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National Solar Jobs Census 2010



A Review of the U.S. Solar Workforce

THE SOLAR FOUNDATION™

Cornell University
ILR School

GREEN LMI

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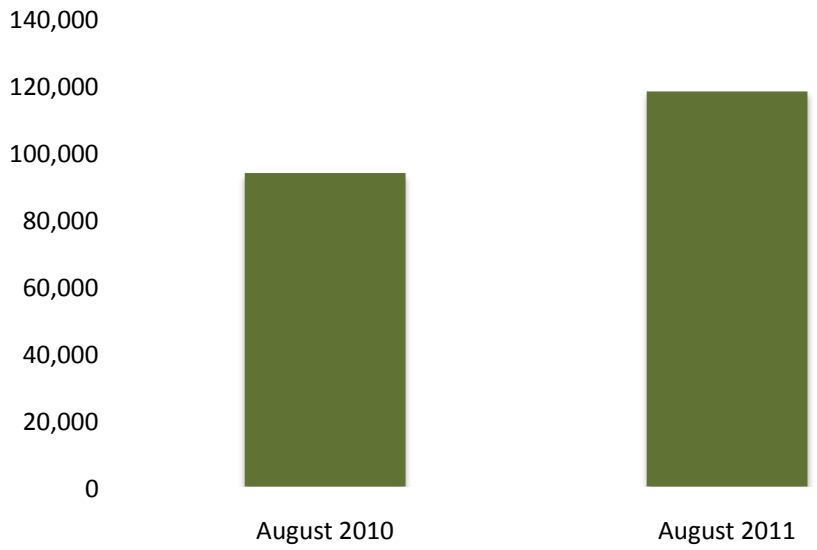
1. Executive Summary

The *National Solar Jobs Census 2010* is the first attempt to quantify the current employment and projected growth of the United States solar industry and is based on a statistically valid sampling of employers throughout the nation.[1] The rapid increase of solar energy generation has warranted a credible study that examines the size and scope of the industry that until now, has been lacking.

The Solar Foundation ™, a 501(c)(3) nonprofit, non-lobbying organization funding solar research and education, recognized this gap and worked with Green LMI Consulting, Cornell University and others to bring this important information to the foreground. This report represents an unprecedented effort to understand the solar industry's labor market conditions and potential for growth.

In general, U.S. solar companies expect to add jobs at a pace that is much faster than the general economy, and are highly optimistic regarding their overall revenue growth over the near term. **Specifically, as of August 2010, the U.S. solar industry employs an estimated 93,000 solar workers** - defined as those workers who spend at least 50% of their time supporting solar-related activities. **Over the next 12 months, over 50% of solar firms expect to add jobs, while only 2% expect to cut workers**. This finding is especially relevant given that the overall expected 12-month growth rate for the entire U.S. economy is only about 2%.

Figure A: Current and Expected U.S. Solar Jobs



[1] The data contained in this report include information gathered from approximately 2,500 employers drawn from every state and from all types of companies; from those who manufacture solar components to those who install them. A rigorous research methodology and strong participation from solar employers allows us to draw more comprehensive conclusions from the data than from previous reports on the industry.

Solar companies can be found in every state, and solar companies of all kinds expect to experience employment growth over the coming year. As would be expected, California is home to about 30% of all solar companies in the U.S., but other states, such as Colorado, Pennsylvania, Texas, Michigan, and Arizona, report either large numbers of solar companies or large numbers of workers at solar-related firms.[2] On a regional basis, the majority of the solar jobs are located in the West, followed by the Northeast, but jobs are growing quickly in all regions.

By comparing the job growth expectations from our research and from existing secondary sources, we can draw several important conclusions.

As of the end of August 2010:

- **There are 93,502 solar workers in the United States, roughly double the number estimated for 2009.**
- **Solar job growth over the next 12 months is anticipated to be 26%, representing nearly 24,000 net new jobs. This expected growth rate is significantly higher than the U.S. economy-wide expectation of 2% growth over the same period.**
- **Nearly half of all firms expect their solar revenue to increase as a percentage of their overall revenue over the next year.**
- **Over half of all solar employers expect to increase their number of solar jobs in the next 12 months, while only 2% anticipate reducing solar staff.**
- **Solar jobs exist in all 50 states.**
- **Employers from all of the studied subsectors expect significant employment growth over the next 12 months.**
- **The average solar installation firm employs 8 solar workers.**
- **The average solar manufacturing firm employs 24 solar workers.**
- **The average solar wholesale trade company employs four solar workers.**
- **The average utility that generates solar electric power employs four solar workers.**

These findings clearly illustrate that the solar industry is a strong and growing cluster that is responsible for thousands of jobs across every state in the nation. The unprecedented growth of the industry is providing much needed job creation despite an historic economic and workforce downturn. The optimism of solar employers in the midst of these conditions illustrates that job growth should continue for years to come.

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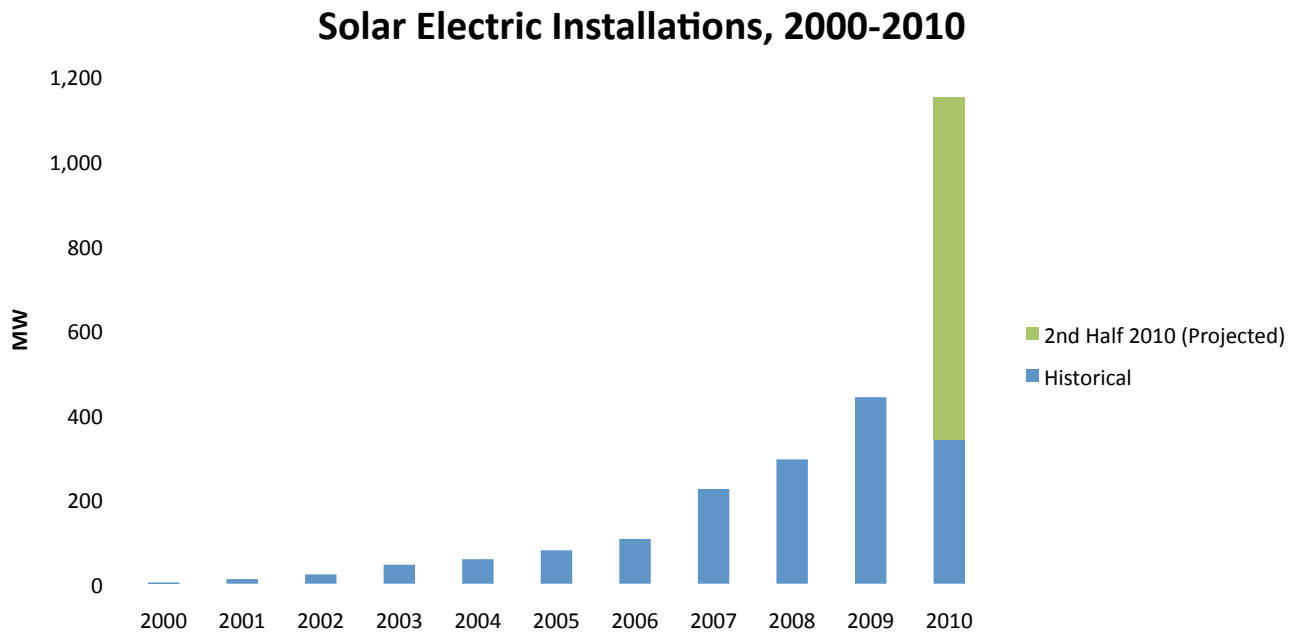
[2] See Appendix Section 5.4 for State-by-State data, where available.

2. Introduction

The solar industry is a strong and growing segment of our national economy. Over the past ten years, companies that design, manufacture, sell, install, and maintain solar systems have emerged in all regions of the United States, providing tens of thousands of jobs throughout the country. These employment opportunities span numerous industries and occupational titles, from skilled laborers to customer service and sales representatives.

In recent years, new technology, favorable legislative policies, and increased consumer demand for clean, renewable sources of energy have led to even more rapid growth of the solar industry. In fact, according to GTM Research, solar photovoltaic installations grew at a *Compound Annual Growth Rate* of 61% between 2006 and 2009.[3] Despite gloomy general economic conditions in most sectors of our nation's economy, the momentum generated by these trends has led to increased optimism about the potential for continued growth of solar jobs.

Figure 1: U.S. Photovoltaic Electric Growth by Megawatts



Source: SEIA/GTM Research, U.S. SolarInsight, 2nd Quarter 2010 (Upside scenario)

This report is a comprehensive analysis of U.S. solar labor market conditions. **Unlike economic impact models that generate employment estimates based on revenue and other economic data and rely on jobs-per-dollar (or jobs-per-megawatt) assumptions, this report provides statistically valid and current data gathered directly from employers**. The primary and secondary data include information about all types of companies engaged in the production,

[3] SEIA/GTM Research, U.S. SolarInsight, 2nd Quarter 2010.

sale, installation, and use of all solar technologies, ranging from photovoltaics to concentrating solar power to solar thermal systems for the residential, commercial and utility sectors.[4]

The primary data contained in this report are drawn from a mixed-methodological survey using direct contact (phone and internet) with solar employers in the United States. Information was collected in July and August 2010 from both a measure of a so-called "known universe," which includes firms from industry and government databases, as well as a random sample of businesses within various construction, wholesale trade, and manufacturing industries. This combined approach, together with a large sample size of nearly 2,500 survey completions, provides statistically valid results with a low margin of error (2.8-5.8% margin of error at 95% confidence level). This rigor allows us to draw broad conclusions about the solar industry with a high degree of confidence.

This report presents the information in several ways. The first section provides a national analysis of the primary data collection from each subsector of the solar value chain, including installation, wholesale trade, manufacturing, utilities, and all other firms. These conclusions are compared to national secondary data, which is presented in Appendix 5.3.

This National Solar Jobs Census 2010 has been conducted by The Solar Foundation ™ and Green LMI Consulting, with assistance from BW Research Partnership. Cornell University provided technical assistance in reviewing and validating the entire process, from data collection through results analysis.

The research findings, which are being released for the first time in this report, provide stakeholders with timely and credible information to understand the solar industry's labor market conditions and potential for further growth. This report is the first effort to collect primary data from employers about the size and scope of the solar industry and its workforce needs. These data are unprecedented and will hopefully inform future efforts of the U.S. Bureau of Labor Statistics to understand the solar labor markets.

It is important to note, however, that there are limitations to the data. Specifically, unlike economic models that generate employment estimates based on revenue and other economic conditions, the primary research findings in this report are drawn from actual survey responses by solar employers. Though this is a highly effective method for collecting real-time information, the employment estimates are based on those responses and therefore represent employers' best estimates on how many jobs they expect to add over the coming year.

The employment growth rates provided in this report are high in comparison with other sectors over the same period. However, Green LMI Consulting and its partners have recently conducted numerous, separate regional reports using similar methodology and survey questions and have found the growth rates contained herein to be similar to those in other renewable energy sectors. At the same time, employers in other sectors, such as healthcare and information

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[4] Information for this report was gathered from secondary sources (primarily relying on O*NET's solar occupational classifications) and from original research from a statistically valid, random sample of solar employers in the United States. *See* Erich C. Dierdorff, et. al, Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations, February 2009.

and communications technologies, are reporting much lower growth expectations (approximately 4% annual growth) when presented with similar surveys. Therefore, although we recognize that the data are based on employer estimates, solar employers in the United States are more realistically confident in their optimism about employment growth than their counterparts in other sectors.[5]



Courtesy and Copyright H&H Solar Energy Services Madison, Wisconsin

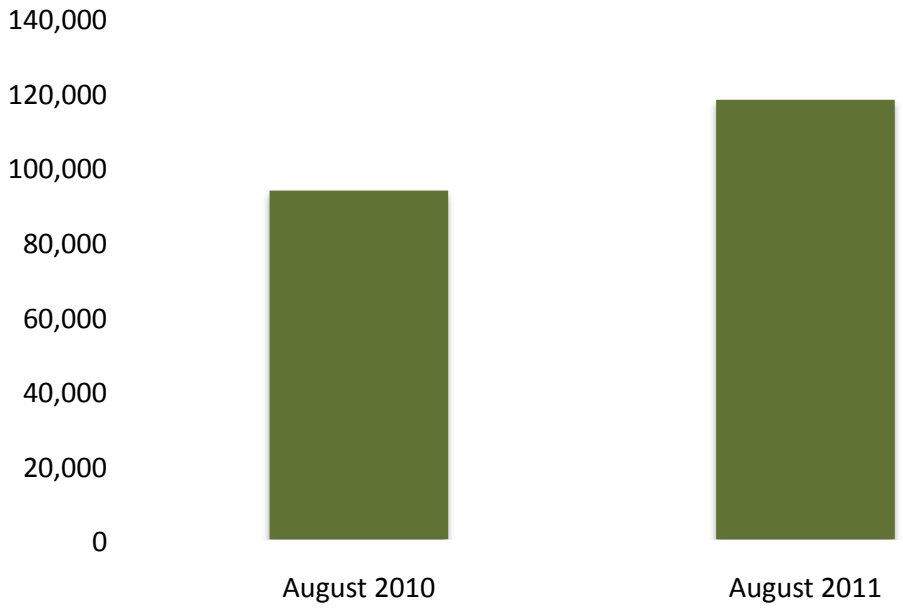
[5] *See* http://coeccc.net/solar; http://coccc.net/ict; http://mpict.org/ict_study_phase2.html.

3. Labor Market Analysis: Primary Data

This section includes a labor market analysis of solar occupations and industries. In addition to a summary of solar employment in the United States, it presents primary data for installation, wholesale trade, manufacturing, utilities, and all other fields. Primary data includes the survey responses from solar employers throughout the country, drawn from a census of known employers and a random sample of companies from relevant industries. The one exception is the utility data, which used a sample of utilities known to have integrated solar technology.[6] The research team also selected specific occupations or job areas for more in-depth analysis, based on a literature review and discussion with industry experts.[7]

Overall, the primary data - or information gathered by our survey of solar employers - indicate that there are currently 16,703 employment locations, employing **93,502 solar workers (defined as those workers who spend at least 50% of their time on solar).**[8] **The number of these solar workers is expected to grow 26% rate, or by approximately 24,000 new jobs.**

Figure 2: Current and Expected U.S. Solar Jobs



As further evidence of solar employer optimism, over 55% of surveyed firms expect to add employees over the next 12 months, while only 2% expect to cut workers over the period, as

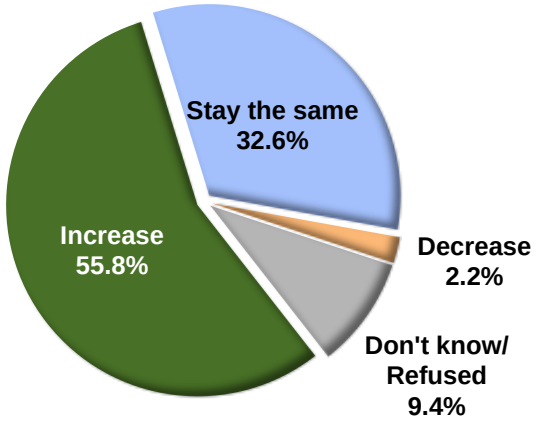
[6] The Solar Electric Power Association ® tracks utility solar integration annually with the Utility Solar Electric Survey. The respondents to the most recent survey comprised the list for the utility sample.

[7] See Appendix Sections 5.1 and 5.2 for a list of data sources and an explanation of the study's methodology.

[8] For the purposes of this report, workers that spend at least 50% of their time on solar activities are referred to as "solar workers." These data come from direct survey responses for all sectors except installation. For an explanation of how installation-related solar employment was calculated, please see Appendix Section 5.2.

illustrated in Figure 2 below. These findings show an industry that is clearly growing much more rapidly than the economy as a whole, which is expected to experience employment growth of only two percent over the coming year.

Figure 3: 12-Month Hiring Expectations - All Solar Firms



Several screener questions were asked of employers to ensure that our sample included only solar firms. The survey respondents were asked to select the appropriate subsector to which their firm belongs, choosing from installation, wholesale trade, manufacturing, utilities,[9] or, for those who did not fit neatly into a category, "other." Many firms reported that their work spanned several subsectors, illustrating the interconnected and interrelated nature of the solar industry and its workers. Though this makes it harder for researchers to categorize companies, it shows that solar firms are active in multiple traditional industry sectors, and that growth in any given sector, such as utility energy production or manufacturing, is important to firms outside of those sectors as well.[10]

[9] The utility industry sector is unique, with partial, if not full, regulatory oversight. A solar Power Generating Utility is not a unique industry segment, but rather a function in a utility spanning many departments. For these reasons, the utility sample, as well as the instrument are different from those used for the other sectors. The "utilities" sample was small, relative to the 2,500 overall respondents, and therefore does not register in Figures 4 and 5 or Table 1.

[10] For the purposes of this report, workers are included in their primary subsector, assigned based on the distribution of firms in the sample. For detailed methodology of survey extrapolations, please see Appendix Section 5.2.

Figure 4: Percentage of Respondents, by Subsector

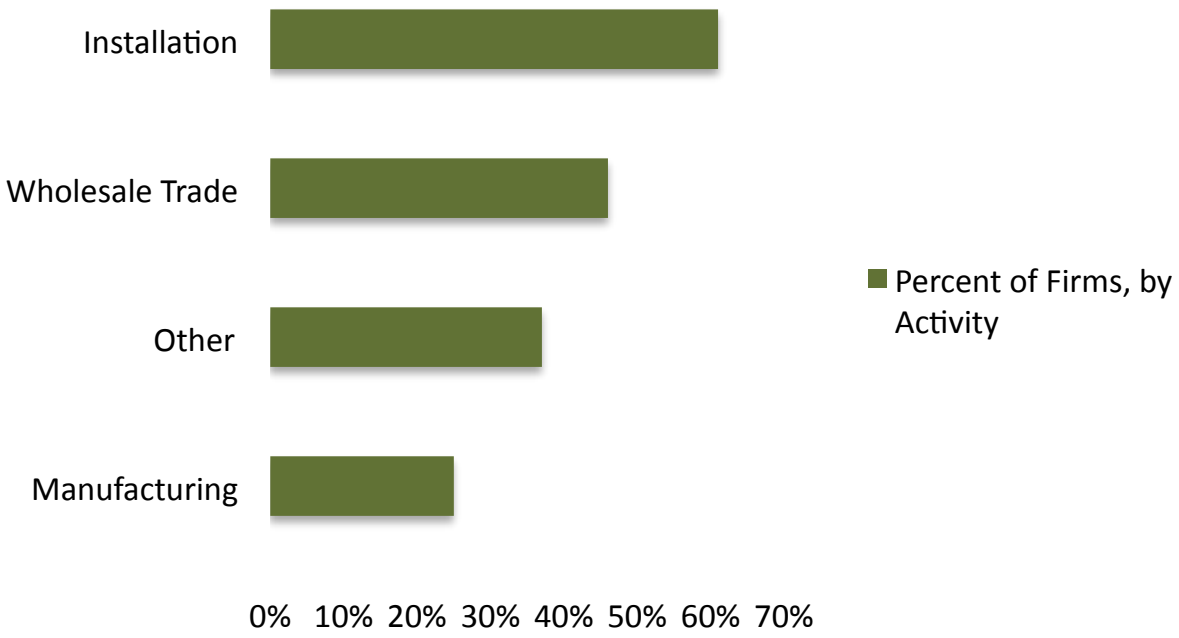
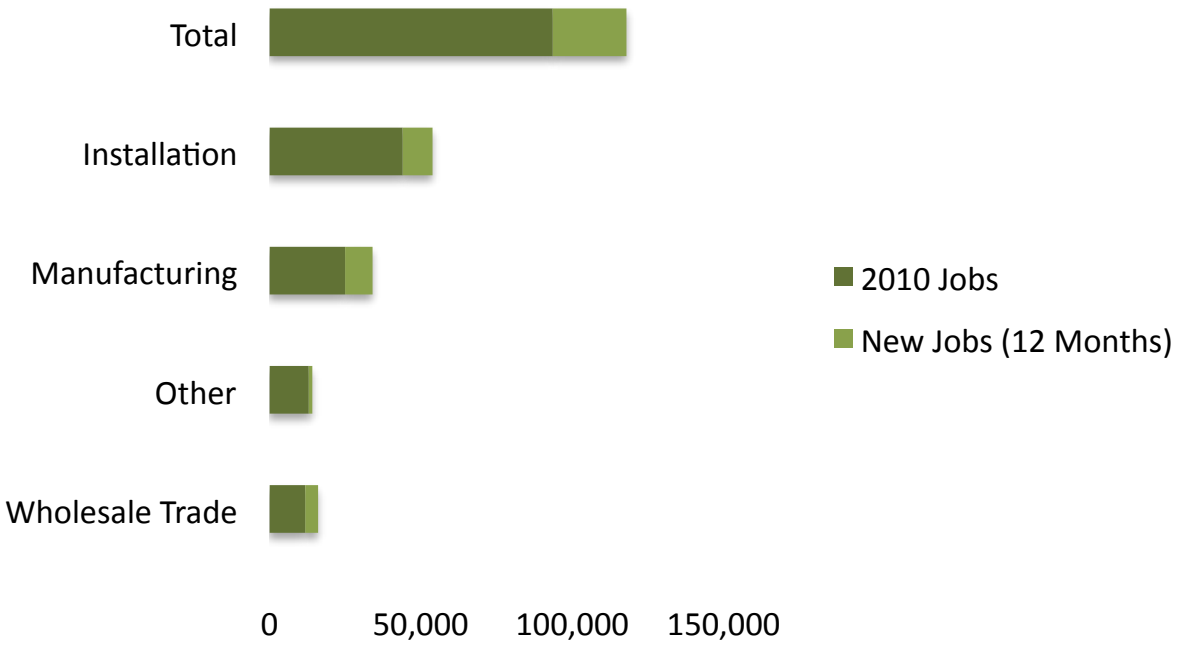


Table 1: Data by Subsector - # of Solar Workers

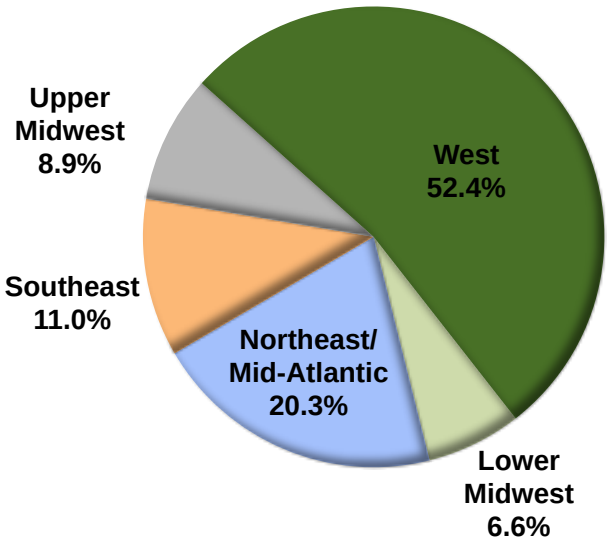
Subsector	*2010 Jobs*	*2011 Jobs*	*Growth*	*Percentage Growth*
Installation	43,934	53,793	9,859	22%
Manufacturing	24,916	33,982	9,066	36%
Wholesale Trade	11,744	15,993	4,249	36%
Other	12,908	14,088	1,180	9%
Total	**93,502**	**117,855**	**24,353**	**26%**

Figure 5: Data by Subsector - # of Solar Workers



Solar employers can be found throughout the nation, though the majority of firms come from the Western United States, followed by the Northeast/Mid-Atlantic Region.

Figure 6: Breakdown of Solar Employers by Region.



Across all of the occupations that were identified for more detailed study, the following five are expected to grow the fastest over the next year:

1. Photovoltaic installers (51-66% growth)
2. Electricians with specific experience in solar installations (42-55% growth)
3. Sales occupations at wholesale trade firms (40-49% growth)
4. Sales representatives or estimators at installation firms (39-47% growth)
5. Roofers with specific experience in solar installations (36-49% growth)

Solar employers also report difficulty finding qualified workers. This surprising result, given the current unemployment rate, could be due to many factors, such as lagging workforce development. It is clear, however, that solar jobs are growing rapidly and are hard to fill, which typically indicates fertile opportunities for job seekers.

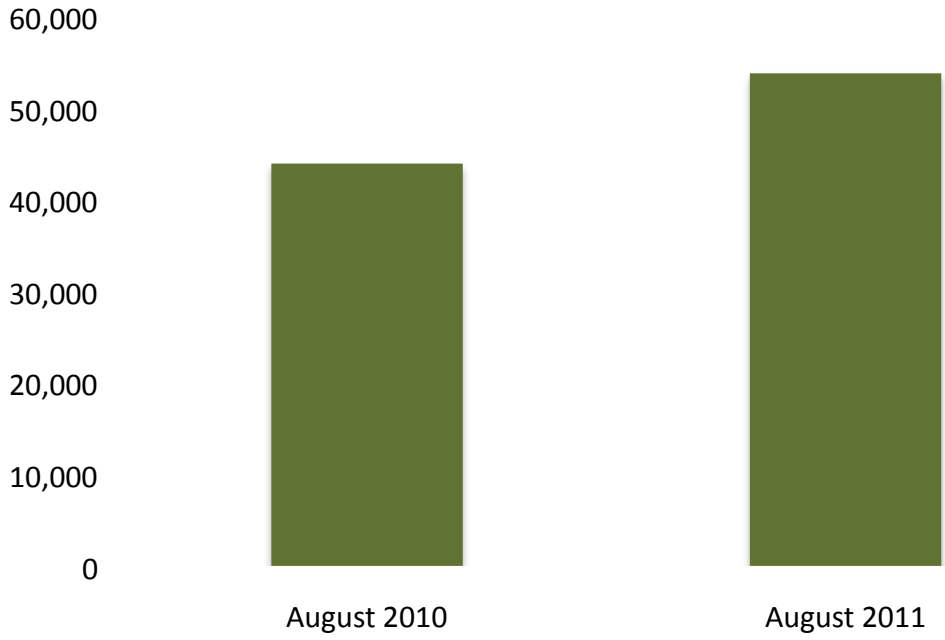


3.1 Installation

The research includes responses from 1,425 installation firms, yielding a statistically valid dataset of employment information representative of the approximately 10,000 locations of companies that derive at least some of their revenue from solar goods and services. These companies employ 43,934 solar workers.

Solar installation firms expect to add 9,859 solar workers over the next 12 months, representing 22% growth.

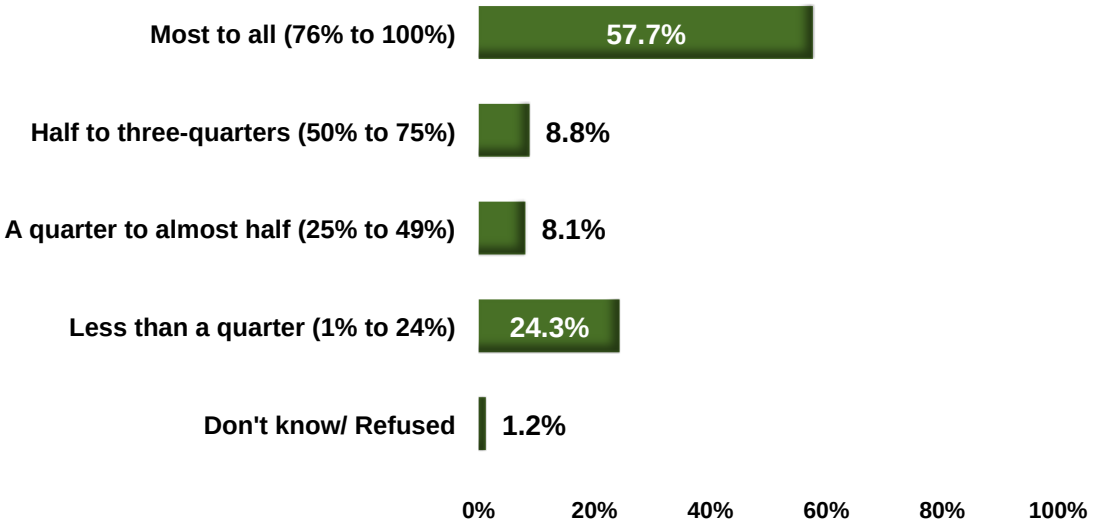
Figure 7: Current and Expected Solar Jobs at Installation Firms



Interestingly, the majority of firms reported that they receive all or most of their revenue from solar projects, while about one in four firms reported that solar makes up less than a quarter of their business.[11]

[11] As would be expected, the number of firms that report most to all of their revenue is solar-related is higher in the known universe than the random sample.

Figure 8: Solar as a Percentage of Revenue - Installation



As illustrated in Figures 9 and 10 below, 92% of firms install photovoltaic systems, while just over half install solar hot water systems, and the majority of firms attribute the largest percentage of their labor hours to photovoltaic systems. This illustrates the trend that many companies install more than one type of system.

Figure 9: Firms by Technology - Installation

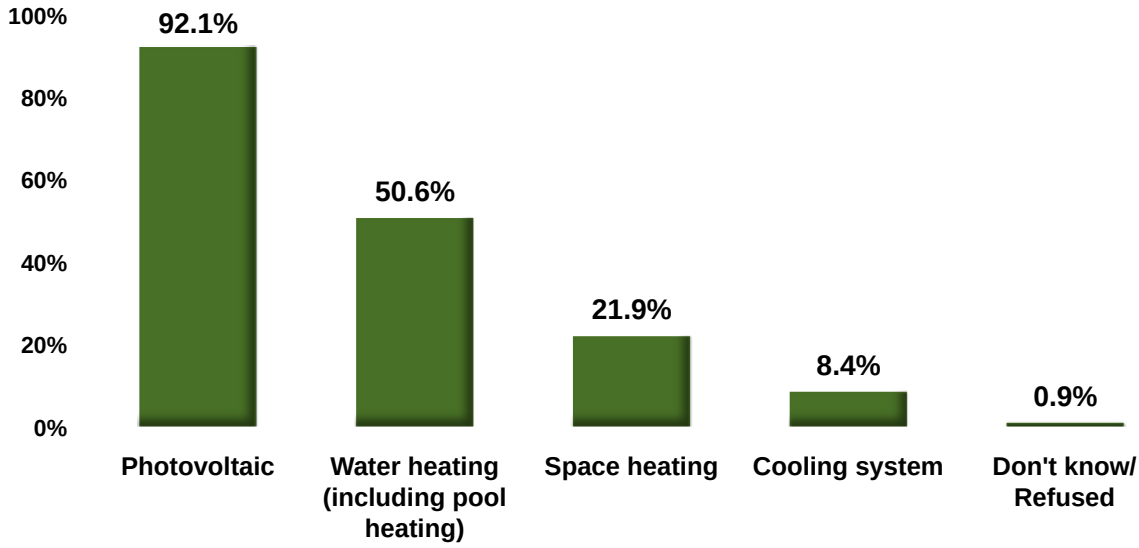
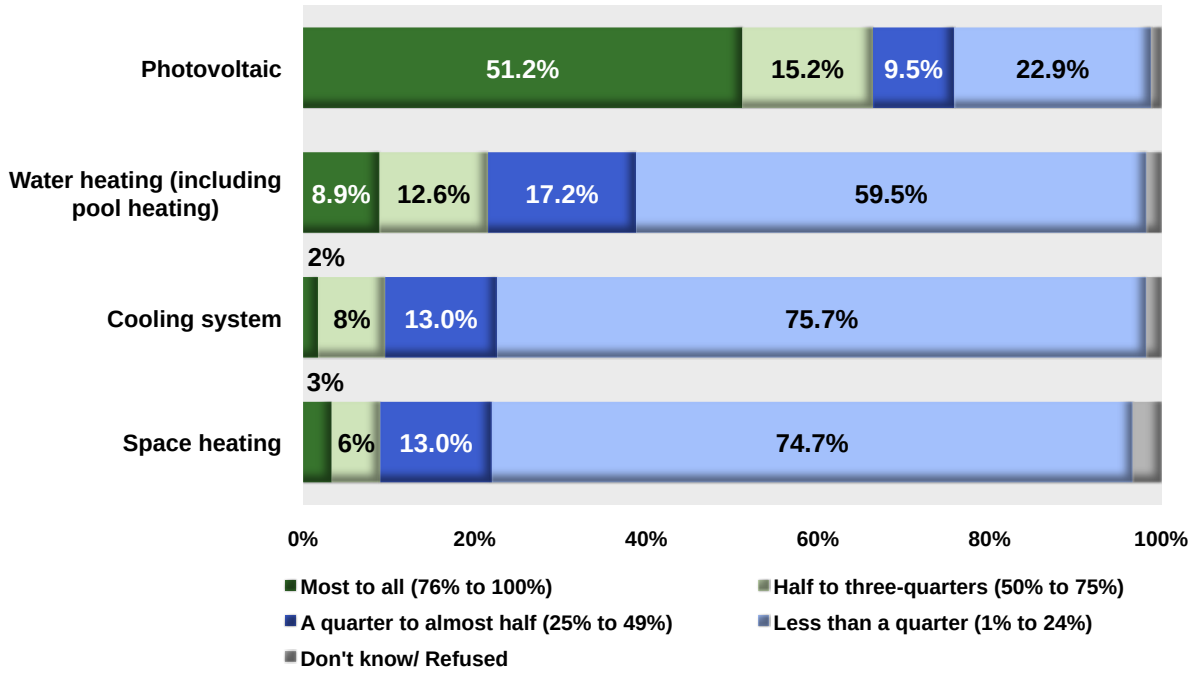


Figure 10: Solar Technologies by Percentage of Labor - Installation



U.S. installation companies are working on systems of varying sizes, though, as would be expected, the majority of installation firms are working on smaller systems, as illustrated in Figure 11 below.

