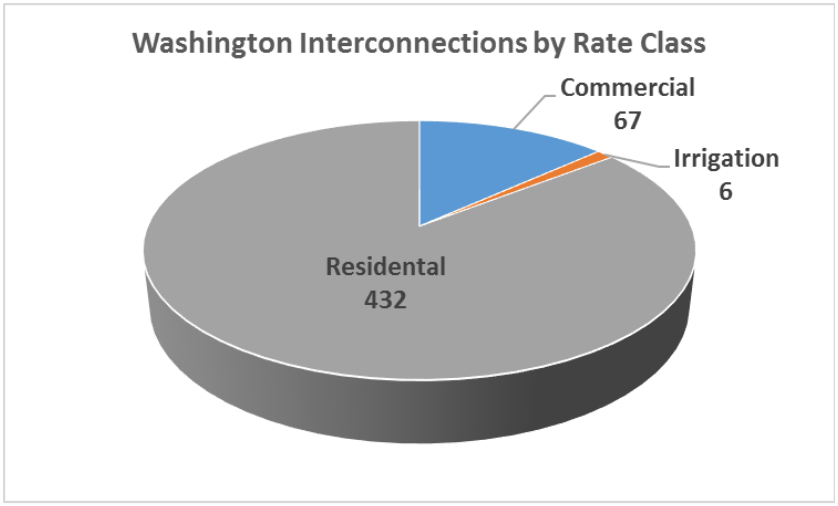
PACIFIC POWER

Let's turn the answers on.

Pacific Power Interconnections







PACIFIC POWER

Pacific Power DOR Incentive

- 2016 program cap was $1,723,365
- 2016 Incentives awarded was about $1,400,000
- The average incentive rate was $0.43
- Made-in-WA under 10 KW paid at $.54/kWh
- Total production was 4,120,143 kWhs (for 2016)
- **Very likely to hit the program cap in 2017**
- **Will reduce** the incentive amounts proportionately for all participants per the DOR program rules

PACIFIC POWER

Solar at Avista

AMT OF CAP REMAINING	$1,286,652.00

Rooftop Solar

- 362 systems (311 applied for incentive)
- 2,275 kW installed (1,840 kW applied for incentive)
  - 1,100+ kWh per kW installed
- $694,260 paid in incentives (2015-2016)
  - 98 new participants

Avista-Owned Community Solar

- 423 kW installed / (1512) 280 W iTek panels
  - 12 mo production: 558,832 kWh
  - 12 mo (state) incentives paid: $603,539.00

Solar Washington – 2016 Update

Leslie Moynihan
Net Metering Program Manager

PUGET SOUND ENERGY

The Numbers

2016 Production Incentive Limit: $10.05 Million

2015-2016 Production Incentive Requests: $10.4 Million

4300 customers eligible for payment this year.

2015
- Production Incentive: $6,022,000
- 3925 Net Metered Customers
- 26.3 MW Capacity

2014
- Production Incentive: $3,130,000
- 2578 Net Metered Customers
- 15.8 MW Capacity

2013
- Production Incentive: $1,838,000
- 1906 Net Metered Customers
- 10.8 MW Capacity

2012
- Production Incentive: $1,106,000
- 1476 Net Metered Customers
- 7.8 MW Capacity

2011
- Production Incentive: $545,000
- 1062 Net Metered Customers
- 5.1 MW Capacity

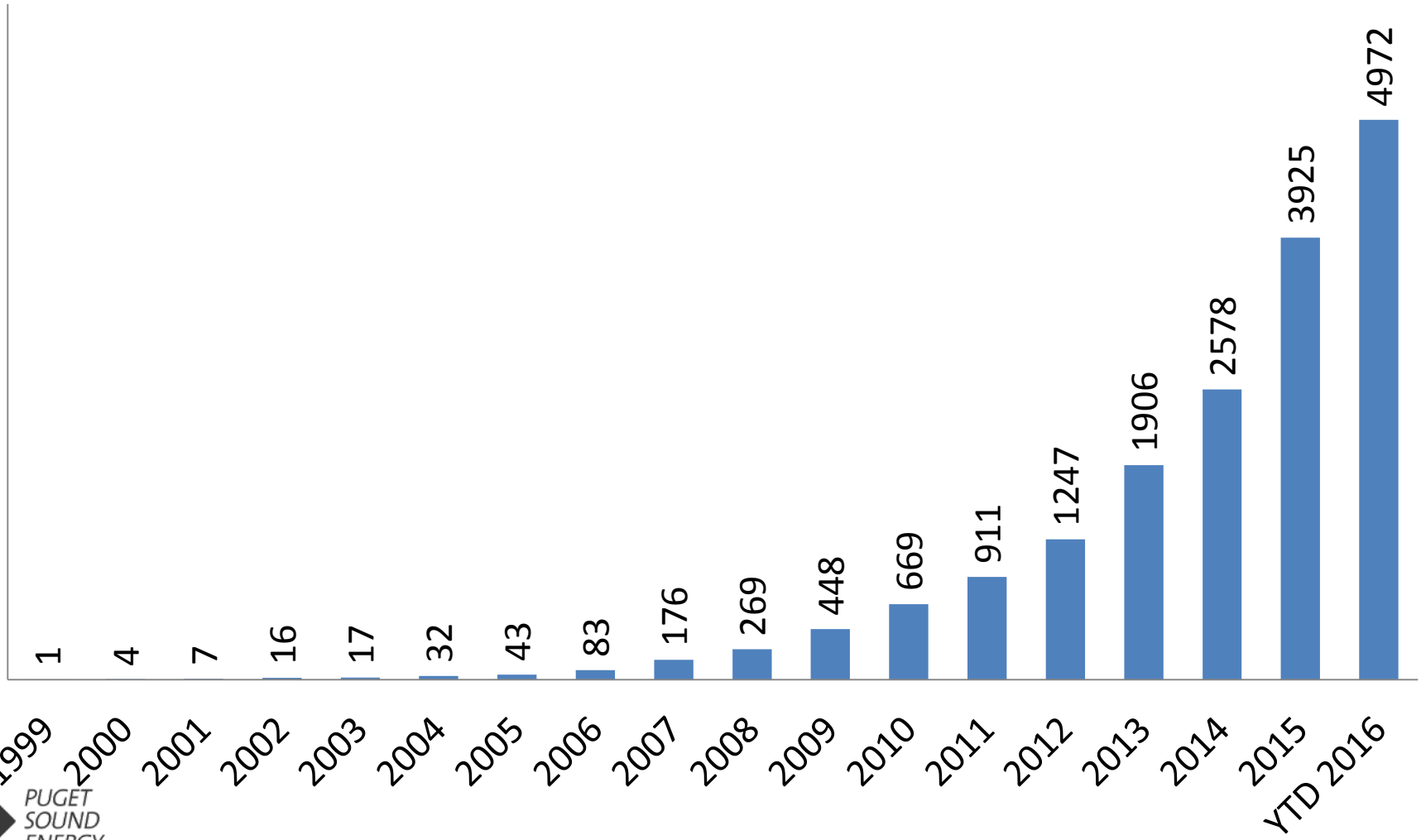
2010
- Production Incentive: $283,000
- 793 Net Metered Customers
- 3.4 MW Capacity

