Maryland Solar Jobs Census 2014

GW Solar Institute
THE GEORGE WASHINGTON UNIVERSITY

The SOLAR FOUNDATION™
RESEARCH & EDUCATION TO ADVANCE SOLAR ENERGY

[bw] RESEARCH PARTNERSHIP

FEBRUARY 2015

Acknowledgements

The Solar Foundation® (TSF) is a national 501(c)(3) nonprofit organization whose mission is to increase understanding of solar energy through strategic research that educates the public and transforms markets. In 2010, TSF conducted its first *National Solar Jobs Census* report, establishing the first credible solar jobs baseline and verifying that the solar industry is having a positive impact on the U.S. economy. Using the same rigorous, peer-reviewed methodology, TSF has conducted an annual *Census* in each of the last five years to track changes and analyze trends.

This *Maryland Solar Jobs Census 2014* report is an offshoot of TSF's *National Solar Jobs Census 2014* effort. Research partners for the *Census 2014* effort include:

- The George Washington University Solar Institute;
- Solar Energy Industries Association (SEIA);
- U.S. Department of Energy's SunShot program and the National Renewable Energy Laboratory (NREL) and;
- Interstate Renewable Energy Council (IREC).

Other sponsors and key contributors to this year's *Census* include: Energy Foundation, William and Flora Hewlett Foundation, Tilia Fund, SolarCity, SunPower, SunEdison, GTM Research/SEIA for providing survey respondents with the *U.S. Solar Market Insight: 2013 YIR* report, and Cornell University's School of Industrial Labor Relations for validating the original *Census* methodological framework.

Special thanks to the Maryland DC Virginia Solar Energy Industries Association (MDV-SEIA) for their sponsorship of this Maryland report. We also want to thank all the Maryland solar employers that participated in the survey. Your responses were critical in providing us with accurate and timely data.

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About the Maryland Solar Jobs Census 2014
This report includes information about all types of Maryland companies engaged in the analysis, research and development, production, sales, installation, and use of all solar technologies – ranging from solar photovoltaics (PV), to concentrating solar power (CSP), to solar water heating systems for the residential, commercial, industrial, and utility market segments.

The findings presented herein are based on rigorous survey efforts throughout the month of November 2014 that include more than 4,800 telephone calls and over 50 emails to known and potential solar establishments across Maryland, resulting in a margin of error of +/-3.91% at a 95% confidence interval. Unlike economic impact models that generate employment estimates based on economic data or jobs-per-megawatt (or jobs-per-dollar) assumptions, The Solar Foundation's *Solar Jobs Census* series provides statistically valid and current data gathered from actual employers. This analysis also purposefully avoids artificially inflating its results with questionable multiplier effects often found in analyses of other industries.

About The Solar Foundation®
The Solar Foundation® (TSF) is an independent 501(c)(3) nonprofit organization whose mission is to increase understanding of solar energy through strategic research that educates the public and transforms markets. TSF is considered the premier research organization on the solar workforce, employer trends, and the economic impacts of solar. It has provided expert advice to leading organizations such as the National Academies, the Inter-American Development Bank, the U.S. Department of Energy, and others during a time of dynamic industry growth and policy and economic uncertainty.

While TSF recognizes that solar energy is a key part of our energy future, it is committed to excellence in its aim to help people fairly and objectively gauge the value and importance of these technologies.

About BW Research Partnership
BW Research is widely regarded as the national leader in labor market research for emerging industries and clean energy technologies. In addition to the *Census* series, BW Research has conducted rigorous solar installation and wind industry labor market analysis for the National Renewable Energy Laboratory, wind energy and energy retrofit studies for the Natural Resources Defense Council, a series of comprehensive clean energy workforce studies for the Commonwealth of Massachusetts, Illinois, Vermont, Florida, Pennsylvania, Iowa, and California and numerous skills and gap analyses for community colleges, workforce investment boards, state agencies, and nonprofit organizations.

BW Research provides high-quality data and keen insight into economic and workforce issues related to renewable energy, energy efficiency, transportation, recycling, water, waste and wastewater management, and other environmental fields. The principals of the firm are committed to providing research and analysis for data-driven decision making.

Introduction

The U.S. solar industry posted yet another record year in 2014. Annual solar capacity is expected to have grown by nearly 40% over the previous year, with a total of more than 7,200 megawatts (MW) of new capacity coming on-line.[1] As in the past, this robust installation growth drove continued increases in solar employment, with The Solar Foundation's *National Solar Jobs Census 2014* finding over 173,807 U.S. solar workers as of November 2014. This figure represents 21.8% employment growth over the previous year, making 2014 the second consecutive year in which growth was near or above 20% and exceeded *Census* projections. Since the inaugural *Census* was conducted in 2010, employment in the solar industry has grown by 86%. Employers remain optimistic about growth in the short term – expecting to add over 36,000 solar workers in 2015 – but are anxious about the impact expected federal policy changes will have on solar employment.

Maryland did its part to contribute to national capacity growth and shared in the employment benefits of the state's commitment to solar energy. **As of November 2014, Maryland employs 3,012 solar workers, representing a 29% increase in employment over the previous year.**[2] Maryland solar companies are looking forward to strong employment growth in 2015 as well, expecting 26% growth in the state solar workforce over the next twelve months.

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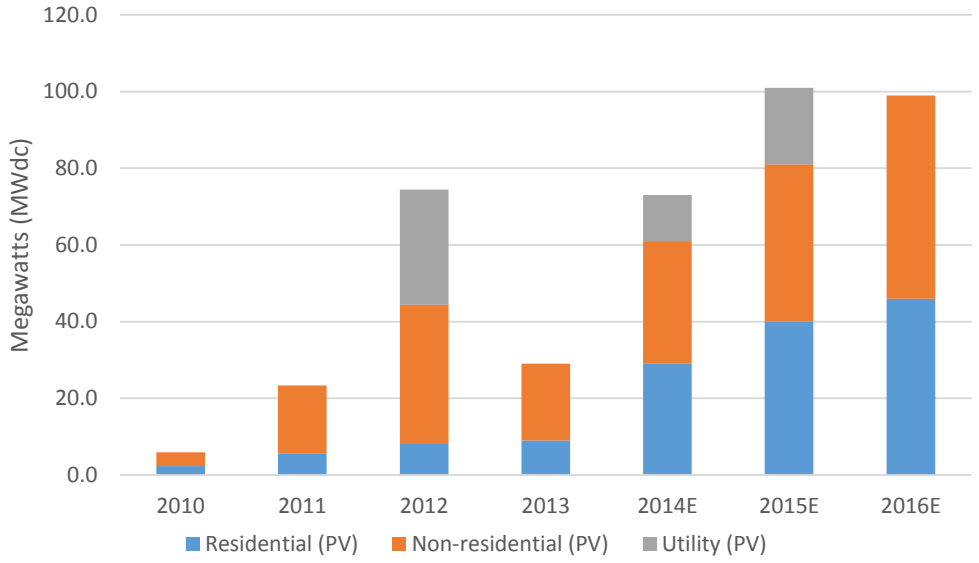
[1] SEIA/GTM Research *Solar Market Insight Q3 2014*

[2] It should be noted that different methods were used to generate employment figures in each of these years. Numbers for 2013 were based on internally-generated estimates based on national *Census* data and other industry data. The figures cited in this 2014 report are based on a survey and statistical extrapolation effort targeting Maryland companies known or suspected to employ solar workers, and are much more rigorous than other estimates. The year over year increase in employment in Maryland is a product of both real employment growth and differing estimation methods.

