



# National and Regional Clean Energy Trends: **Workforce Implications**

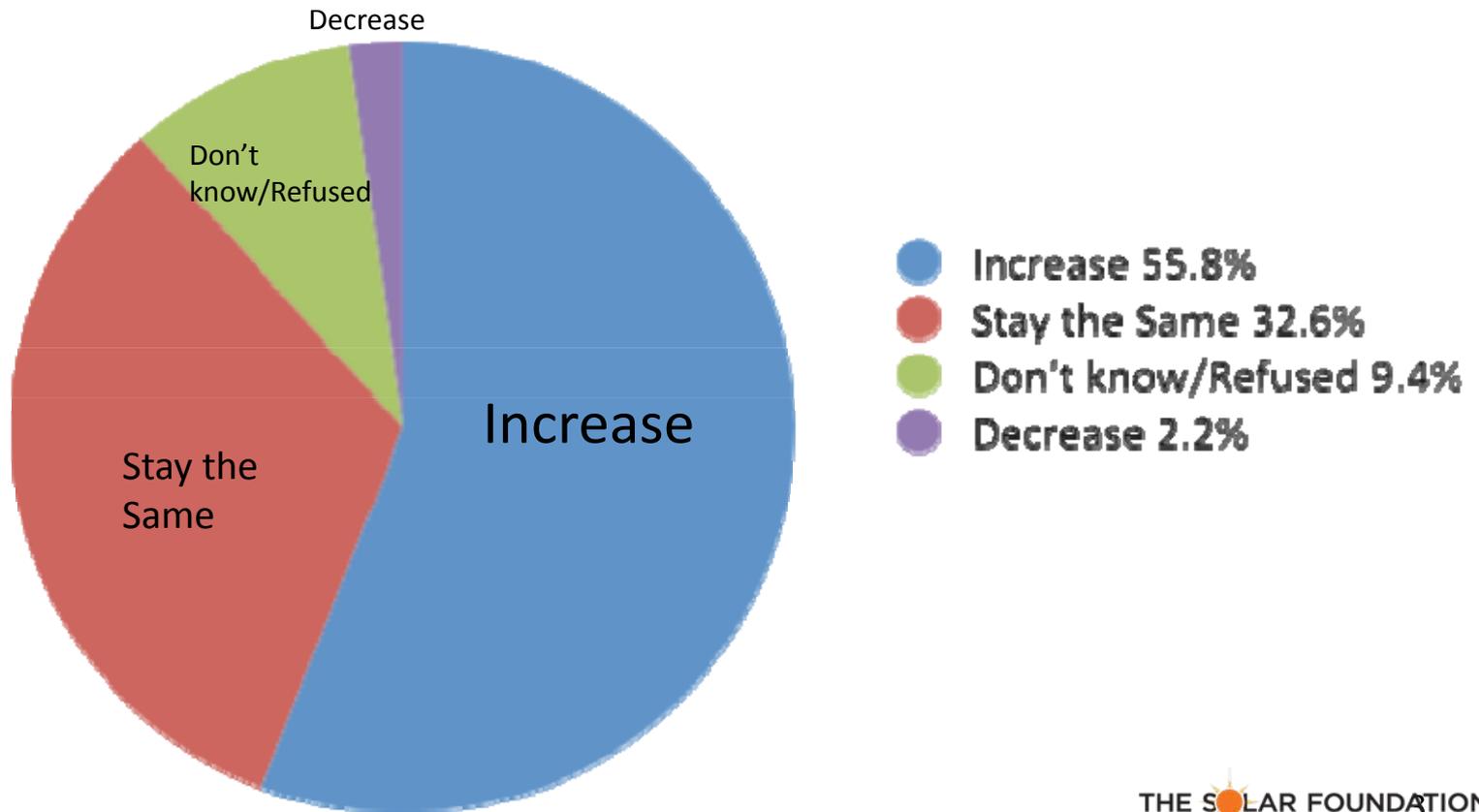