Through Sept 2016:

4972 Solar Net Metered Customers
34.5 MW Capacity

PSE PUGET SOUND ENERGY

Net Metering Growth



PSE PUGET SOUND ENERGY

27

Total Systems By County (As of 9/30/2016)

County	***Count***
Island	258
King	1702
Kitsap	548
Kittitas	246
Pierce	218
Skagit	459
Thurston	557
Whatcom	984
Total Systems	4972

PSE PUGET SOUND ENERGY

Tacoma Power
Solar Program

Mark Aalfs
Program Manager
October 2016

TACOMA POWER
TACOMA PUBLIC UTILITIES

Solar Program

Rooftop and Community Solar Programs

Program results as of June 30, 2016

	number of customers	kW	kWh	production payments
Rooftop solar	270	1,362	1,057,338	$464,180
Community solar	1,006	298	165,398	$178,630
Total	1,276	1,660	1,222,736	$642,810

Four Community Solar systems – utility owned: 75, 75, 75, and 73 kW

Total: 298 kW. Completed: February 2016

TACOMA POWER
TACOMA PUBLIC UTILITIES

Solar Program

- Rooftop Solar average payment rate in 2016: $0.44
- Tacoma Power taxable power sales: $326,600,601
- 2016 solar incentives cap: $1,633,003
- 2016 percent of cap: 39%
- Projected date for reaching program payment cap: June 2019
- Solar grid-tied customers not eligible for state production incentives: Tacoma Community College, Pierce College, Puyallup Tribe, Puyallup Nation Housing Authority, Tacoma Solid Waste. Total: 84 kW

TACOMA POWER
TACOMA PUBLIC UTILITIES

Contact Info

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Solar Program
Conservation Resources Management
Tacoma Power
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Tacoma, WA 98411
Direct: 253-502-8939
Office: 253-502-8619

maalfs@cityoftacoma.org

https://www.mytpu.org/tacomapower/

https://www.mytpu.org/tacomapower/about-tacoma-power/dams-power-sources/solar-metering.htm