Figure 1: Annual Maryland Solar Photovoltaic Capacity Additions, 2010-2016E



Source: SEIA/GTM Research *Solar Market Insight* report series

As in the national solar industry and those in other states, solar job growth remains intimately tied to new installed capacity. Maryland is expected to have had its second-best year for new capacity yet in 2014, with over 70 MW projected to have been installed. The residential and non-residential market segments are the major drivers of capacity growth, with 29 MW and 32 MW expected to have been installed in the segments, respectively, in 2014. Should the state have achieved the 29 MW of projected residential capacity, it will have installed more residential solar in 2014 than in the previous four years combined. As of the publication of this report, only about 50% of this capacity projection had been installed; however, the nearly 13 MW installed in the first three quarters of 2014 still represent 44% growth in annual residential installed capacity over the previous year.[3]

Looking forward in the near term, annual installed capacity is expected to keep growing, with the state posting approximately 100 MW of new capacity across all market segments in each of 2015 and 2016. As usual, this increased capacity can be expected to result in solar employment growth, especially in demand-side sectors such as installation, sales and distribution, and project development, which collectively represent 76% of all solar jobs in the nation. In Maryland, by comparison, these sectors account for 90% of all solar workers, perhaps suggesting an even stronger link between demand for solar and job growth.

Maryland's success to date – and continued progress – which solar can be attributed, at least in part, to its collection of supportive state policies. The state Renewable Portfolio Standard requires utilities and retail electricity suppliers to derive 20% of their retail electricity sales by 2020 (and thereafter) from renewable energy. In addition, the RPS includes a 2% carve-out for solar energy, which is one of the most aggressive percentage-

[3] SEIA/GTM Research *Solar Market Insight Q3 2014*

based RPS solar targets in the eastern U.S. (second only to New Jersey and tied with Delaware) and among the top five in the nation.[4] The solar renewable energy certificates (SRECs) used to demonstrate compliance with the carve-out have been consistently trading for $120-150 over the last two years.[5]

In addition, the state offers a modest tax credit for residential and corporate solar customers, as well as a state rebate for these systems. Maryland is also one of at least two dozen states allowing for third-party ownership of solar energy systems, a financing tool that continues to enable at least half – and up to 90%, in some cases – of the residential systems installed in states like California, Arizona, Colorado, Massachusetts, New Jersey, and New York.[6] The state also has a robust net metering policy, which has consistently been given a grade of "A" by industry advocates and analysts since 2007.[7]

Throughout 2014, Maryland solar companies and supporters have worked to expand access to solar financing, one of the greatest remaining barriers to solar adoption. In late 2014, Anne Arundel County approved a clean energy loan program for commercial property owners under Maryland state law authorizing the creation of local Property Assessed Clean Energy programs, which allow property owners to finance energy improvements that are repaid through special assessments on property tax bills.[8] Earlier in the year, a bill was passed to reduce regulatory requirements for crowdfunding campaigns – a growing trend in solar project finance.[9] Progress on this front was not limited to legislative changes, however. Solar companies also worked to increase financing options, expanding the availability of third-party ownership as well as new alternatives to leases or power purchase agreements, such as solar loans.

Continued annual investigations of employment in the Maryland solar industry will help determine the ongoing impacts of both existing and new policies (such as a new proposal to double the state's RPS requirements to 40% renewables by 2025[10]) on the state's solar workforce.

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[4] North Carolina Clean Energy Technology Center *Database of State Incentives for Renewables and Efficiency* at www.dsireusa.org/solar

[5] From SRECTrade at www.srectrade.com/srec_markets/maryland. Accessed January 22, 2015.

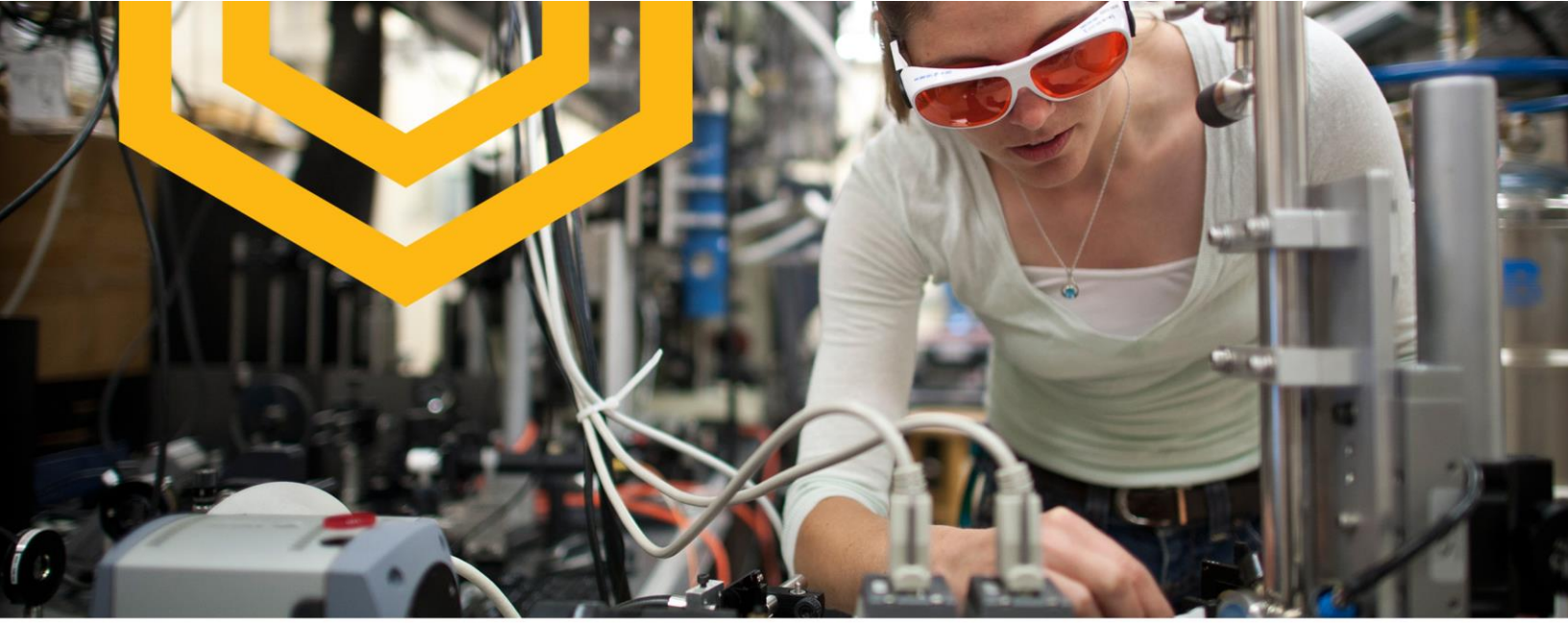
[6] SEIA/GTM Research *Solar Market Insight* Q3 2014