Philip Jordan, Green LMI Consulting

# 1

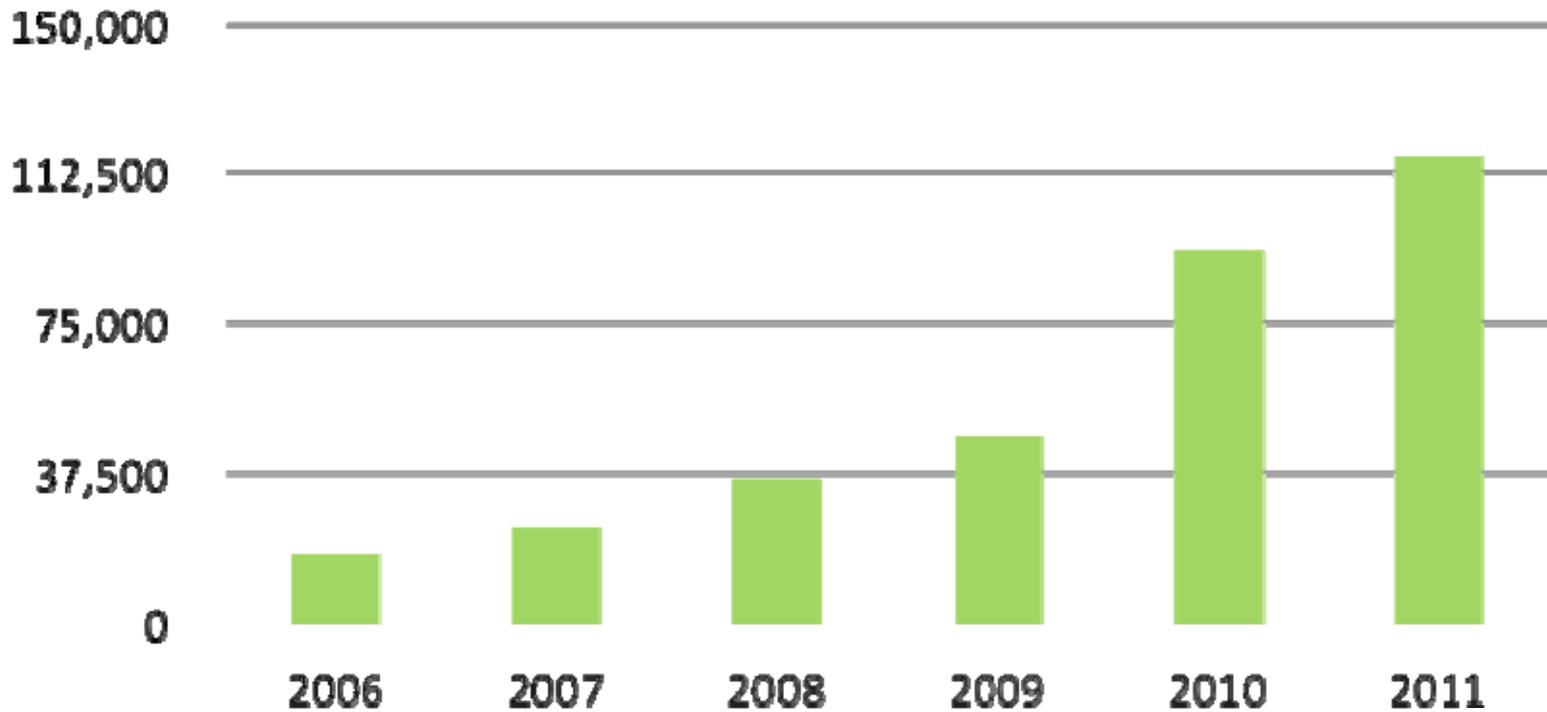
An Overview of Studies:  
The Solar Foundation 2010  
Jobs Census