Figure 11: Percentage of Firms Working on Systems, by Size - Installation

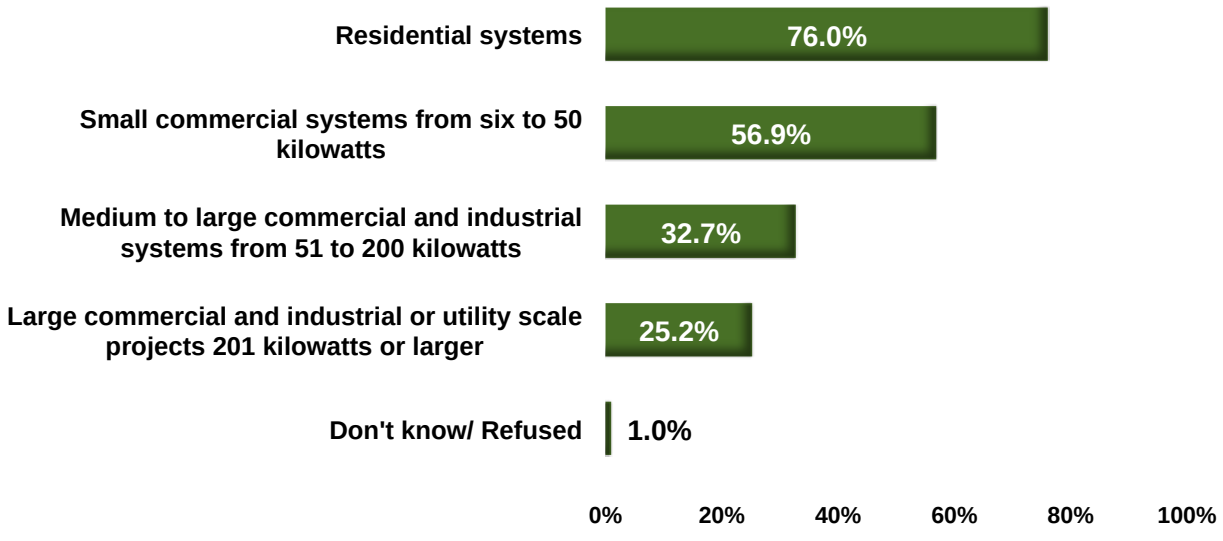
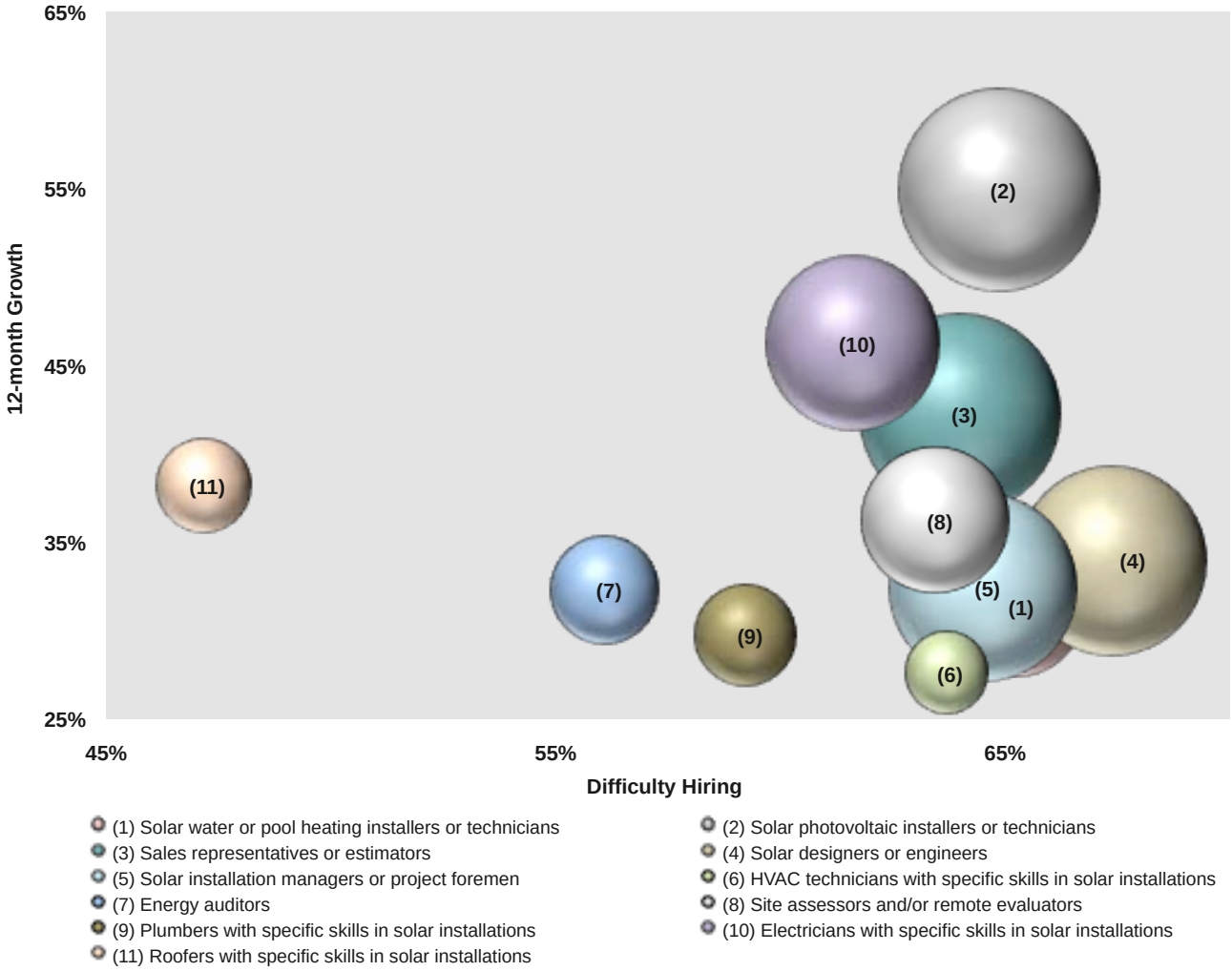


Table 2 and Figure 12 below illustrate installation-related occupational data, including the percent of firms that employ the occupation, the percent of firms that report difficulty finding qualified applicants that meet their firms' hiring expectations, and the annual expected growth rate.

Table 2: Occupational Data - Installation

Occupation/Category	*Percent Employing*	*Difficulty hiring*	*Growth*
Solar water or pool heating installers or technicians	33%	65%	29-36%
Solar photovoltaic installers or technicians	72%	65%	51-66%
Sales representatives or estimators	70%	64%	39-47%
Solar designers or engineers	62%	67%	33-36%
Solar installation managers or project foremen	61%	65%	32-36%
HVAC technicians with specific skills in solar installations	11%	64%	25-39%
Energy auditors	20%	56%	31-40%
Site assessors and/or remote evaluators	37%	64%	35-38%
Plumbers with specific skills in solar installations	17%	59%	25-32%
Electricians with specific skills in solar installations	53%	62%	42-55%
Roofers with specific skills in solar installations	15%	47%	36-49%

Figure 12: Occupational Data - Installation



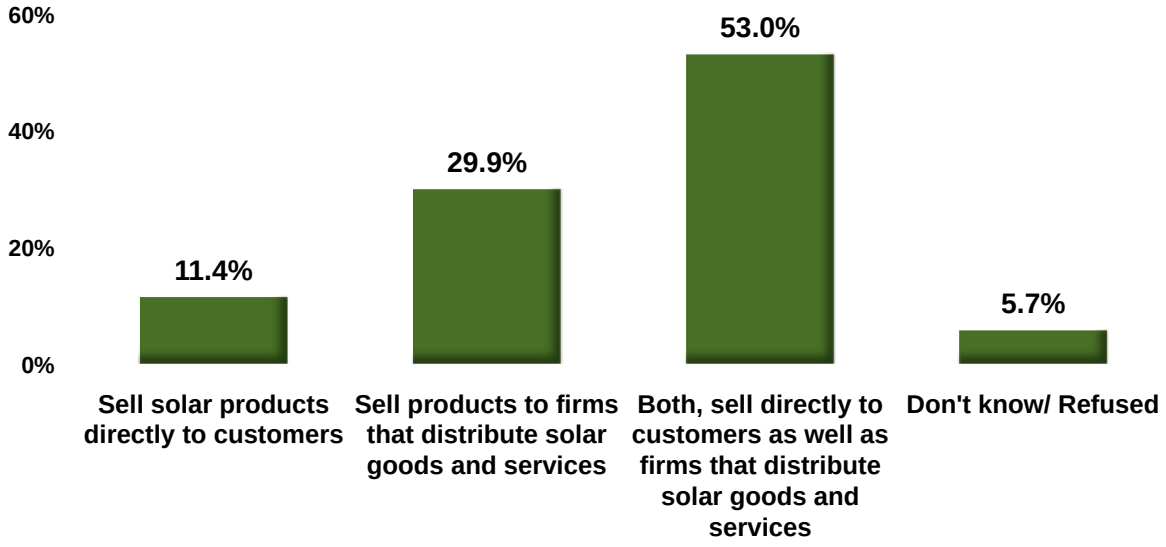
In Figure 12 above, the diameter of the bubble represents the percentage of firms from the sample that hire each occupation, the vertical axis illustrates the 12-month growth rate, and the horizontal axis represents the percentage of firms that report difficulty hiring.

3.2 Manufacturing

Similar to installation firms, the solar manufacturing firms surveyed for this study can be found across the nation, producing goods across many technology types and selling them directly to consumers and to distributors. Manufacturers also expect robust revenue and employment growth over the next 12 months.

As might be expected, the majority of firms sell goods to both distributors and consumers, though only about one in nine sell exclusively to consumers. The Solar Foundation ™ asked specifically about whether manufacturers sell products directly to customers or to other businesses.

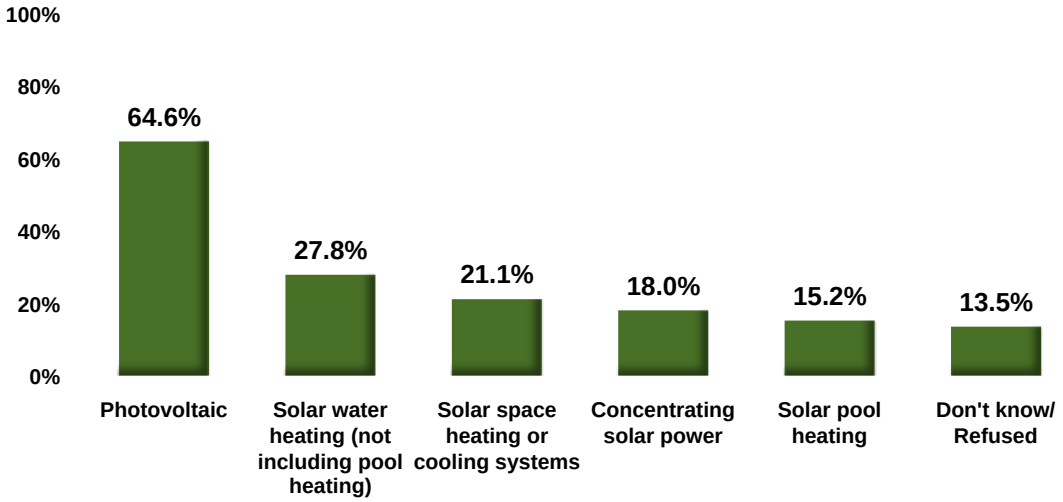
Figure 13: Solar Sales - Percentage of Manufacturing Firms, by Sales Channel



The surveyed firms domestically manufacture a variety of products, though the majority manufacture photovoltaic systems.

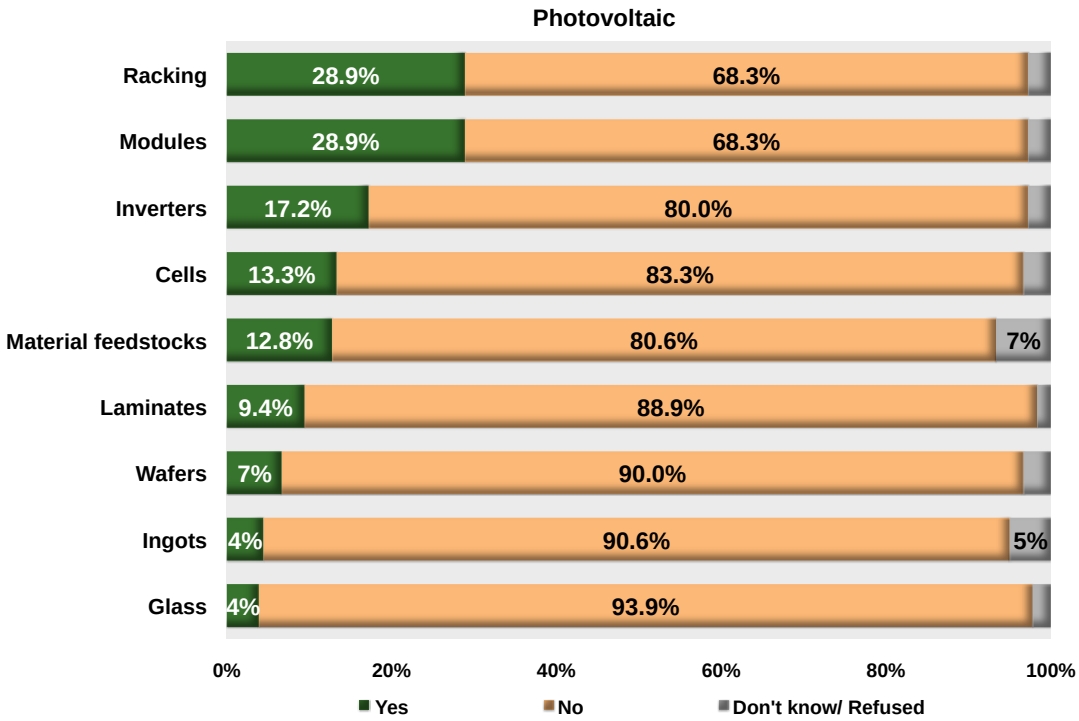


Figure 14: Percentage of Firms by Product - Manufacturing



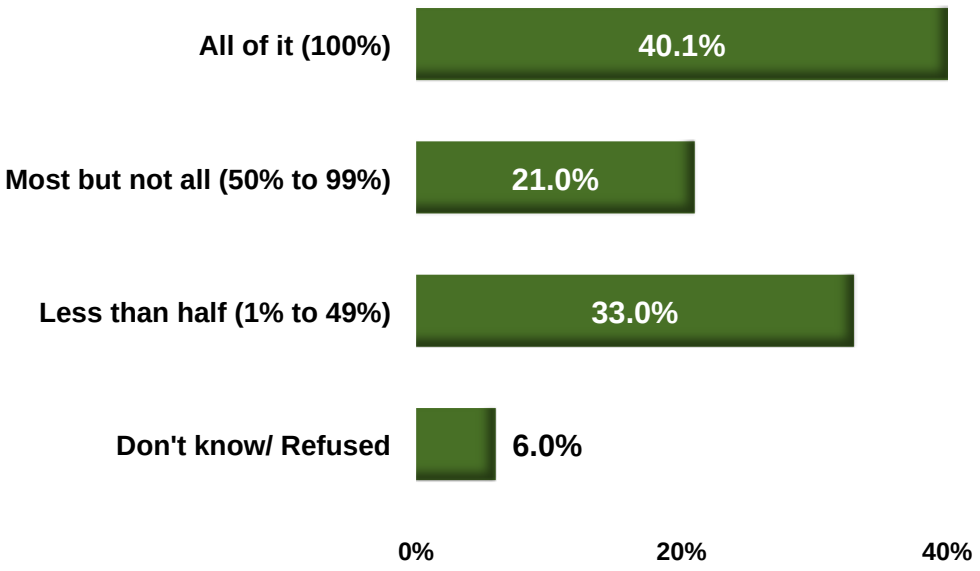
The Solar Foundation ™ also interviewed component manufacturers as part of its sample. Of the photovoltaic producers surveyed, the highest percentage manufacture racking and modules at their U.S. locations, while the fewest produce ingots and glass.

Figure 15: Photovoltaic Manufacturing, by Component



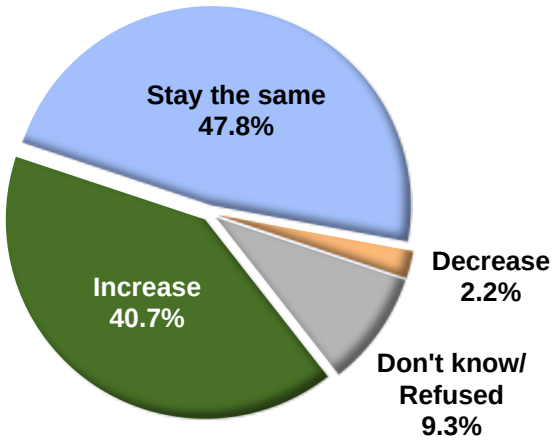
Over 40% of the manufacturing firms surveyed produce solar products exclusively, while for one in three, solar represents less than 50% of their revenue.

Figure 16: Percentage of Revenue Related to Solar Products - Manufacturing



Over 40% of firms expect their percentage of revenue from solar sales to increase, while only 2% expect it to decrease. Employers indicated that they expect an average of nearly 44% growth in their solar related sales revenue.

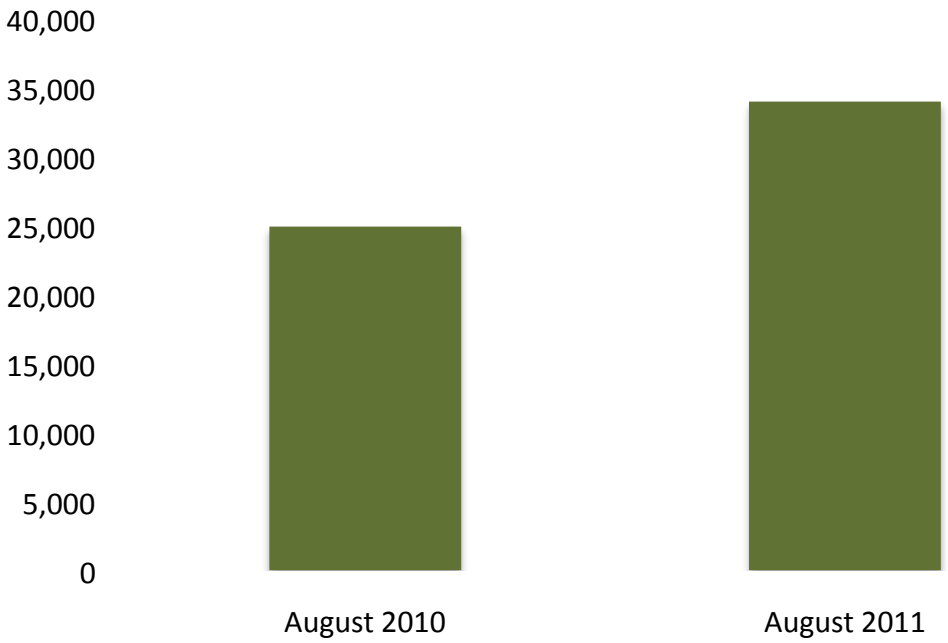
Figure 17: 12-Month Expectations of Revenue Attributed to Solar Sales - Manufacturing



Solar manufacturers employ nearly 25,000 solar workers and expect strong growth over the coming year. The companies anticipate adding **about 9,000 solar workers over the next 12 months**, an astounding 36% growth rate, and about double of the employers' expectations for their overall employment growth (including non-solar workers). The growth in U.S. solar manufacturing jobs is clearly one of the most important and interesting findings of the research.

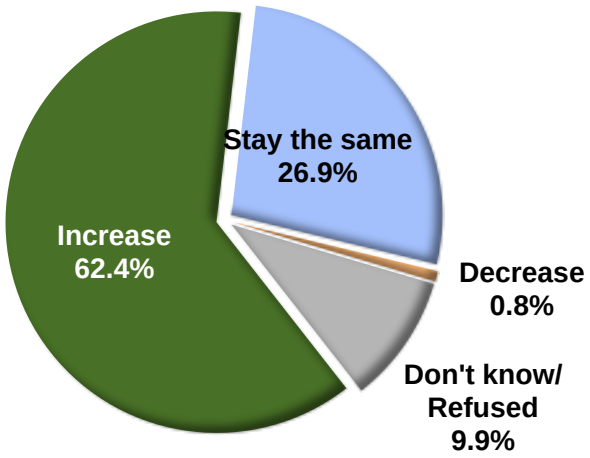


Figure 18: Current and Expected Solar Jobs in Manufacturing



Nearly two in three firms expect to add employees over the next 12 months, while virtually no firms expect to cut workers over the period.

Figure 19: 12-Month Employment Expectations - Manufacturing



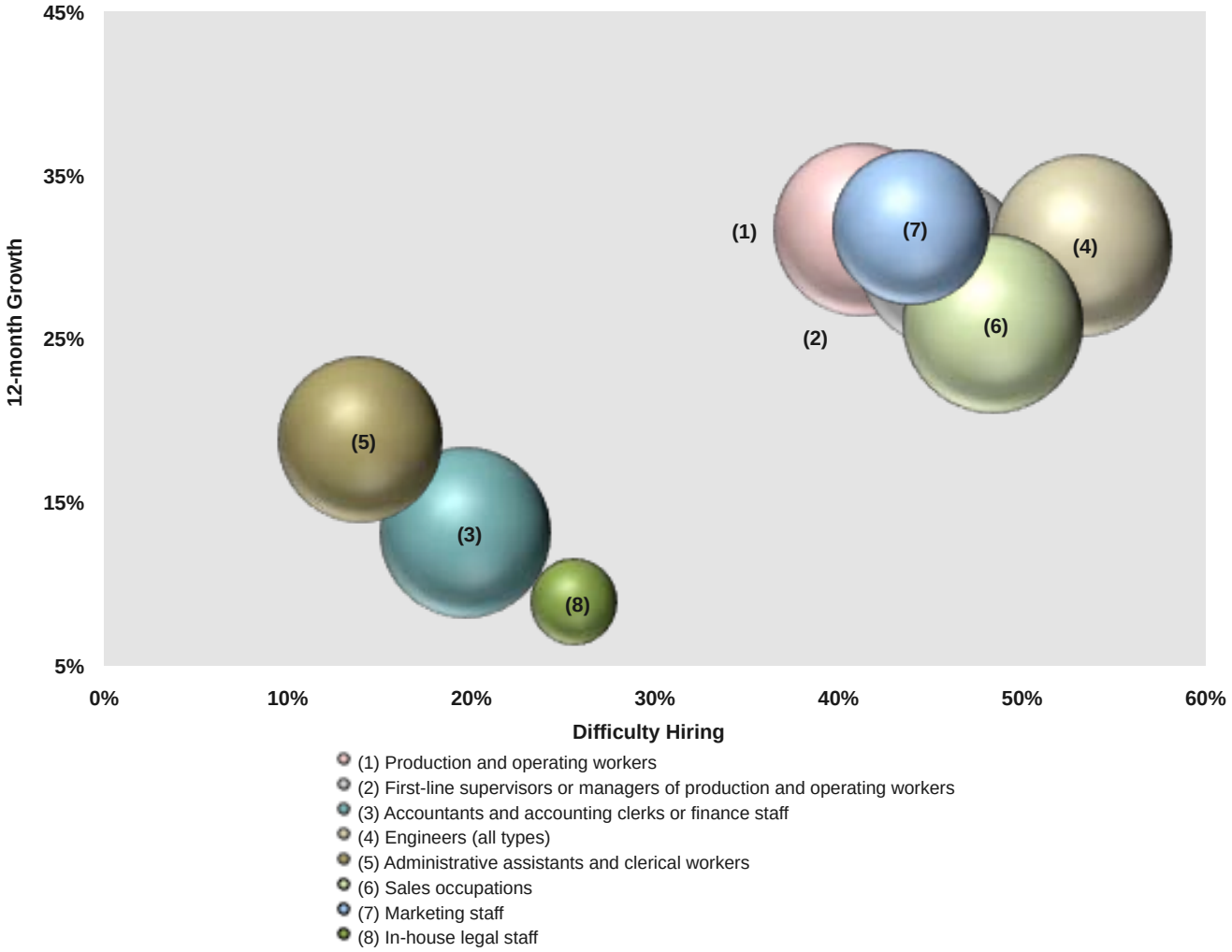
The Solar Foundation ™ also asked manufacturing firms about eight specific occupations and occupational categories, specifically referencing those employees that spend at least some of

their time on solar-related business. These include administrative, legal, finance, technical, and other staff. Table 3 and Figure 20 below illustrate the growth rate, difficulty hiring, and percentage of firms who hire for each of these eight occupations.

Table 3: Occupational Data - Manufacturing

Occupation/Category	*Percent Employing*	*Difficulty hiring*	*Growth*
Production Workers	67%	41%	32-45%
First-line supervisors or managers of production and operating workers	62%	46%	30-36%
Accountants and accounting clerks or finance staff	65%	20%	13-15%
Engineers (all types)	74%	53%	31-38%
Administrative assistants and clerical workers	60%	14%	19-22%
Sales Occupations	72%	48%	26-29%
Marketing staff	54%	44%	32-37%
In-house legal staff	16%	26%	9%

Figure 20: Occupational Data - Manufacturing

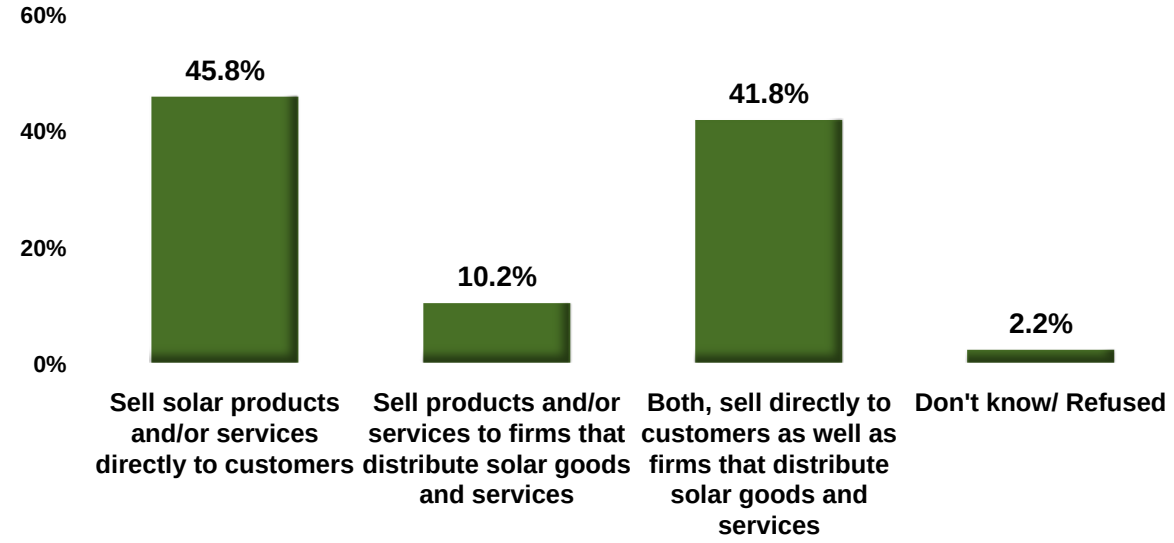


In Figure 20 above, the diameter of the bubble represents the percentage of firms from the sample that hire each occupation, the vertical axis illustrates the 12-month growth rate, and the horizontal axis represents the percentage of firms that report some or great difficulty hiring applicants that meet their firms' expectations regarding qualifications and/or experience.

3.3 Wholesale Trade

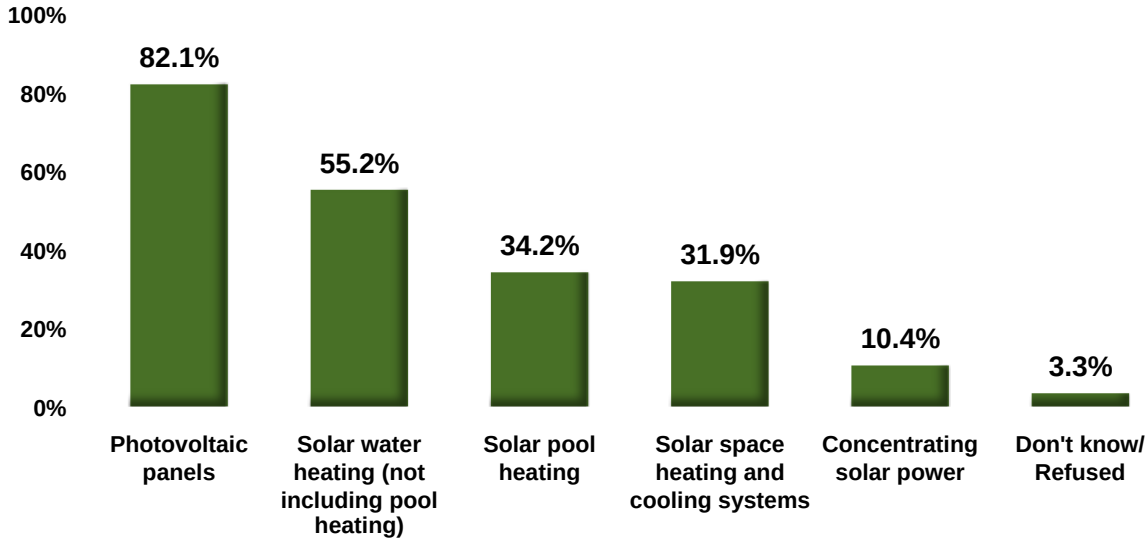
One of the critical, yet often overlooked, stages of the value chain of the solar industry is wholesale trade and distribution. The employers in solar wholesale trade sell all types of systems, from residential solar pool heaters to commercial-scale photovoltaic systems. They also sell components such as brackets, valves, raw materials, extruded parts, and other items that are critical to the design and construction of solar projects. The firms sell directly to consumers and also to other businesses, and can be found in every state in the nation.

Figure 21: Wholesale Solar Sales - Consumer Direct v. Business to Business



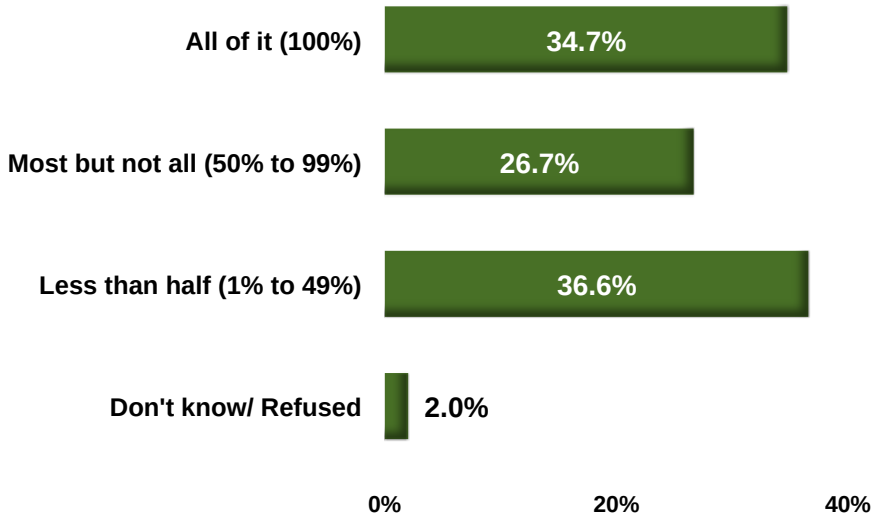
The surveyed firms sell a variety of products, though the majority sell photovoltaic systems, followed by solar water heaters.

Figure 22: Percentage of Firms by Product Sales - Wholesale Trade



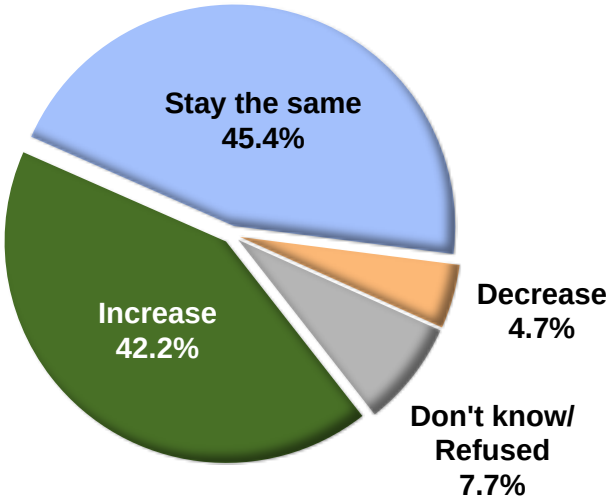
More than one in three of the trade firms surveyed sell solar products exclusively, while a similar number report that less than half of their business is related to solar products (by revenue).

Figure 23: Percentage of Revenue Related to Solar Products - Wholesale Trade



Over 42% of firms expect their percentage of revenue from solar sales to increase, while fewer than 5% expect it to decrease. Employers indicated that they expect an average of over 34% growth in their solar related sales revenue.

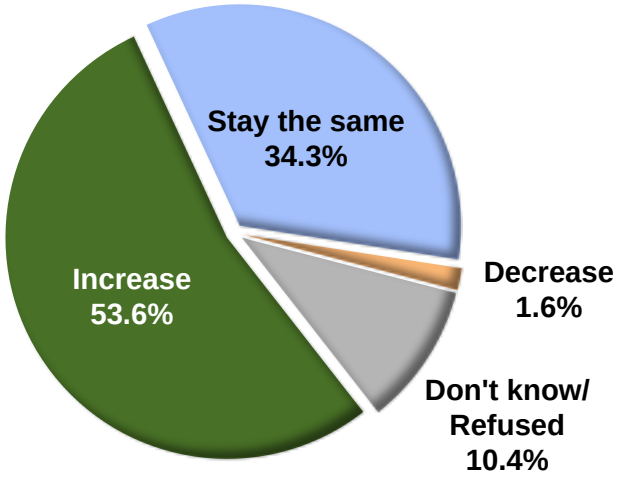
Figure 24: 12-Month Expectations of Revenue Attributed to Solar Sales - Wholesale Trade



The Solar Foundation ™ surveyed nearly 500 solar wholesale trade firms for this study. Like their counterparts in other segments of the value chain, solar trade firms expect strong

employment growth over the next 12 months, with over 54% expecting to add employees and fewer than 2% expecting to cut workers.

Figure 25: 12 Month Hiring Expectations - Wholesale Trade



These wholesale trade firms employ about **11,700 solar workers**. Employers report an anticipated 22-25% growth rate overall, or 8,700 new jobs across all divisions and employee types. When asked specifically about solar workers, the growth rate swells to 36-47%, or approximately 4,200 of the 8,700 total new jobs in the sector.

Figure 26: Current and Expected Solar Jobs in Wholesale Trade



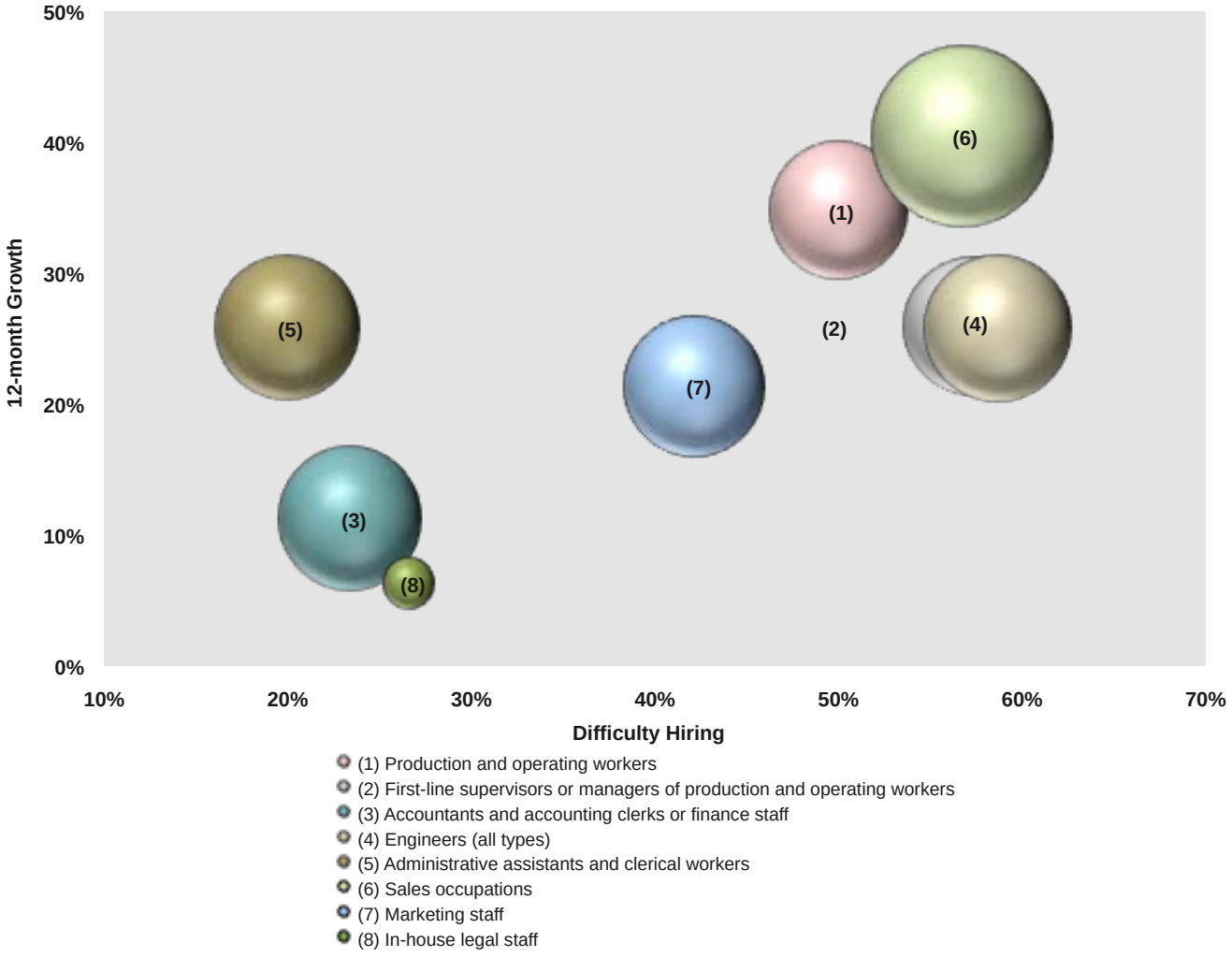
The Solar Foundation ™ also asked trade firms about eight specific occupations and occupational categories. These include administrative, legal, finance, technical, and other staff. Table 4 and Figure 27 below illustrate the growth rate, difficulty hiring, and percentage of firms who hire for each of the eight occupations.