[7] Interstate Renewable Energy Council/Vote Solar Initiative *Freeing the Grid 2015* at www.freeingthegrid.org

[8] County Council of Anne Arundel County, Maryland Bill No. 68-14, available at www.aacounty.org/CountyCouncil/Resources/2014/68-14.pdf

[9] Maryland General Assembly SB0811 (2014), available at http://mgaleg.maryland.gov/2014RS/chapters_noln/Ch_557_sb0811T.pdf

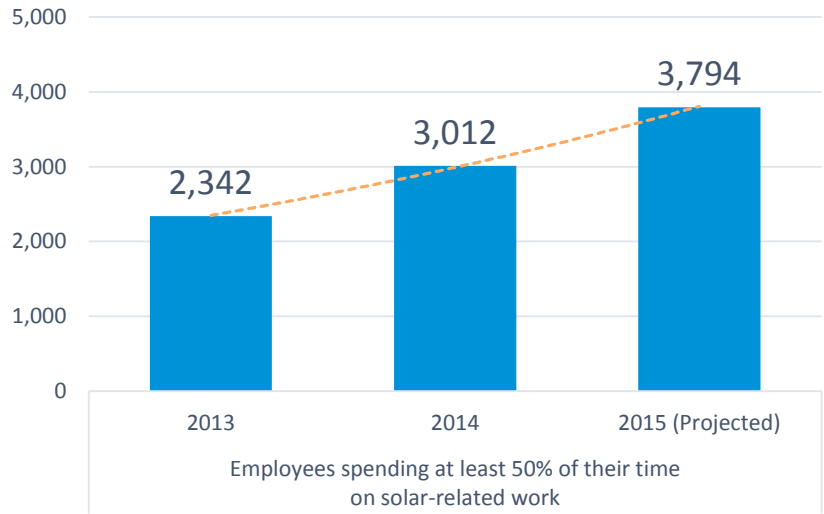
[10] See: "Renewable energy supporters rally in Annapolis" from ABC 2 News Baltimore at www.abc2news.com/news/political/renewable-energy-supporters-rally-in-annapolis



Overview

The Maryland solar industry employs 3,012 workers[11] at 275 establishments throughout the state and is ranked #13 in jobs and #13 as a percentage of all jobs. **This is 670 more solar workers than in 2013, representing a growth rate of approximately 29%, which is more than 40 times faster than the growth rate for all jobs in Maryland (0.7%) over the same period.** Employers expect to add more than 750 new solar workers over 2015, at a growth rate of 25.9%. This compares to a projected growth rate of 1.2% for 2015 for all jobs in Maryland.[12]

Figure 2: Maryland Solar Employment – 2013 – 2015



[11] About 94% of solar workers in Maryland spend all of their time focused on solar work.
[12] Economic Modeling Specialists, International, 2014.3

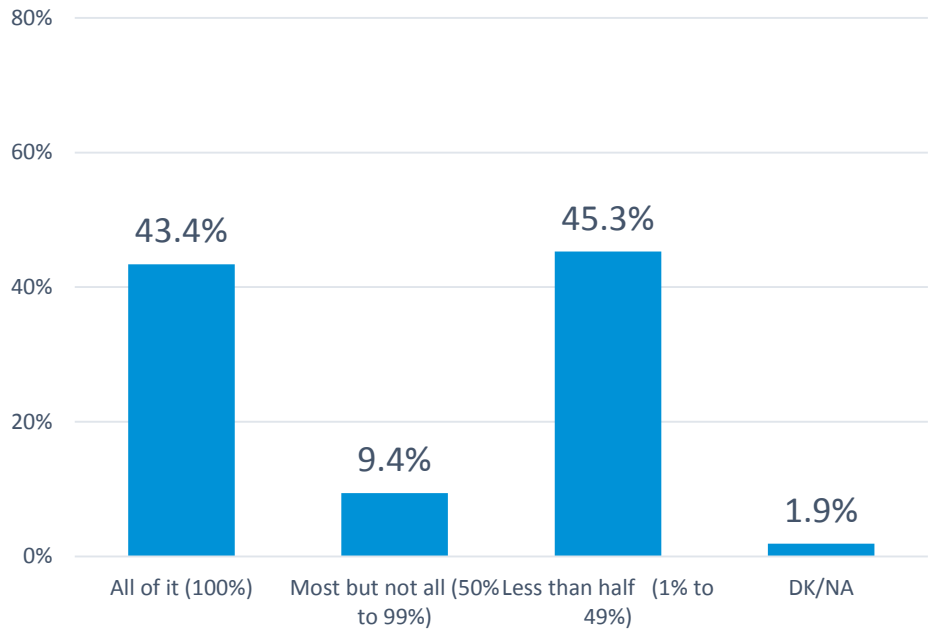
The installation sector employs the overwhelming majority of solar workers (78.4%), however, project developers expect to add workers at the fastest rate over the coming 12 months.

Table 1: Maryland Solar Employment by Sector – 2014 – 2015

	2014	Projected 2015	Projected 2014-2015 Growth
Installation	2,362	3,008	27.3%
Manufacturing	129	152	17.8%
Sales & Distribution	135	172	27.4%
Project Developers	216	284	31.5%
All Other	170	177	4.1%
Total	3,012	3,794	26.0%

Maryland solar establishments were also asked about the percentage of their revenues attributed to solar. A smaller proportion of Maryland firms receive all of their revenues from solar (43.4%) compared to the national average (46.4%).