# Hiring Expectations – All Firms

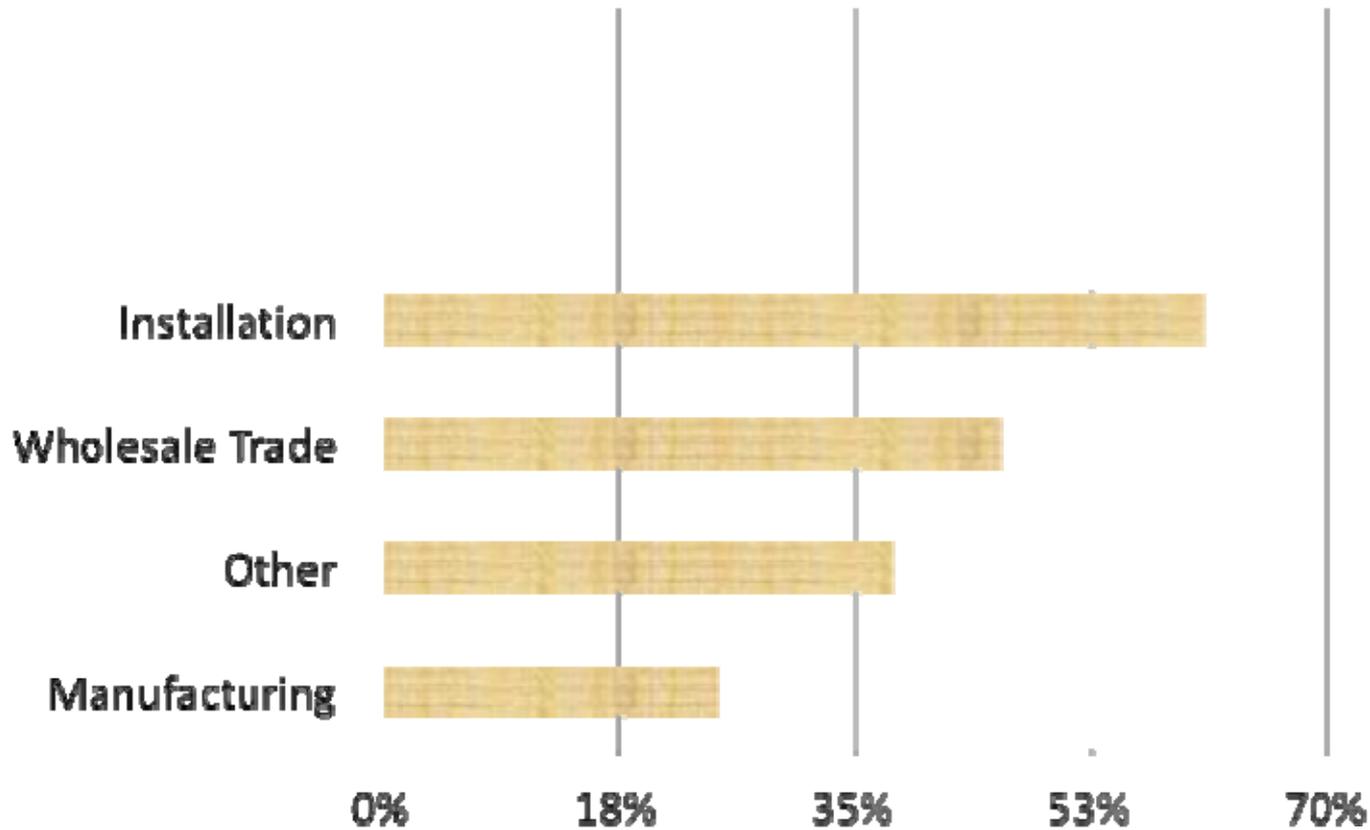
Between August 2010 – August 2011



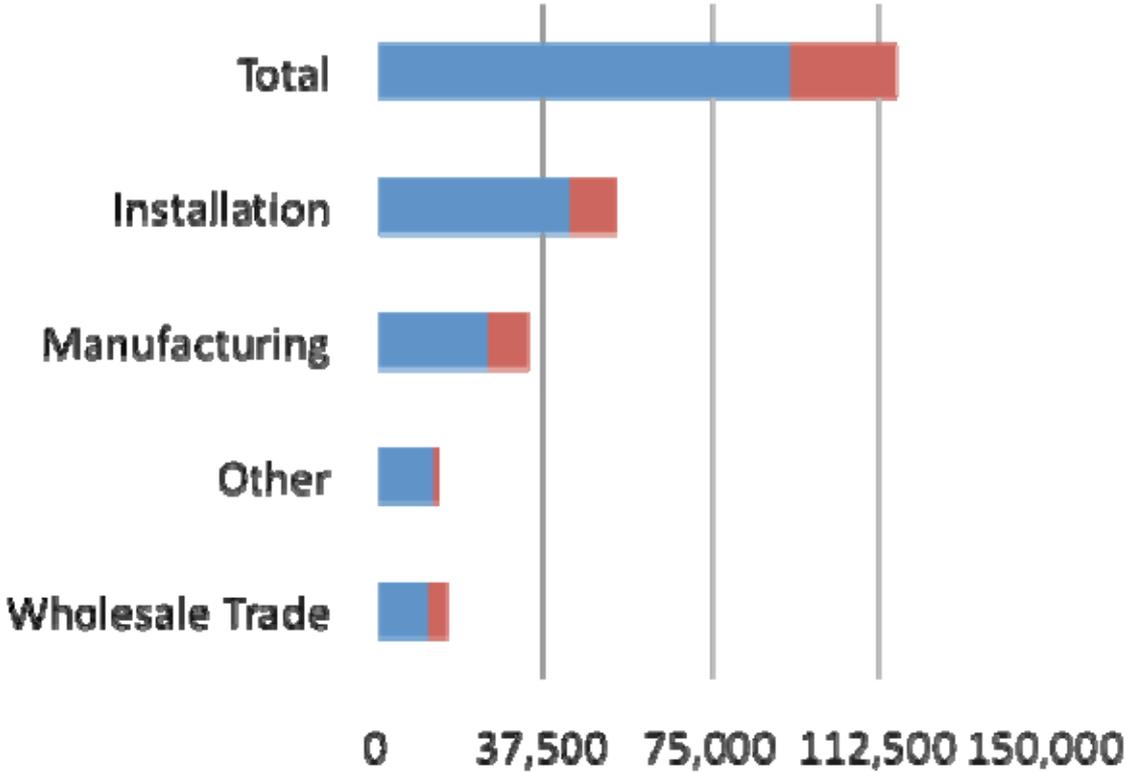
# Estimated U.S. Solar Industry Employment