Table 4: Occupational Data - Wholesale Trade

Occupation/Category	*Percent Employing*	*Difficulty hiring*	*Growth*
Production Workers	39%	50%	35-46%
First-line supervisors or managers of production and operating workers	40%	57%	26-36%
Accountants and accounting clerks or finance staff	42%	24%	11-14%
Engineers (all types)	44%	59%	26-33%
Administrative assistants and clerical workers	42%	20%	26-37%
Sales Occupations	68%	57%	40-49%
Marketing staff	40%	42%	21-28%
In-house legal staff (note small sample size)	5%	27%	-29%-6%



Figure 27: Occupational Data - Wholesale Trade

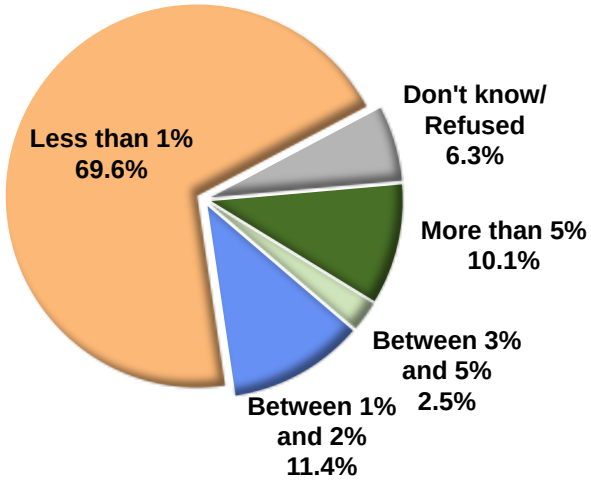


In Figure 27 above, the diameter of the bubble represents the percentage of firms from the sample that hire each occupation, the vertical axis illustrates the 12-month growth rate, and the horizontal axis represents the percentage of firms that report some or great difficulty hiring applicants that meet their firms' expectations regarding qualifications and/or experience.

3.4 Utilities

In addition to the production, sale, distribution and installation of solar systems, The Solar Foundation ™ also surveyed utilities on their solar employment and expectations over the next year. **The 79 firms that responded to the survey were drawn from a sample of utilities that represent nearly 99% of all the utilities that are active in solar energy**.[12] However, as illustrated in Figure 28, according to the survey responses, solar still makes up only a small percentage of these utilities' overall energy profile.

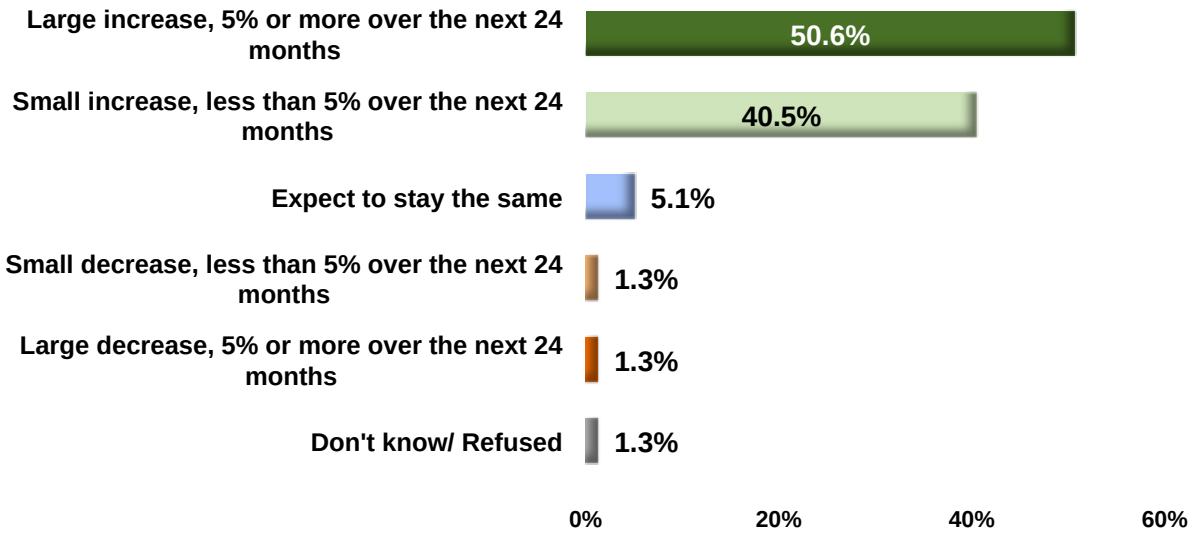
Figure 28: Utilities' Percentage of Energy from Solar



Despite these relatively small percentages, over 90% of the utilities surveyed believe that their solar profiles will increase in the coming year, and about one in two believe that the increase will be greater than 5%. Only 2.6% of utilities expect a decrease in their solar production over the next 24 months.

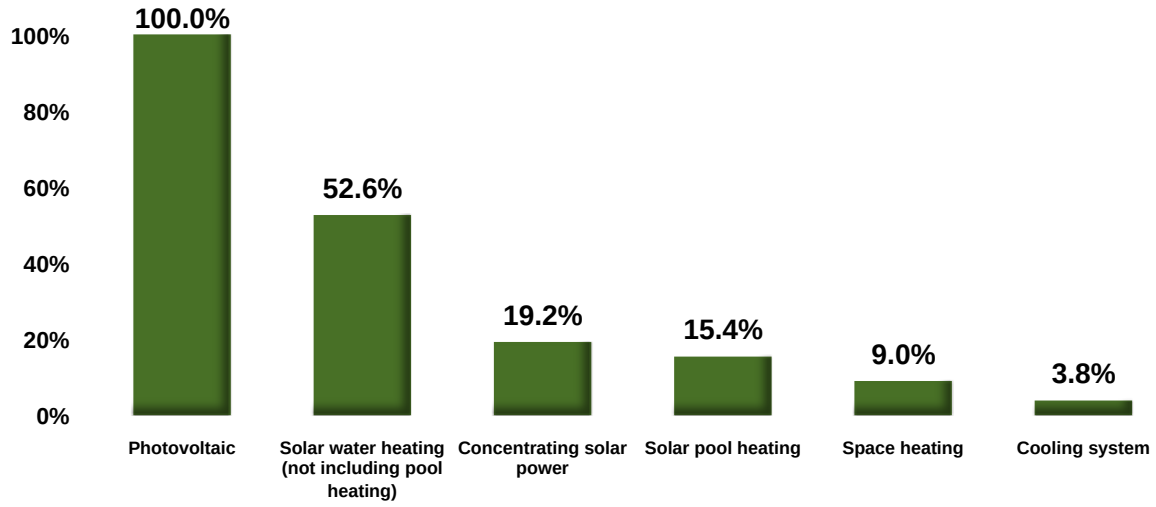
[12] 2009 Utility Solar Rankings, Solar Electric Power Association, May 2010. Available at: www.SolarElectricPower.org

Figure 29: 24-Month Expected Change in Solar Profile



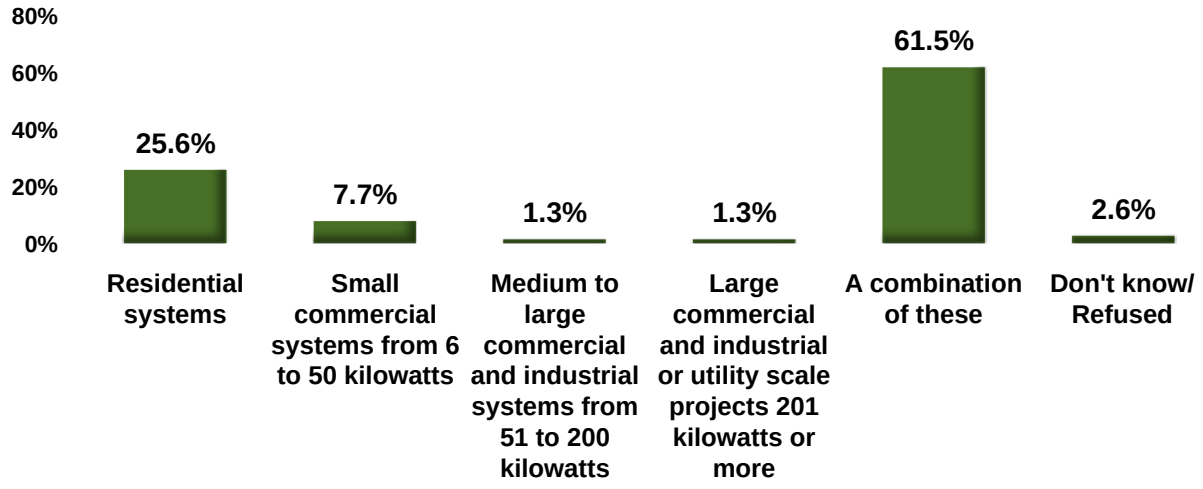
The utilities surveyed work on systems of all types, though all are involved in photovoltaics, and over 50% of the utilities are involved in solar hot water systems.

Figure 30: Solar Utilities by Technology



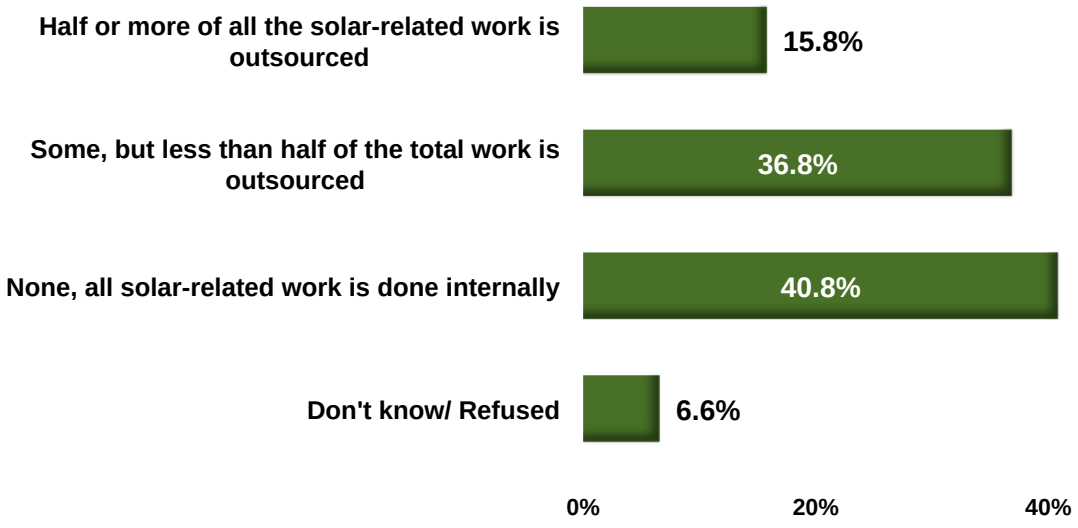
Specifically regarding photovoltaics, the utilities work on a variety of systems, and though the majority work on systems of various sizes, a large number work exclusively on residential systems.

Figure 31: Photovoltaic System Size - Utilities



The utilities were also asked about whether they tend to outsource their solar-related work. Over 40% of respondents indicated that work was done internally, and only 16% reported that they outsource half or more of all solar work**.**

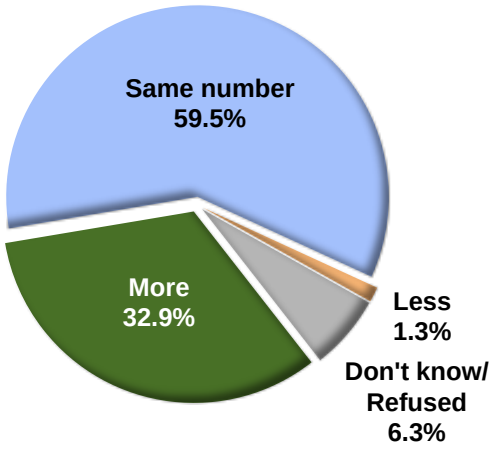
Figure 32: Utility Outsourcing



The 79 solar utilities that responded to The Solar Foundation ™ survey employ over 159,000 workers across all divisions. Nearly 1,000 of those, or 0.6%, spend at least half of their time working on renewable energy projects, and almost 400, or 37% of those workers spend at least

half of their time on solar projects. Over the next 24 months,[13] approximately one in three utilities expect to add employees and only 1.3% expect to cut workers that spend at least half of their time on renewable energy projects.

Figure 33: 24-Month Renewable Energy Employment Expectations - Utilities



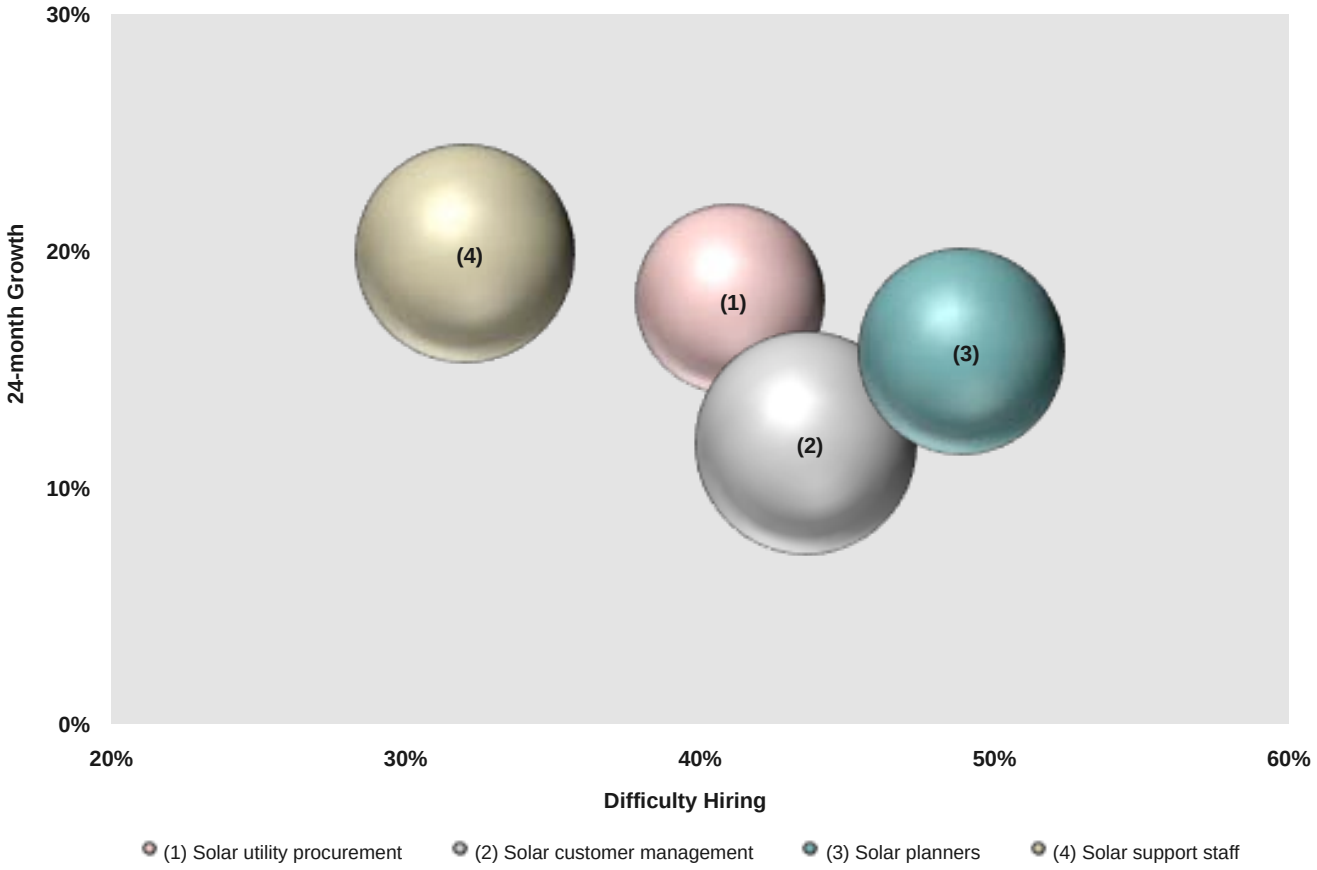
Utilities expect this growth to occur at a rapid pace. For workers that spend at least half of their time on renewable energy projects, utilities expect two year growth of 17-31%. For workers that spend at least half of their time on solar projects, the two-year growth expectation swells to 32-60%. Table 5 and Figure 34 illustrate the 24-month occupational data collected on utility firms.

Table 5: 24-Month Occupational Data - Utilities

Occupation/Category	*Percent Employing*	*Difficulty hiring*	*Growth*
Solar utility procurement	53%	41%	18-29%
Solar customer management	74%	44%	12-14%
Solar planners	63%	49%	16-41%
Solar support staff	71%	32%	20-47%

[13] Based on the unique regulatory structure of the utility sector, it was determined that employers would provide more reliable information if asked about 24-month, rather than 12-month employment growth.

Figure 34: 24-Month Occupational Data - Utilities



In Figure 34 above, the diameter of the bubble represents the percentage of firms from the sample that hire each occupation, the vertical axis illustrates the 24-month growth rate, and the horizontal axis represents the percentage of firms that report some or great difficulty hiring applicants that meet their firms' expectations regarding qualifications and/or experience.



3.5 Other

Approximately 200 solar firms that participated in this study did not identify with a specific category presented to them. For instance, 24% reported that their firm is engaged in research and development of solar technologies. Similar to their counterparts, over half of the "other" firms that participated in this study expect to add employees over the next 12 months, and more than one in three expect revenue attributed to solar goods and services to increase over the period.

The firms in this category currently employ nearly 13,000 workers. Employment growth rates at these firms are expected to be much lower as compared to the specific solar sectors studied in this report. Over the next year, other firms expect to add nearly 1,200 new solar jobs over the coming year (9.1% annual growth).

Figure 35: Percentage of Revenue Attributed to Solar - Other

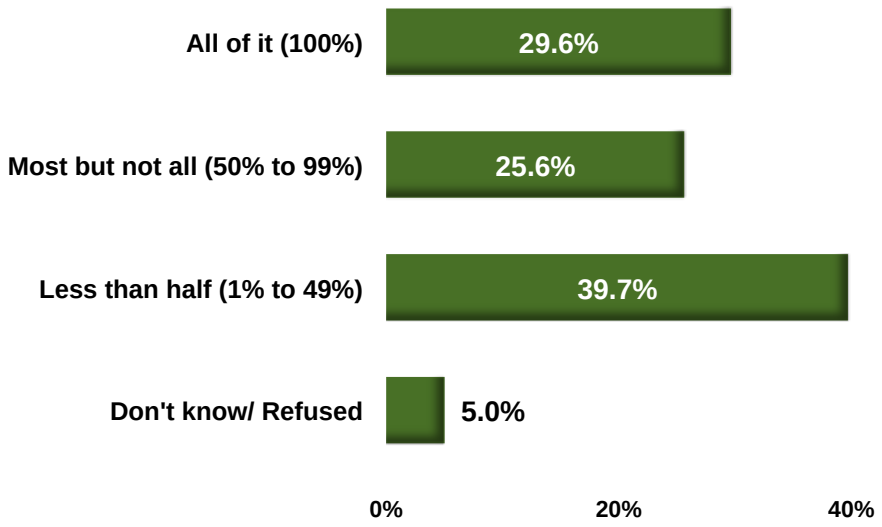


Figure 36: 12-Month Expectations of Revenue Attributed to Solar Goods and Services - Other

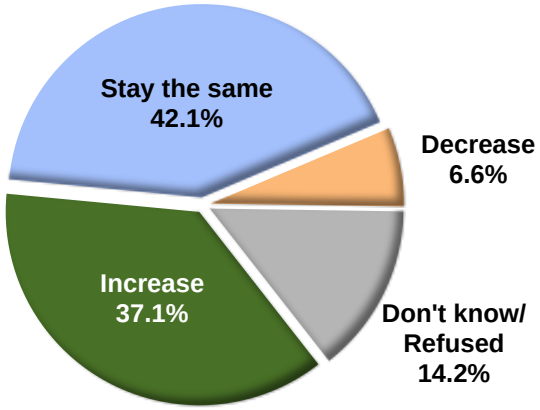
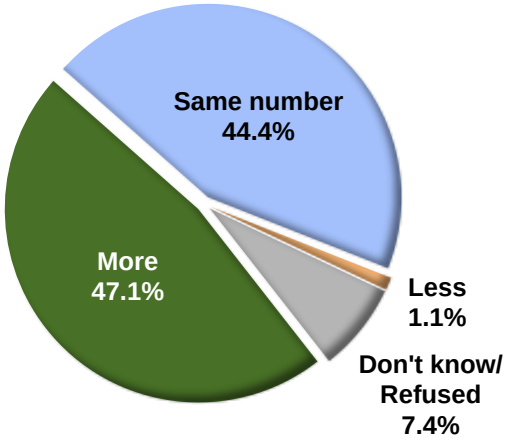


Figure 37: 12 Month Hiring Expectations - Other



4. Conclusion

This report, the first national solar workforce study to collect employer data from all segments of the industry, finds that solar firms can be found in every state and employ tens of thousands of workers throughout the country. As would be expected, the solar industry includes companies of all sizes and firms that are exclusively solar as well as those that include solar as just one part of their overall business. Our rigorous research methodology and strong participation from solar employers allows us to draw more comprehensive conclusions from the data than from previous reports.

Individual states do not have the same distribution of installation, manufacturing, and wholesale trade firms, or utilities employing solar, as seen at the national level. To more fully understand state-level solar labor markets, more detailed state-by-state data collection, research and analysis is needed. This report will provide important information to guide those efforts.

Overall, solar firms expect to add jobs at a pace that is much faster than the general economy, and are highly optimistic regarding their overall revenue growth over the near term. Specifically, firms that derive at least some revenue from solar goods and services employ over 93,000 solar workers. Over the next 12 months, over half of all solar firms expect to add jobs, while only 2% expect to cut workers.

By comparing the job growth expectations from our research and from existing secondary sources, we can draw several important conclusions:

1. **Solar companies employ 93,000 solar workers, and expect the number of solar workers to grow by 26%** or 24,000 new solar workers.

2. **Nearly half of all firms expect their solar revenue to increase** as a percentage of their overall revenue over the next year.

3. **Employers from all of the studied subsectors and all regions of the country expect significant employment growth** over the next 12 months.

These findings clearly illustrate that the solar industry is a strong and growing cluster that is responsible for thousands of jobs across every state in the nation. The unprecedented growth of the industry is providing much needed job creation despite a historic economic and workforce downturn. The optimism of solar employers in the midst of these conditions should yield continued job growth for years to come.

5. Appendices

5.1 Data Sources

EMSI Data Sources and Calculations

Industry Data

In order to capture a complete picture of industry employment, EMSI basically combines covered employment data from Quarterly Census of Employment and Wages (QCEW) produced by the Department of Labor with total employment data in Regional Economic Information System (REIS) published by the Bureau of Economic Analysis (BEA), augmented with County Business Patterns (CBP) and Nonemployer Statistics (NES) published by the U.S. Census Bureau. Projections are based on the latest available EMSI industry data, 15-year past local trends in each industry, growth rates in statewide and (where available) sub-state area industry projections published by individual state agencies, and (in part) growth rates in national projections from the Bureau of Labor Statistics.

State Data Sources

This report uses state data from the following agencies: Alabama Department of Industrial Relations; Alaska Department of Labor and Workforce Development; Arizona Department of Commerce, Research Administration; Arkansas Department of Workforce Services; California Labor Market Information Department; Colorado Department of Labor and Employment; Connecticut did not provide us with a data source; Delaware Office of Occupational and Labor Market Information, Delaware Wages 2004; District of Columbia did not provide us with a data source; Florida Agency for Workforce Innovation; Georgia Department of Labor, Workforce Information and Analysis, Occupational Information Services Unit; Hawaii Department of Labor and Industrial Relations, Research and Statistics Office; Idaho Department of Labor; Illinois Department of Employment Security, Employment Projections; Indiana Department of Workforce Development; Iowa Workforce Development; Kansas Department of Labor, Labor Market Information Services, Kansas Wage Survey; Kentucky Office of Employment and Training; Louisiana Department of Labor; Maine did not provide us with a data source; Maryland Department of Labor, Licensing and Regulation, Office of Labor Market Analysis and Information; Massachusetts did not provide us with a data source; Michigan Department of Labor and Economic Growth, Bureau of Labor Market Information and Strategic Initiatives; Minnesota Department of Employment and Economic Development; Mississippi Department of Employment Security; Missouri Department of Economic Development; Montana Department of Labor and Industry, Research and Analysis Bureau; Nebraska Workforce Development; Nevada Department of Employment, Training and Rehabilitation, Information Development and Processing Division, Research and Analysis Bureau; New Hampshire Department of Employment Security; New Jersey Department of Labor and Workforce Development; New Mexico Department of Labor, Bureau of Economic Research and Analysis; New York Department of Labor, Division of Research and Statistics; North Carolina Employment Security Commission, Labor Market Information Division; North Dakota Job Service, Labor Market Information Center; Ohio Department of Job and Family Services, Labor Market Information Division; Oklahoma Employment Security Commission; Oregon Employment Department, Oregon Labor Market Information System; Pennsylvania

Department of Labor and Industry, Center for Workforce Information and Analysis; Rhode Island did not provide us with a data source; South Carolina Employment Security Commission, Labor Market Information Department; South Dakota Department of Labor, Labor Market Information Division; Tennessee Department of Labor and Workforce Development, Research and Statistics Division; Texas Workforce Commission; Utah Department of Workforce Services; Vermont did not provide us with a data source; Virginia Employment Commission, Economic Information Services; Washington State Employment Security Department, Labor Market and Economic Analysis Branch; West Virginia Bureau of Employment Programs, Research Information & Analysis Division; Wisconsin Department of Workforce Development, Bureau of Workforce Information; Wyoming Department of Employment, Research and Planning.

5.2 Data Limitations and Methodology

The following three-phased methodology describes the survey methodology to gather employer information from both self-identified or known solar employers, those firms that are connected to solar industry associations and can be found on solar employer databases, and unknown solar employers that are found in industry classifications that are more likely to have solar employers. This methodology describes the process that was followed for all of the solar employer surveys except for those completed by utilities.

Phase 1: Develop, classify and analyze a database of self-identified or known solar employers. The first phase created a comprehensive database of all known or self-identified solar employers across the country. This database was developed by a collaborative effort between the national solar industry associations and partners. The comprehensive database was developed from all of the partners' contact information of employers. Duplicates were identified and removed following a stringent evaluation of firm phone numbers, locations, and firm names.

The database of employers did not include variables that consistently identified which sector (manufacturing, installation, wholesale trade, research & development, ...) each employer was involved in, the size of the employer, or whether the employer had a single location or represented multiple locations.

Phase 2: Survey of self-identified or known solar employers.

The second phase of the survey research was a census, using online and telephone surveys of all solar employers from the database developed in phase one. Employers were asked which sector they were involved in (installation, manufacturing, wholesale trade, research & development and other) and based on their response they were forwarded to the appropriate survey instrument. All employers in the database with email information were sent multiple online invitations and for those that did not complete an online survey, they were called up to three times. The employers without email information were called up to five times and asked to participate in the survey by completing a brief phone survey. These results represent the solar employer community that is connected to regional and national solar trade associations.

It is important to note that surveys were completed for each employment location and not necessarily for each firm. So if a solar employer was asked to participate in a survey, s/he would be asked about the employment profile of a given location and not of the entire firm.

Margin of error: Survey of self-identified or known solar employers.

The overall margin of error for the known universe of the solar employer survey, at the 95 percent level of confidence, is between +/- 1.06 percent and +/- 1.76 percent (depending on the distribution of each question) for questions answered by all 2,181 employers from the universe of 7,440 solar employment locations estimated in the known universe. This also represents a response rate of 29 percent from the database of known solar employers, which includes employers in manufacturing, installation, wholesale trade, research & development and other related solar industries.

It is important to note that questions asked of smaller sub-groups of respondents will have a margin of error greater than +/-1.76 percent, with the exact margin of error dependent on the number of respondents within each sub-group as well as the distribution of responses.

Phase 3: A random sampling of employers in industry classifications that are most likely to have unknown solar employers.

The final phase of the survey research was a sampling of employers in specific industries within wholesale trade, manufacturing, and the construction (installation) industries. The survey was completed over the phone and the sample was stratified by industry, region and firm size (4 or less employees or 5 or more employees). These results represent the solar employers that make up the wholesale trade, manufacturing, and construction industry employers within the industry classifications noted below.

It is important to note that the percentage of overlap between the known and unknown universe of solar employers was calculated based on the incidence of firms that were sampled as part of the unknown universe but also found to be in the known universe file or firms that indicated they had already completed a similar survey. The resulting calculation of overlapping firms was taken out of the total estimate of firms in the known universe of solar employers.

Wholesale trade: Provides the cleanest opportunity to interview firms that were not in the known universe list because there are two NAICS (North American Industry Classification System) codes that are very specific to solar distributors/ wholesalers:

42372031 – Solar energy system supplier, and parts wholesaler

42372032 - Solar energy equipment wholesaler.

According to InfoUSA, there are 1,558 firms that indicated one of these two wholesale trade designations as their primary industry classification and 778 that indicated them as their secondary classification. All 2,336 firms that identified one of these two NAICS codes as their primary or secondary industry classification were called and asked whether they were in the solar industry and if they would participate in the survey.

Manufacturing: Industry classifications for manufacturing related to solar were not as specifically identified with solar work. Three NAICS codes were identified with the highest expected concentration of firms that manufacture solar products and components. These NAICS codes were:

333611 – Turbine and turbine generator set unit manufacturing

334413 - Semiconductor and related device manufacturing

335911 - Storage battery manufacturing.

According to InfoUSA, there are 2,582 firms that indicated one of these three manufacturing designations as their primary industry classification and 1,994 that indicated them as there

secondary classification. All 4,576 firms that were identified in one of these three NAICS codes as their primary or secondary industry classification were called and asked whether they were in the solar industry and if they would participate in the survey.

Construction: Industry classifications for the construction industry related to solar were not specifically identified with solar work. Five NAICS codes were identified with the highest expected concentration of firms that provide solar installation services. These NAICS codes were:

236118	Residential remodelers
238160	Roofing contractors
238210	Electrical contractors
238220	Plumbing & HVAC contractors
238990	All other specialty trade contractors.

According to InfoUSA, there are 214,131 firms that indicated one of these five construction designations as their primary industry classification. A total of 10,000 firms stratified by employer size and region within the country were called and asked whether they were in the solar industry and if they would participate in the survey.

Margin of Error: Survey of unknown solar employers in specific industries.

The overall margin of error for the unknown or random universe of solar employer in wholesale trade, manufacturing and the construction industry, at the 95 percent level of confidence, is between +/- 3.79 percent and +/- 6.31 percent (depending on the distribution of each question) for questions answered by all 235 employers that completed a survey from the universe of 9,263 solar employment locations estimated of unknown employers in wholesale trade, manufacturing and construction.

It is important to note that questions asked of smaller sub-groups of will have a margin of error greater than +/-6.31 percent, with the exact margin of error dependent on the number of respondents within each sub-group as well as the distribution of responses.

Methodology for Utilities Survey

The survey methodology for the Utilities survey was an online or telephone survey census of all solar utility employers. All solar utility employers identified by Solar Electric Power Association ® (SEPA) were sent an email invitation to complete the survey. Those employers that did not complete an online survey were called via telephone and asked to participate in a short survey. In total, 79 utilities completed a survey, from a total contact list of 149, resulting in a response rate of over 50 percent.

5.3 National Secondary Data Analysis

5.3.1 Solar Industry Overview

Accurate and reliable secondary data on solar employment does not yet exist. This is because solar companies and occupations are included in broad categories with other firms that are not in the industry. For example, existing classifications combine solar installation companies with electrical contractors. Therefore, the information based on solar installation in the secondary data is a better proxy on related industries - including the solar companies within them - rather than the solar-specific information that we collected in our primary research.[14]

Despite the limitations, secondary data can provide reliable information on many traditional sectors, which can help inform the broad clusters that define economic regions and to compare solar employment with employment rates at other similarly situated firms. **It is critically important to understand that the figures presented in this section do not represent solar employment, but rather include much broader categories to which we can compare the specific solar data collected in the primary research**. Using classifications developed by numerous sources, the industries most associated with solar firms are expected to add over 173,000 jobs over the next twelve months and nearly 725,000 jobs over the five year period ending in 2015, representing an impressive 4% growth over the next year and 16.3% growth rate over the five-year period. Though most subsectors do appear to show moderate to strong growth over the next five years, the installation sector is by far the largest and fastest growing of the subsectors, according to EMSI data.

Our secondary data analysis relies on Economic Modeling Specialists, Inc. (EMSI) analysis of traditional, solar-related industries (by the North American Industry Classification System, or NAICS code) and occupations (by Standard Occupational Classification, or SOC) that are drawn from O*NET's *Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations*, the California Community Colleges Center of Excellence *Green Economy Overview*, the Political Economy Research Institute's *Green Recovery Report* and original research from the random sample of employers.

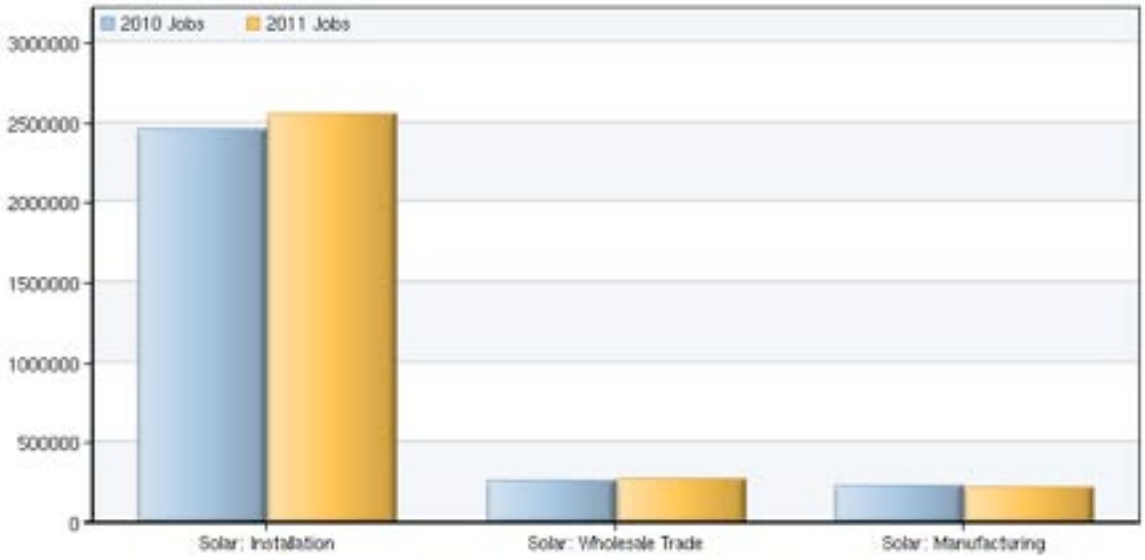
Table 6 illustrates the various NAICS codes that most frequently include solar companies.

[14] The secondary data collected for this report is limited by the nature of the classification of solar firms. This results in information that is illustrative for general and broad conclusions but cannot be reasonably relied on to draw specific conclusions at the level of validity that primary research can provide, because too many non-solar firms are included within the current classification systems. Therefore, existing data is skewed because it includes many other types of firms that are not in the solar industry, which may be declining or growing at different rates than their solar counterparts.