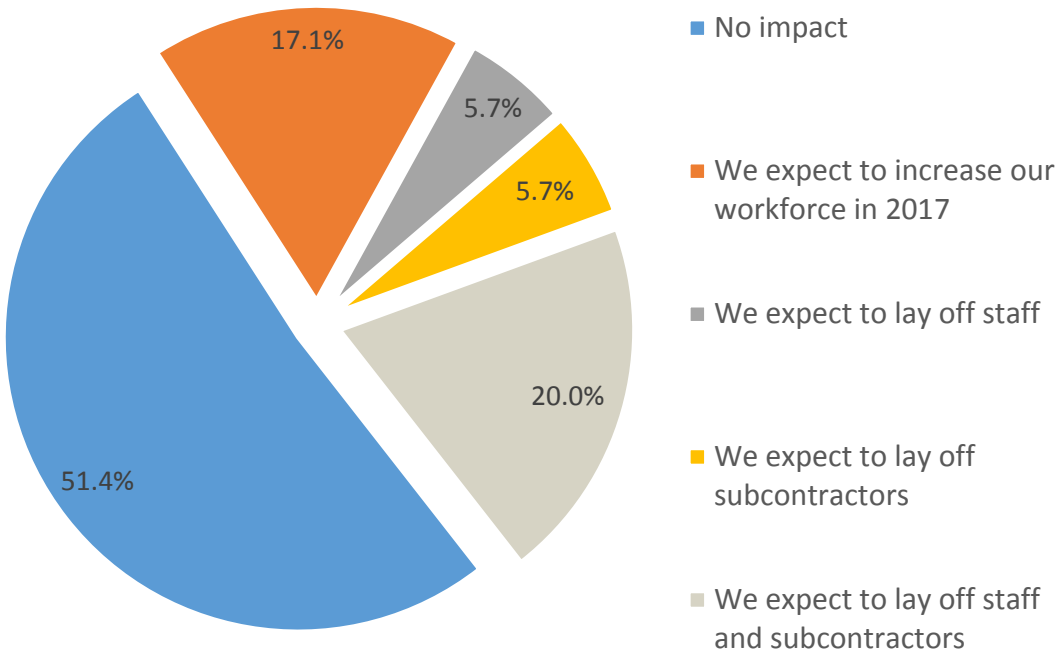
Figure 3: Company Revenues Attributed to Solar



The overwhelming majority (87%) of all solar installations were financed, as opposed to purchased outright. This is higher than the national average and may suggest that the greater number of pure-play solar firms in Maryland offer innovative financing for systems.

As part of the *Census 2014* effort, employers were asked what employment changes they are expecting once the 30% federal Investment Tax Credit (ITC) reduces to 10% for commercial projects and is eliminated for residential installations after 2016. About 70% of Maryland employers report that the ITC has significantly improved their business, and about one-third expect to lay off staff and/or subcontractors as a result of its expiration.

Figure 4: Investment Tax Credit Expiration Expected Employment Impact



Maryland solar employers hired fewer women and ethnic and racial minorities than their national counterparts, with the exception of African-Americans. Maryland solar employers hired over twice as many African-Americans (on a percentage basis) as the national average for solar companies (6%).

Table 2: Demographics of Recent Solar Hires

	2014 MD Solar	2014 National Solar	MD Workforce Overall[13]
Women	16.6%	21.6%	51.2%
African-American	14.8%	6.0%	24.1%
Veterans of the U.S. Armed Forces	7.5%	9.7%	n/a
Latino or Hispanic	6.7%	16.3%	6.8%
Asian or Pacific Islanders	4.5%	7.0%	5.3%

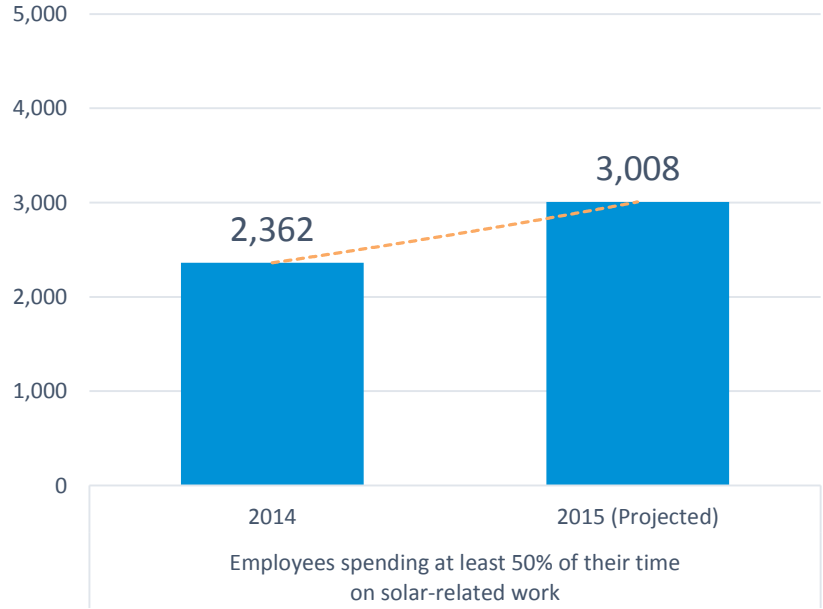
The following pages include a detailed breakdown of the installation sector and specific workforce needs of Maryland employers. While there are a number of firms and workers in manufacturing, sales, project development, and other activities, these sectors had insufficient responses to provide statistically significant data.

[13] Economic Modeling Specialists, International, 2014.3

Installation

The installation sector represents nearly 80% of all solar employment in Maryland, employing 2,362 workers. This is expected to rise by 27.4%, exceeding 3,000 installation workers by the 4th quarter of 2015.

Figure 5: Projected Employment Growth, Installation Sector



Just over four in five installation firms work with photovoltaic products, which is similar to the national number. There are more installation firms working with solar water heating in Maryland as compared to the national average. No firms surveyed reported working with concentrating solar power.