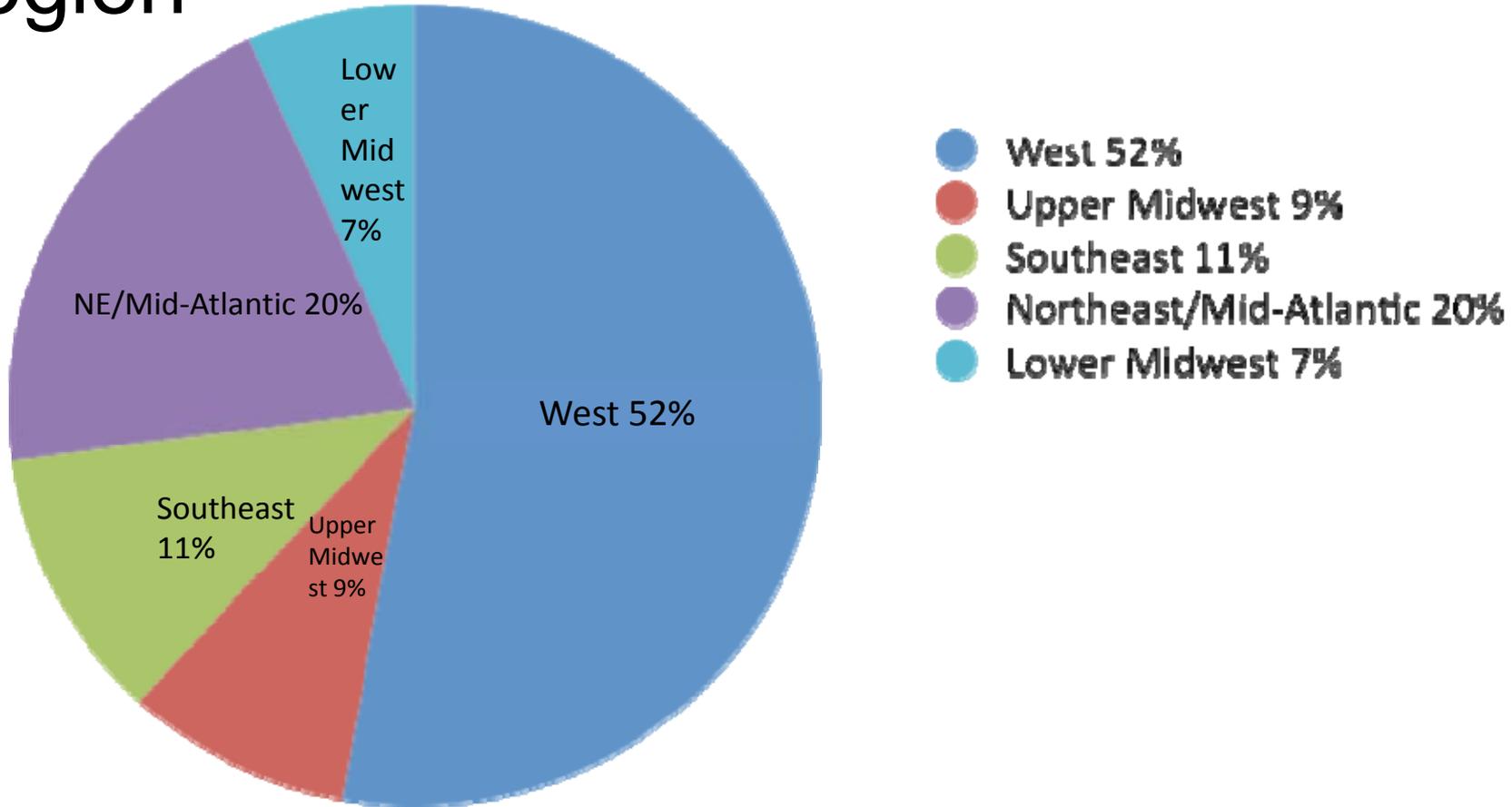
# Percentage of Firms, By Subsector



# Subsector Growth