Table 6: Solar NAICS Codes

NAICS Code	*Description*	*Subsector*
236118	Residential Remodelers	Installation
238160	Roofing Contractors	Installation
238210	Electrical Contractors and Other Wiring Installation Contractors	Installation
238220	Plumbing, Heating, and Air-Conditioning Contractors	Installation
238190	Other Foundation, Structure, and Building Exterior Contractors	Installation
238990	All Other Specialty Trade Contractors	Installation
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	Wholesale Trade
423620	Electrical and Electronic Appliance, Television, and Radio Set Merchant Wholesalers	Wholesale Trade
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	Wholesale Trade
333414	Heating Equipment Manufacturing	Manufacturing
333611	Turbine and Turbine Generator Set Units Manufacturing	Manufacturing
334413	Semiconductor and Related Device Manufacturing	Manufacturing
334419	All other Electrical and Component Manufacturing	Manufacturing
221119	Other Electric Power Generation	Utilities

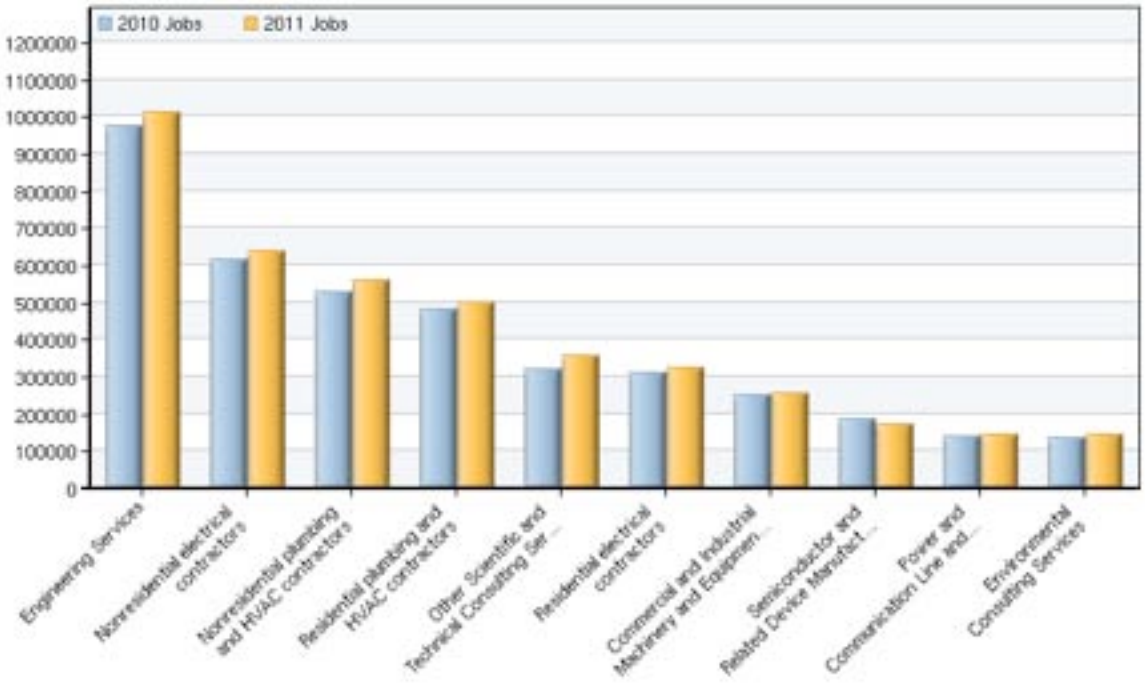
Figure 38: Secondary Data on Subsectors



Source: EMSI Complete Employment, 3rd Quarter 2010

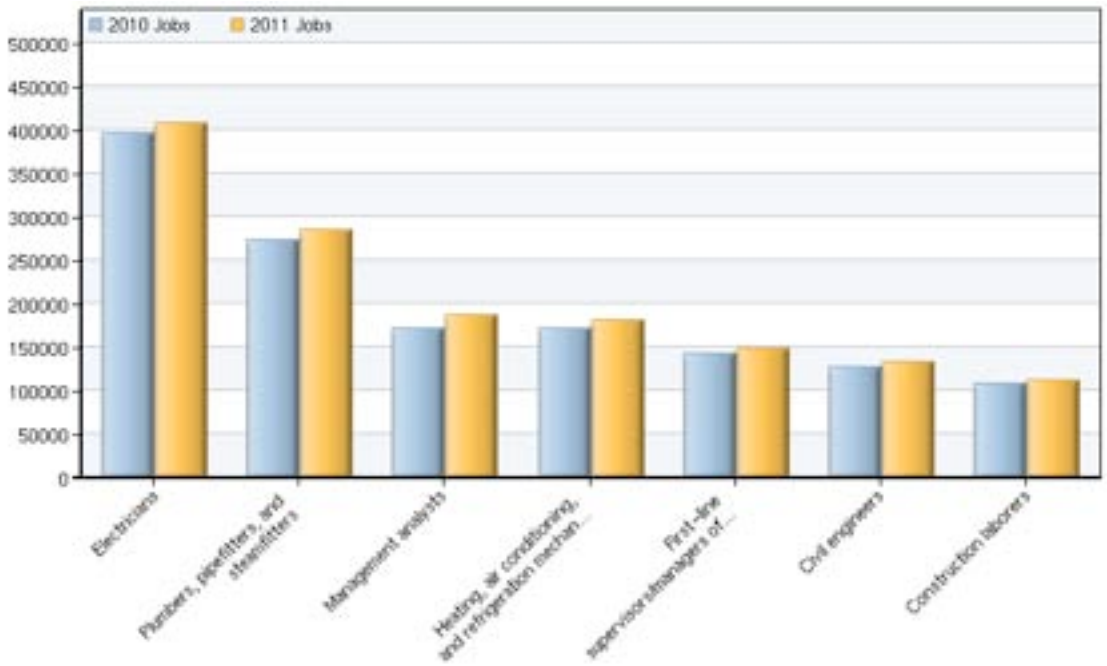
Reviewing the more specific industries within these broad subsectors, engineering firms, electrical contractors, and plumbing and HVAC contractors are expected to experience the greatest growth, along with their related traditional occupations.

Figure 39: Secondary Data - Employment by Traditional Occupations Related to Solar



Source: EMSI Complete Employment, 3rd Quarter 2010

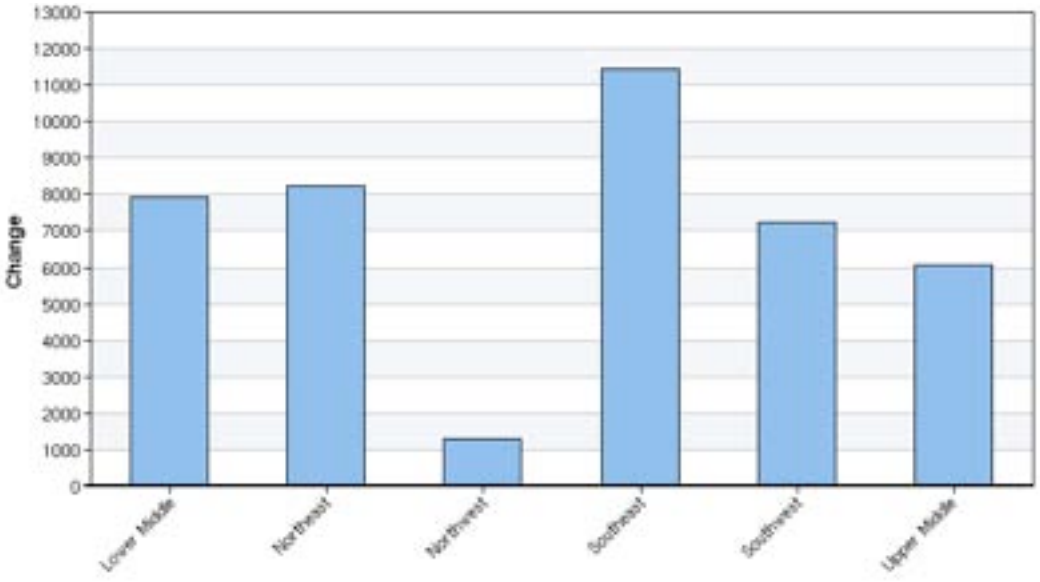
Figure 40: Secondary Data - Employment Growth by Traditional Occupations



Source: EMSI Complete Employment, 3rd Quarter 2010

Regionally, the Southeast is expected to add the most jobs of any area across all solar subsectors over the next year, followed by the Northeast and Upper Midwest.

Figure 41: Secondary Data - Regional Comparisons by Employment Growth (12 Month)



Source: EMSI Complete Employment, 3rd Quarter 2010

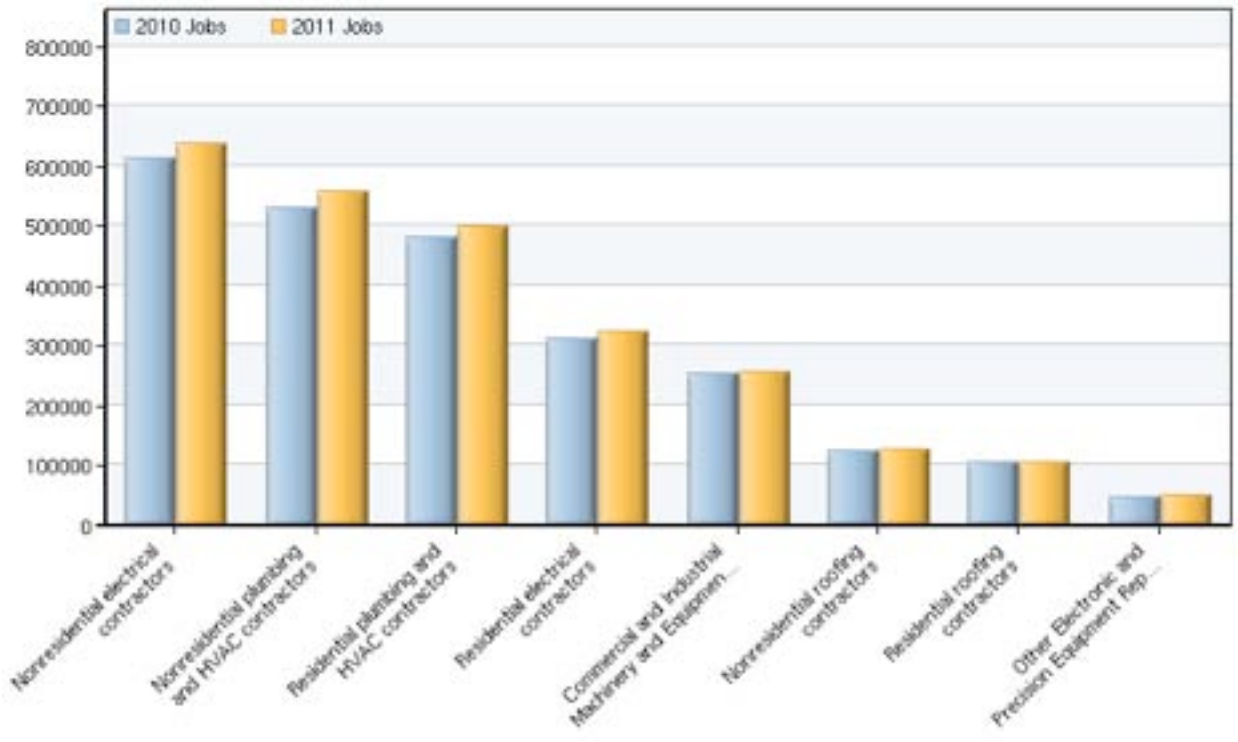
5.3.2 Installation Data

Existing labor market data for solar installers are limited because firms and occupations related to those installations tend to be classified in more broadly defined construction industries. For example, many solar installation firms are classified as electrical contractors (NAICS 238211 and 238212), roofing contractors (NAICS 238161 and 238162), plumbing and HVAC contractors (NAICS 238221 and 238222), to name a few. Compounding this matter, solar installer occupations are typically included with electricians (SOC 47-2111), plumbers (SOC 47-2152), roofers (SOC 47-2181) and other construction-related job titles.

Despite these limitations, analyzing the aggregate information for solar installation-related industries and occupations can be illustrative, particularly in order to compare the projected growth and wage information across geographic regions. The data also provide insight into the overall potential for growth on a national level. Data provided for the selected industries includes all jobs, not only those directly related to solar.

According to EMSI data, the traditional industries associated with solar are expected to experience job growth of over 3.75% over the next year - nearly double the anticipated overall job growth of 2% over the same period but only one-fifth of the 18% anticipated growth reported by solar installers. Of the industries selected for review, the largest growth is expected from non-residential plumbing and HVAC contractors (29,039 new jobs) closely followed by non-residential electrical contractors (22,068 new jobs).

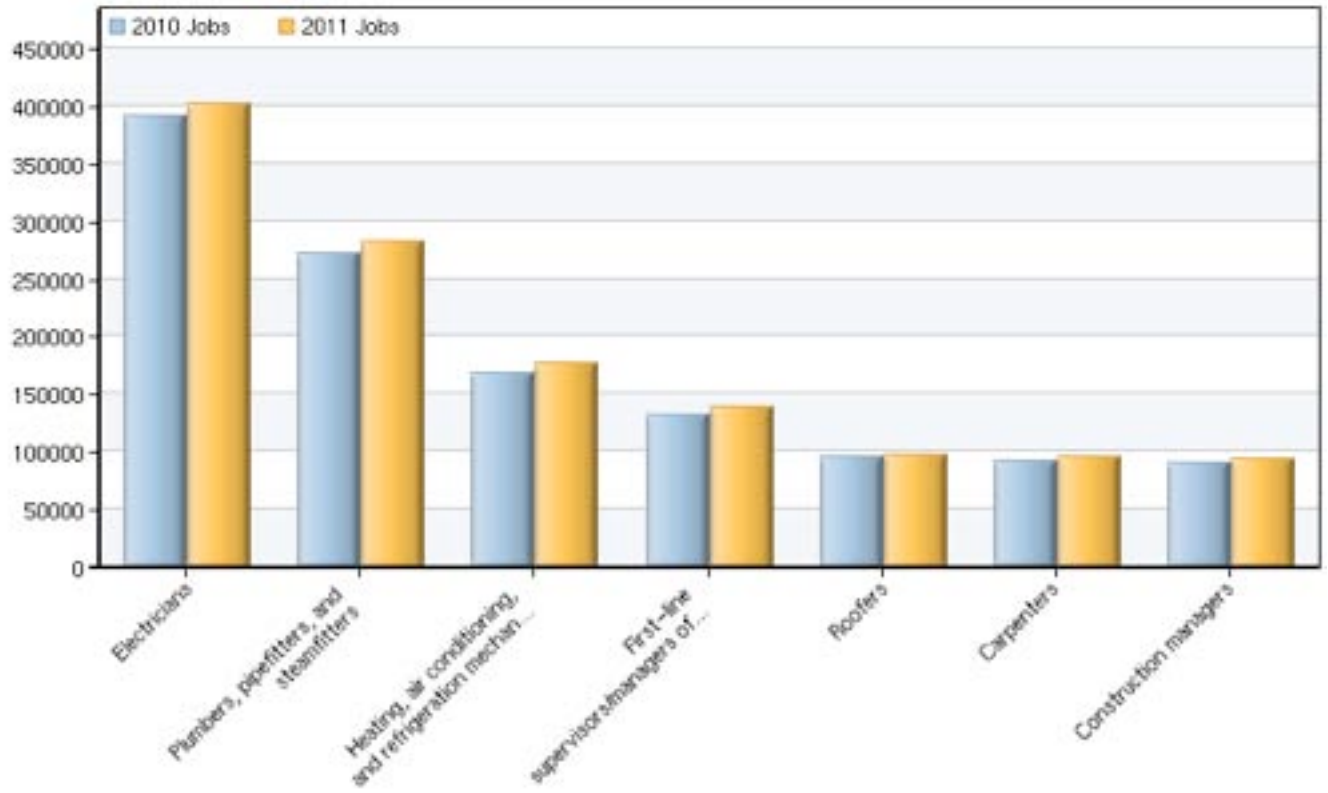
Figure 42: 12 Month Occupational Growth in Traditional Industries Related to Installations



Source: EMSI Complete Employment, 3rd Quarter 2010

Within these industries, the top occupational growth is expected for plumbers, pipefitters, and steamfitters, followed closely by electricians and HVAC mechanics and installers.

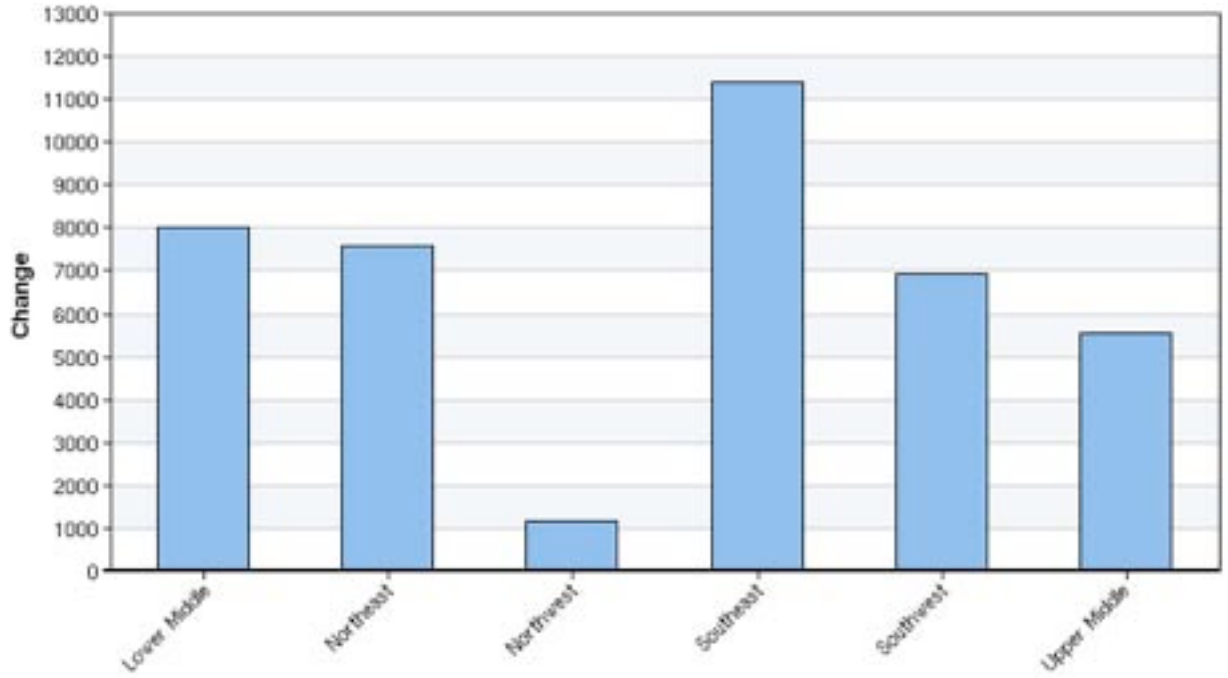
Figure 43: Secondary Data - Top Occupations Within Traditional Industries Related to Installations



Source: EMSI Complete Employment, 3rd Quarter 2010

From a regional perspective, the Southeast is expected to show the largest growth in establishments and occupational growth, followed by the Lower Midwest and the Northeast, over the next 12 months.

Figure 44: Secondary Data - Regional Comparison by Employment



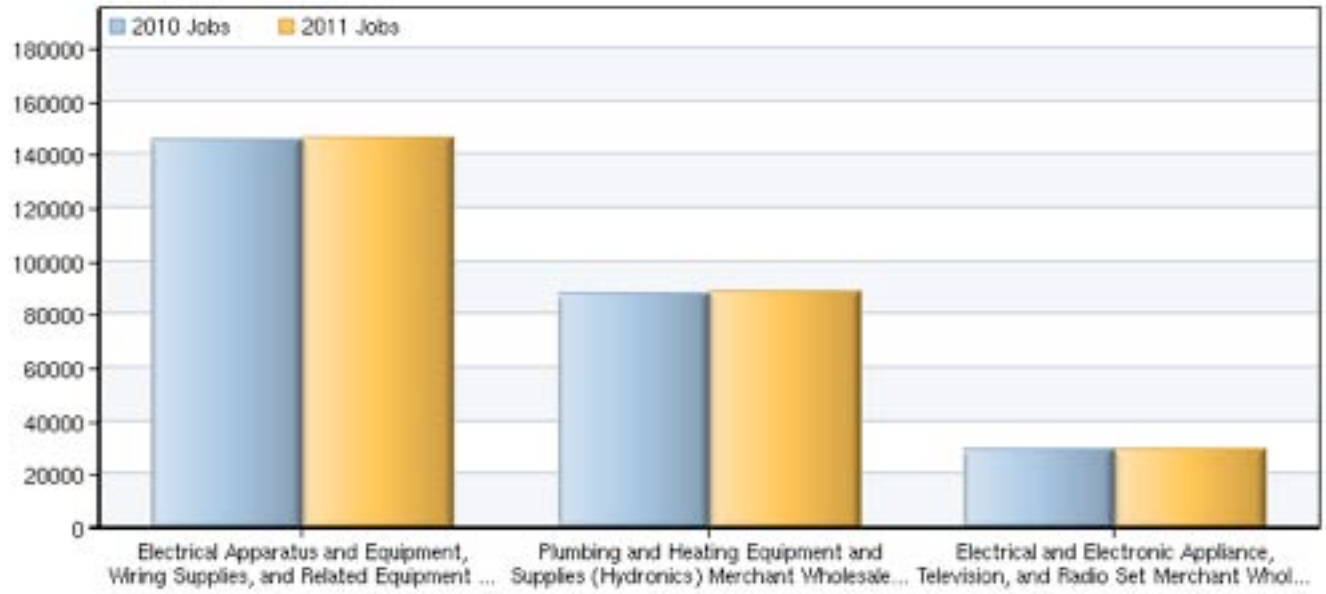
Source: EMSI Complete Employment, 3rd Quarter 2010

5.3.3 Wholesale Trade

The existing data for wholesale trade firms and occupations in the solar industry are also categorized with other firms that sell electrical and plumbing supplies. According to existing literature, solar equipment wholesalers are included in three categories: Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers (423610), Electrical and Electronic Appliance, Television, and Radio Set Merchant Wholesalers (423620), and Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers (423720).

Over the next year, EMSI data indicate that the wholesale trade industries that include solar firms expect to add over 2,200 jobs, representing a growth rate of 1%. Nearly 60% of this growth is expected from Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers, followed closely by Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers.

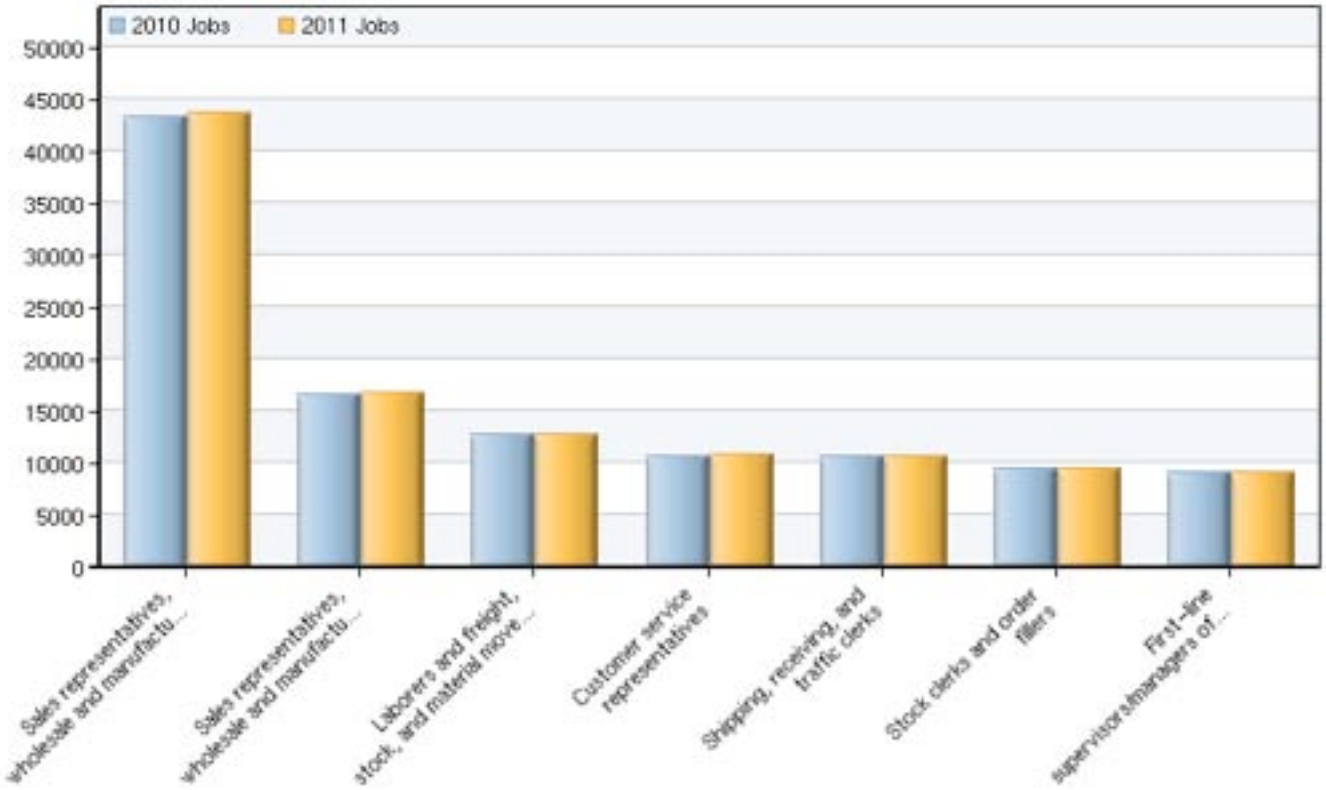
Figure 45: Secondary Data - Traditional Industries Related to Solar Wholesale Trade



Source: EMSI Complete Employment, 3rd Quarter 2010

Within these industries, sales representatives and customer service representatives are expected to be top occupations.

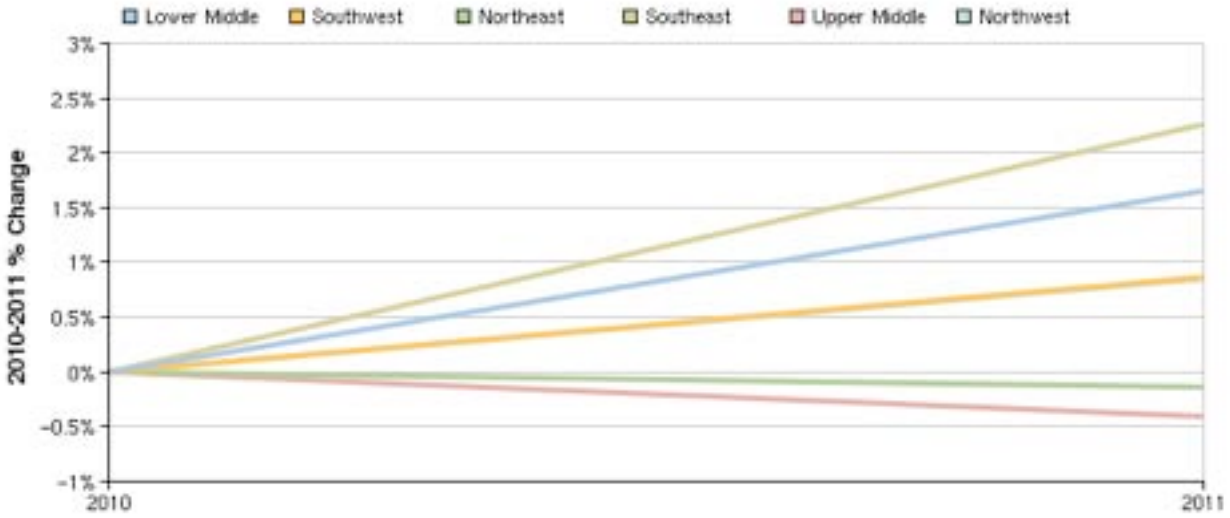
Figure 46: Occupational Growth in Traditional Industries Related to Wholesale Trade



Source: EMSI Complete Employment, 3rd Quarter 2010

From a regional perspective, three of the six regions represent the majority of the employment growth in the selected wholesale trade industries over the coming year, led by the Southeast, Lower Midwest, and Southwest.

Figure 47: Regional Comparison of Employment in Traditional Industries Related to Trade



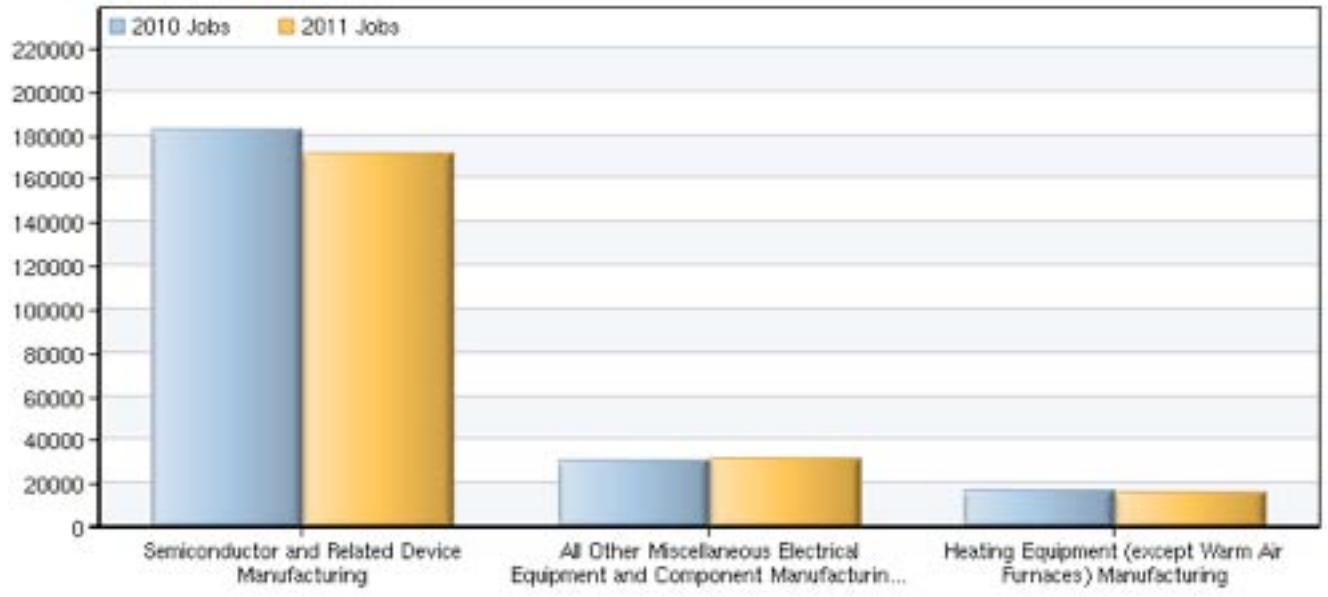
Source: EMSI Complete Employment, 3rd Quarter 2010

5.3.4 Manufacturing

The existing labor market data for solar manufacturing is skewed because the NAICS codes that are most relevant for solar product manufacturing also include manufacturing for other products that are facing steep declines. According to existing reports, these NAICS codes include Heating Equipment (except Warm Air Furnaces) Manufacturing (333414), Semiconductor and Related Device Manufacturing (334413), and All Other Miscellaneous Electrical Equipment and Component Manufacturing (335999).

Drawing a sharp contrast from the solar-specific manufacturing data gathered in the primary analysis for this report, EMSI data indicate that the wholesale trade industries that include solar firms expect to lose over 10,000 jobs over the next year, a net loss of 4.5%. Semiconductor and Related Device Manufacturing firms are expected to lose nearly 11,000 jobs, Heating Equipment Manufacturing firms are expected to lose approximately 600 jobs, and Miscellaneous Electrical Equipment and Component Manufacturing firms are expected to add nearly 1,000 jobs.

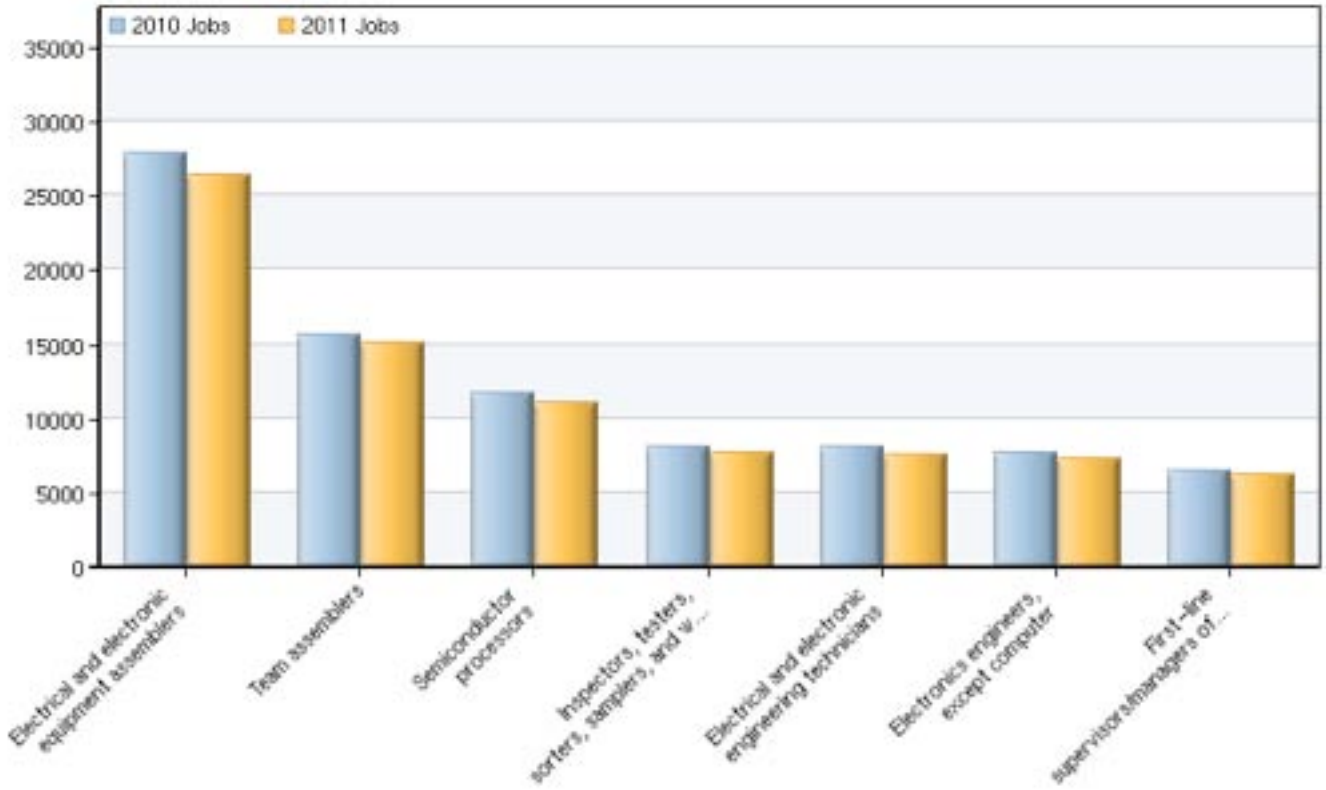
Figure 48: Employment in Traditional Industries Related to Solar Manufacturing



Source: EMSI Complete Employment, 3rd Quarter 2010

Assemblers and processors are expected to face the toughest employment prospects over the next year and beyond.

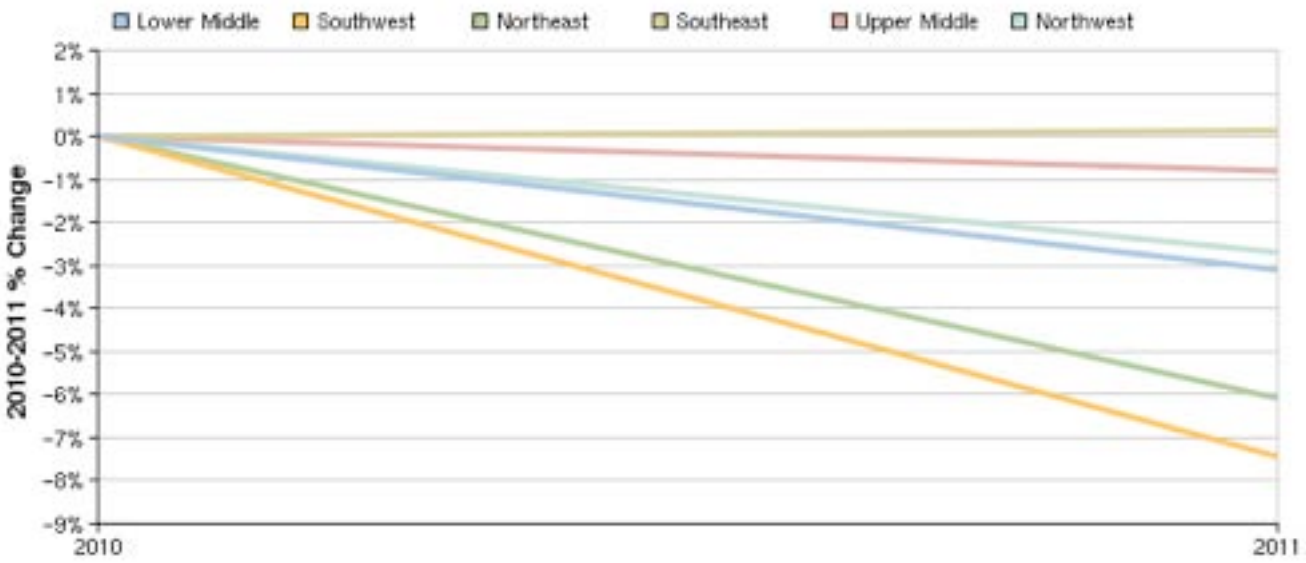
Figure 49: Employment in Traditional Industries Related to Solar Manufacturing, by Occupation



Source: EMSI Complete Employment, 3rd Quarter 2010

From a regional perspective, the Southeast is the only region expected to experience job growth in these industries, adding 31 jobs over the year.