Table 3: Solar Firms by Technology – Installation

	2014
Photovoltaic	83.9%
Water heating	29.0%
Concentrating solar power	0.0%
Other	19.4%

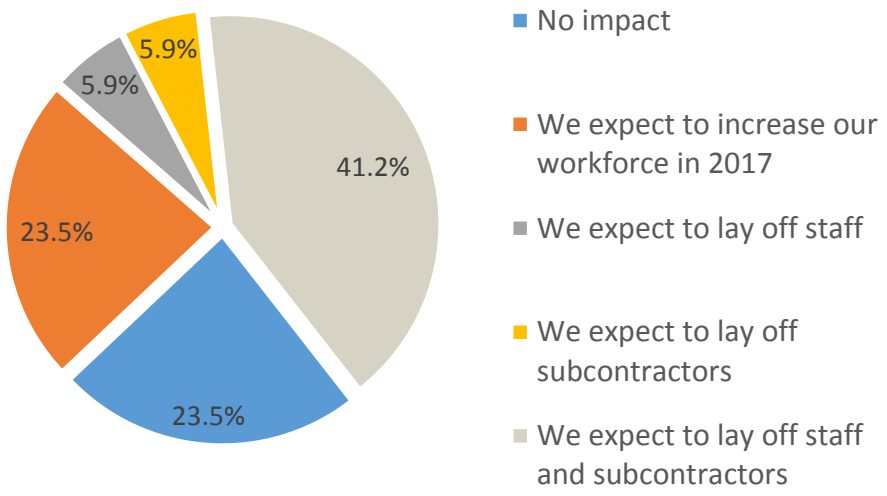
Photovoltaic installers report that they primarily work on residential systems (52%). Approximately 36% are involved in commercial/industrial projects, and 12% install utility-scale systems (these are often subcontractors to larger project developers).

Table 4: Solar Firms by Size of Project

	Primary PV Project
Residential	52.0%
Commercial	36.0%
Utility-Scale	12.0%

More than half (53%) of solar installers in Maryland expect to lay off staff and/or subcontractors if the ITC is not renewed. As installation represents the largest industry sector in the state, this could result in a decline in total statewide solar employment.

Figure 6: Employment Impact of ITC Expiration – Installation

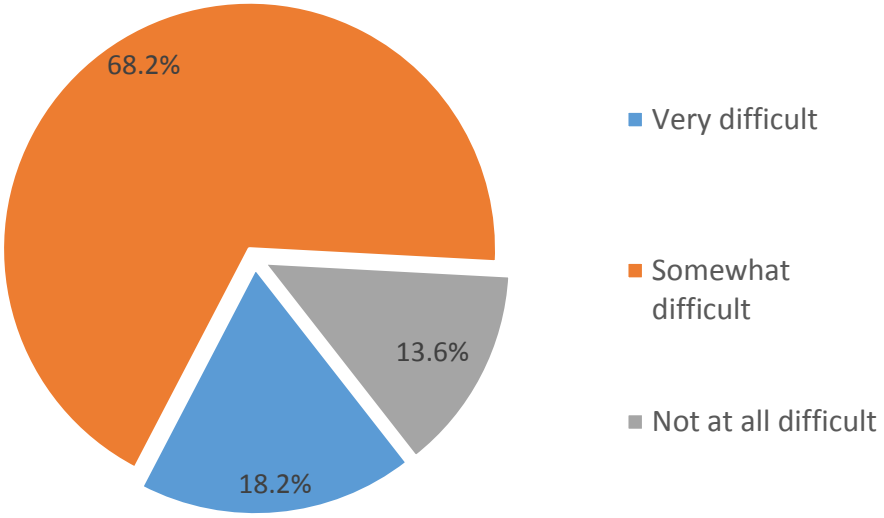


Workforce Development

Approximately 720 solar workers were hired in Maryland, with about 485 as newly created positions, 220 to replace retiring workers, and 15 were existing employees that were given new solar responsibilities. This section includes detailed findings from the survey, including profiles of these new hires.

Solar establishments in Maryland report average difficulty finding applicants that meet their companies' qualifications. The survey shows that 18.2% of Maryland solar employers find it very difficult – and 68.2% somewhat difficult – to find qualified workers for their open positions.

Figure 7: Employer Difficulty Hiring



Solar installers pay slightly less in Maryland ($22.67) than the national average ($24.01) for installation workers, though the amount is significantly more than the living wage in the state of $13.99 per hour.[14]

As with other parts of the U.S., experience matters in Maryland. Over half (55.4%) of the workers hired in 2014 were reported to have prior experience. About 26.3% of workers hired over the period had a bachelor's degree or higher, while only 2.3% had an associate's degree.

Finally, Maryland employers were asked about their use of on-the-job training and credentials. Employers in Maryland are less likely to have formal OJT programs (though nearly three in four still do), and slightly more value credentials, as compared to the national averages (Table 5).

Table 5: Workforce Profiles

	Difficulty hiring %very/some/not	OJT %yes/no	Credentials %yes/no
Maryland	18/71/12	75/25	64/36
United States	17/60/23	79/21	61/39