Expectations



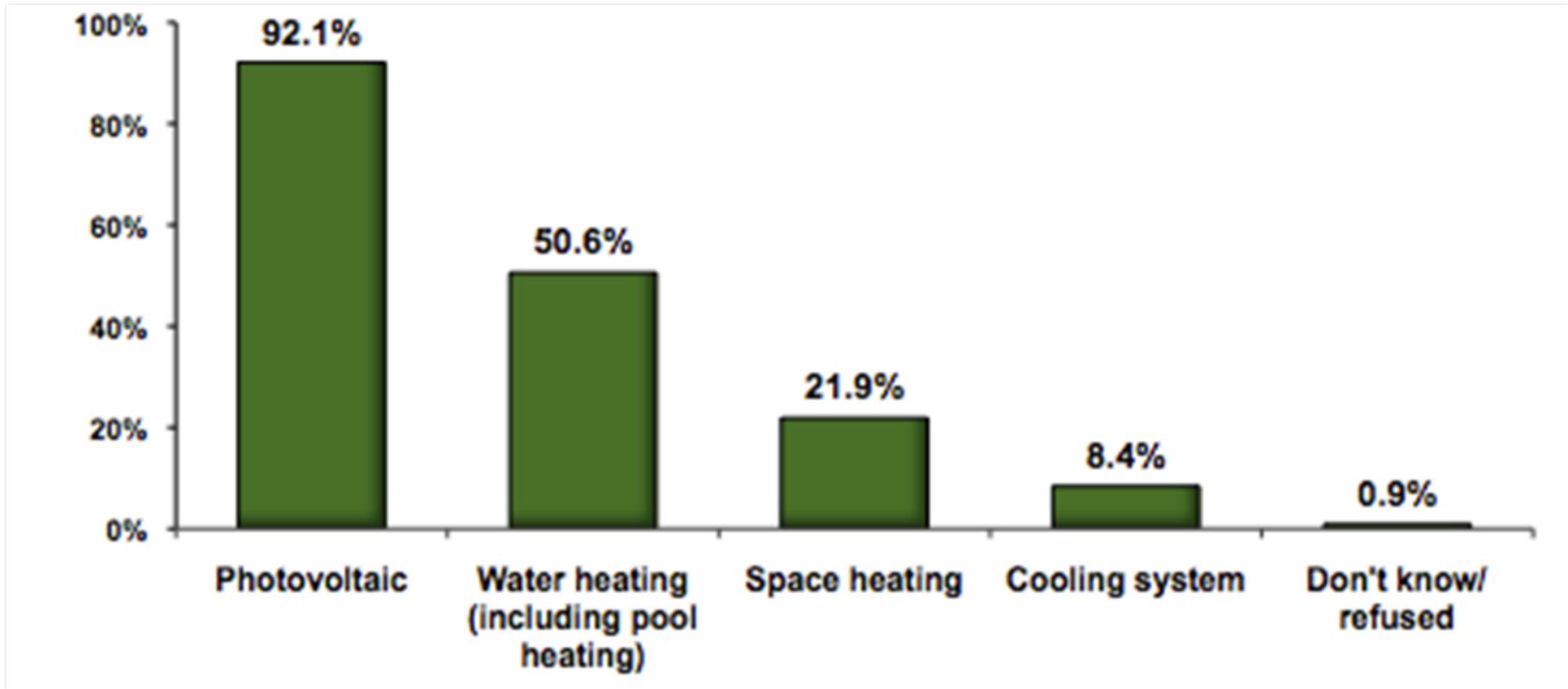
# Breakdown of Solar Employers by Region