Figure 50: Regional Comparison of Employment in Traditional Industries Related to Solar Manufacturing

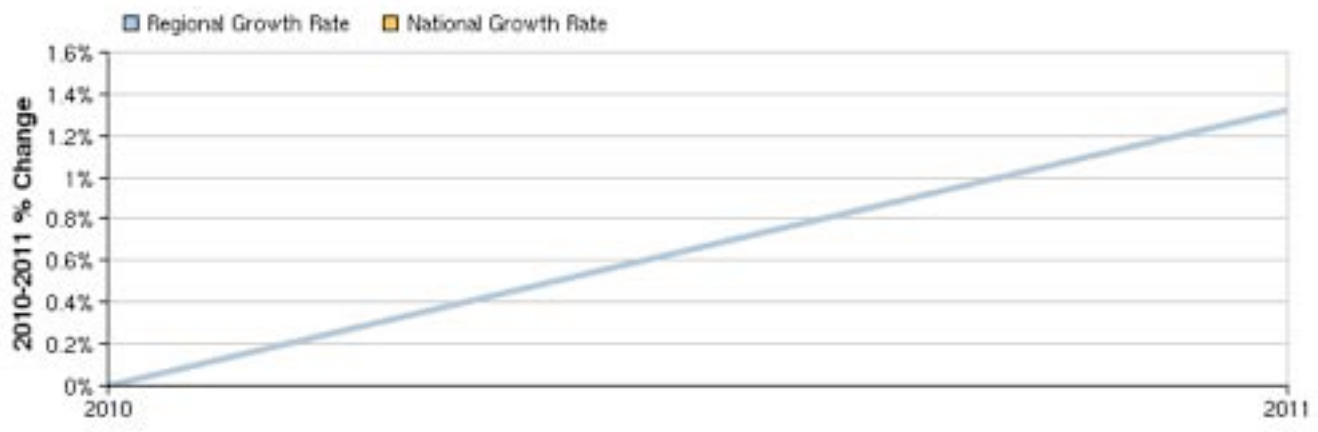


Source: EMSI Complete Employment, 3rd Quarter 2010

5.3.5 Utilities

Existing information on utilities is generally highly reliable, however, as is the case with the other subsectors studied in this report, solar power generation utilities are categorized with many other types of power plants. Though transmission, controls, and bulk power distribution all represent important facets of solar utility information, the classifications are far too broad to draw reasonable and accurate conclusions from secondary sources. Therefore, for the purpose of this analysis, the only industry selected for review is Other Electric Power Generation (NAICS 221119), a sector which includes wind, geothermal, and biomass power generation utilities and firms, among others. Over the next year, EMSI data predict 159 new jobs, or growth of 1%.

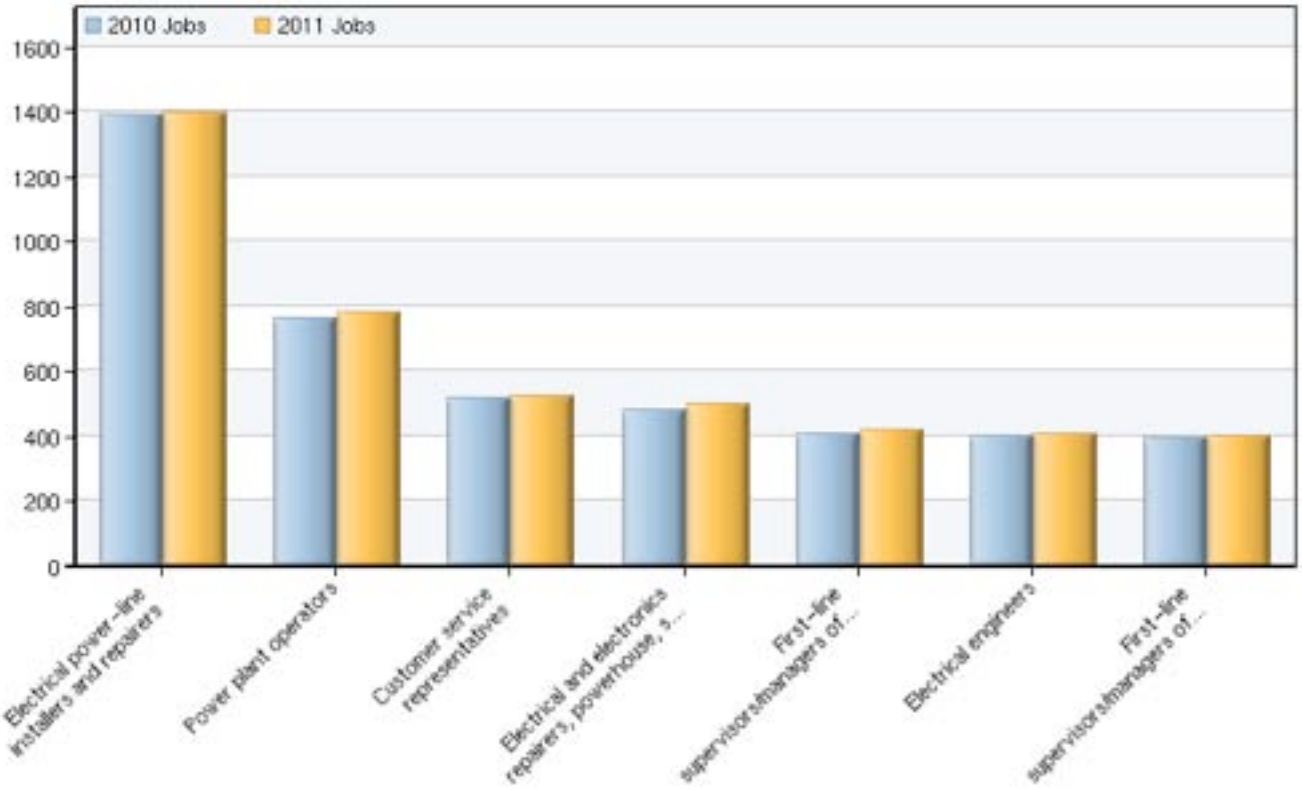
Figure 51: 12-Month Growth Rate of "Other" Electric Power Utilities



Source: EMSI Complete Employment, 3rd Quarter 2010

From an occupational standpoint, power plant operators, and first-line supervisors/ managers of production and operating workers are expected to add the most new jobs, closely followed by electrical and electronics repairers, powerhouse, substation, and relay workers.

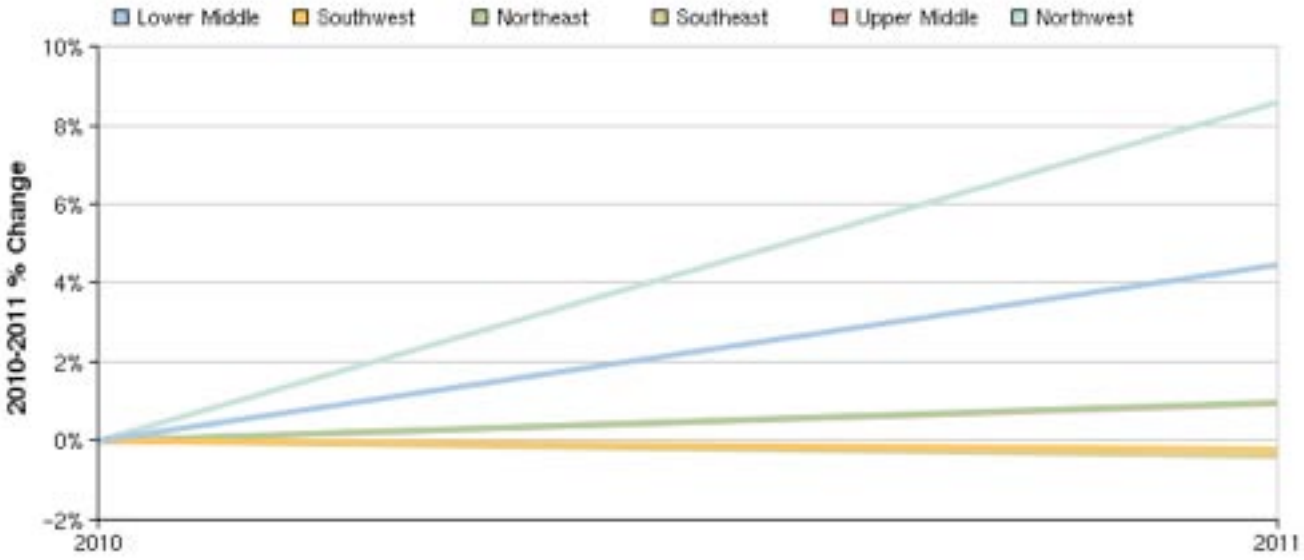
Figure 52: 12-Month Growth Rate of Traditional Occupations Related to Utilities



Source: EMSI Complete Employment, 3rd Quarter 2010

From a regional perspective, the Lower Midwest and the Northwest are expected to add the most jobs in the selected industries.

Figure 53: 12-Month Growth Regional Comparison - Utilities



Source: EMSI Complete Employment, 3rd Quarter 2010

5.4 State-by-State Data Collection

The following page includes a summary of The Solar Foundation's independent analysis of state-level data. This section also includes the raw survey responses, secondary data on each state, and as a comparison, labor market information on the fossil fuel electric power generation sector.

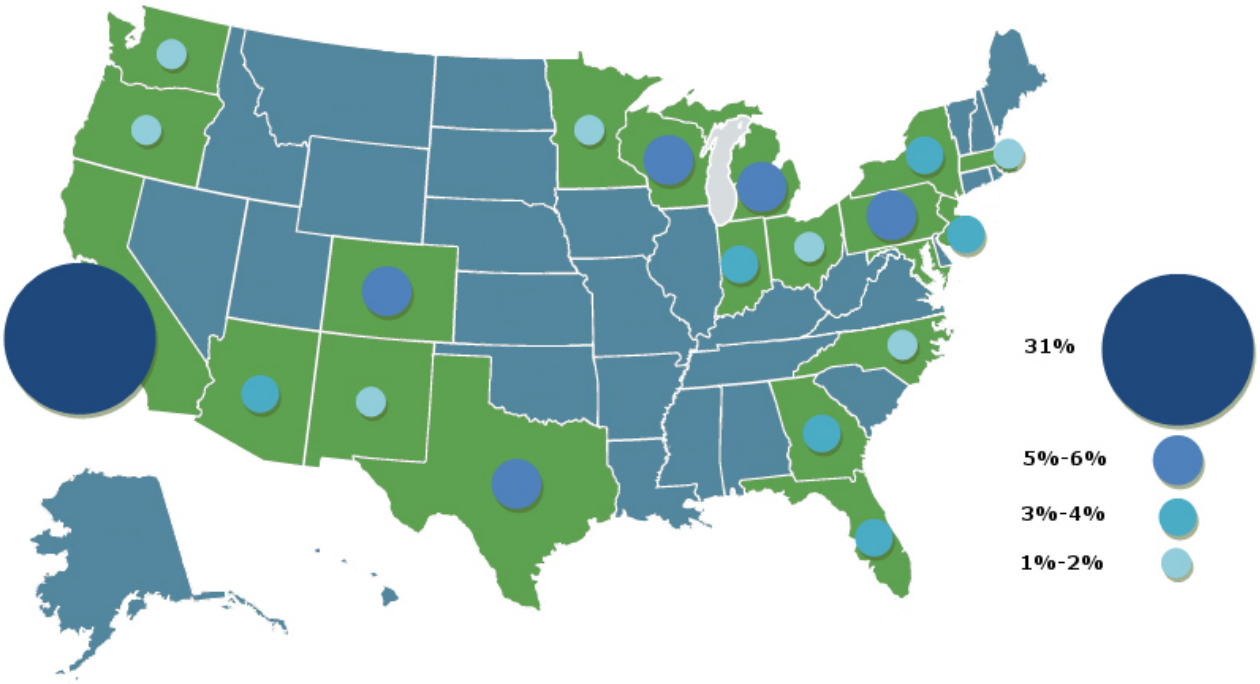
National Solar Jobs Census

Top Solar States

The Solar Foundation conducted an independent analysis of state-level data that were collected by employers as part of the National Solar Jobs Census 2010. This information is important because it provides a way to measure the effectiveness of certain state-driven policies. Because this census is national in scope, state-level data is limited due to geographically-diverse response rates and unrepresentative samples. By reviewing the national data and individual state responses, however, it is possible to generate approximate employment data on a state-by-state basis. Please note that certain states with low number of solar firms may be ranked highly because those firms are larger manufacturers, rather than smaller installer firms. Based on this analysis, the top 10 states for solar jobs are:

Rank	State	Survey Responses[1]	Estimated Solar Jobs	Estimated Solar Firms[2]
1	**California**	17,352	**36,000**	1,072
2	**Pennsylvania**	3,193	**6,700**	282
3	**Texas**	3,068	**6,400**	170
4	**Michigan**	3,023	**6,300**	76
5	**Wisconsin**	2,885	**6,000**	89
6	**Colorado**	2,528	**5,300**	254
7	**Georgia**	2,157	**4,500**	62
8	**Arizona**	1,815	**3,800**	230
9	**New York**	1,654	**3,500**	225
10	**Indiana**	1,628	**3,400**	25

Estimated Jobs in Top 20 States as Percent of Total Solar Jobs



[1] These figures include the total number of jobs at all solar firms in each state, as indicated by the survey responses.
[2] For more information on solar companies in each state, visit: www.solarworksforamerica.com.

For additional state-level data, please visit The Solar Foundation's website at: www.TheSolarFoundation.org.

5.4.1 Alabama

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

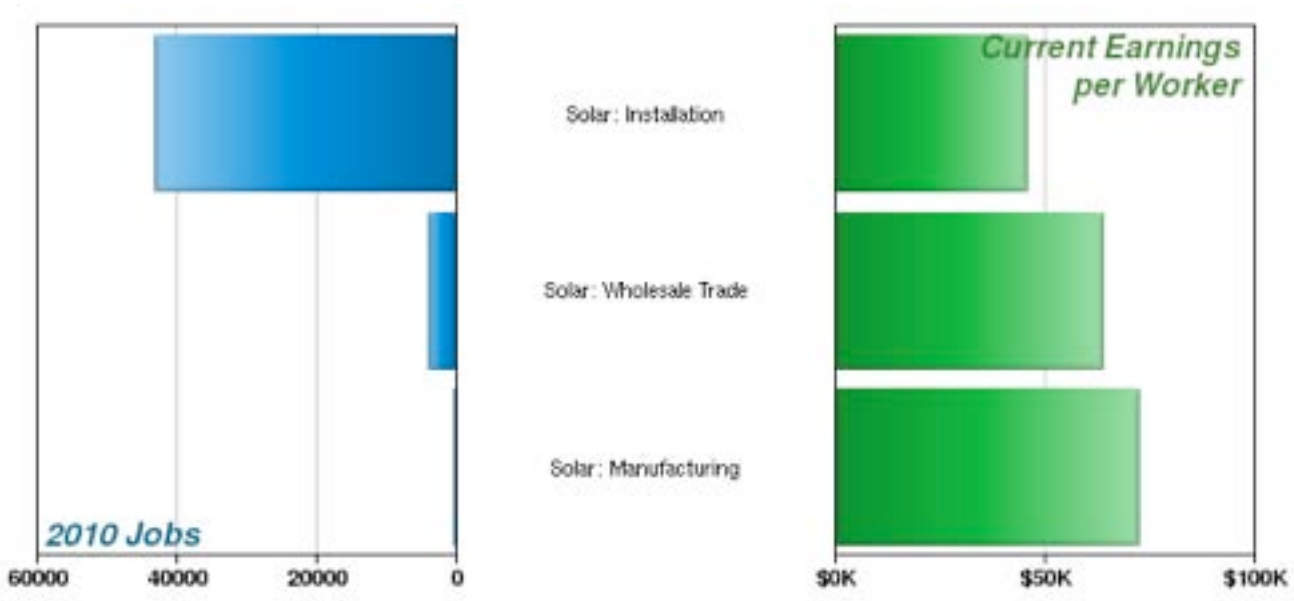
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	4,101	4,165	64	2%	42
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.2 Alaska

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

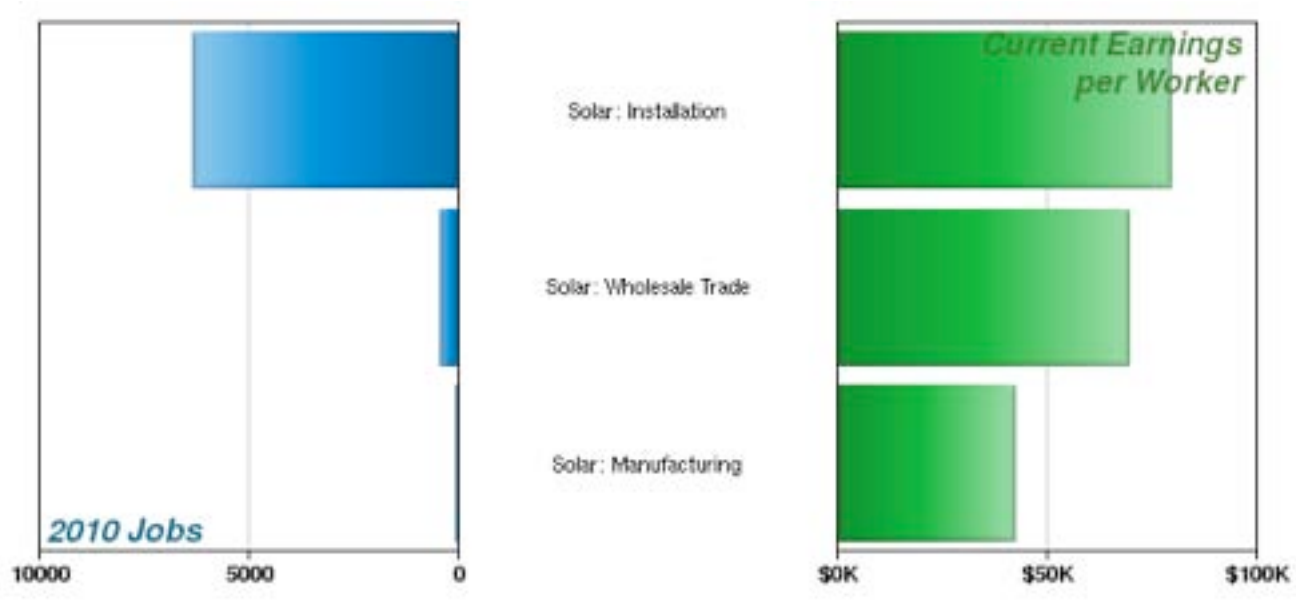
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	396	372	-24	-6%	27
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.3 Arizona

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	104	4%	1,815	2,105	16%
National Total	2,426	n/a	57,197	67,889	19%

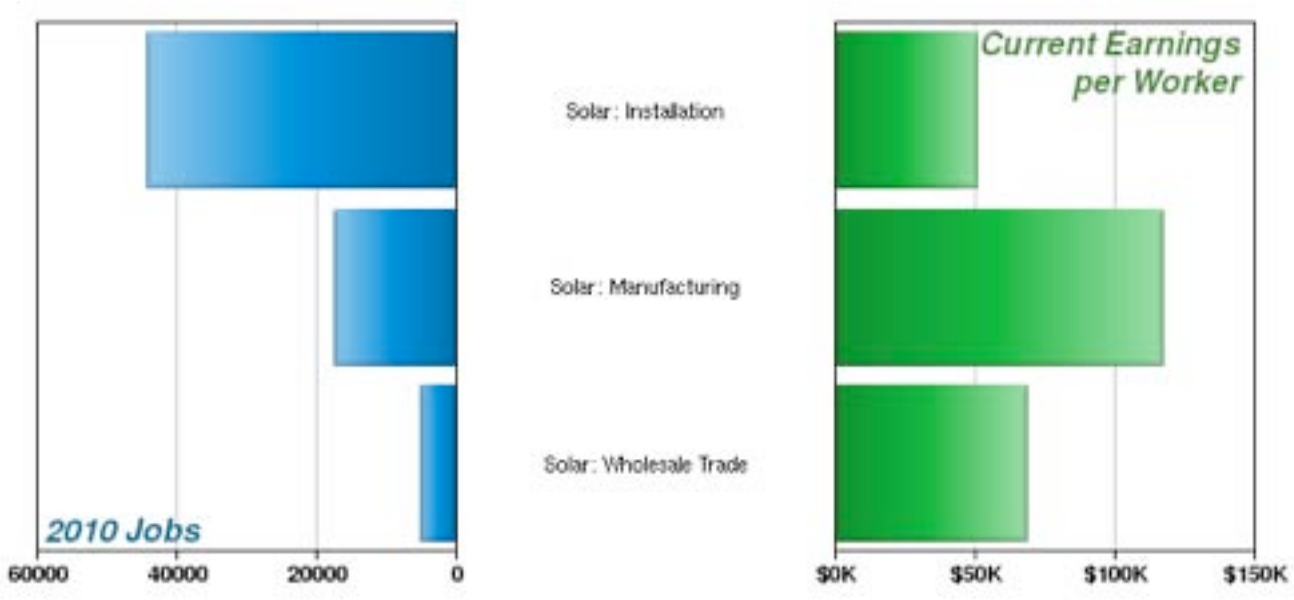
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	5,489	5,479	-10	0%	15
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.4 Arkansas

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

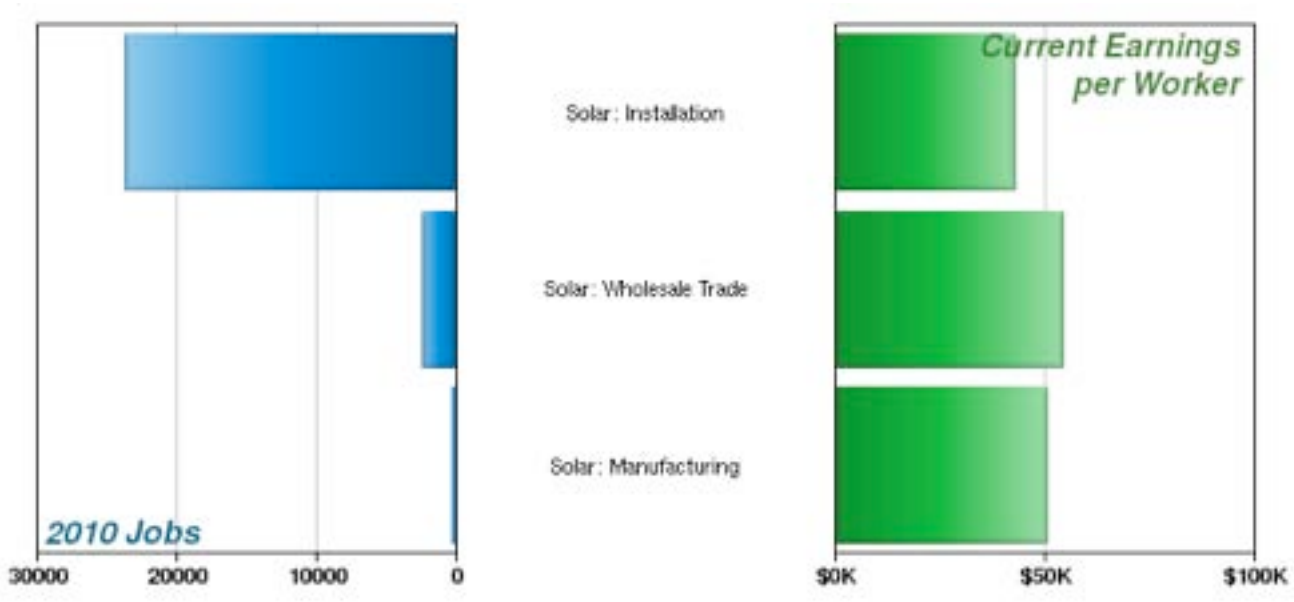
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	165	135	-30	-18%	3
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.5 California

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	698	29%	17,352	21,804	26%
National Total	2,426	n/a	57,197	67,889	19%

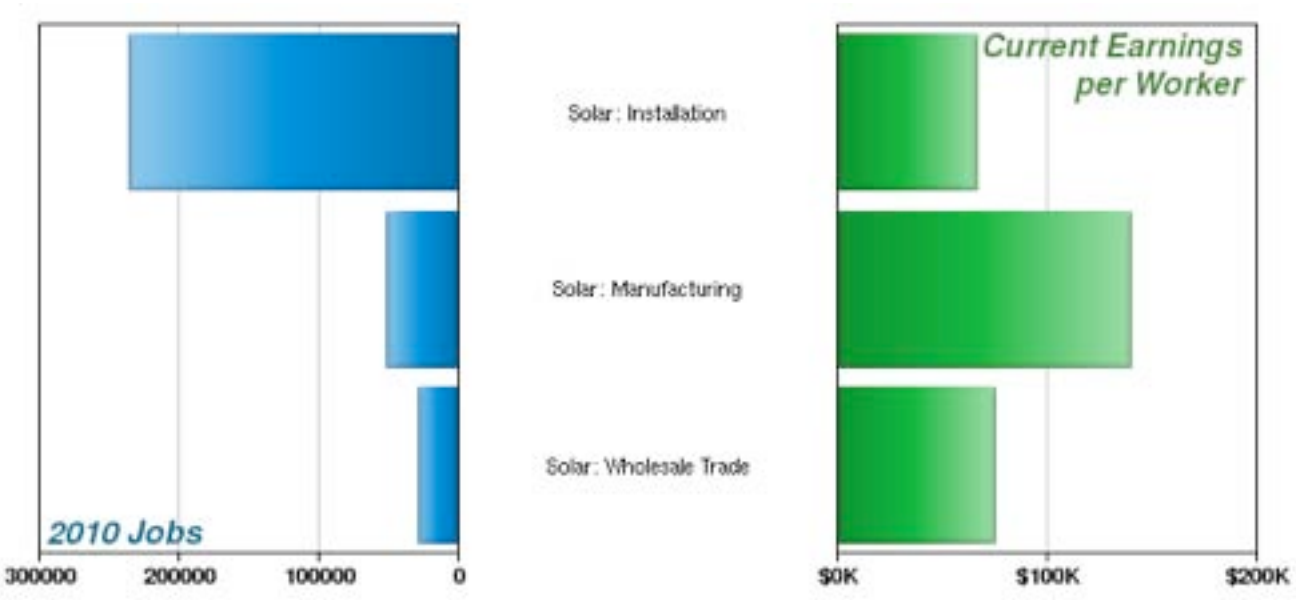
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	13,845	14,055	210	2%	228
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.6 Colorado

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	155	6%	2,582	3,172	23%
National Total	2,426	n/a	57,197	67,889	19%

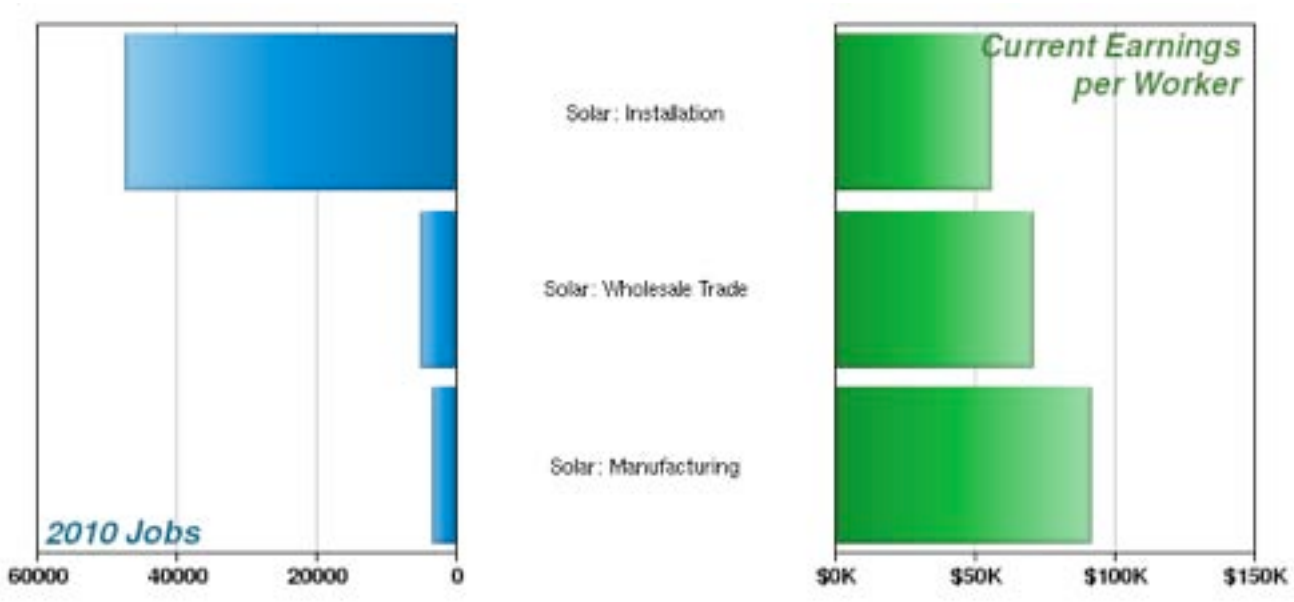
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	492	481	-11	-2%	13
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.7 Connecticut

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	32	1%	199	247	24%
National Total	2,426	n/a	57,197	67,889	19%

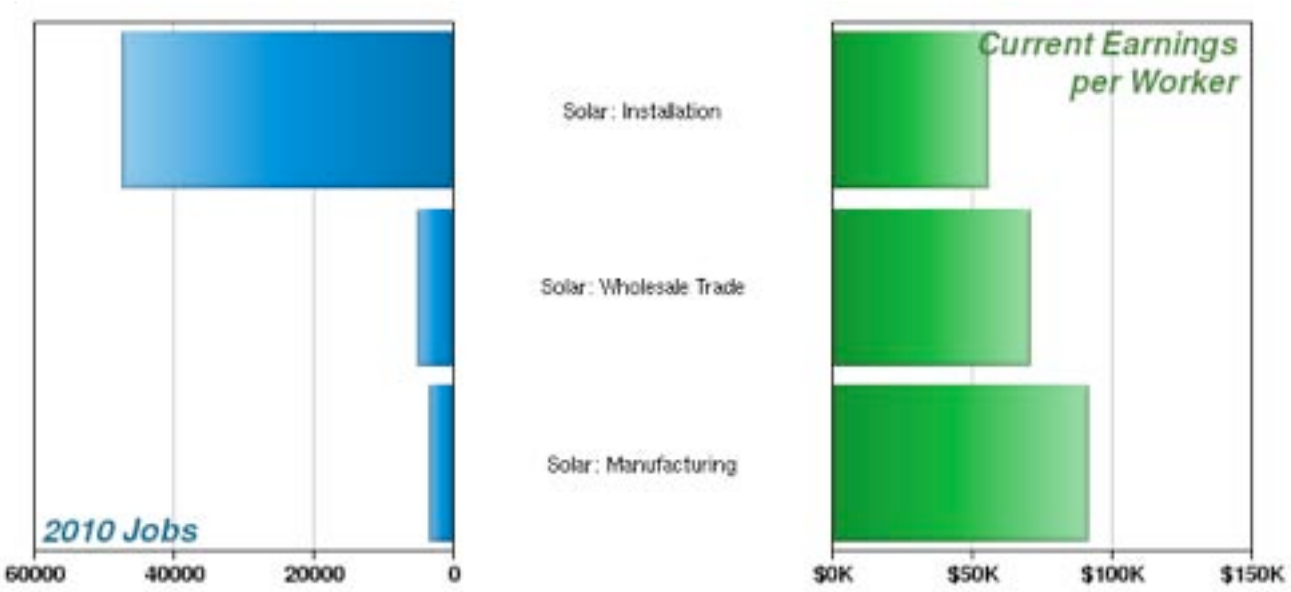
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	253	199	-54	-21%	9
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.8 Delaware

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	11	<1%	175	208	19%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

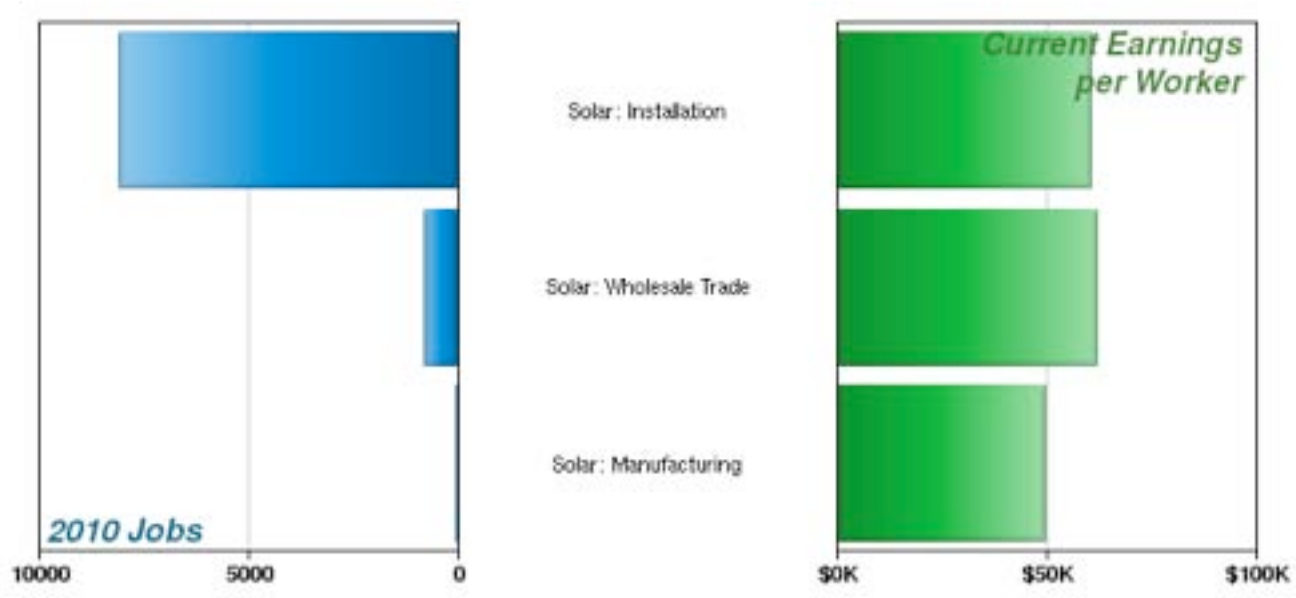
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	92	75	-17	-18%	5
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.9 District of Columbia

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	12	<1%	608	634	4%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

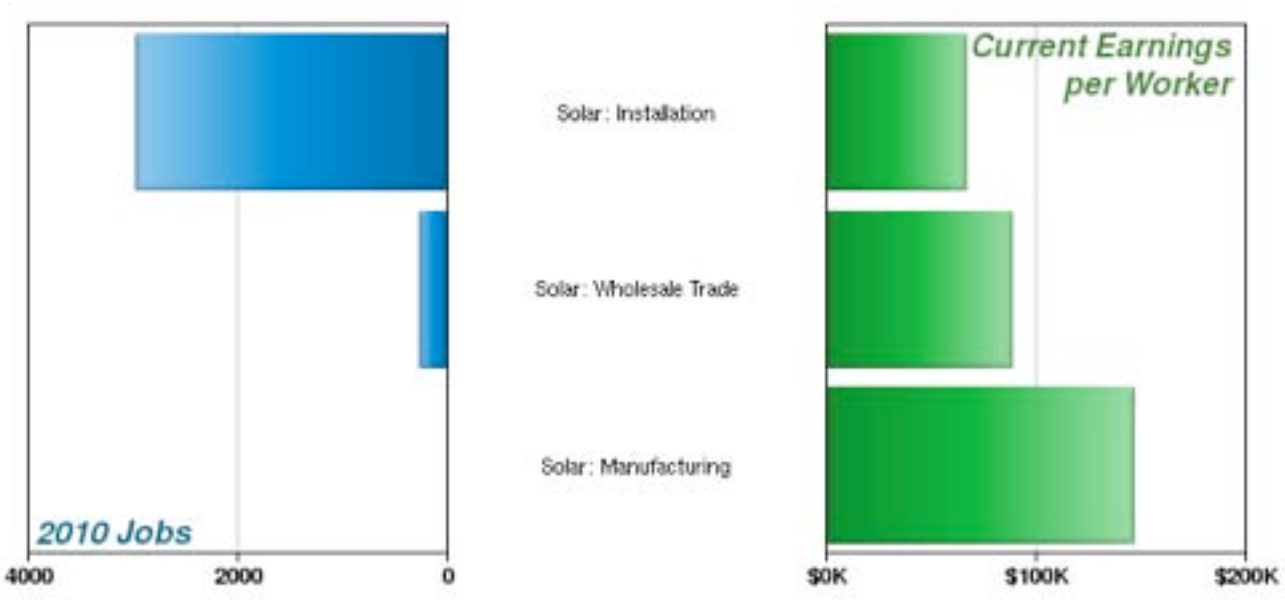
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	29	22	-7	-24%	5
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.10 Florida