[14] http://www.dllr.state.md.us/labor/prev/livingwagefaqs.shtml#1

Figure 8: Map of State Legislative District Employment

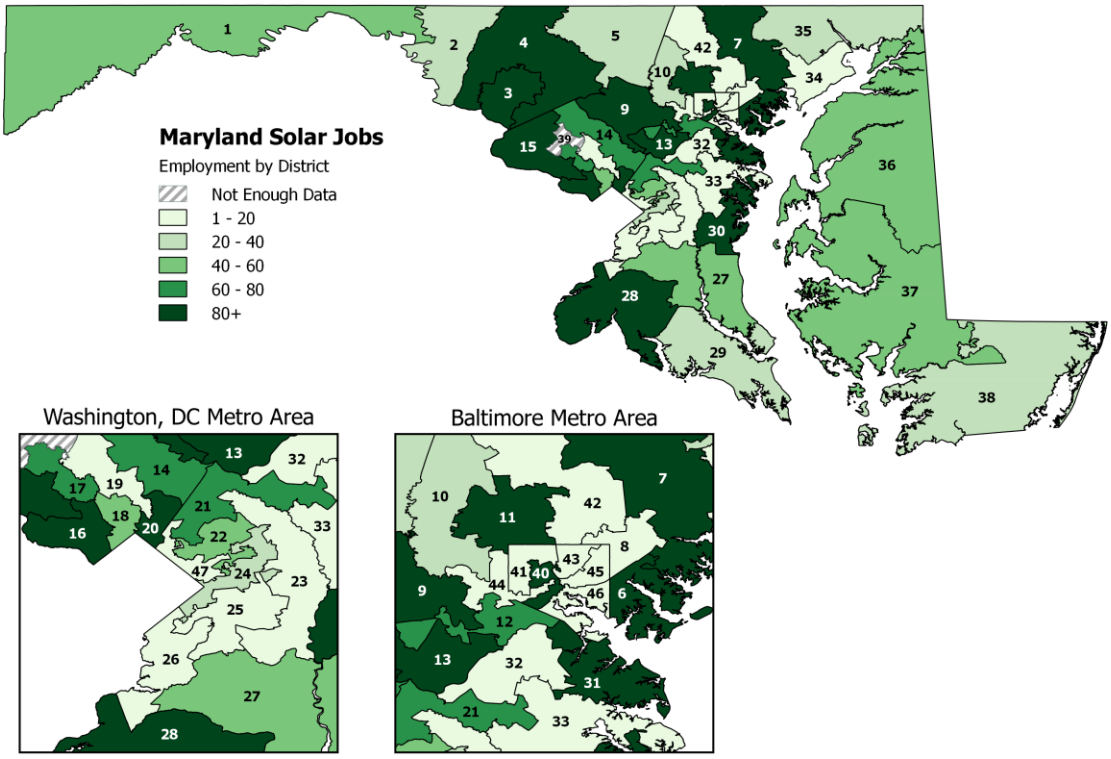


Table 6: State House District Employment

District	Representative	2014 Emp.	Women	African American	Latino/ Hispanic		Asian/ Pacific Islander	Veterans	Members of a Union
1A	Wendell R. Beitzel								
1B	Jason C. Buckel	45	7	7	3		2	3	0
1C	Mike McKay								
2A	Neil Parrot								
2A	Andrew A. Serafini	29	5	4	2		1	2	0
2B	Brett Wilson								
3A	Carol L. Krimm								
3A	Karen Lewis Young	140	23	21	9		6	11	1
3B	William Folden								
4	Kathy Afzali								
4	Kelly Schulz	103	17	15	7		5	8	0
4	David E. Vogt III								
5	Susan W. Krebs								
5	Justin Ready	29	5	4	2		1	2	0
5	Haven Showmaker								

6	**Robin L. Grammer Jr.**								
6	**Robert B. Long**	85	14	13	6		4	6	0
6	**Ric Metzgar**								
7	**Rick Impallaria**								
7	**Pat McDonough**	82	14	12	5		4	6	0
7	**Kathy Szeliga**								
8	**Eric M. Bromwell**								
8	**John W.E. Cluster Jr.**	16	3	2	1		1	1	0
8	**Christan Miele**								
9A	**Trent Kittleman**								
9A	**Warren E. Miller**	84	14	12	6		4	6	0
9B	**Robert L. Flanagan**								
10	**Benjamin Brooks**								
10	**Jay Lakisi**	36	6	5	2		2	3	0
10	**Adrienne A. Jones**								
11	**Shelly Hettleman**								
11	**Dan K. Morhaim**	82	14	12	5		4	6	0
11	**Dana Stein**								
12	**Eric Ebersole**								
12	**Terri L. Hill**	72	12	11	5		3	5	0
12	**Clarence K. Lam**								
13	**Vanessa E. Atterbeary**								
13	**Shane E. Pendergrass**	414	69	61	28		19	31	2
13	**Frank S. Turner**								
14	**Anne R. Kaiser**								
14	**Eric G. Luedtke**	79	13	12	5		4	6	0
14	**Craig J. Zucker**								
15	**Kathleen M. Dumais**								
15	**David Fraser-Hidalgo**	256	42	38	17		12	19	1
15	**Aruna Miller**								
16	**C. William Frick**								
16	**Ariana B. Kelly**	126	21	19	8		6	9	1
16	**Marc Korman**								
17	**Kumar P. Barve**								
17	**Jim Gilchrist**	68	11	10	5		3	5	0
17	**Andrew Platt**								
18	**Alfred C. Carr Jr.**								
18	**Ana Sol Gutierrez**	60	10	9	4		3	5	0
18	**Jeff Waldstreicher**								

19	**Bonnie Cullision**								
19	**Benjamin F. Kramer**	5	1	1	0		0	0	0
19	**Marice Morales**								
20	**Sheila E. Hixson**								
20	**David Moon**	304	50	45	20		14	23	1
20	**William C. Smith Jr.**								
21	**Ben Barnes**								
21	**Barbara Frush**	66	11	10	4		3	5	0
21	**Joseline A. Pena-Melnyk**								
22	**Tawanna P. Gaines**								
22	**Anne Healey**	58	10	9	4		3	4	0
22	**Alonzo T. Washington**								
23A	**Geraldine Valentone-Smith**								
23B	**Marvin E. Holmes Jr.**	16	3	2	1		1	1	0
23B	**Joseph F. Vallario Jr.**								
24	**Erek L. Barron**								
24	**Carolyn J. B. Howard**	24	4	4	2		1	2	0
24	**Michael L. Vaughn**								
25	**Angela Angel**								
25	**Darryl Barnes**	16	3	2	1		1	1	0
25	**Dereck E. Davis**								
26	**Tony Knotts**								
26	**Kriselda Valderrama**	10	2	2	1		0	1	0
26	**Jay Walker**								
27A	**James E. Proctor Jr.**								
27B	**Michael A. Jackson**	42	7	6	3		2	3	0
27C	**Mark N. Fisher**								
28	**Sally Jameson**								
28	**Edith J. Patterson**	82	14	12	5		4	6	0
28	**C. T. Wilson**								
29A	**Matthew Morgan**								
29B	**Deborah C. Rey**	22	4	3	1		1	2	0
29C	**Anthony J. O'Donnell**								
30A	**Michael E. Busch**								
30A	**Herb McMillan**	132	22	19	9		6	10	1
30B	**Seth A. Howard**								
31A	**Ned Carey**								
31B	**Nicholaus R. Kipke**	115	19	17	8		5	9	0
31B	**Meagan C. Simonaire**								

32	**Pamela Beidle**								
32	**Mark S. Chang**	1	0	0	0		0	0	0
32	**Theodore Sophocleus**								
33	**Tony McConkey**								
33	**Sid Saab**	18	3	3	1		1	1	0
33	**Cathy Vitale**								
34A	**Glen Glass**								
34A	**Mary Ann Lisanti**	8	1	1	1		0	1	0
34B	**Susan K. McComas**								
35A	**Kevin Balley Hornberger**								
35B	**Andrew Cassilly**	29	5	4	2		1	2	0
35B	**Teresa E. Reilly**								
36	**Steven J. Arentz**								
36	**Jefferson L. Ghrist**	47	8	7	3		2	4	0
36	**Jay A. Jacobs**								
37A	**Sheree Sample-Hughes**								
37B	**Christopher T. Adams**	42	7	6	3		2	3	0
37B	**Johnny Mautz**								
38A	**Charles J. Otto**								
38B	**Carl Anderton Jr.**	35	6	5	2		2	3	0
38C	**Mary Beth Carozza**								
39	**Charles Barkley**								
39	**Kirill Reznik**	-	-	-	-		-	-	-
39	**Shane Robinson**								
40	**Frank M. Conaway Jr.**								
40	**Antonio L. Hayes**	87	14	13	6		4	7	0
40	**Barbara Robinson**								
41	**Jill P. Carter**								
41	**Nathaniel T. Oaks**	8	1	1	1		0	1	0
41	**Samuel I. Rosenberg**								
42A	**Stephen W. Lafferty**								
42B	**Susan L. M. Aumann**	1	0	0	0		0	0	0
42B	**Chris West**								
43	**Curt Anderson**								
43	**Maggie McIntosh**	5	1	1	0		0	0	0
43	**Mary L. Washington**								
44A	**Keith E. Haynes**								
44B	**Charles E. Sydnor III**	8	1	1	1		0	1	0
44B	**Pat Young**								