# 2

## NREL Solar Installer Study

# Percent of Solar Installation Firms by Technology



## Anticipated 12-Month Solar Installation Full-Time Equivalent Growth Rate

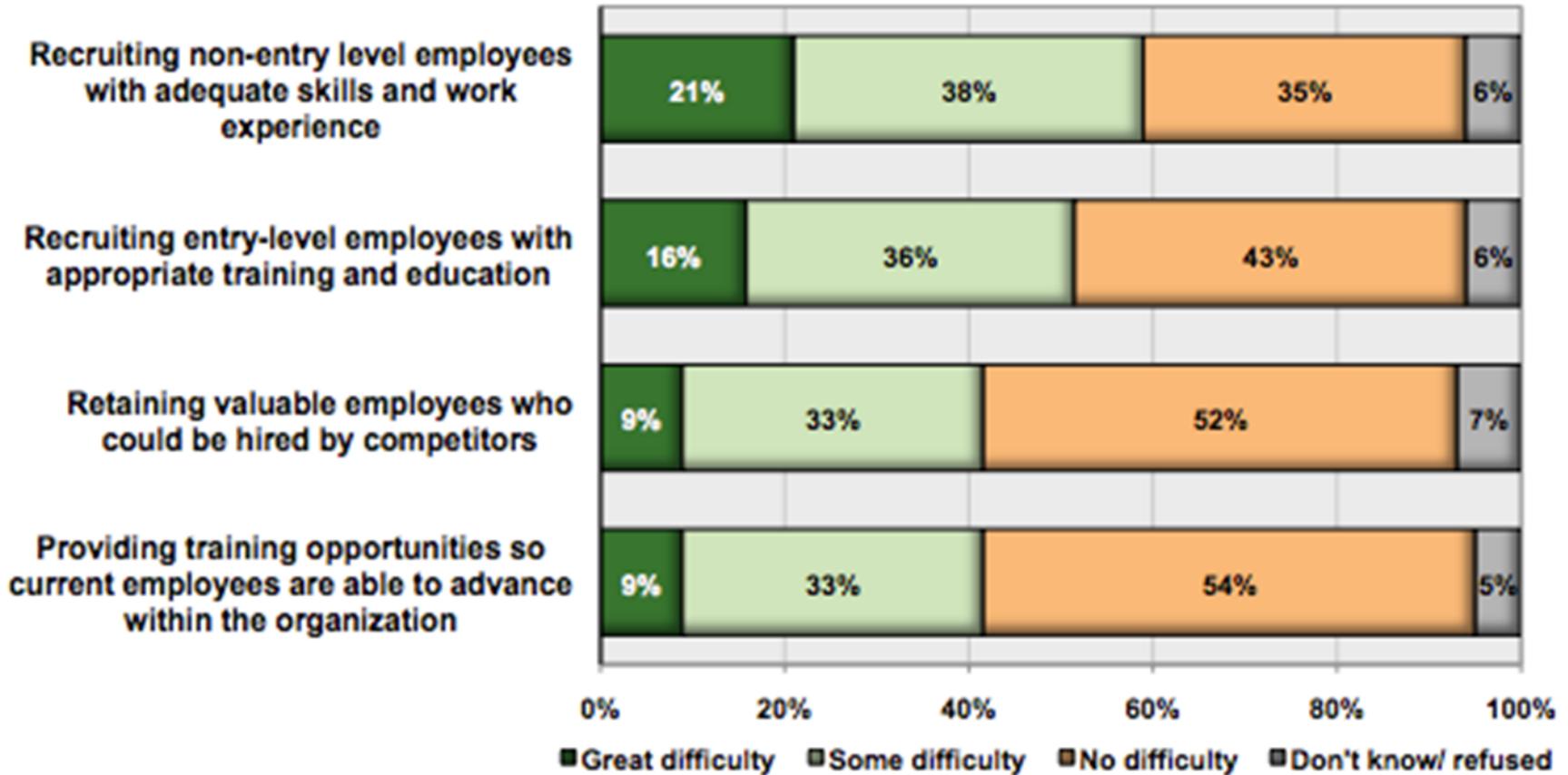
<b>Description</b>	<b>2010 Jobs</b>	<b>2011 Jobs</b>	<b>Change</b>	<b>% Change</b>
Permanent Employment (Across All Divisions)	147,501	174,554	27,053	18%
Permanent Employees at Least 50% Solar	43,934	53,793	9,859	22%
Temporary and Seasonal Workers	19,897	n/a	n/a	n/a