TACOMA POWER
TACOMA PUBLIC UTILITIES

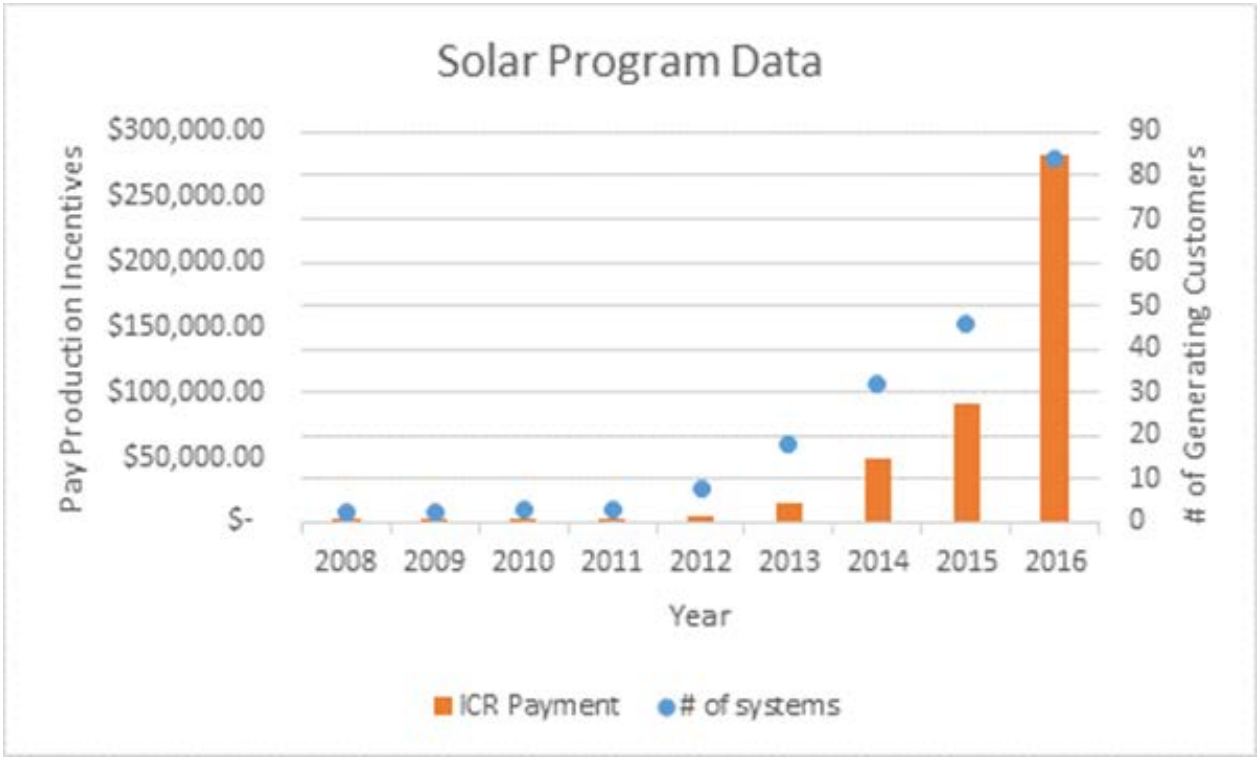
Washington Solar Summit Presentation

Dawn Senger
Energy Specialist
Energy Services Department
City of Richland

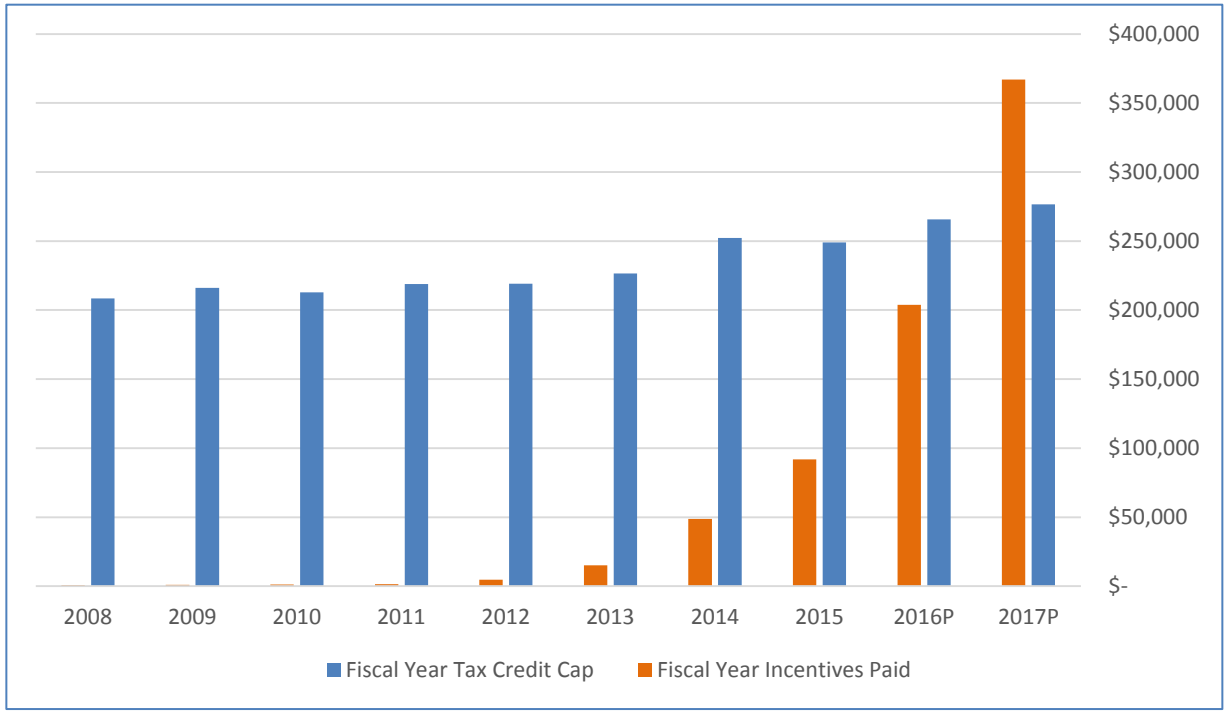
Program offerings

- All systems are residential customers. The total number of systems is 89.
- Given the current level of tax credit the City can claim from Washington State to offset the cost recovery incentives we provide customers, we are not approving any additional Renewable Energy System Cost Recovery Incentive (ICR) applications at this time.
- Although the City is suspending application to the ICR program, the City will continue to accept net metering applications for all solar systems. Several customers continue to move forward with these systems in order to take advantage of net metering.

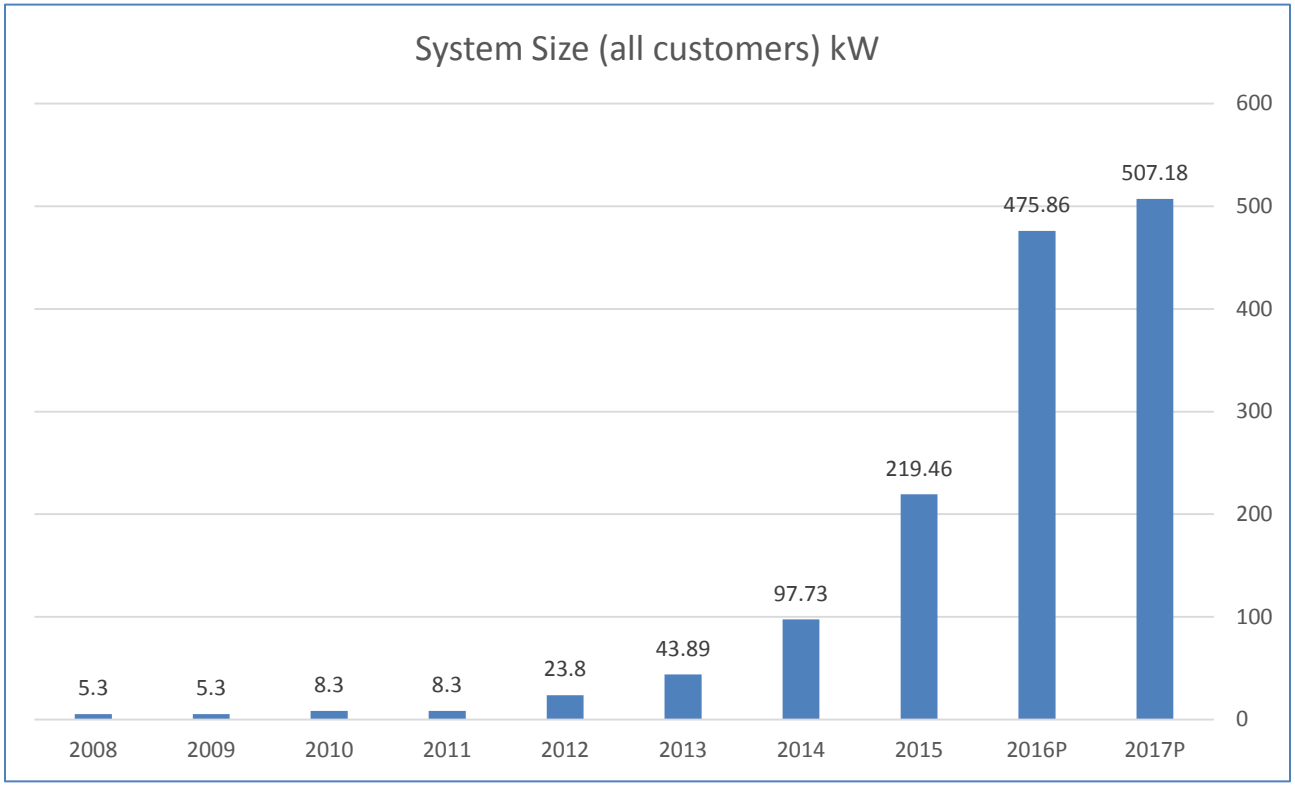
Data


Solar Program Data
Pay Production Incentives
$300,000.00
$250,000.00
$200,000.00
$150,000.00
$100,000.00
$50,000.00
$-
90
80
70
60
50
40
30
20
10
0
# of Generating Customers
2008
2009
2010
2011
2012
2013
2014
2015
2016
Year
ICR Payment
# of systems