45	Talmadge Branch								
45	Cheryl D. Glenn	5	1	1	0		0	0	0
45	Cory V. McCray								
46	Luke Clippinger								
46	Peter A. Hammen	8	1	1	1		0	1	0
46	Brooke E. Lierman								
47A	Diana M. Fennell								
47A	Jimmy Tarlau	11	2	2	1		0	1	0
47B	Will Campos								
	Total	3,012	500	446	202		136	226	12
	% Total	100.0%	16.6%	14.8%	6.7%		4.5%	7.5%	0.4%

Table 7: State Senate District Employment

District	Representative	2014 Emp.	Women	African American	Latino/ Hispanic	Asian/ Pacific Islander	Veterans	Members of a Union
1	George C. Edwards	45	7	7	3	2	3	0
2	Christopher B. Shank	29	5	4	2	1	2	0
3	Ronald N. Young	140	23	21	9	6	11	1
4	Michael J. Hough	103	17	15	7	5	8	0
5	Joseph M. Getty	29	5	4	2	1	2	0
6	Johnny Ray Salling	85	14	13	6	4	6	0
7	J.B. Jennings	82	14	12	5	4	6	0
8	Katherine Klausmeier	16	3	2	1	1	1	0
9	Gail H. Bates	84	14	12	6	4	6	0
10	Delores G. Kelley	36	6	5	2	2	3	0
11	Bobby A. Zirkin	82	14	12	5	4	6	0
12	Edward J. Kasemeyer	72	12	11	5	3	5	0
13	Guy Guzzone	414	69	61	28	19	31	2
14	Karen S. Montgomery	79	13	12	5	4	6	0
15	Brian J. Feldman	256	42	38	17	12	19	1
16	Susan C. Lee	126	21	19	8	6	9	1
17	Cheryl C. Kagan	68	11	10	5	3	5	0
18	Richard S. Madaleno Jr.	60	10	9	4	3	5	0
19	Roger P. Manno	5	1	1	0	0	0	0
20	Jamie Raskin	304	50	45	20	14	23	1
21	Jim Rosapepe	66	11	10	4	3	5	0
22	Paul G. Pinsky	58	10	9	4	3	4	0

23	**Douglas J. J. Peters**	16	3	2	1	1	1	0
24	**Joanne C. Benson**	24	4	4	2	1	2	0
25	**Ulysses Currie**	16	3	2	1	1	1	0
26	**C. Anthony Muse**	10	2	2	1	0	1	0
27	**Thomas V. Mike Miller Jr.**	42	7	6	3	2	3	0
28	**Thomas M. Middleton**	82	14	12	5	4	6	0
29	**Steve Waught**	22	4	3	1	1	2	0
30	**John C. Astle**	132	22	19	9	6	10	1
31	**Bryan W. Simonaire**	115	19	17	8	5	9	0
32	**James E. DeGrange Sr.**	1	0	0	0	0	0	0
33	**Edward R. Reilly**	18	3	3	1	1	1	0
34	**Robert Cassilly**	8	1	1	1	0	1	0
35	**Wayne Norman**	29	5	4	2	1	2	0
36	**Stephen S. Hershey Jr.**	47	8	7	3	2	4	0
37	**Adelaide C. Eckardt**	42	7	6	3	2	3	0
38	**James N. Mathias Jr.**	35	6	5	2	2	3	0
39	**Nancy J. King**	-	-	-	-	-	-	-
40	**Catherine E. Pugh**	87	14	13	6	4	7	0
41	**Lisa A. Gladden**	8	1	1	1	0	1	0
42	**James Brochin**	1	0	0	0	0	0	0
43	**Joan Carter Conway**	5	1	1	0	0	0	0
44	**Shirley Nathan-Pulliam**	8	1	1	1	0	1	0
45	**Nathaniel J. McFadden**	5	1	1	0	0	0	0
46	**Bill Ferguson**	8	1	1	1	0	1	0
47	**Victor R. Ramirez**	11	2	2	1	0	1	0
	Total	3,012	500	446	202	136	226	12
	% of Total	100.0%	16.6%	14.8%	6.7%	4.5%	7.5%	0.4%