## Growth Rate, Difficulty Hiring, and Wage Range by Occupation

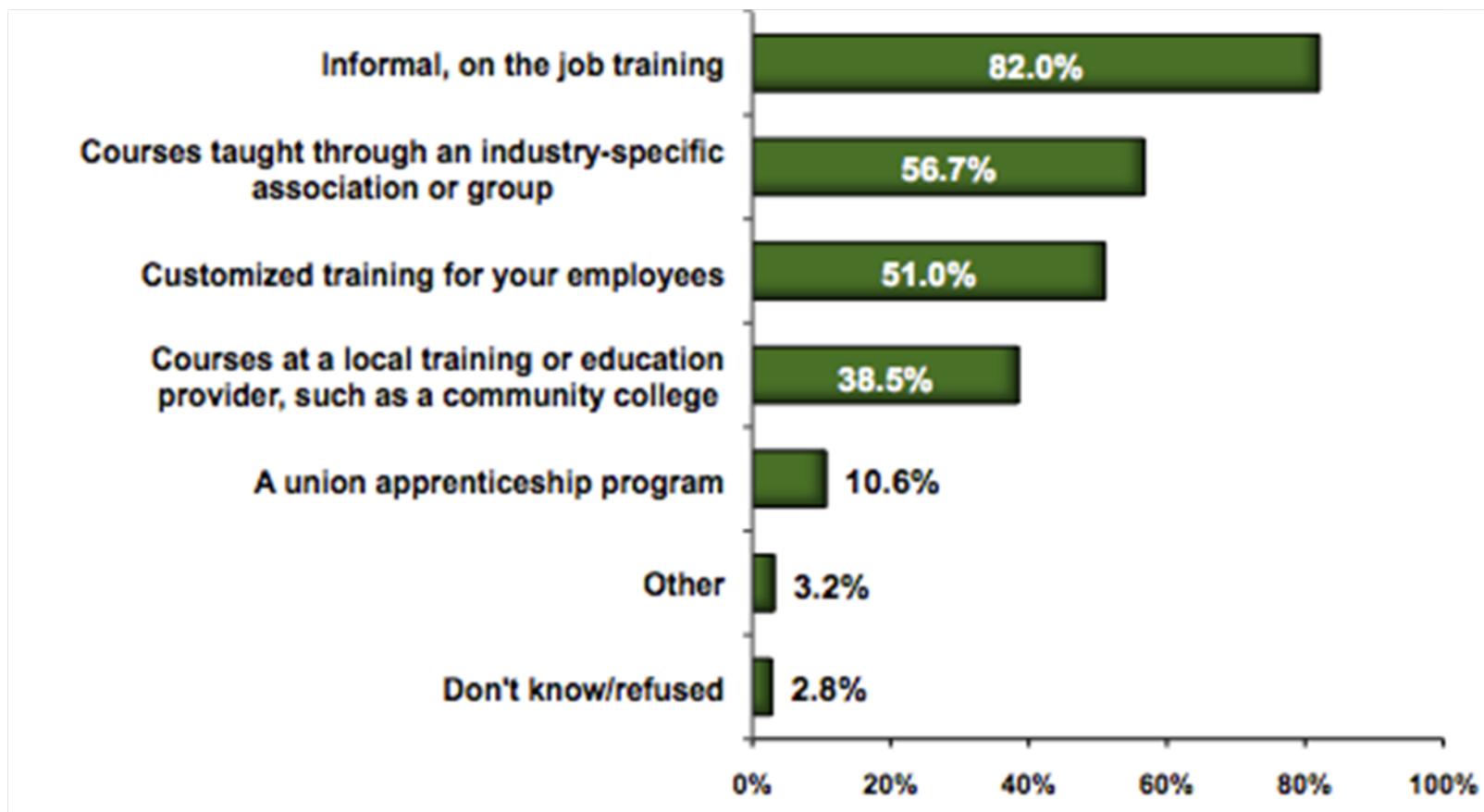
<b>Occupation</b>	<b>Difficulty Hiring</b>	<b>Firms that Employ</b>	<b>12-Month Growth %</b>	<b>Hourly Median Wage</b>
Solar water- or pool-heating installers or technicians	65%	33%	29%	\$15–\$24
Solar photovoltaic installers or technicians	62%	72%	51%	\$15–\$25
Sales representatives or estimators	64%	70%	39%	\$19–\$32
Solar designers or engineers	67%	62%	33%	\$19–\$31
Solar installation managers or project foremen	65%	61%	32%	\$20–\$30
HVAC technicians with specific skills in solar installation	64%	11%	25%	\$14–\$25
Energy auditors	56%	20%	31%	\$17–\$25
Site assessors and remote evaluators	64%	37%	35%	\$16–\$25
Plumbers with specific skills in solar installation	59%	17%	25%	\$18–\$30
Electricians with specific skills in solar	62%	53%	42%	\$20–\$31
Roofers with specific skills in solar installation	47%	15%	36%	\$15–\$25