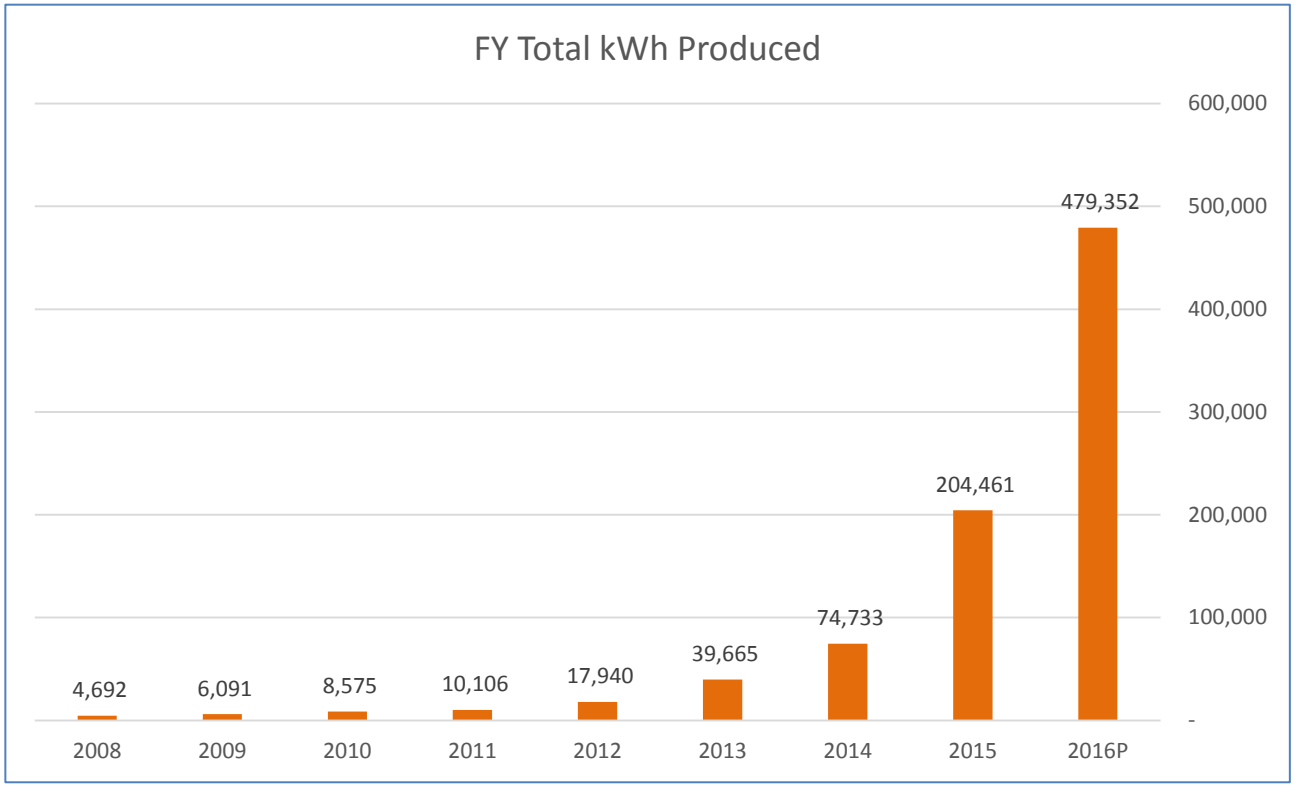
Incentives Paid vs Tax Credit Cap



System Size (all customers) kw



FY Total kWh Produced



2016 WASHINGTON STATE SOLAR SUMMIT

State of Solar – Seattle City Light

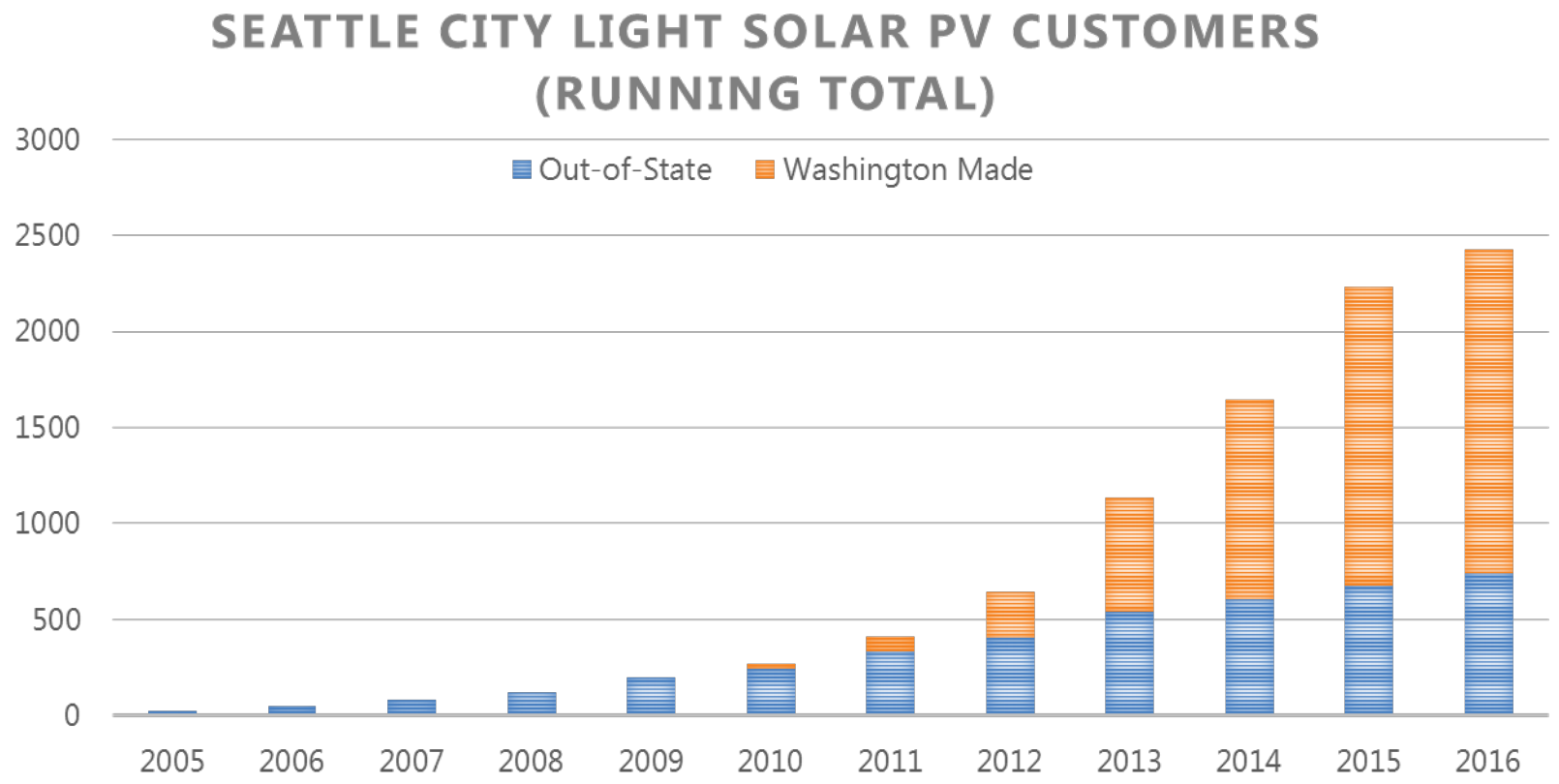
Jake Wade | 15 Oct 16

THE NATION'S GREENEST UTILITY
SINCE 1905
SEATTLE CITY LIGHT

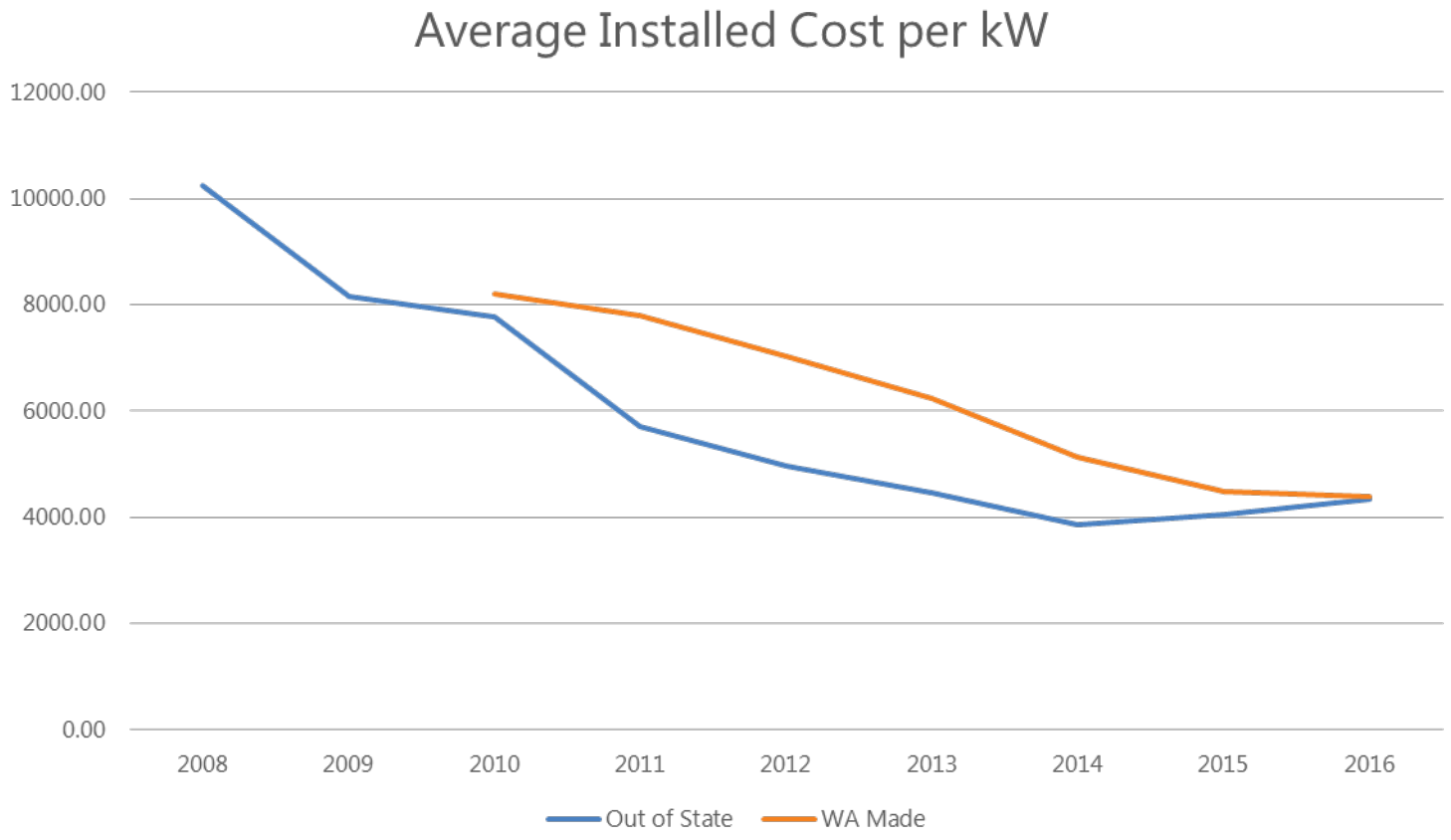
CITY LIGHT NUMBERS

- Number of systems installed as of 30 Jun 16: **2429**
- Number of KW installed: **15.5 MW**
- kWh generated in production year 2016: **11,500 MWh**
- System Detail:
  - Residential **12.7 MW**
  - Commercial **1.6 MW**
  - Industrial **1.0 MW**
  - Community **.17 MW** (35% of customers, 1% of kW, 4% of WA Incentive)
- Payment rate in 2016: **.725**
- Total dollars paid out in 2016: **$3.79 M**
- Net-metering requirements: **10 MW** (RCW 80.60) **20 MW** (SMC 21.49)