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	94	4%	1,416	1,680	19%
National Total	2,426	n/a	57,197	67,889	19%

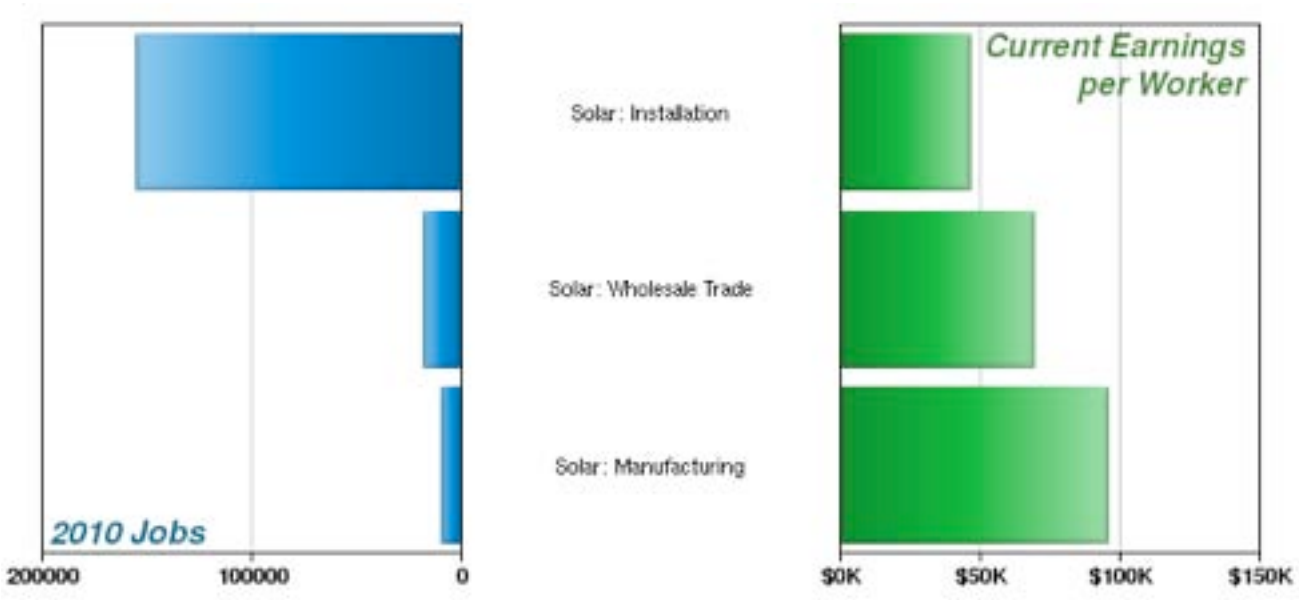
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	4,969	4,318	-651	-13%	71
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.11 Georgia

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	34	1%	2,157	2,913	35%
National Total	2,426	n/a	57,197	67,889	19%

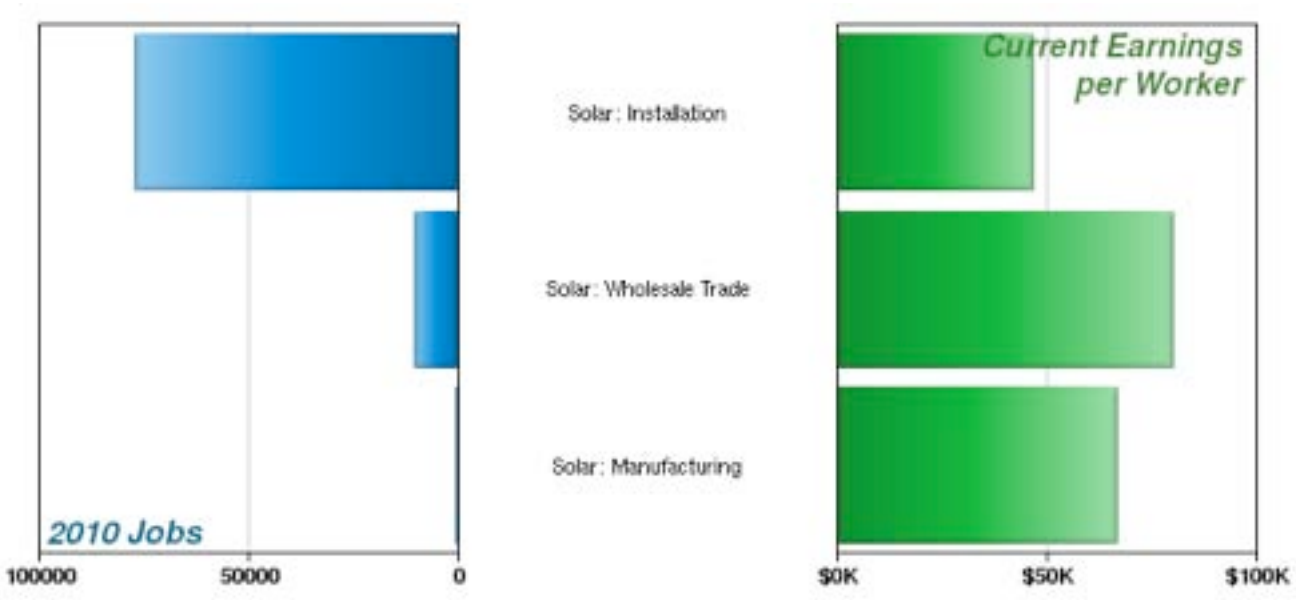
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	n/a	n/a	n/a	n/a	n/a
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010 (Not Enough Jobs in Region)

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.12 Hawaii

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	29	1%	426	555	30%
National Total	2,426	n/a	57,197	67,889	19%

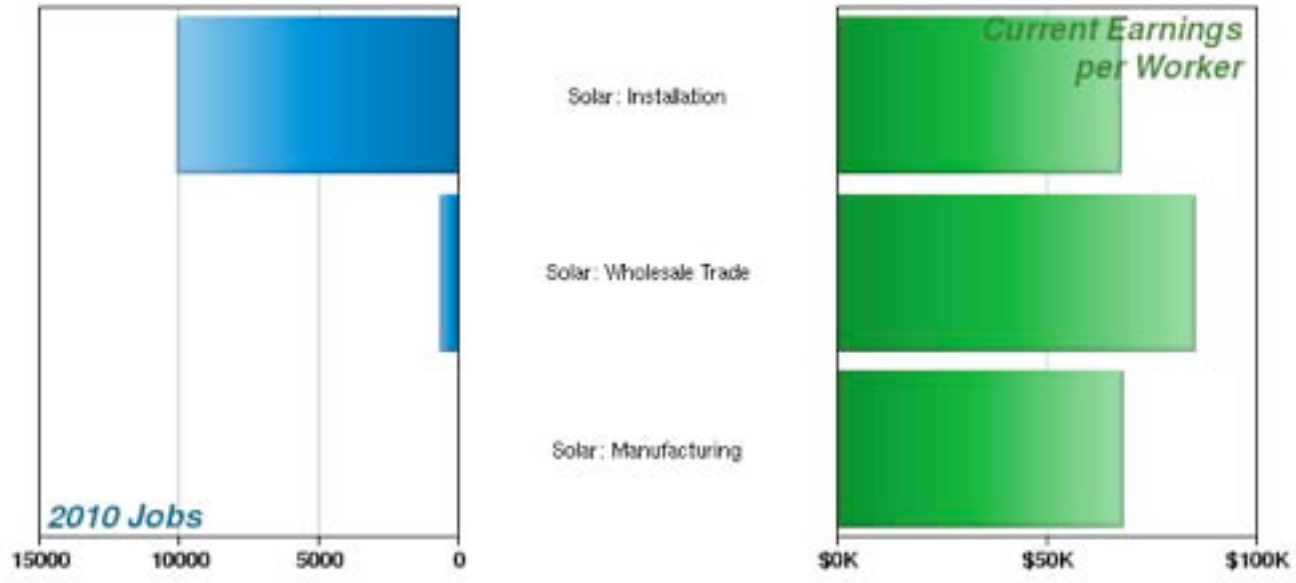
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	2,589	2,623	34	1%	20
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.13 Idaho

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	16	<1%	84	106	26%
National Total	2,426	n/a	57,197	67,889	19%

Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.

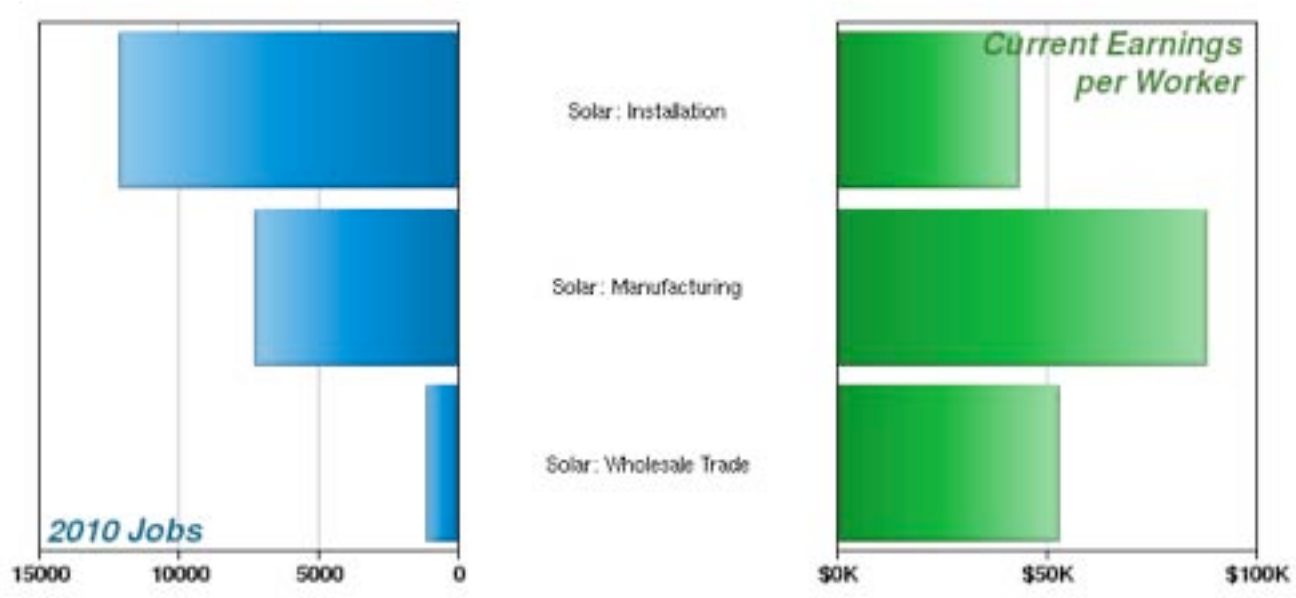
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	n/a	n/a	n/a	n/a	n/a
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.14 Illinois

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	35	1%	533	692	30%
National Total	2,426	n/a	57,197	67,889	19%

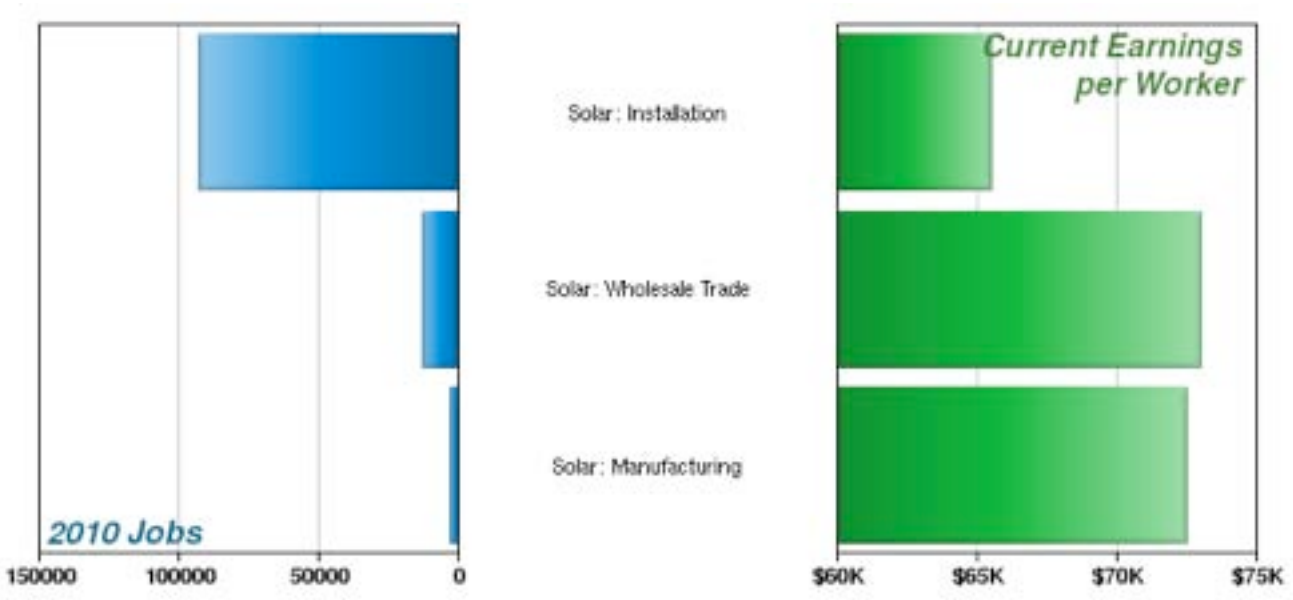
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	2,497	2,267	-230	-9%	46
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.15 Indiana

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	14	<1%	1,628	1,837	13%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

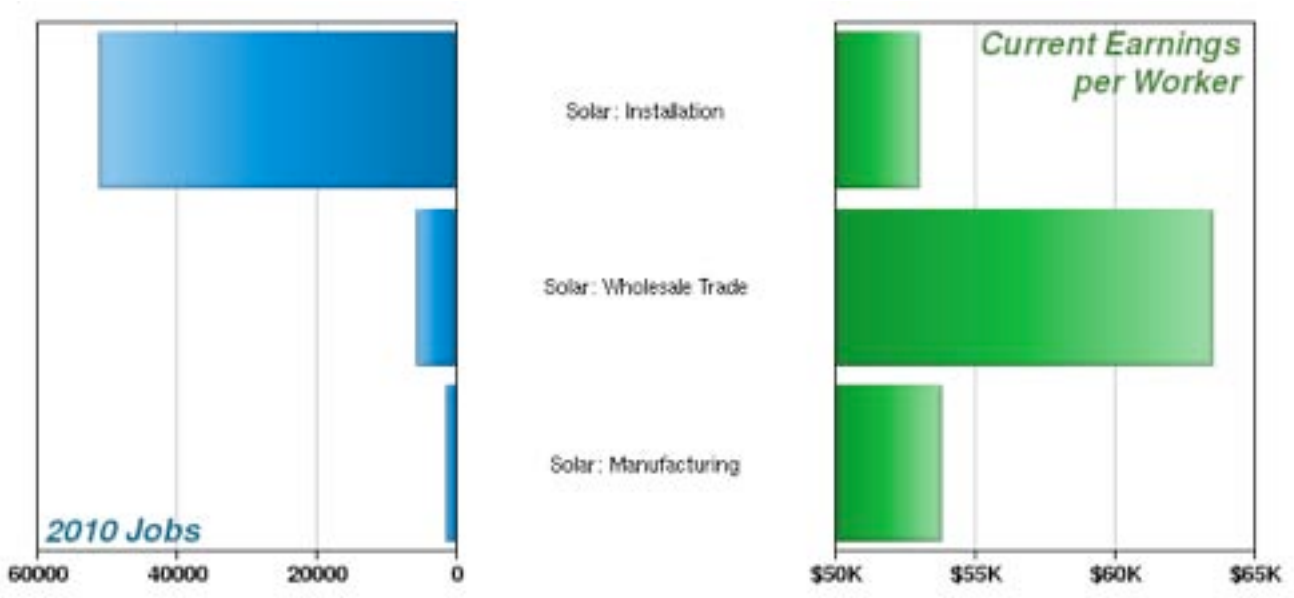
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	6,506	6,125	-381	-6%	103
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.16 Iowa

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	11	<1%	39	54	39%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

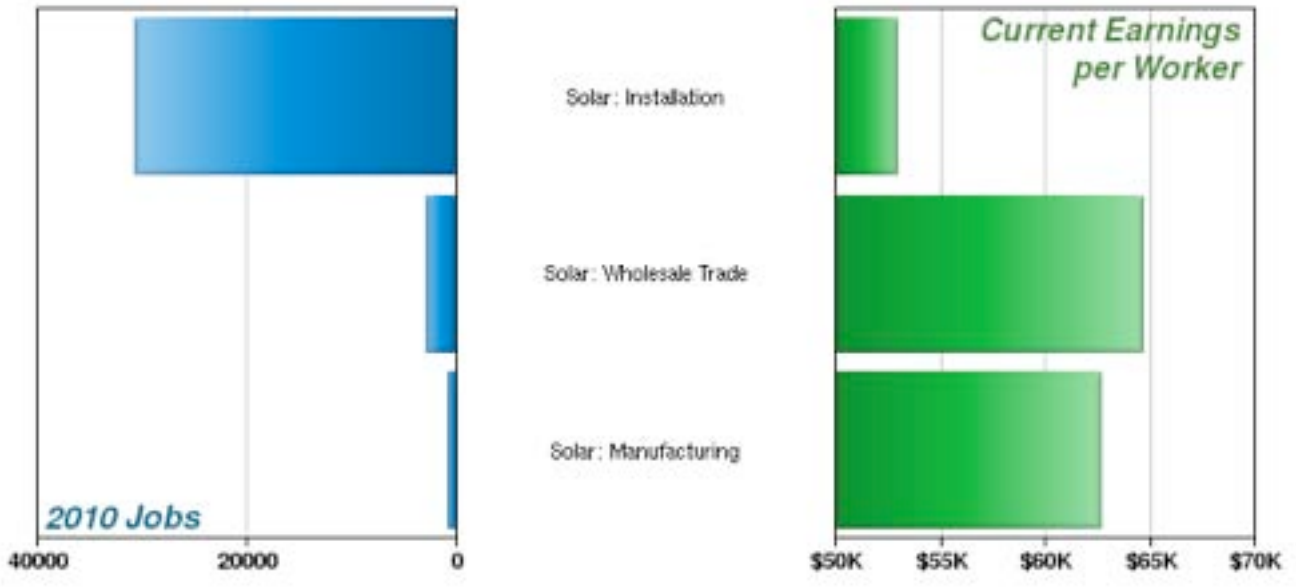
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	2,967	3,003	36	1%	137
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.17 Kansas

Primary Data

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

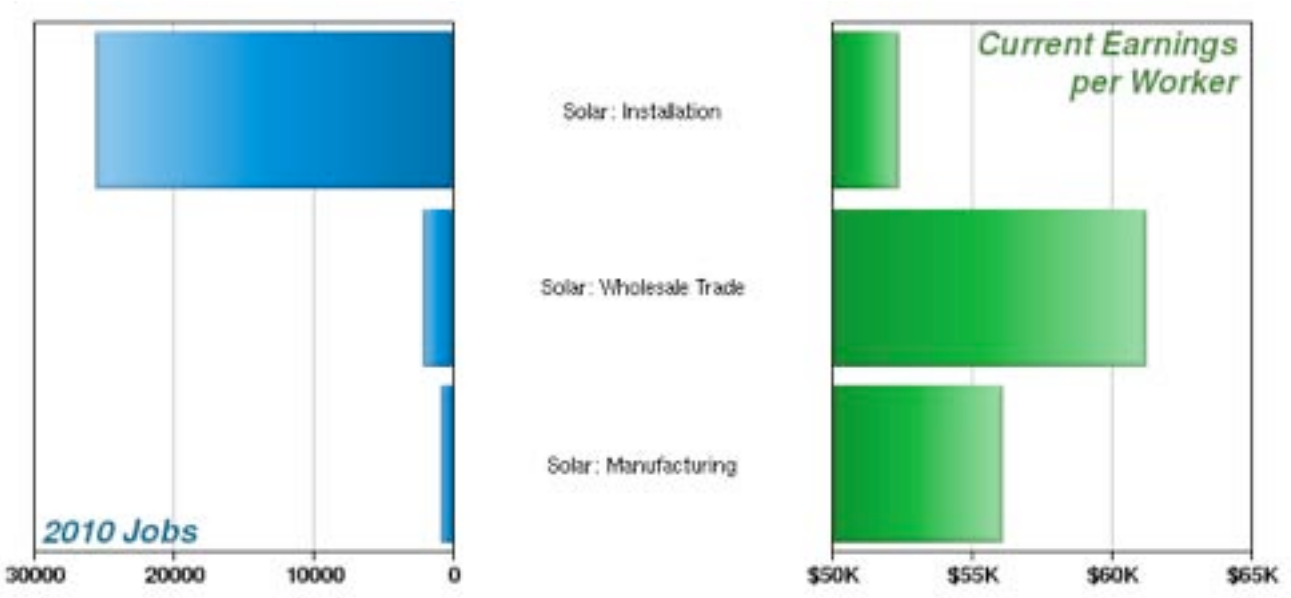
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	155	113	-42	-27%	5
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.18 Kentucky

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	10	<1%	266	313	18%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

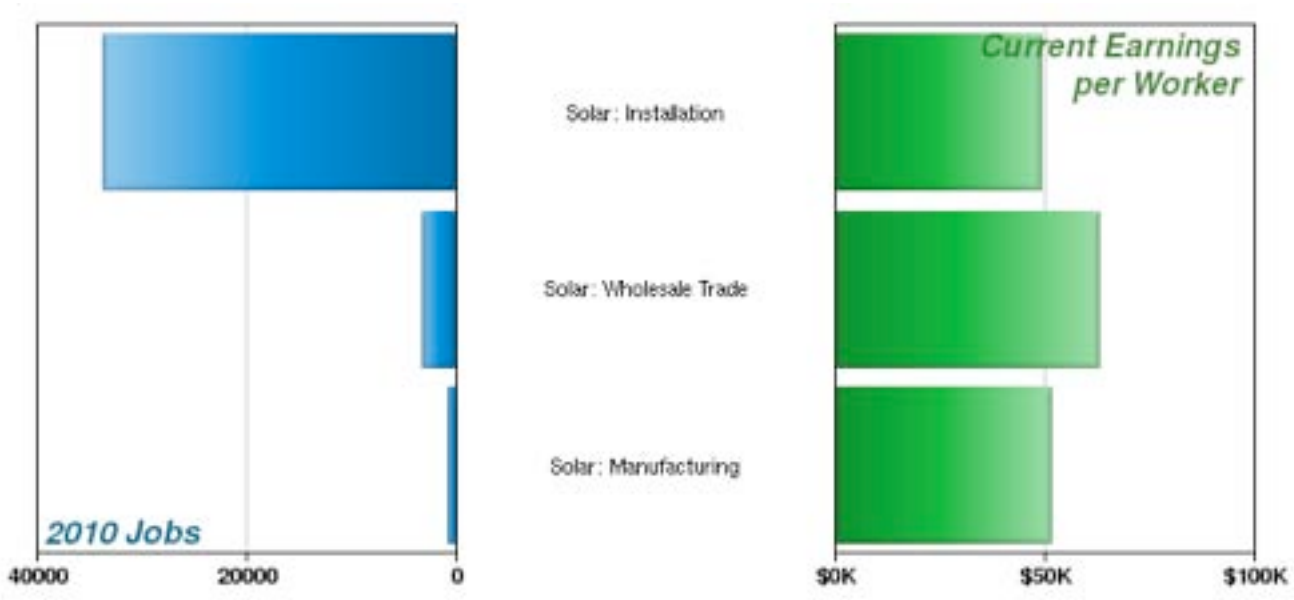
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,695	1,652	-43	-3%	30
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.19 Louisiana

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	38	2%	225	371	65%
National Total	2,426	n/a	57,197	67,889	19%

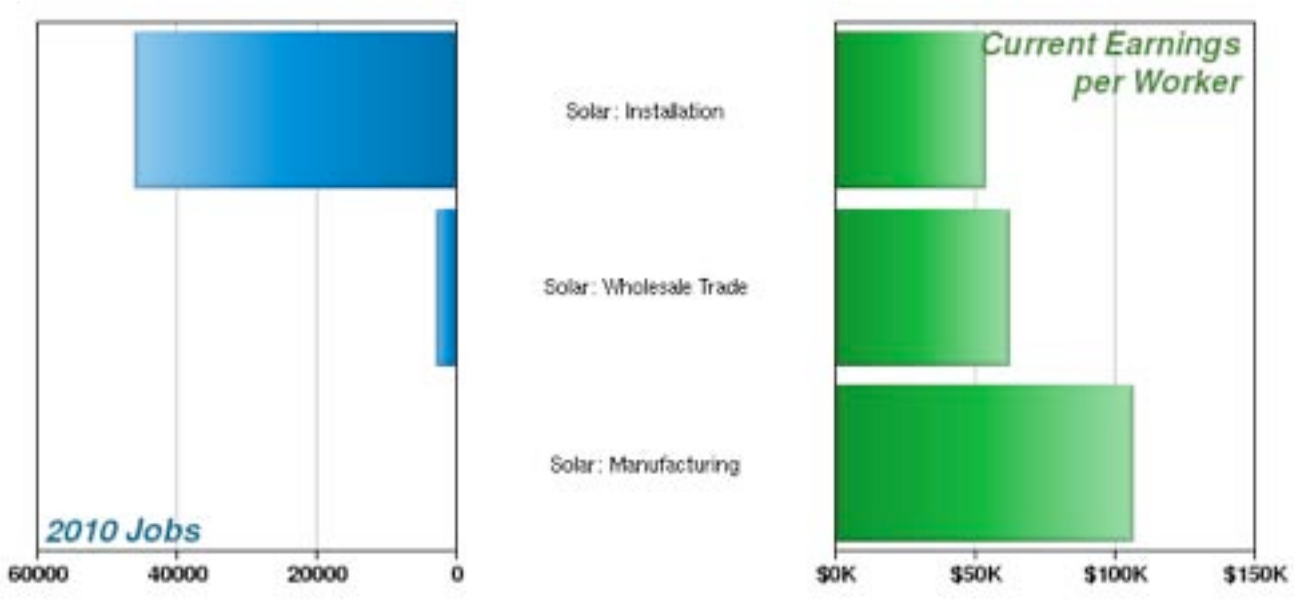
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,216	1,202	-14	-1%	26
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.20 Maine

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	17	<1%	216	282	31%
National Total	2,426	n/a	57,197	67,889	19%

Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.

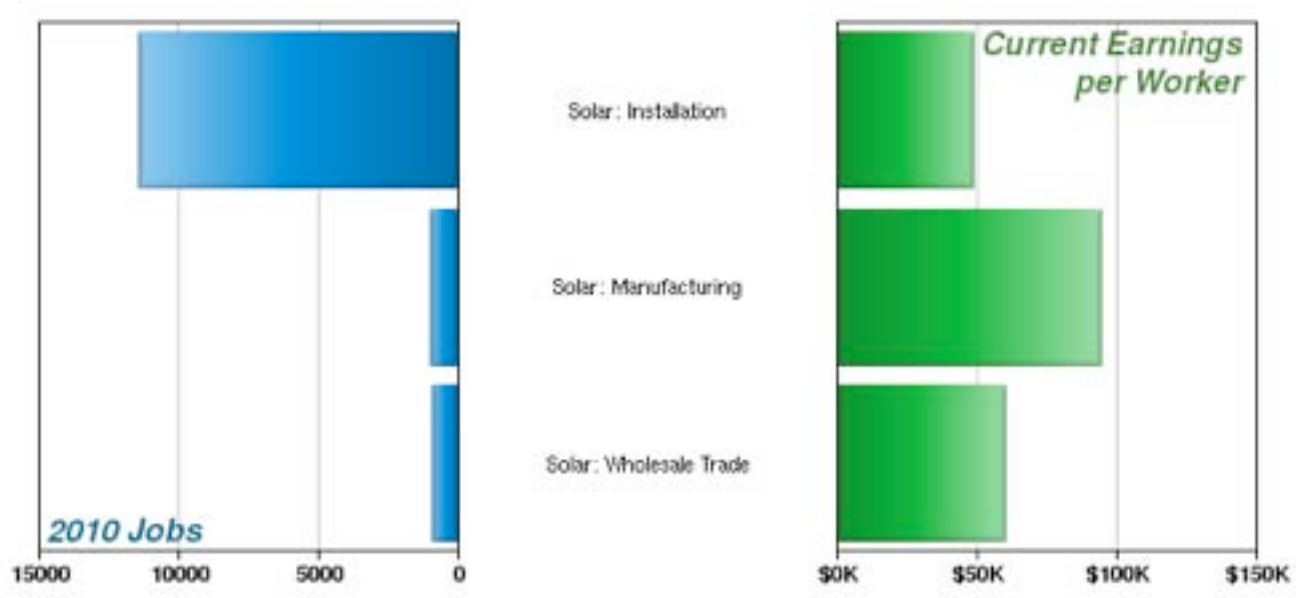
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	86	69	-17	-20%	5
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.21 Maryland

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	41	2%	867	1,094	26%
National Total	2,426	n/a	57,197	67,889	19%

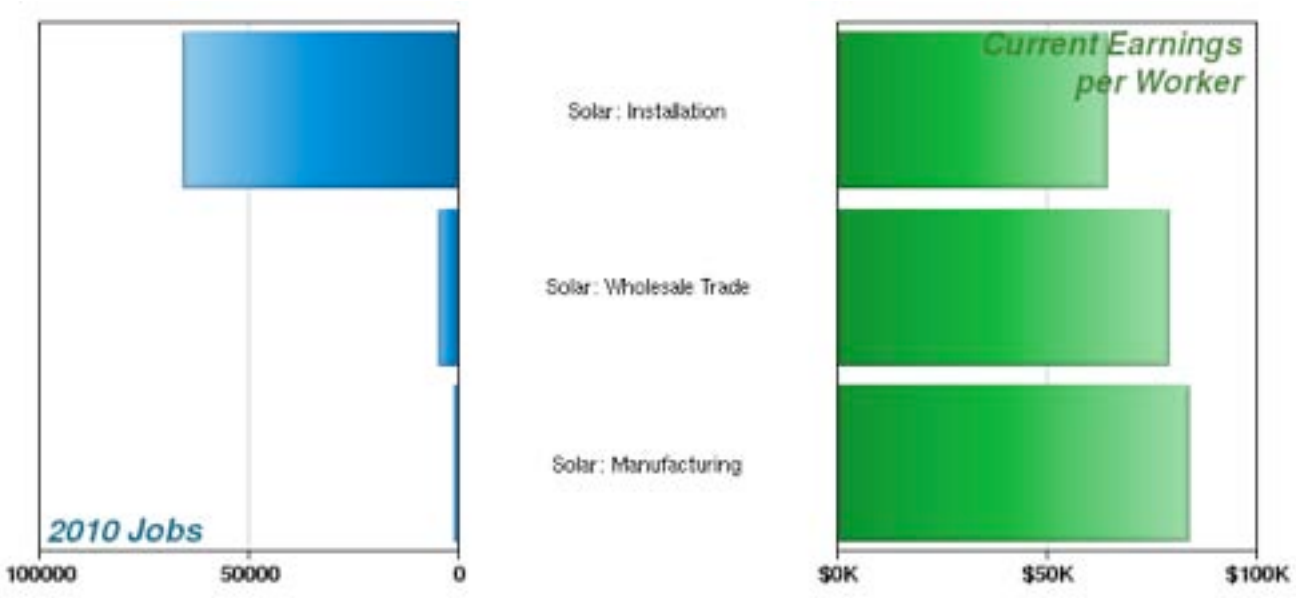
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	2,032	2,133	101	5%	9
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.22 Massachusetts

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	57	2%	796	975	23%
National Total	2,426	n/a	57,197	67,889	19%

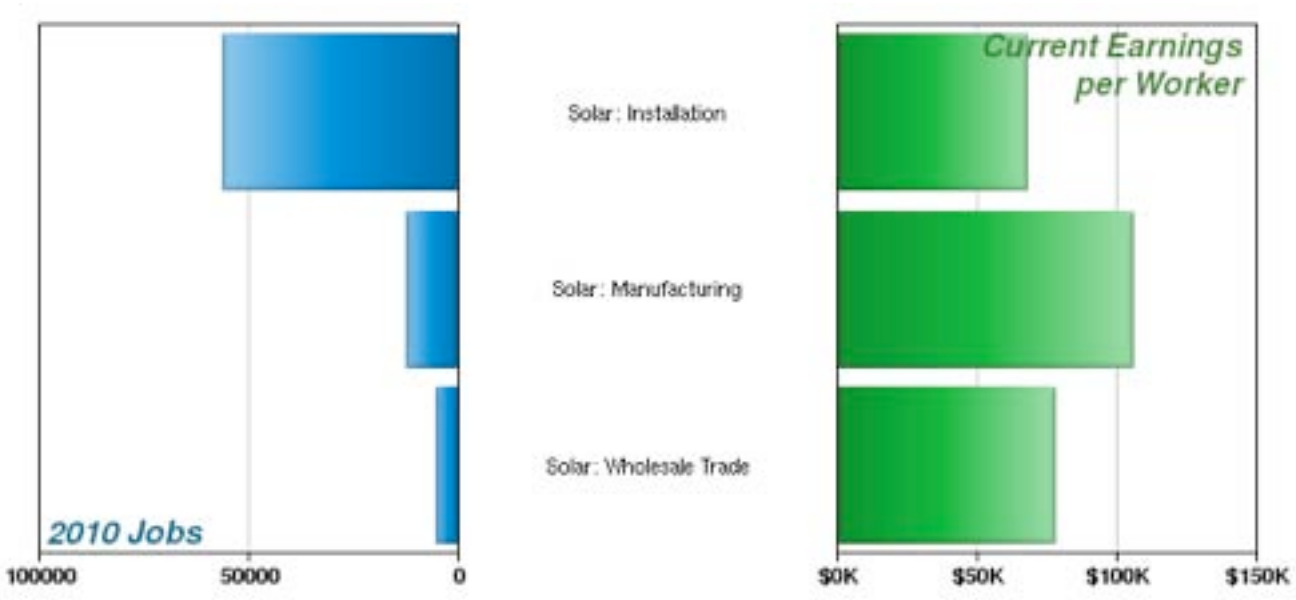
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	2,627	2,170	-457	-17%	74
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.23 Michigan

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	41	2%	3,023	3,453	14%
National Total	2,426	n/a	57,197	67,889	19%

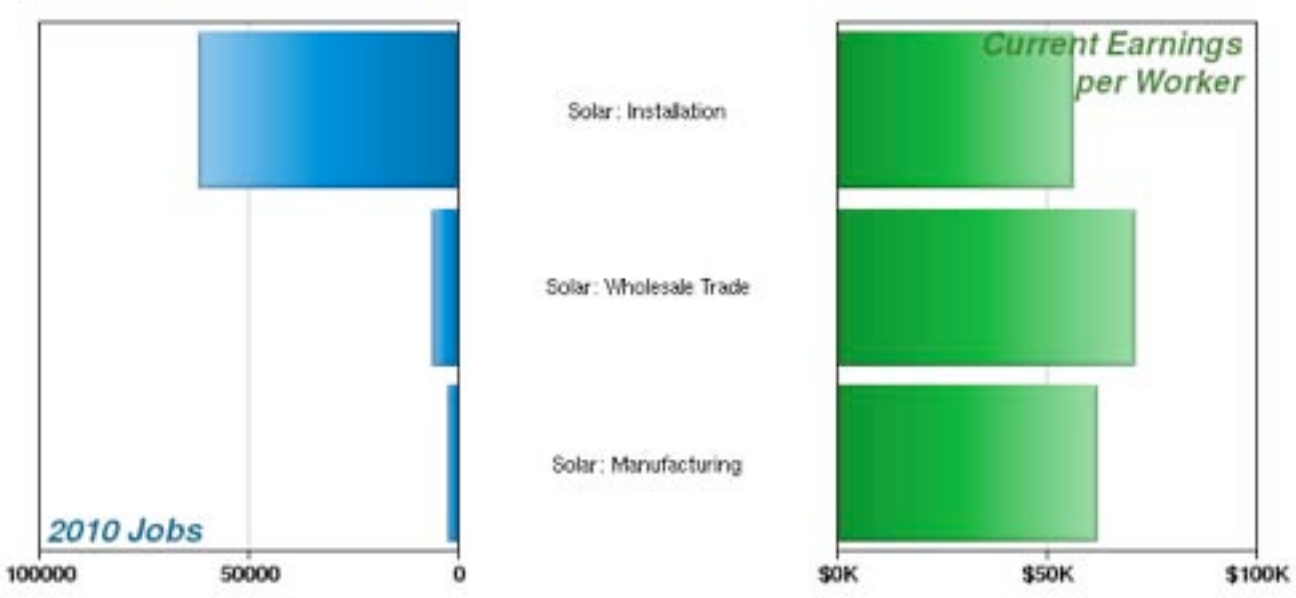
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	11,408	11,119	-289	-3%	108
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.24 Minnesota