Figure 9: Map of Congressional District Employment

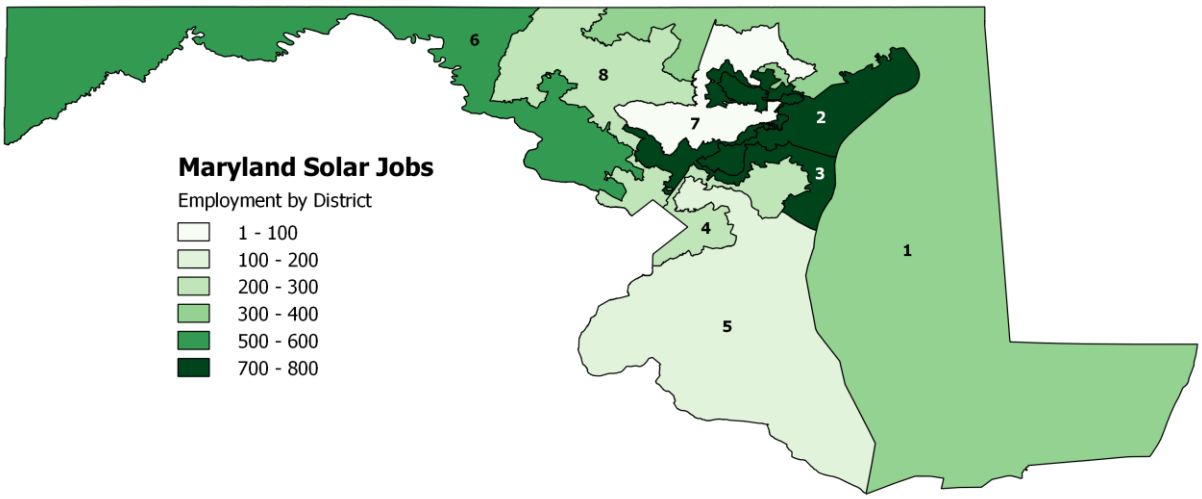


Table 8: Congressional District Employment

District	Representative	2014 Emp.	Women	African American	Latino/ Hispanic	Asian/ Pacific Islander	Veterans	Members of a Union
1	Andy Harris	459	76	68	31	21	34	2
2	Dutch Ruppersberger	487	81	72	33	22	37	2
3	John P. Sarbanes	616	102	91	41	28	46	2
4	Donna F. Edwards	290	48	43	19	13	22	1
5	Steny H. Hoyer	187	31	28	13	8	14	1
6	John K. Delaney	591	98	88	40	27	44	2
7	Elijah E. Cummings	94	16	14	6	4	7	0
8	Christopher Van Hollen Jr.	288	48	43	19	13	22	1
	Total	3,012	500	446	202	136	226	12
	% Total	100.0%	16.6%	14.8%	6.7%	4.5%	7.5%	0.4%

Note: Due to a larger margin of error, overlapping geographic boundaries may not total to overall demographic figures.

Conclusions

The Maryland solar industry is growing rapidly, far outpacing overall statewide job growth over the past year, and even exceeding the national solar industry's historic growth. Owing primarily to projected increases in annual installed capacity in the near term, firms in Maryland remain optimistic, expecting to add about 750 new workers through 2015 at a rate of nearly 26% growth. This expected growth will continue to be driven by a host of supportive state-level policies, further declines in the installed cost of solar, and the rising cost of electricity delivered through the electric grid.[15]

Solar job creation is impacting people of all different backgrounds, including women, ethnic and racial minorities, and veterans of the U.S. Armed Forces. The jobs often require experience, and on average pay well above the living wage. The jobs are accessible to people without a college degree, though prior experience is critical to landing a solar job in Maryland.

The ITC has clearly helped solar companies flourish in Maryland, with 82.5% of firms reporting that it has helped their business (70% significantly so), and nearly half of firms report that they will lay off staff or contractors (or both). Though the future for the ITC beyond 2016 remains unclear – as does the actual impact its scheduled decline and expiration will have on employment – the Maryland solar industry will at least benefit from the expanded access to solar financing (both public and private) observed in 2014, which stands to make solar more of a possibility for home and business owners, local governments, school districts, and non-profit organizations. While policy certainty is key for solar business growth, it will be interesting to see what impacts policy changes proposed in 2015 will have on next year's solar jobs numbers. For example, a proposal to double the state's existing Renewable Portfolio Standard would very likely help increase the amount of new solar installed capacity seen in the state, leading in turn to increased solar employment.

Only continued annual reinvestigations of solar employment in Maryland will reveal how solar companies – and workers – will fare.

[15] During the period covered by the National Solar Jobs Census report series, average installed costs for residential solar energy systems have declined by 35%, non-residential costs have fallen by almost 50%, and utility-scale solar by approximately 60% (as reported by the Solar Energy Industries Association in its quarterly Solar Market Insight reports). Over the same period, data from the U.S. Energy Information Administration shows that national average retail electricity rates across all sectors have increased by over 16%.

Maryland

3,012
Solar Jobs

13 ↑7
Solar Jobs Rank
(Change since 2013)

157
Solar Companies

13
Solar Jobs Rank as Percent of State Employment

$27,840,000.00
2012-2014 Private Solar Investment, Project Finance Excluded
Rank 7

$971,000,000.00
2012-2014 Private Project Finance
Rank 4

$4,500.00
2012-2014 Public Investments
Rank 16

11
2010-2014 Solar Patents
Rank 10(t)

8
Private Solar Investment Rank, Adjusted for Gross Regional Product

6
Private Project Investment Rank, Adjusted for Gross Regional Product

16
Public Investments Rank, Adjusted for Gross Regional Product

12
Solar Revenues Rank

19
Number of Homes Powered by Solar Rank
~19,010 Homes

13
Electricity Price Rank (Most Expensive)

Allowed
Legal Status of Third-Party Ownership

A
Net Metering Policy Grade

B
Interconnection Policy Grade

20%
by 2022
Renewable Portfolio Standard (RPS) Target

2%
by 2020
RPS Solar Carve-Out Target

Solar Employment Data as of October 2014 Investment Data Source: Cleantech Group's i3 Data Platform
GRP Data Source: Economic Modeling Specialists International Patents Source: USPTO PAIR System

Methodology

The *Maryland Solar Jobs Census* methodology is most closely aligned with the Bureau of Labor Statistics' methodology for its Quarterly Census of Employment and Wages (QCEW) and Current Employment Statistics (CES). Like BLS, this study uses survey questionnaires and employer-reported data, though ours are administered by phone and email, as opposed to mail.

Also like BLS, we develop a hierarchy of various categories that represent solar value chain activities (within their broader NAICS framework), develop representative sample frames, and use statistical analysis and extrapolation in a very similar manner to BLS. We also constrain our universe of establishments by relying on the most recent data from the BLS or the state departments of labor, depending on which is collected most recently. We believe that the categories that we have developed could be readily adopted by BLS should it choose to begin to quantify solar employment in its QCEW and CES series.

The survey was administered to a known universe of solar employers that includes approximately 181 establishments and is derived from the Solar Energy Industries Association's *National Solar Database* as well as other public and private sources. Of these establishments, 50 provided information about their solar activities (or lack thereof), and 40 submitted full or substantially completed surveys.

The Maryland survey was also administered to a stratified, clustered, random sampling from various industries that are potentially solar-related that include a total of 5,867 establishments in Maryland. After an extensive cleaning and de-duplication process, a sampling plan was developed that gathered information on the level of solar activity (including none) from 518 establishments. Of these, 27 establishments qualified for and completed full surveys. This level of sampling rigor provides a margin of error of +/-3.91%. For a more complete description of the methodology, please see the *National Solar Jobs Census 2014* available at www.tsfcensus.org.

It is of further importance to note that the figures provided in this report are estimates based on surveys administered only to employers in installation, manufacturing, sales and distribution, project development and "other" establishments in research and development, legal services, finance and accounting, academia, government agencies, nonprofit organizations, and other ancillary employers that do solar work. Data for the "other" category do not capture all jobs or establishments in the category. Although some "other" establishments are included in the "known universe," accounting, legal, finance, and other ancillary establishments spend only a very small portion of their time on solar activities. Thus, full inclusion would lead to inflated employment counts.

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For questions about this report or to explore options for an in-depth solar jobs study for your state/region, please contact Andrea Luecke at The Solar Foundation, aluecke@solarfound.org.

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