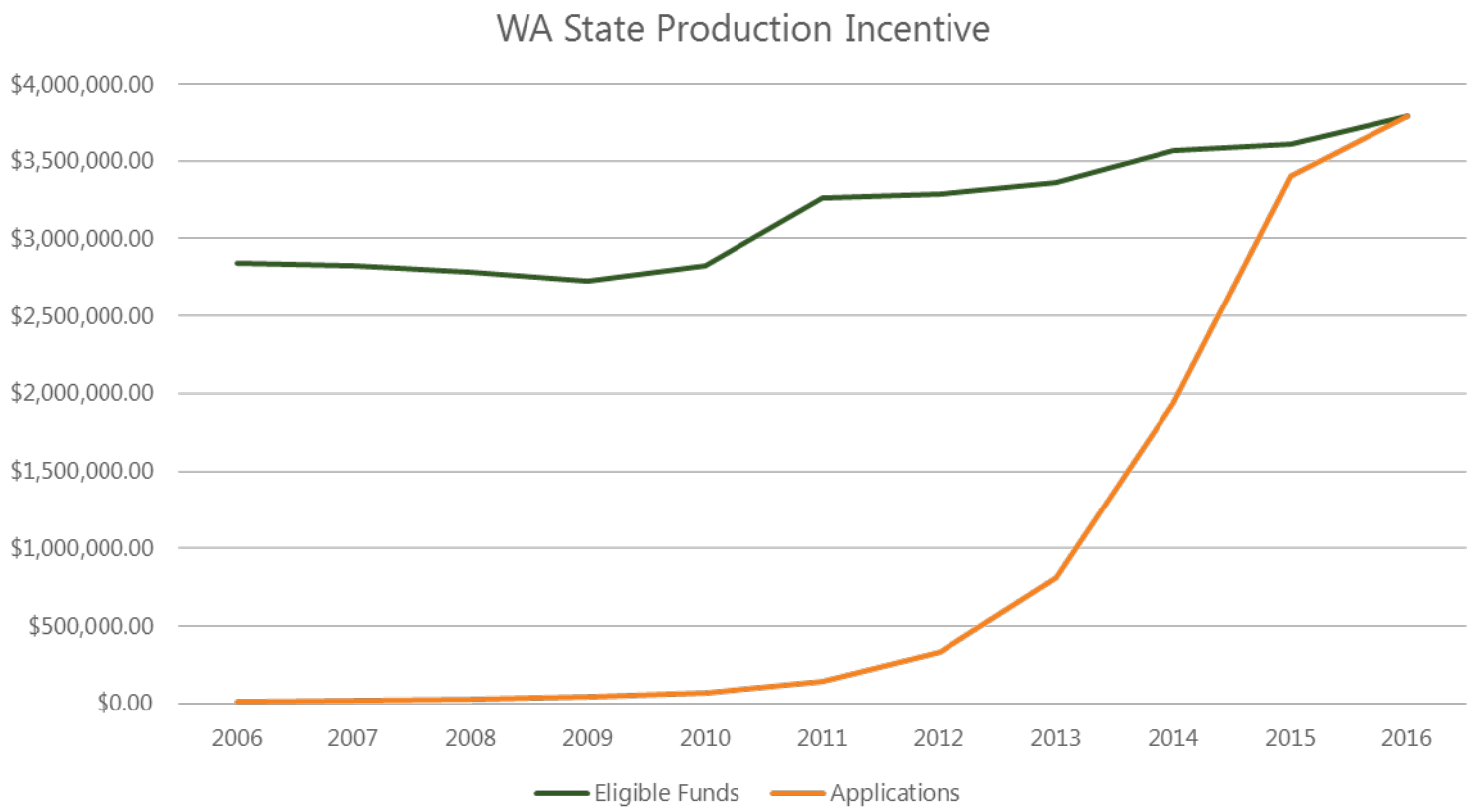
CITY LIGHT PV CUSTOMERS



COST PER KILOWATT



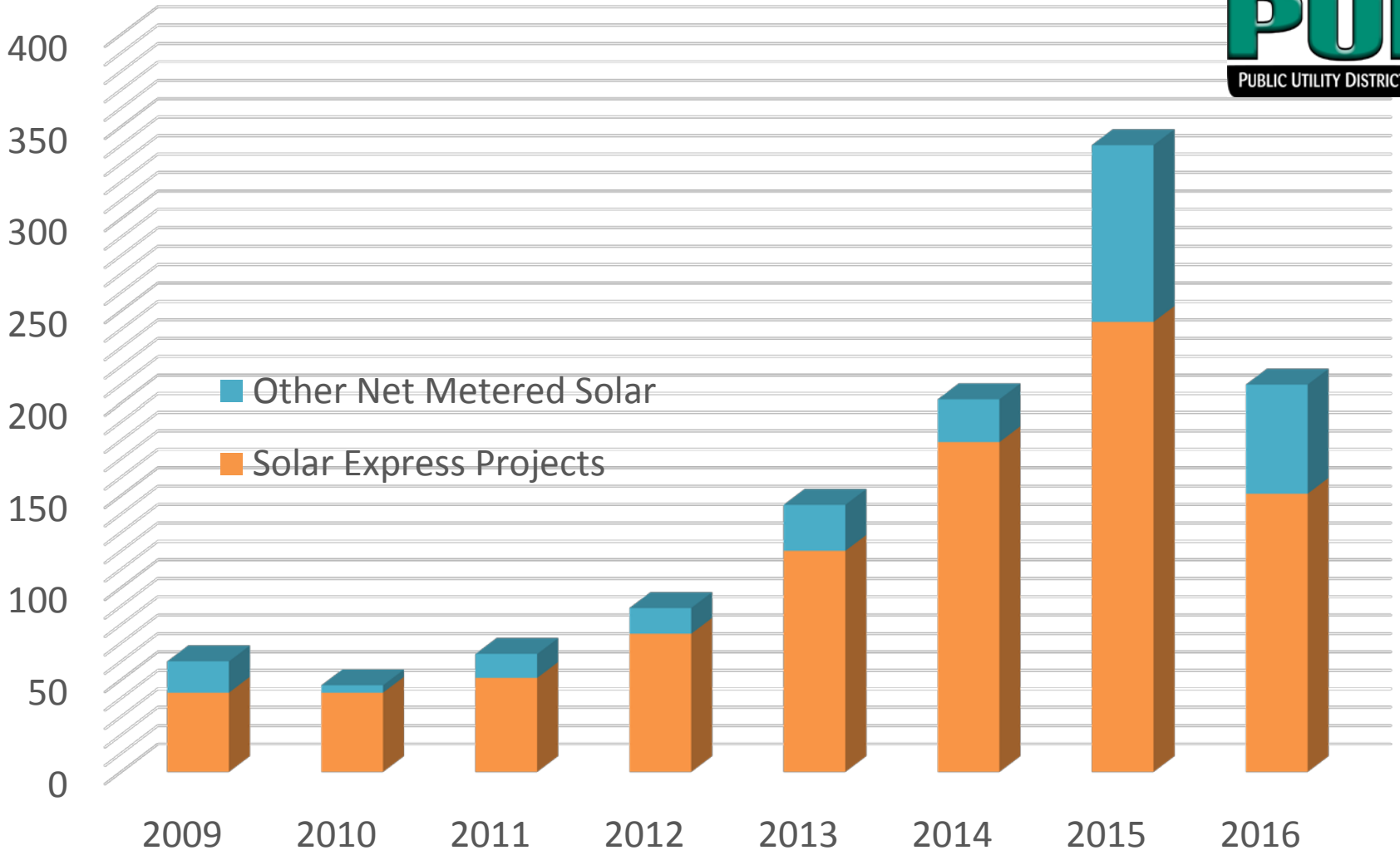
WA STATE PRODUCTION



Jefferson County PUD

- Total Systems Installed as of June 2016
  - Residential - 226
  - Commercial - 8
  - Solar Groups - 1
- 1,1973.4 Mwh generated in production year 2016
- Incentive Payment Rates Paid
  - 2014 – 100% (54¢/kwh, made-in-Washington example)
  - 2015 – 70% (37.8¢/kwh)
  - 2016 – 61.53% (33.22¢/kwh)

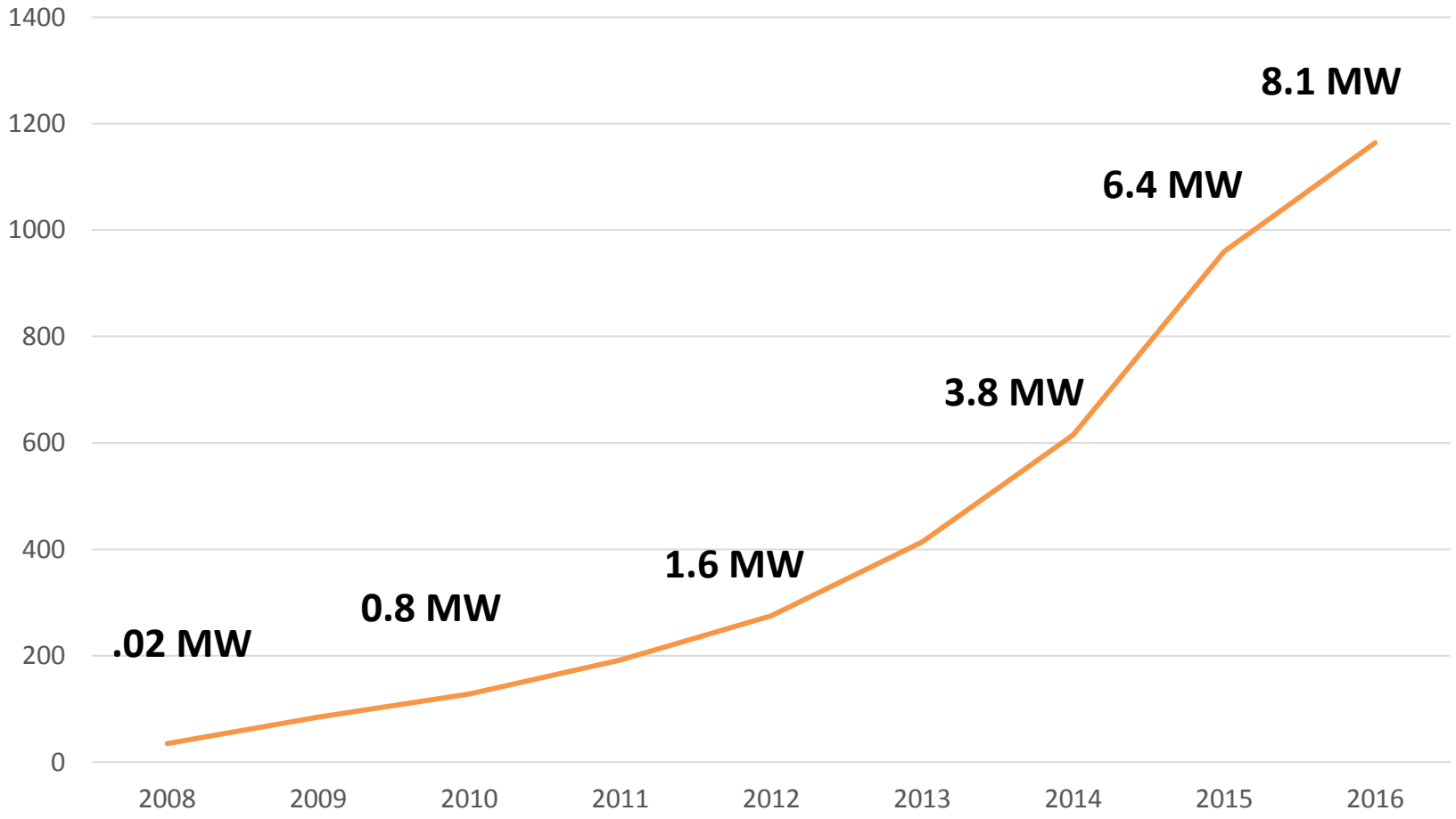
Solar Demand by Number of New Projects*



*2016 numbers are as of August 30, 2016

PUD's Cumulative Customer-Generation

8.1 MW as of 9-1-2016



SNOHOMISH COUNTY PUD
PUBLIC UTILITY DISTRICT NO. 1

Current Trends in Specs

2015 Specs

- 326 Residential
- 12 Commercial

72% through Solar Express

Avg Residential Size: **7.3 kW**

Average Cost per Watt: $4.24

97% use WA-made modules

2016 Specs (as of Aug 30, 2016)

- 202 Residential
- 8 Commercial

73% through Solar Express

Avg Residential Size: **7.8 kW**

Average Cost per Watt: $3.87

94% use WA-made modules

SNOHOMISH COUNTY PUD
PUBLIC UTILITY DISTRICT NO. 1

Production Data

About 1,050 certified systems installed to date

- Generated 5.8 million kWh during 2015-2016 FY
- Administered $2.6 million in incentive payments (87% of our limit)
- Average annual production: 891 kWh

Photo credit: Rents Due Ranch, Fire Mountain Solar

Questions?