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	37	2%	1,193	1,121	(6)%
National Total	2,426	n/a	57,197	67,889	19%

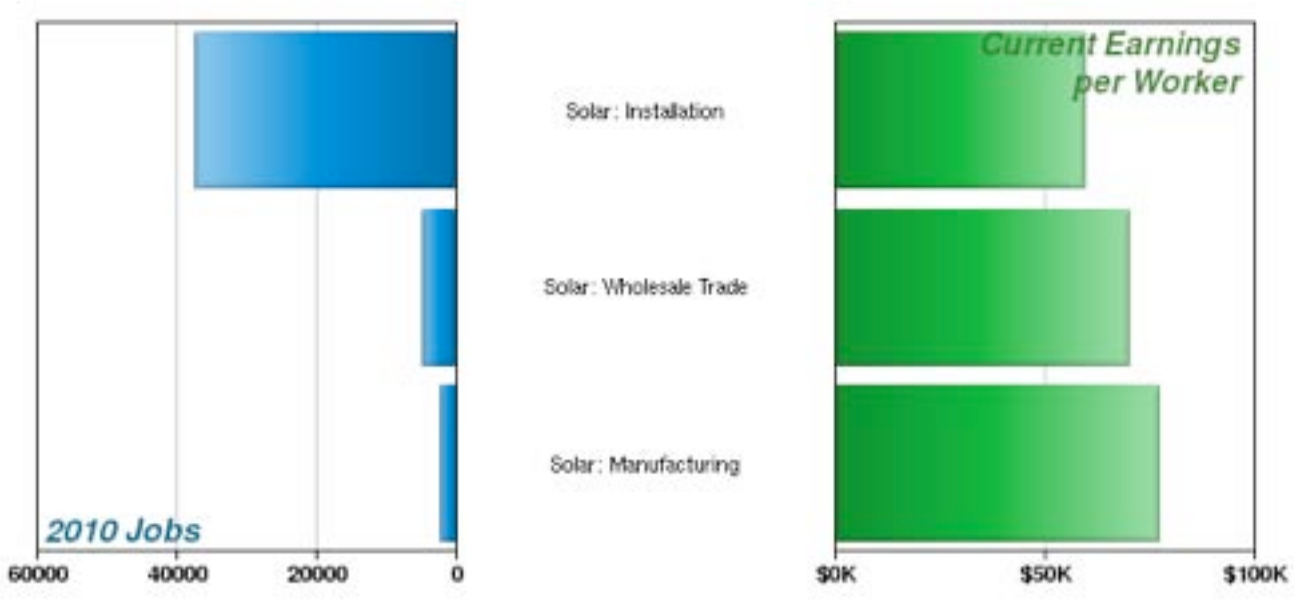
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	820	725	-95	-12%	28
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.25 Mississippi

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

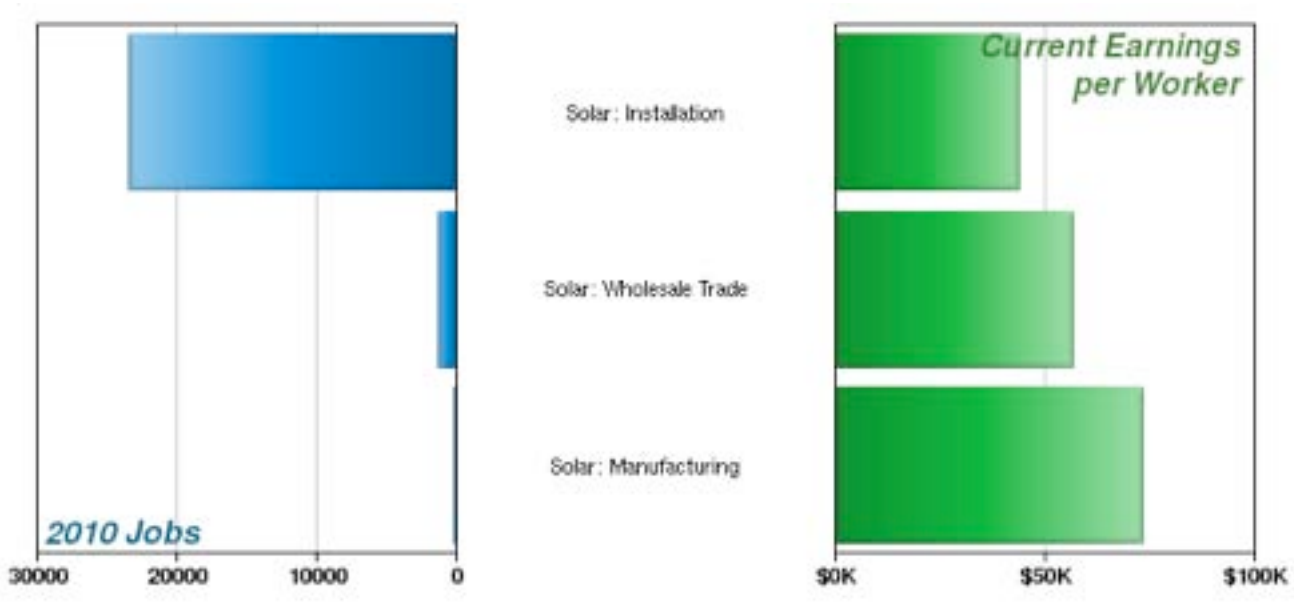
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,473	1,440	-33	-2%	52
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.26 Missouri

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	16	<1%	72	138	92%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

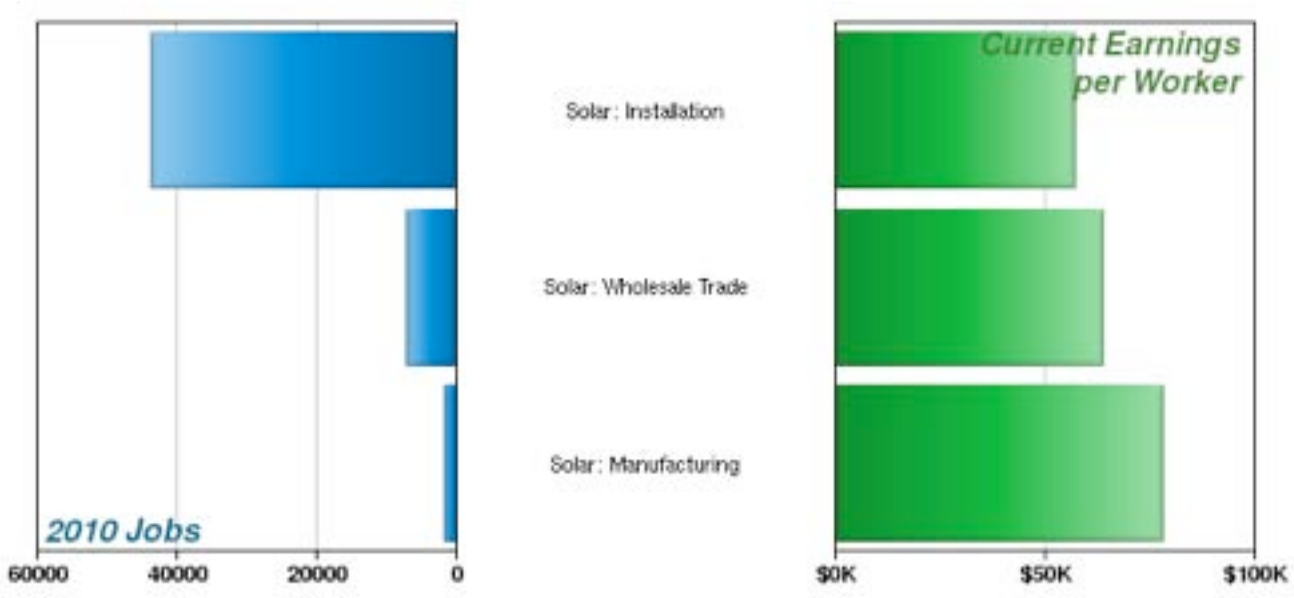
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,999	1,993	-6	0%	27
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.27 Montana

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	24	1%	467	485	4%
National Total	2,426	n/a	57,197	67,889	19%

Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.

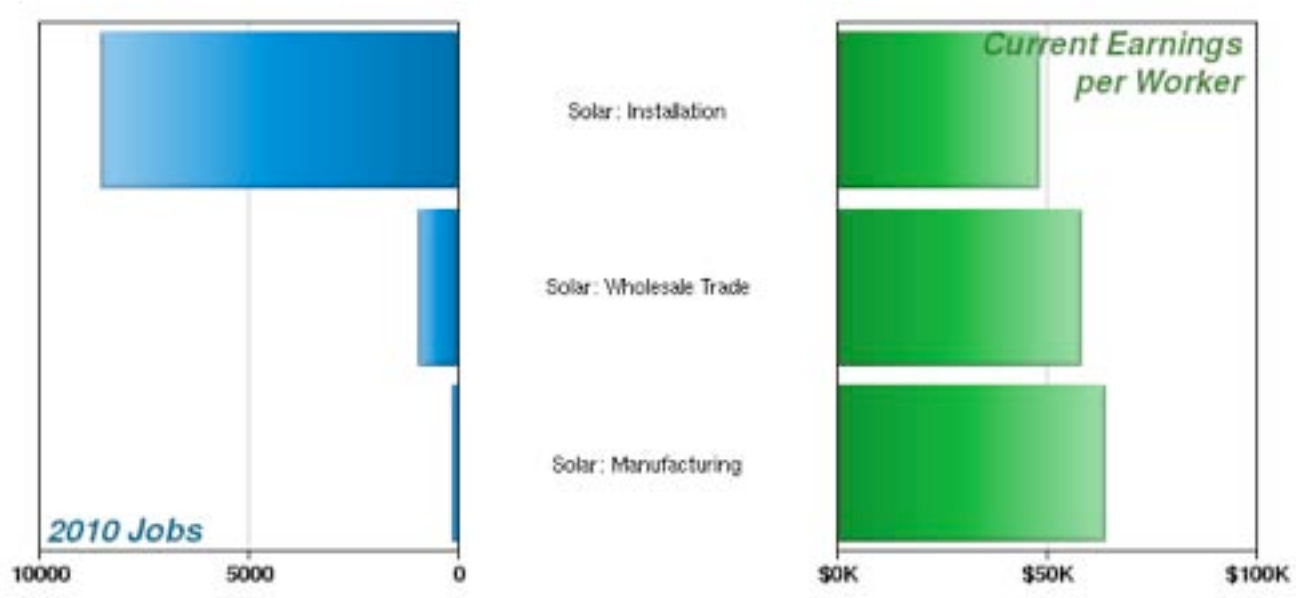
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	475	381	-94	-20%	8
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.28 Nebraska

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

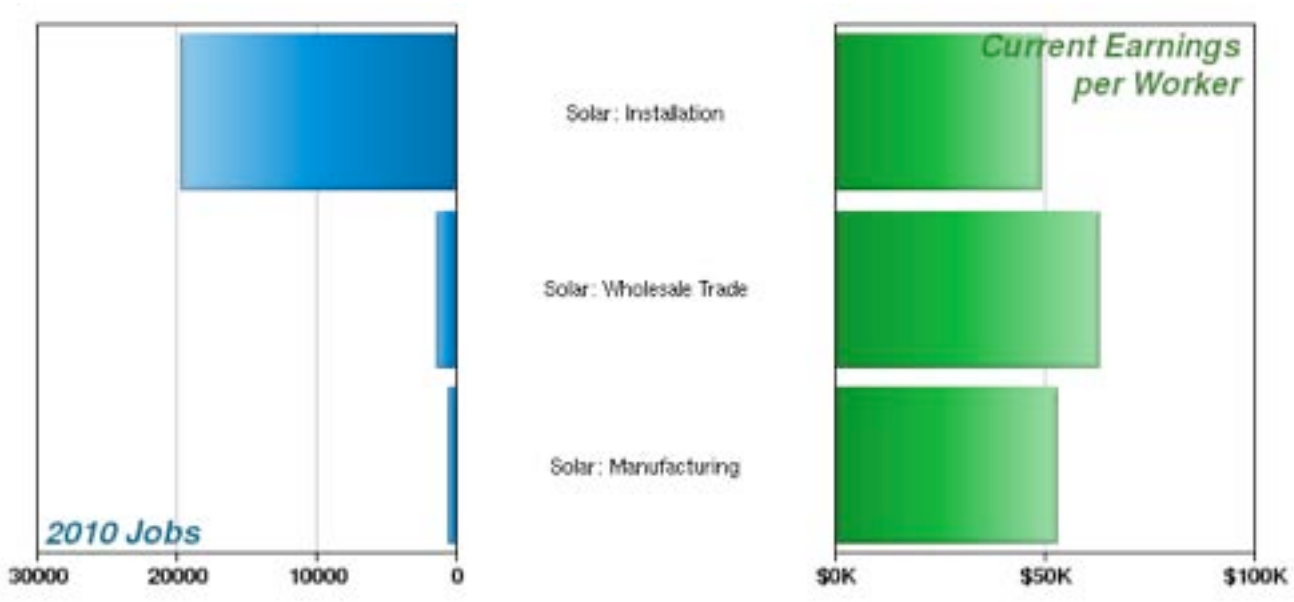
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	15	16	1	7%	1
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.29 Nevada

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	40	2%	747	1,427	91%
National Total	2,426	n/a	57,197	67,889	19%

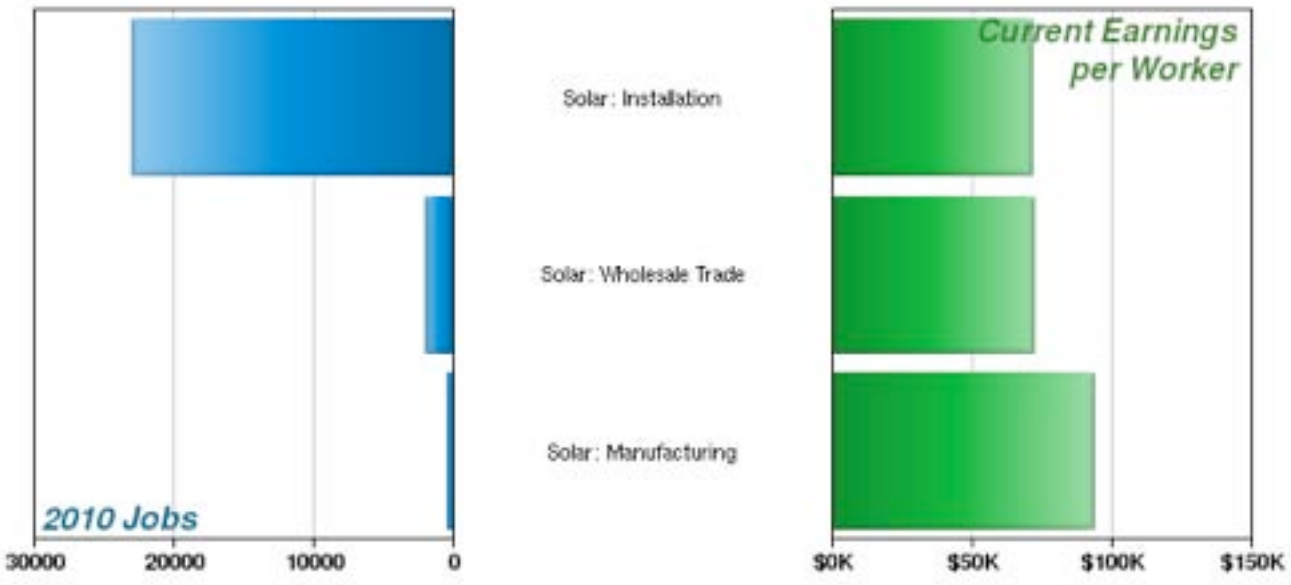
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	562	513	-49	-9%	16
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.30 New Hampshire

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	17	<1%	58	70	21%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

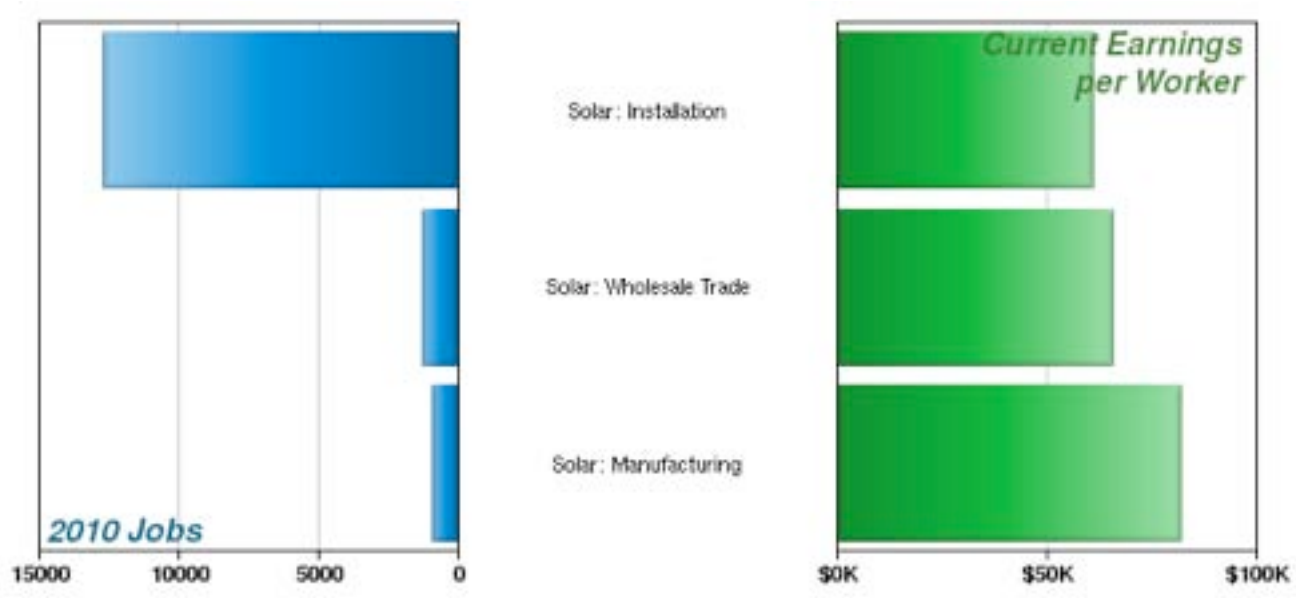
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	359	353	-6	-2%	10
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.31 New Jersey

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	67	3%	1,475	1,875	27%
National Total	2,426	n/a	57,197	67,889	19%

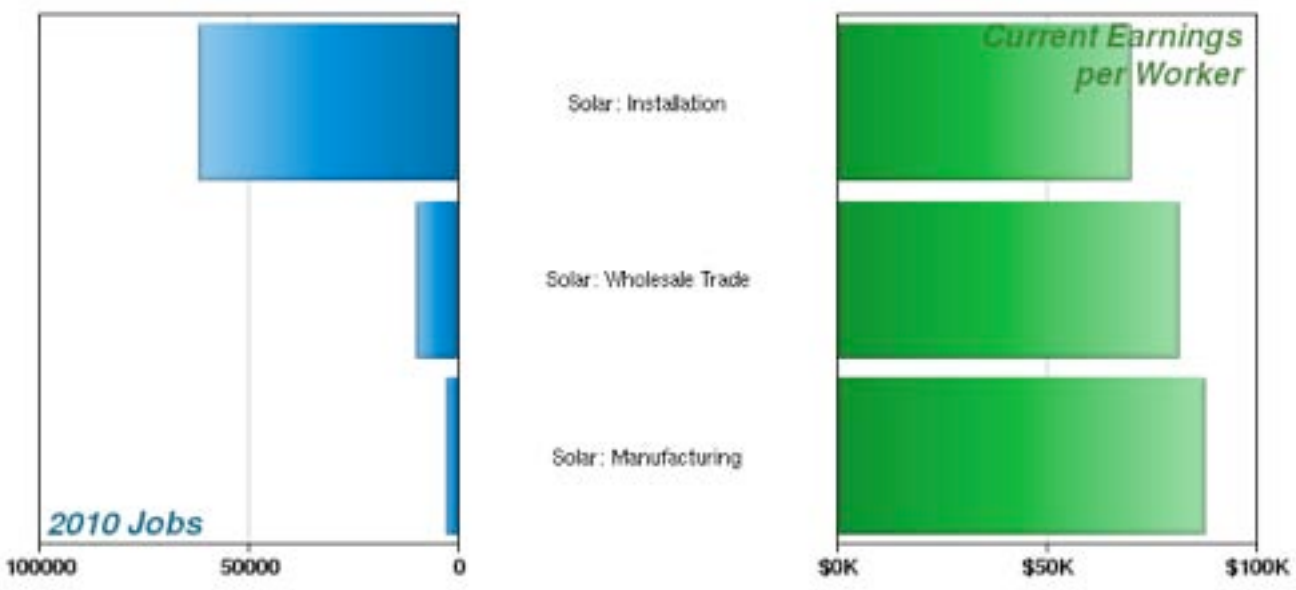
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,120	1,109	-11	-1%	24
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.32 New Mexico

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	50	2%	788	1,027	30%
National Total	2,426	n/a	57,197	67,889	19%

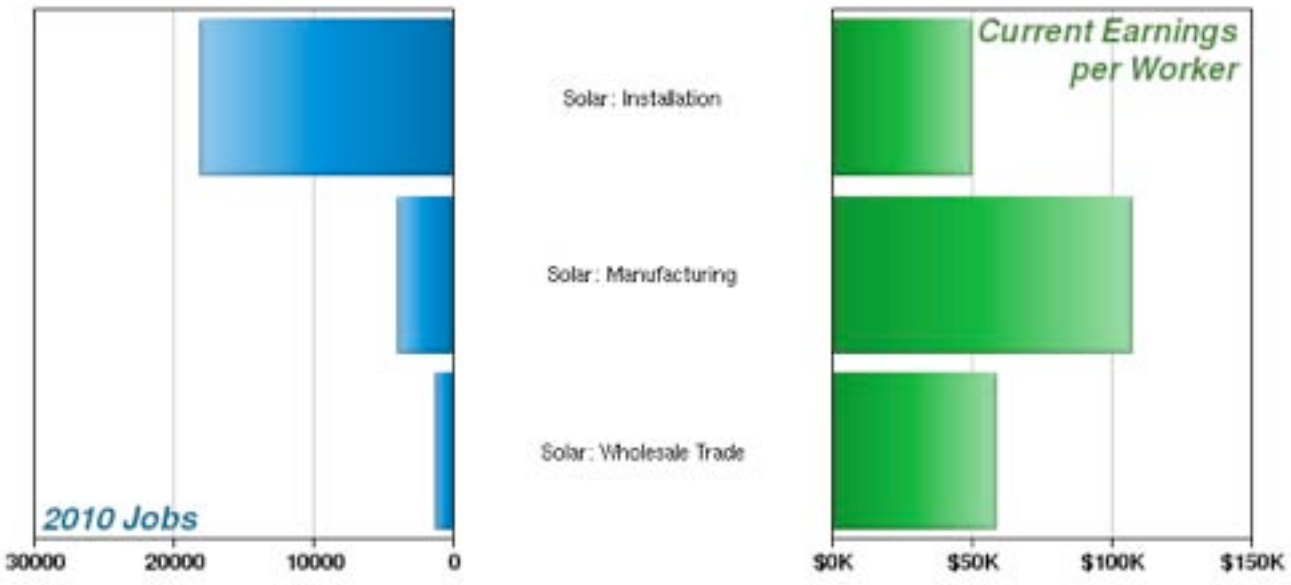
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	686	683	-3	0%	14
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.33 New York

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	86	4%	1,654	1,977	20%
National Total	2,426	n/a	57,197	67,889	19%

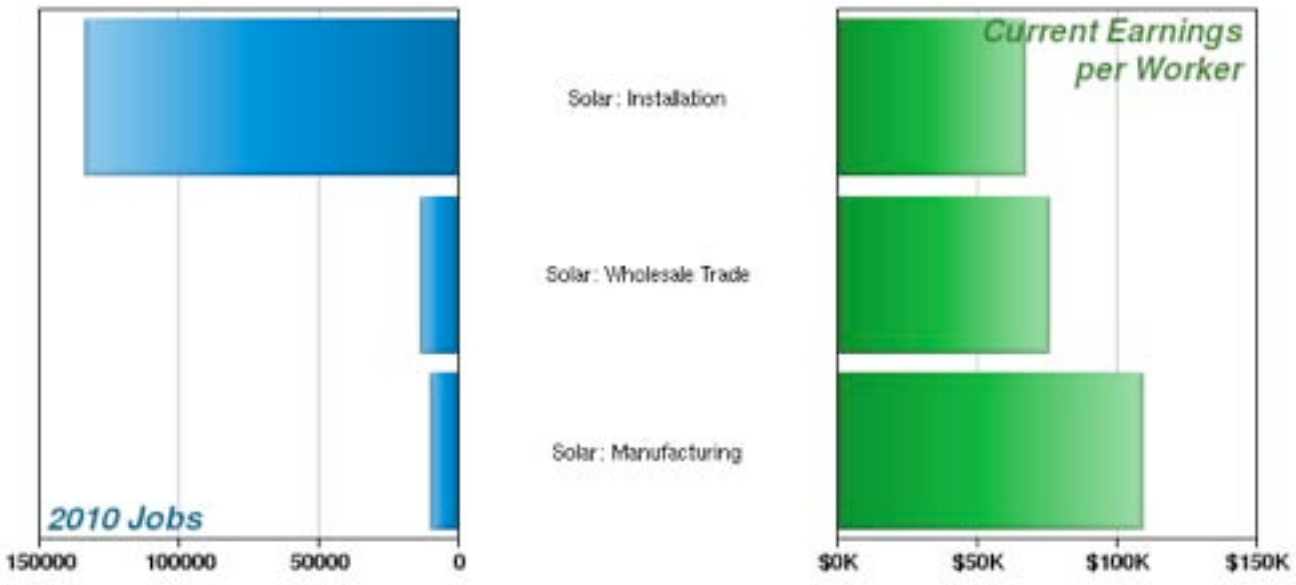
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	25,903	24,917	-986	-4%	214
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.34 North Carolina

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	57	2%	1,033	1,419	37%
National Total	2,426	n/a	57,197	67,889	19%

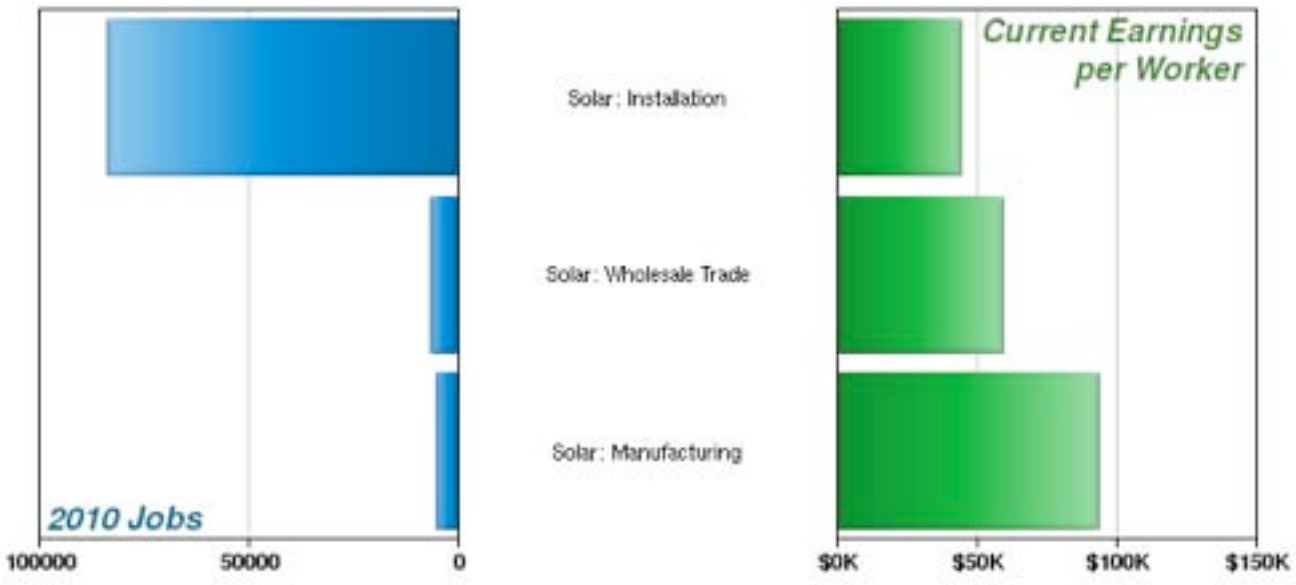
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,767	1,569	-198	-11%	38
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.35 North Dakota

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

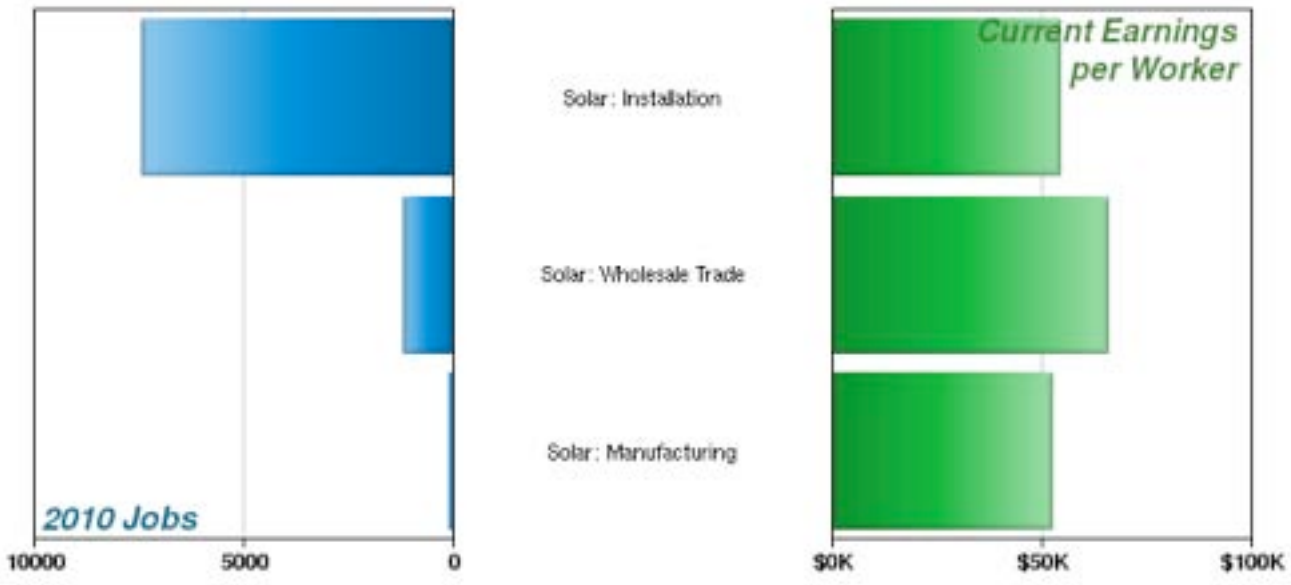
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	853	839	-14	-2%	9
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.36 Ohio

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	24	1%	1,088	1,153	6%
National Total	2,426	n/a	57,197	67,889	19%

***Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.**

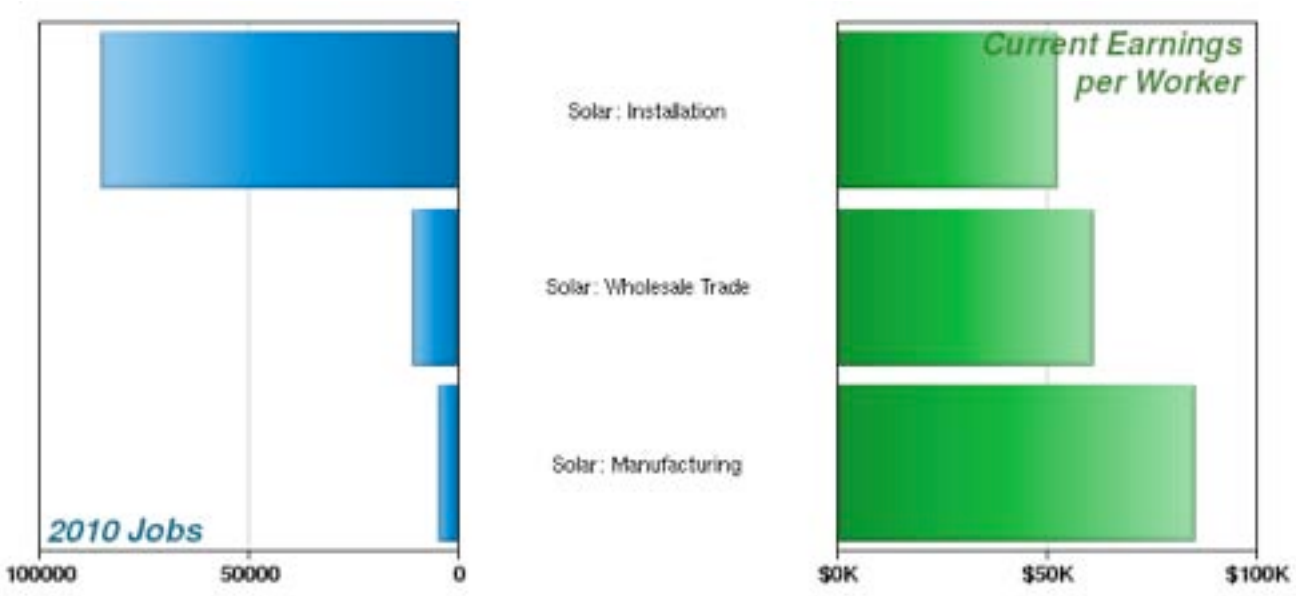
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	5,053	4,881	-172	-3%	76
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.37 Oklahoma

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

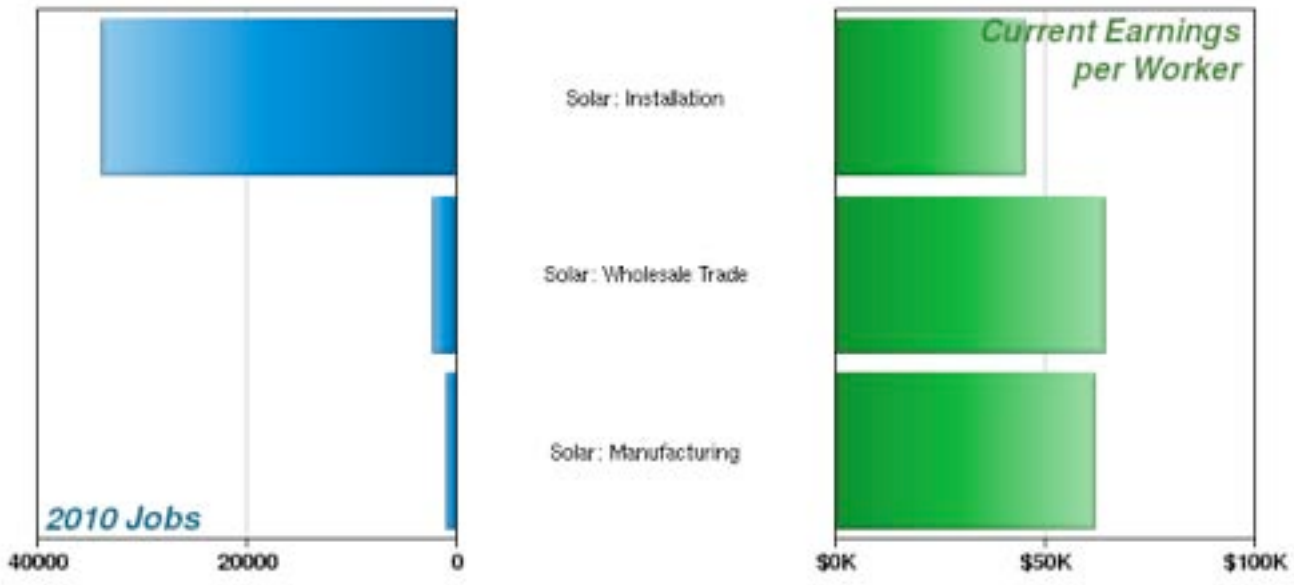
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	3,171	3,135	-36	-1%	60
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.38 Oregon