Erika Coveny
Assistant Program Manager, Renewables
Residential Energy Efficiency
Ph: 425-783-1906
emcoveny@snopud.com

SNOHOMISH COUNTY PUD
PUBLIC UTILITY DISTRICT NO. 1

Photo credit: Camano Center, Fire Mountain Solar

Clark Public Utilities

Solar Update 2016

Bart Hansen

Photo Voltaic Solar Systems

PHOTO VOLTAIC SYSTEMS

AS OF 10/10/2016 @ 9:27:16 AM

INSTALL ACTIVITY	9/10/2016 - 10/10/2016
CUSTOMER QTY	4
GENERATOR* QTY	4
TTL CAPACITY (kW)	14.00

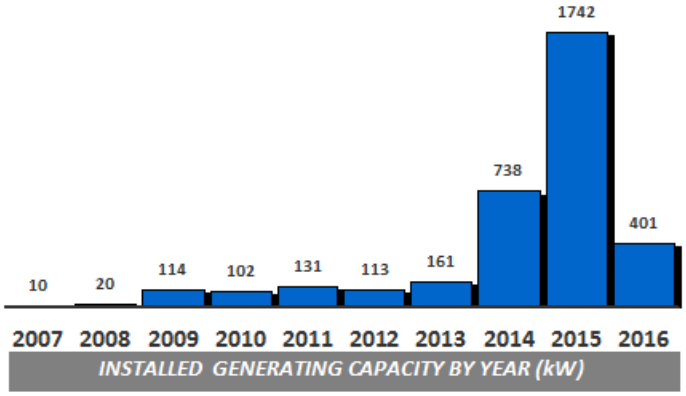
* GENERATOR QTY IS EQUAL TO THE NUMBER OF INVERTERS PER SYSTEM.

SECTOR TOTALS**	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
CUSTOMER QTY	533	32	7
GENERATOR* QTY	625	66	53
TTL CAPACITY (kW)	3026.51	319.54	286.20

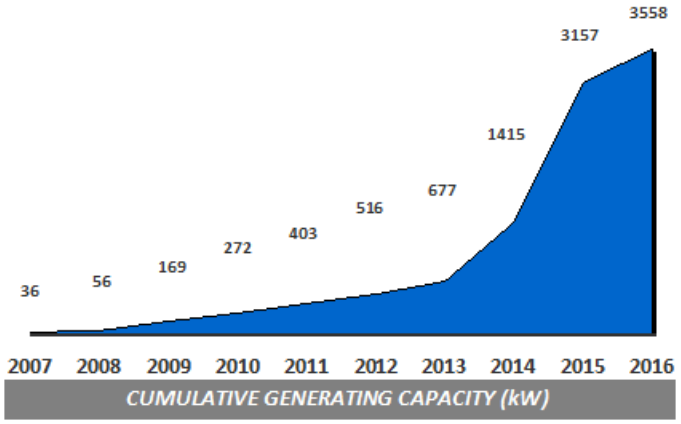
* GENERATOR QTY IS EQUAL TO THE NUMBER OF INVERTERS PER SYSTEM.
** INCLUDES JOBS IN THE PIPELINE.

YEARLY ACTIVITY	PREVIOUS	2009	2010	2011	2012	2013	2014	2015	2016	TOTAL	PIPELINE**	TOTAL
CUSTOMER QTY	21	8	9	31	33	37	123	234	63	559	13	572
GENERATOR* QTY	27	24	19	35	40	41	181	295	67	729	15	744
TTL CAPACITY (kW)	55.69	113.74	102.09	131.48	112.83	161.11	738.02	1742.50	400.96	3,558.40	73.85	3,632.25

* GENERATOR QTY IS EQUAL TO THE NUMBER OF INVERTERS PER SYSTEM.
** PIPELINE CONSISTS OF SYSTEMS ENTERED INTO THE DATABASE BUT NOT YET INSTALLED.



INSTALLED GENERATING CAPACITY BY YEAR (kW)



CUMULATIVE GENERATING CAPACITY (kW)

Generator Totals by Sector

Clark Public Utilities

INSTALLED NET-METERED GENERATOR AC CAPACITY

AS OF 9/22/2016 @ 3:27:53 PM

RESIDENTIAL		**3056.48 kW**
	Photo Voltaic	3042.58 kW
	Wind	12.7 kW
	Engine Generator	1.2 kW
COMMERCIAL		**288.22 kW**
	Photo Voltaic	286.47 kW
	Wind	1.75 kW
INDUSTRIAL		**284.6 kW**
	Photo Voltaic	284.6 kW
TOTAL		**3629.3 kW**
CUMULATIVE GENERATING CAPACITY CAP		70 %
APPROXIMATE NUMBER OF AVAILABLE PROJECTS		224
1996 Peak Demand x 0.5% (1033MW x .005 = 5.165MW)		

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PUGET SOUND BIZTALK

Moses Lake silicon plant to shut down due to ongoing trade war with China over solar panels

Feb 9, 2016, 7:01am PST

Feb 9, 2016

REC Silicon is shutting down its production plant in Moses Lake.

REC Silicon will shut down its Moses Lake plant this month due in part to an ongoing trade dispute between China and the United States.

The company said it would shut down two units at the Moses Lake plant, which makes solar-grade silicon for the solar panel industry, until June.

The plant won't immediately layoff any of the 400 employees. The Columbia Basin Herald reports that those employees will be shifted to maintenance and repair work but the company also said in a release that restarting the units was "dependent on the ongoing negotiations towards a resolution in the solar trade war and the general market development outside China."

May 5, 2016

Columbia Basin Herald

REC Silicon to resume production in Moses Lake this month

Story | Comments

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REC Silicon/courtesy photo

REC Silicon

REC Silicon will restart production at its Moses Lake plant later this month.

Posted: Thursday, May 5, 2016 11:34 am

By Ryan Minnerly | 0 comments

MOSES LAKE — REC Silicon announced this week that it will restart production of solar-grade polysilicon at its Moses Lake plant later this month.

According to the announcement, the company will restart its Silane III unit and half-rate production, and the Silane IV unit will restart along with full-rate production in June. The company also announced that the maintenance work that has been completed since production at the Moses Lake plant was curtailed earlier this year "should allow us to run the FBR (Fluid Bed Reactor) unit as well as Silane III and IV for two years without an extended outage," the announcement states.

REC Silicon stopped production on the Silane III unit in Moses Lake in July 2015, with expectations that it would resume production in January 2016. However, in February the company shuttered the rest of its production and extended the shutdown of Silane III. The moves were made in response to impacts from the ongoing trade dispute between the U.S. and China regarding duties charged on the polysilicon material, which is used in solar panels.

The trade disagreement involves tariffs imposed by China on U.S.-made polysilicon imports, to the tune of 57 percent, according to a previous Herald report. The duty is reportedly a response to U.S. duties imposed on Chinese-made solar panels. The dispute has been ongoing for several years, but REC Silicon had previously been able

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