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	81	3%	872	1,101	26%
National Total	2,426	n/a	57,197	67,889	19%

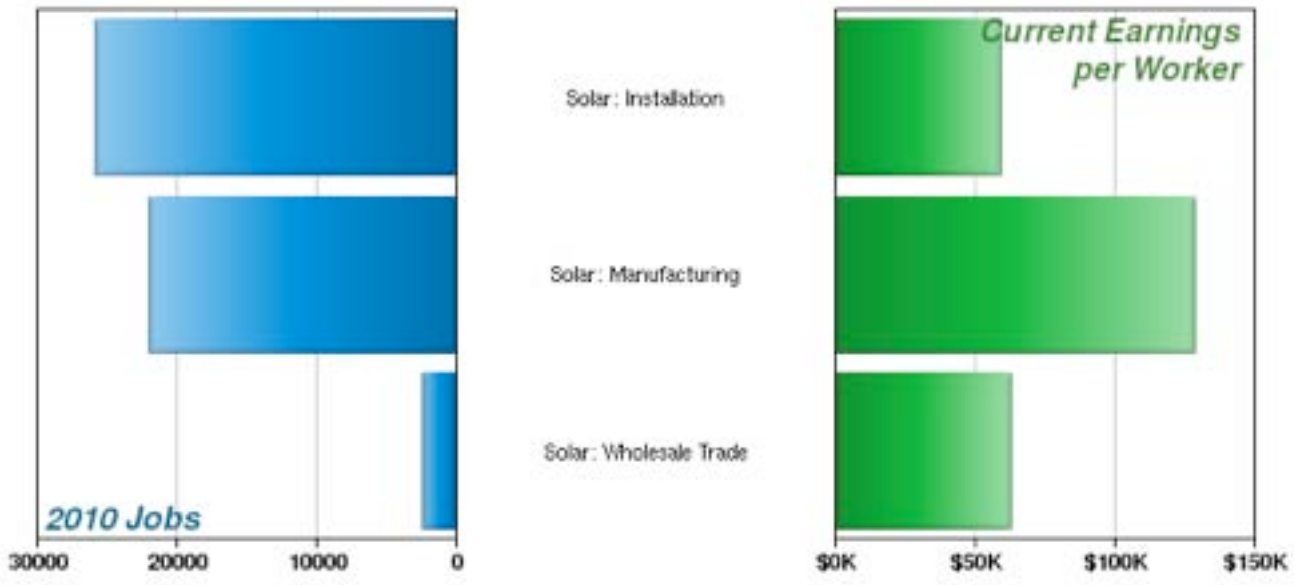
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	230	180	-50	-22%	7
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.39 Pennsylvania

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	113	5%	3,193	3,869	21%
National Total	2,426	n/a	57,197	67,889	19%

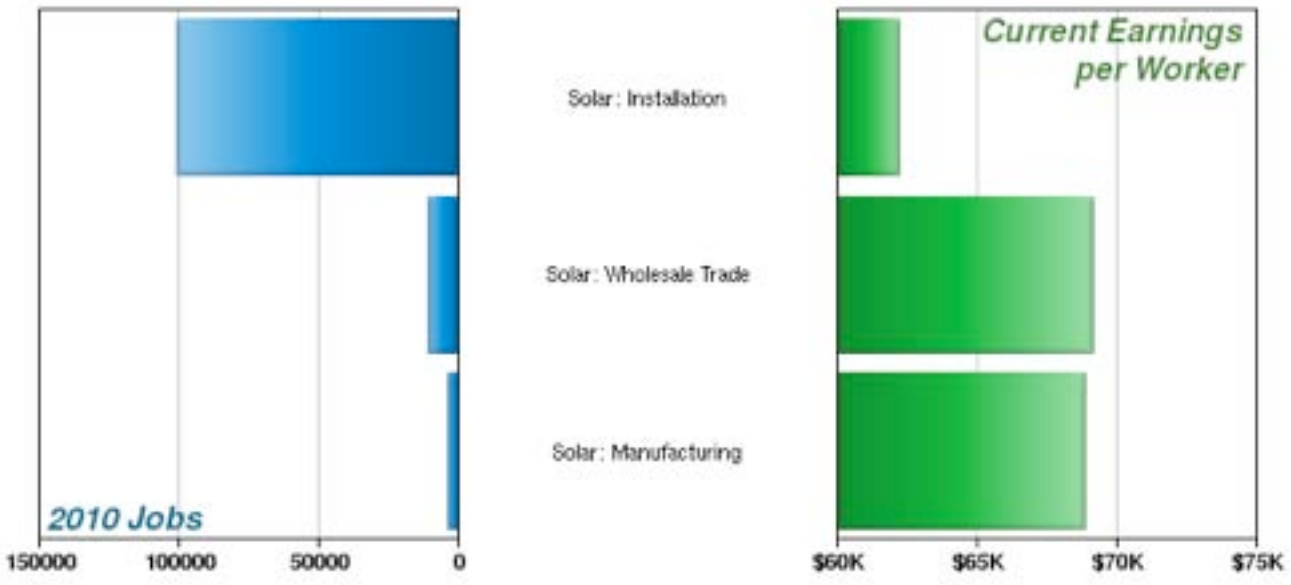
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	4,100	3,826	-274	-7%	64
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.40 Rhode Island

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

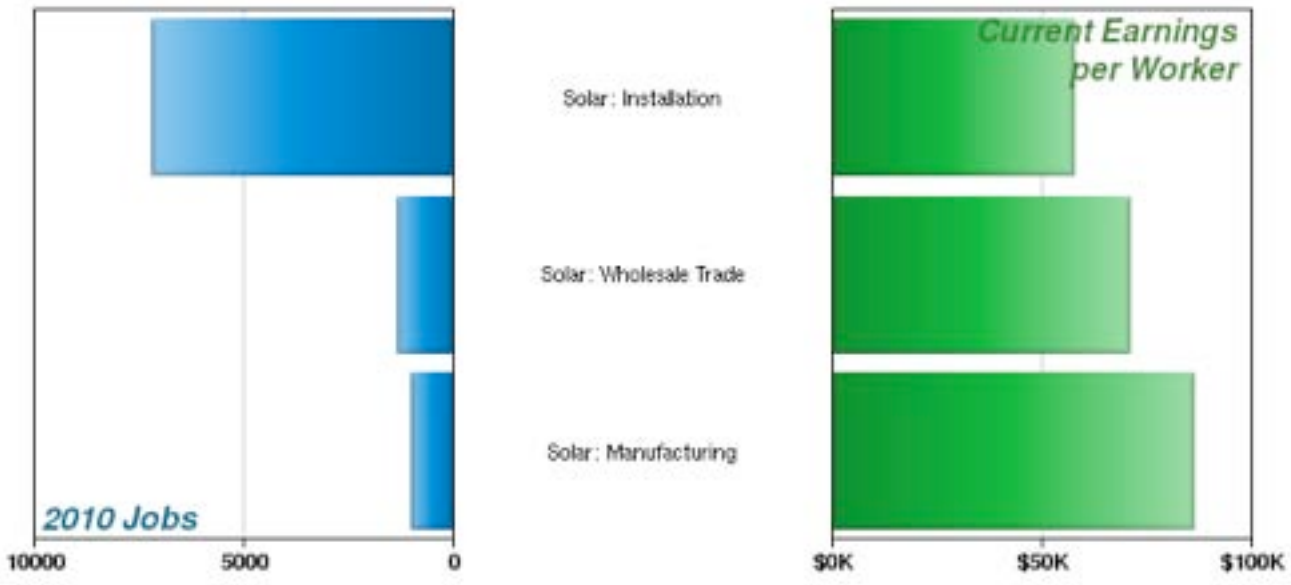
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	117	123	6	5%	7
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.41 South Carolina

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	14	<1%	226	503	123%
National Total	2,426	n/a	57,197	67,889	19%

Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.

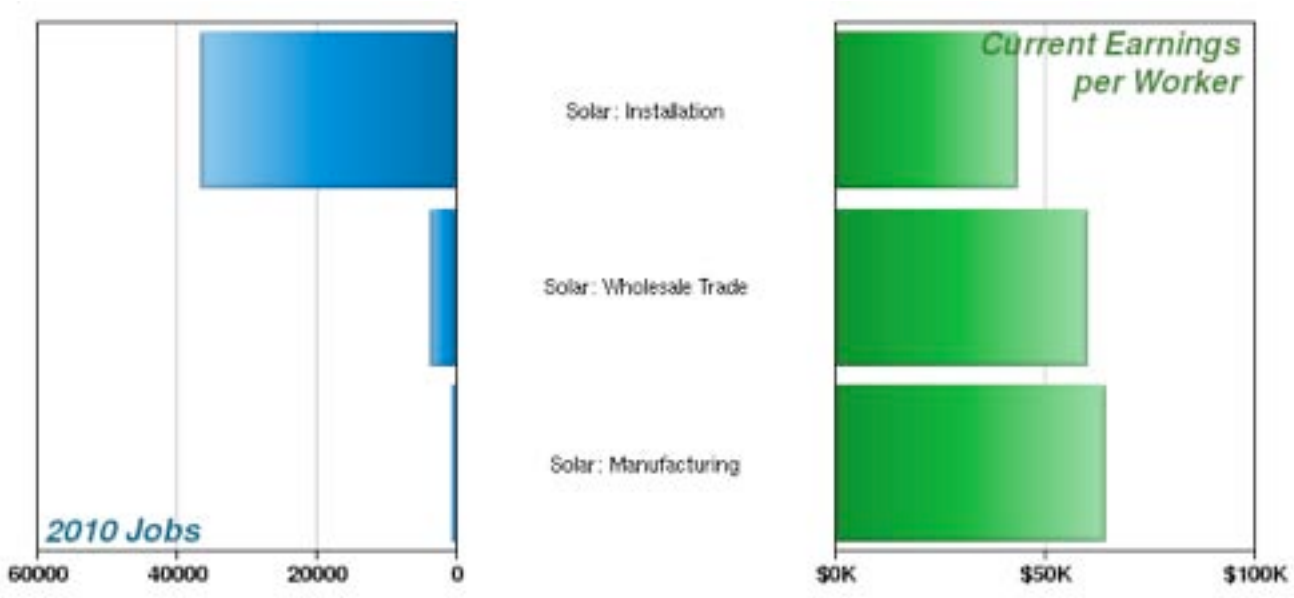
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	4,695	4,788	93	2%	49
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.42 South Dakota

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

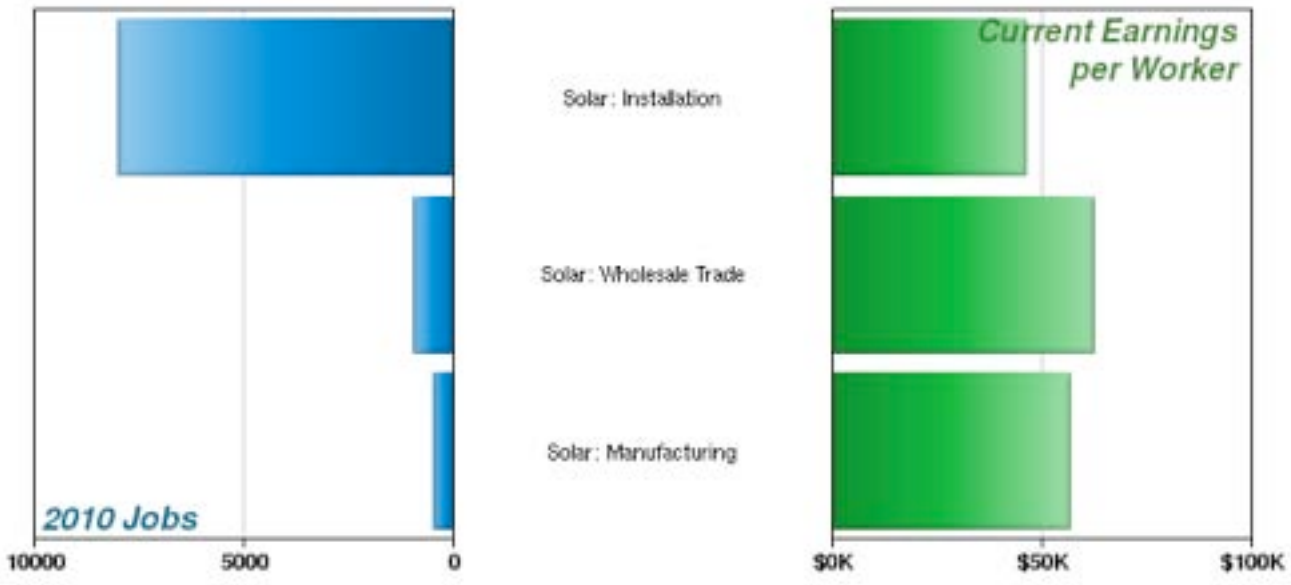
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	23	18	-5	-22%	3
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.43 Tennessee

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	17	<1%	657	857	30%
National Total	2,426	n/a	57,197	67,889	19%

Due to small sample size, these data should be used to draw general conclusions about the state's solar workforce.

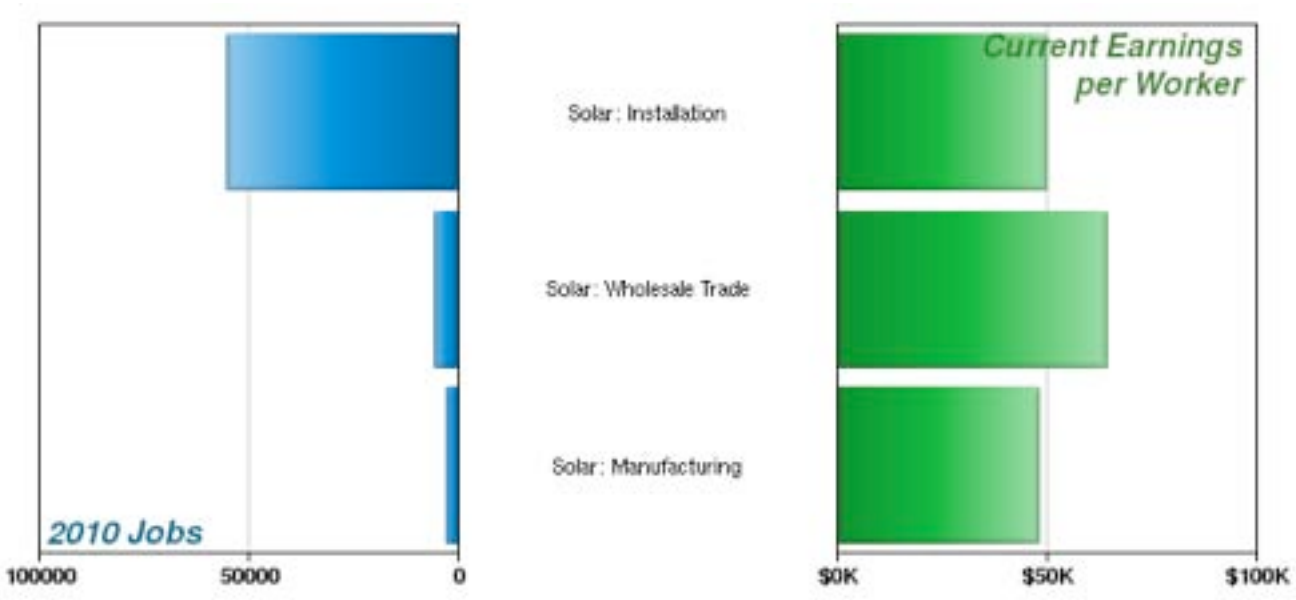
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	n/a	n/a	n/a	n/a	n/a
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010 (Not Enough Jobs in Region)

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



5.4.44 Texas

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	75	3%	3,068	3,443	12%
National Total	2,426	n/a	57,197	67,889	19%

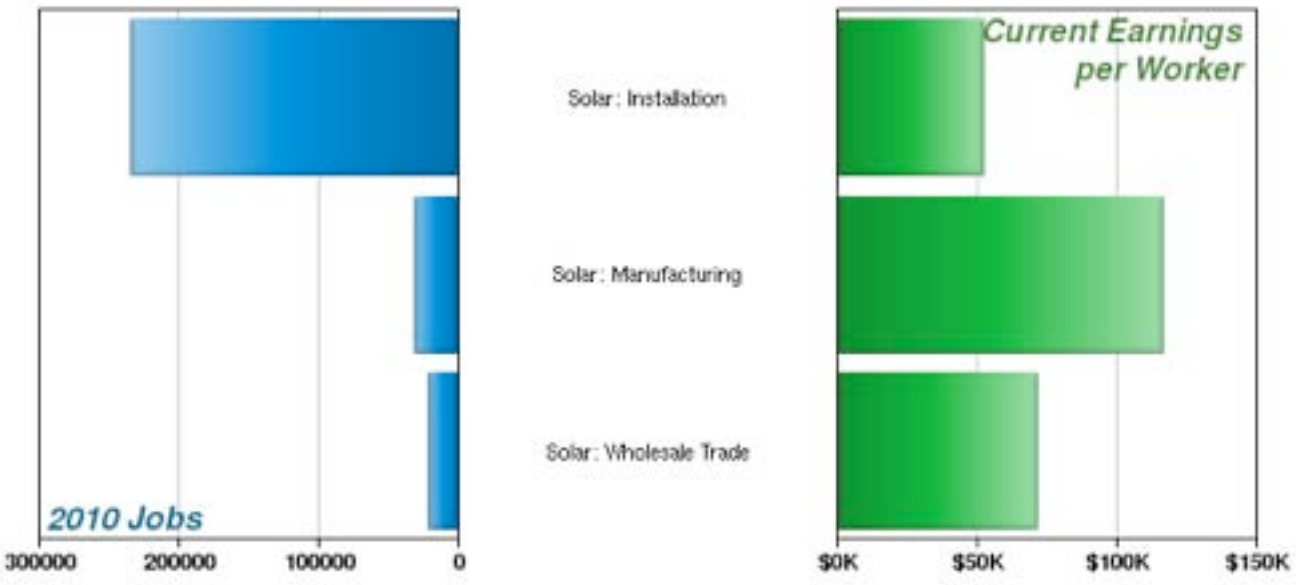
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	4,975	5,120	145	3%	109
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.45 Utah

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	31	1%	678	747	10%
National Total	2,426	n/a	57,197	67,889	19%

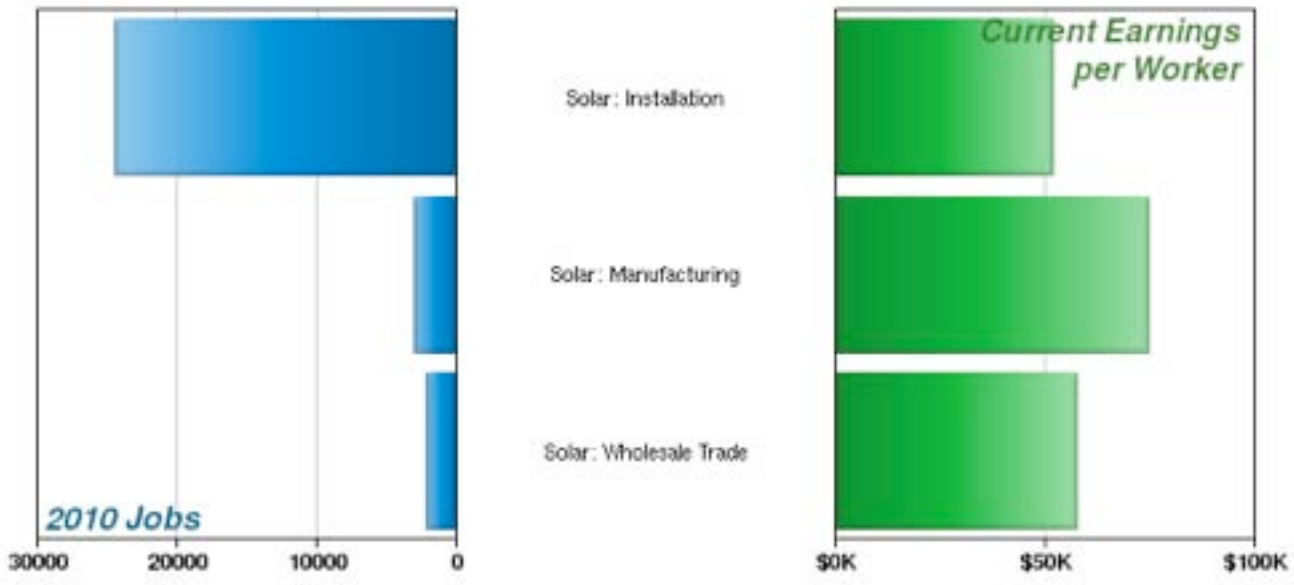
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,090	1,076	-14	-1%	10
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.46 Vermont

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	30	1%	320	389	22%
National Total	2,426	n/a	57,197	67,889	19%

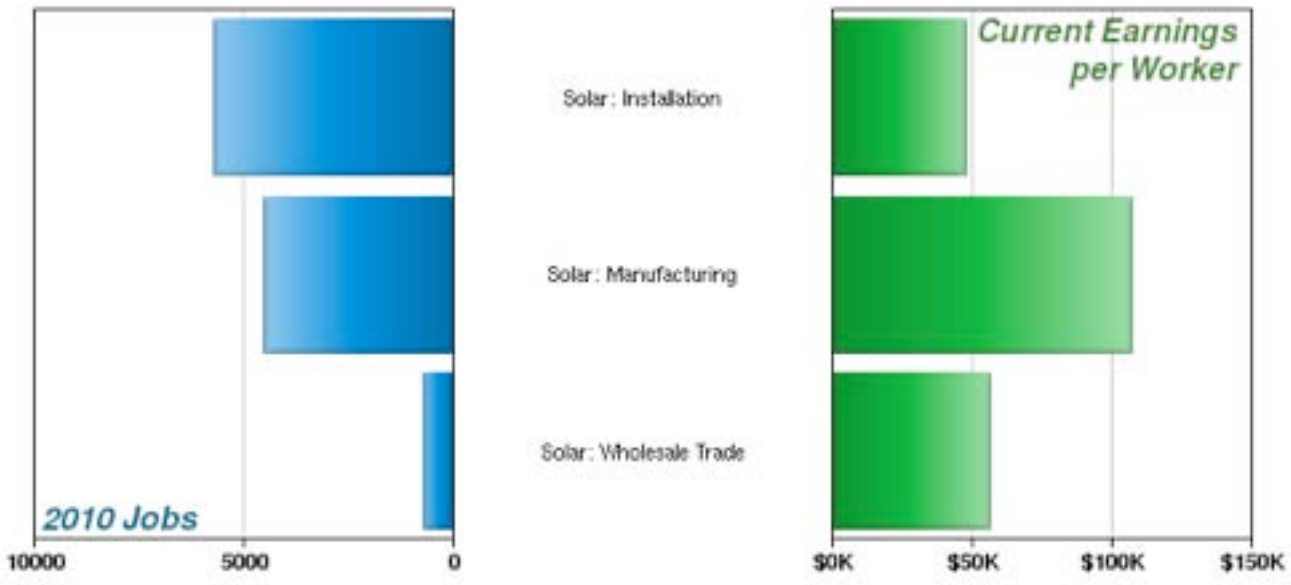
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	n/a	n/a	n/a	n/a	n/a
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010 (Not Enough Jobs in Region)

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.47 Virginia

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	26	1%	208	276	33%
National Total	2,426	n/a	57,197	67,889	19%

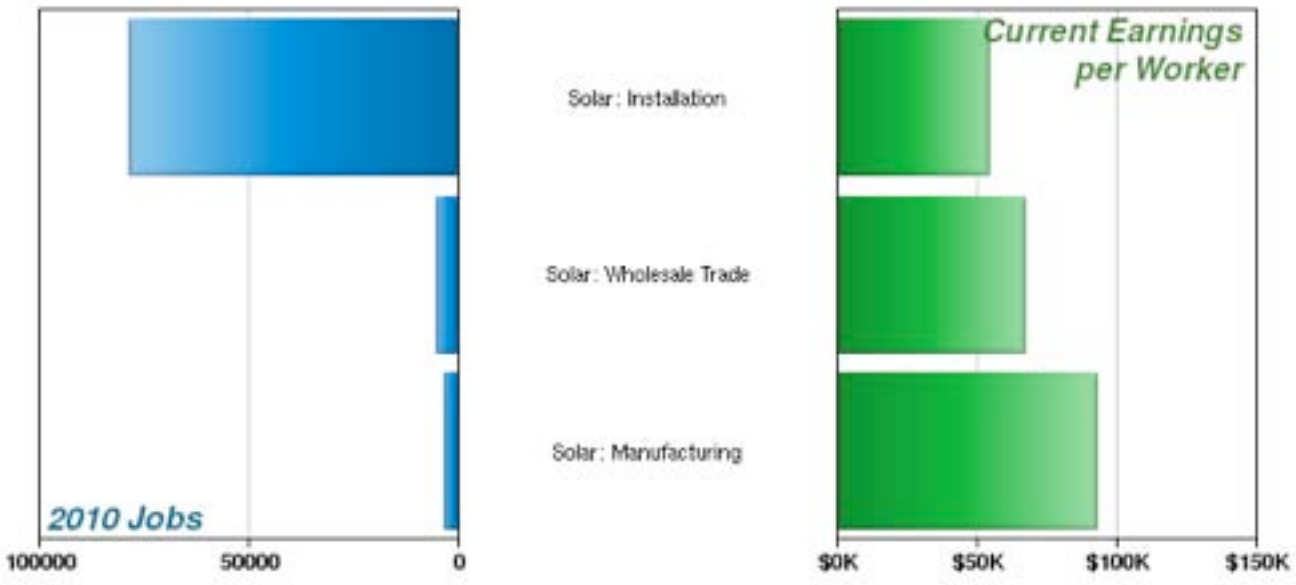
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,648	1,620	-28	-2%	49
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.48 Washington

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	29	1%	819	1,022	25%
National Total	2,426	n/a	57,197	67,889	19%

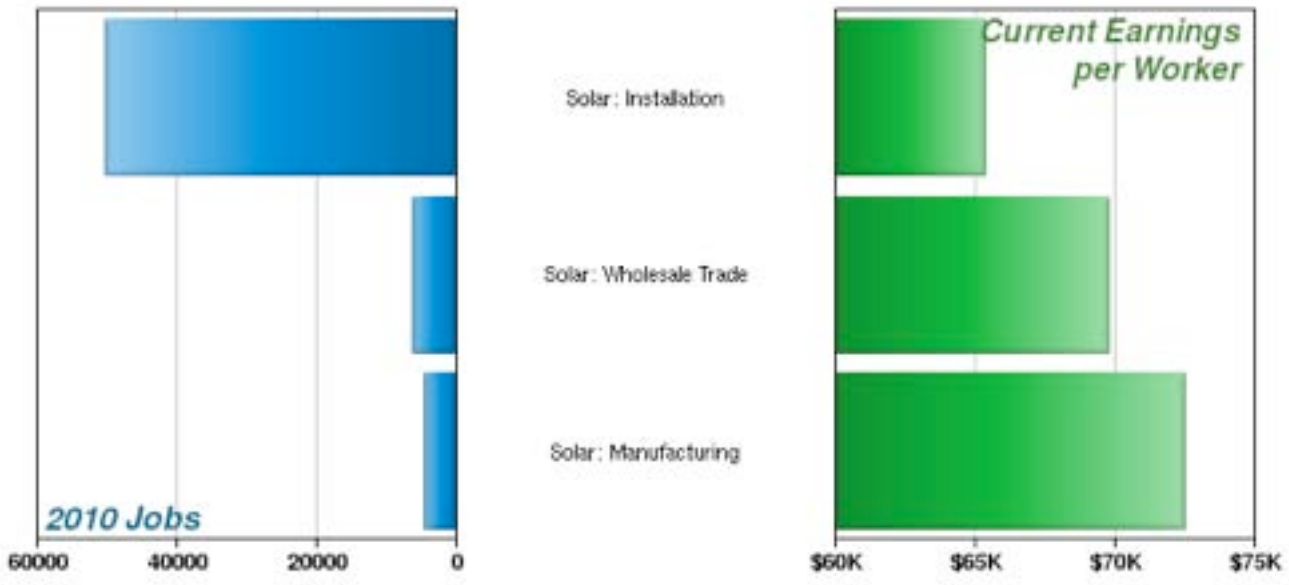
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	306	317	11	4%	3
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.49 West Virginia

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

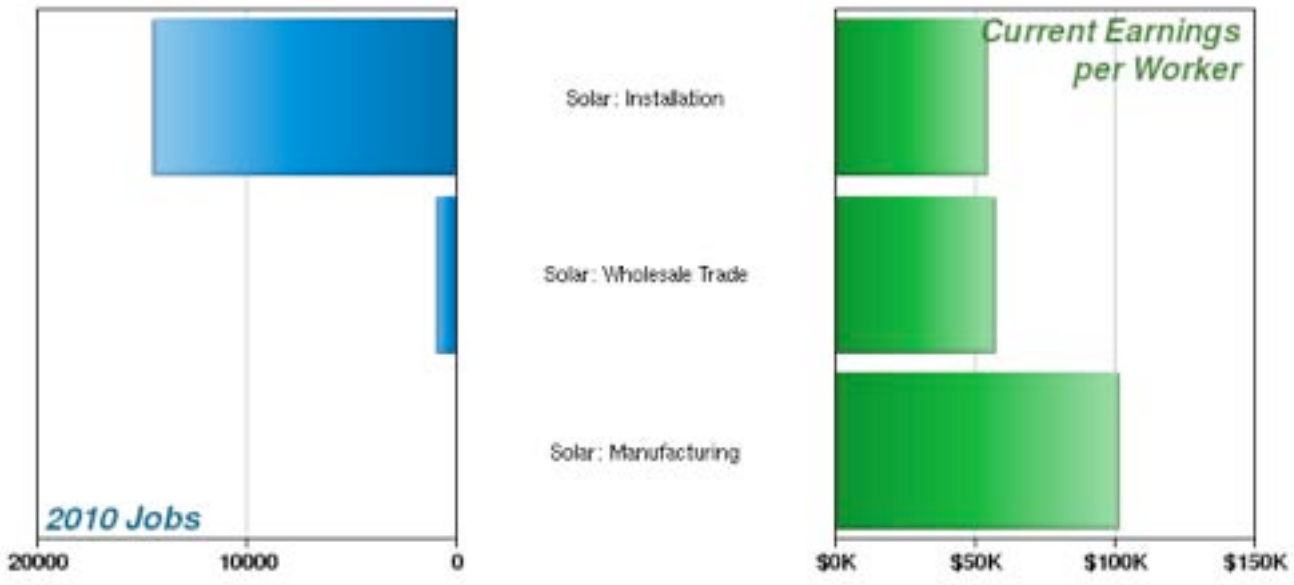
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	3,937	3,837	-100	-3%	74
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.50 Wisconsin

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	47	2%	2,855	3,105	9%
National Total	2,426	n/a	57,197	67,889	19%

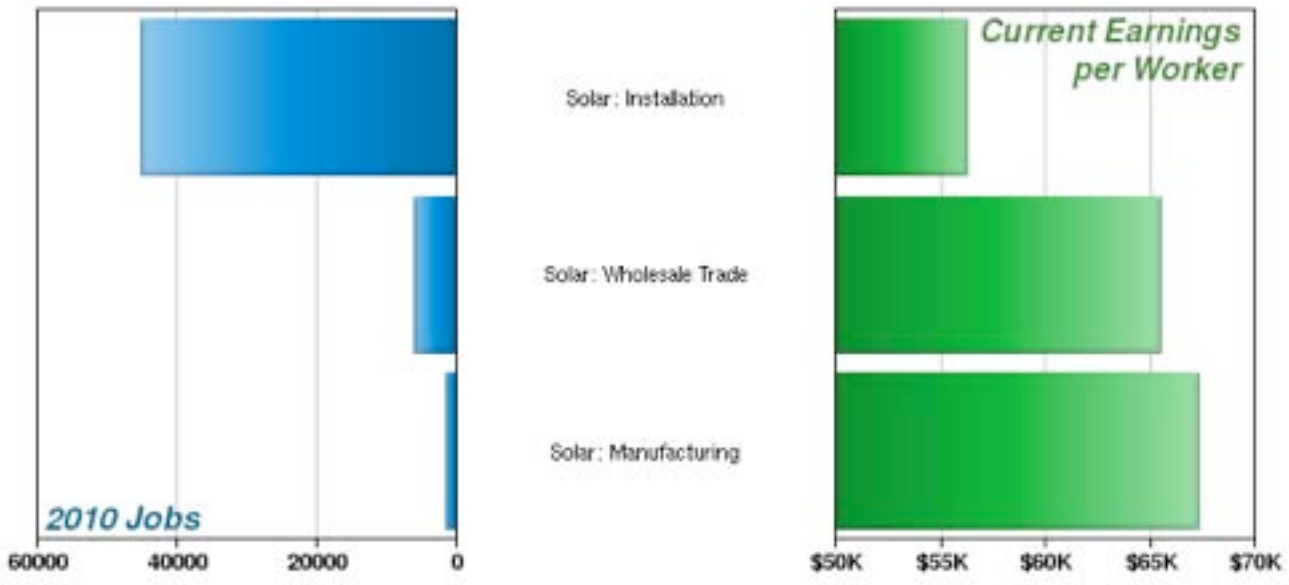
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	5,381	5,032	-349	-6%	85
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010

5.4.51 Wyoming

Primary Data

Description	Responses (n)	% of Total	2010 Jobs	2011 Jobs	% Change
State Total	n/a	n/a	n/a	n/a	n/a
National Total	2,426	n/a	57,197	67,889	19%

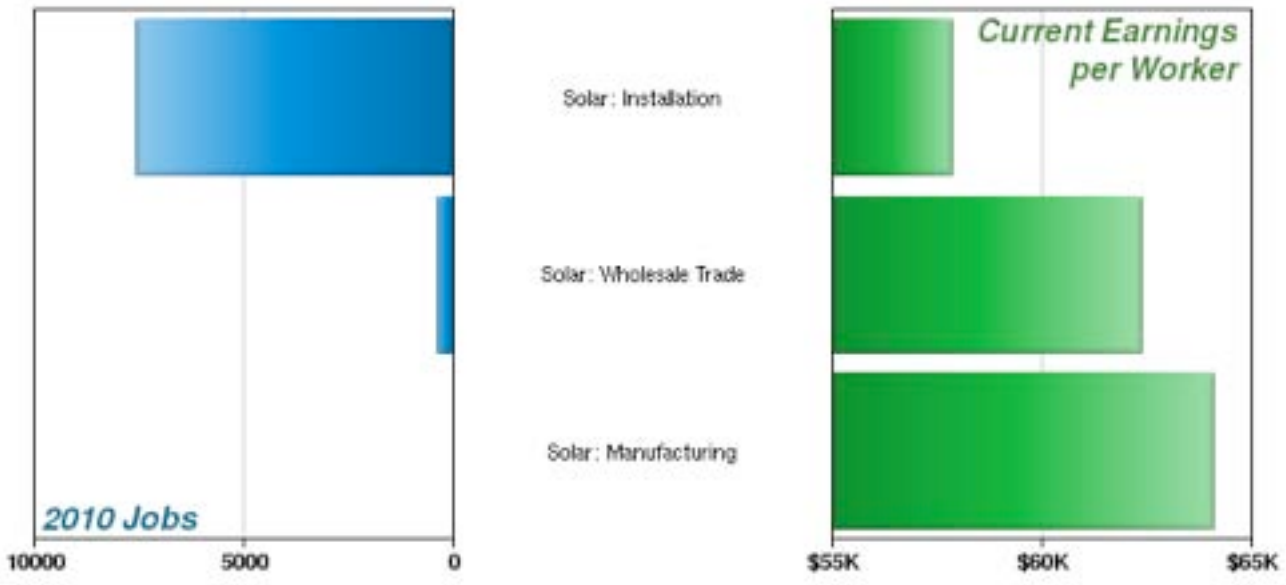
Secondary Data

For comparison purposes, the following table represents the number of jobs in the fossil fuel electric power generation sector.

Description	2010 Jobs	2011 Jobs	Change	% Change	2009 Establishments
State Total	1,077	1,069	-8	-1%	7
National Total	135,458	131,352	-4,106	-3%	2,035

Source: EMSI Complete Employment - 3rd Quarter 2010

This section includes data on traditional occupations related to the solar industry to compare relative size (2010 jobs) and earnings of workers in each sector.



Source: EMSI Complete Employment - 3rd Quarter 2010