**\* Wage information provided by employers is often biased because employers have an interest in keeping wage expectations low, explaining the wide range of wages. Also, the range reflects the differences between entry-level and experienced workers.**

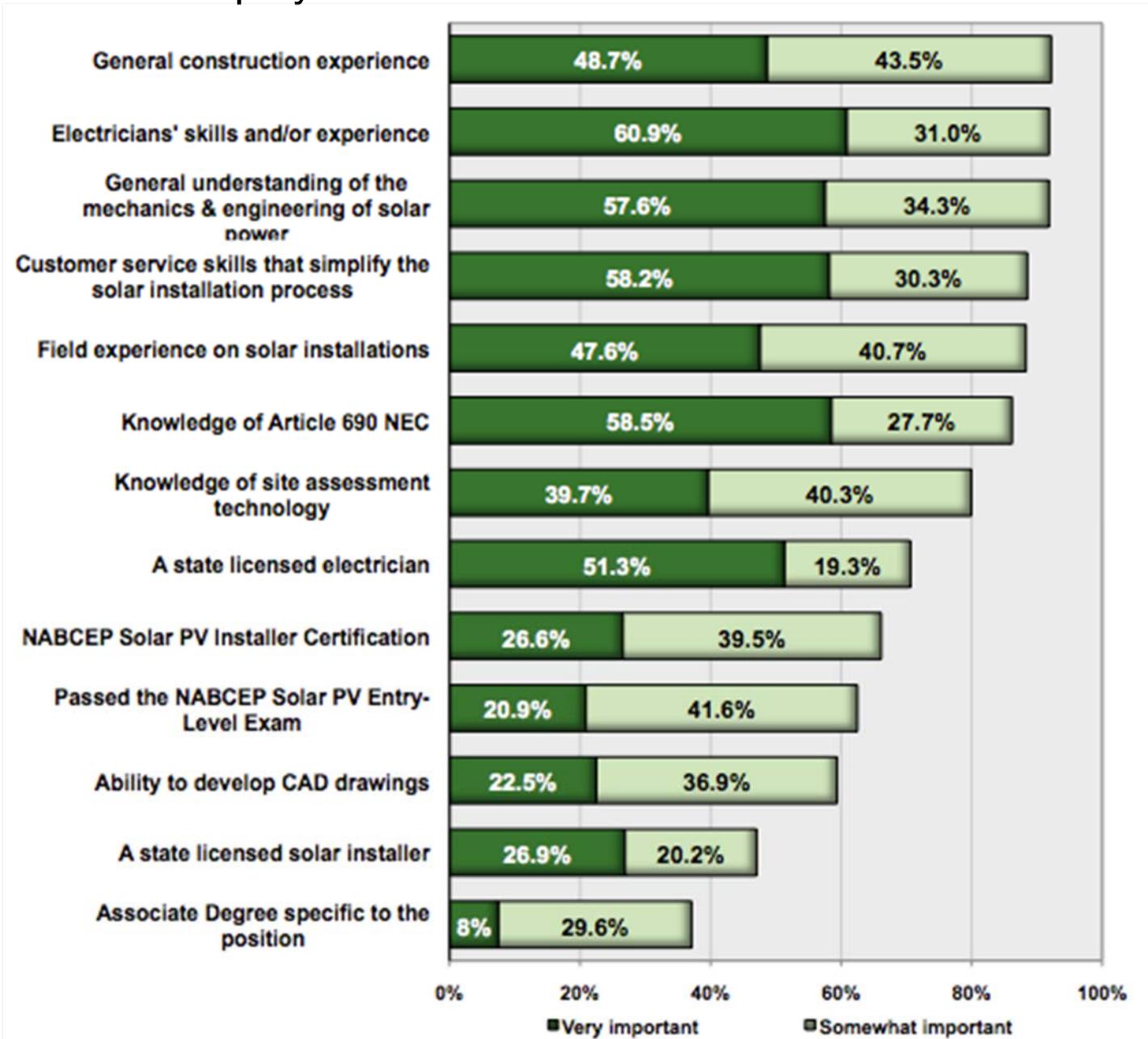
# Solar Workforce Challenges



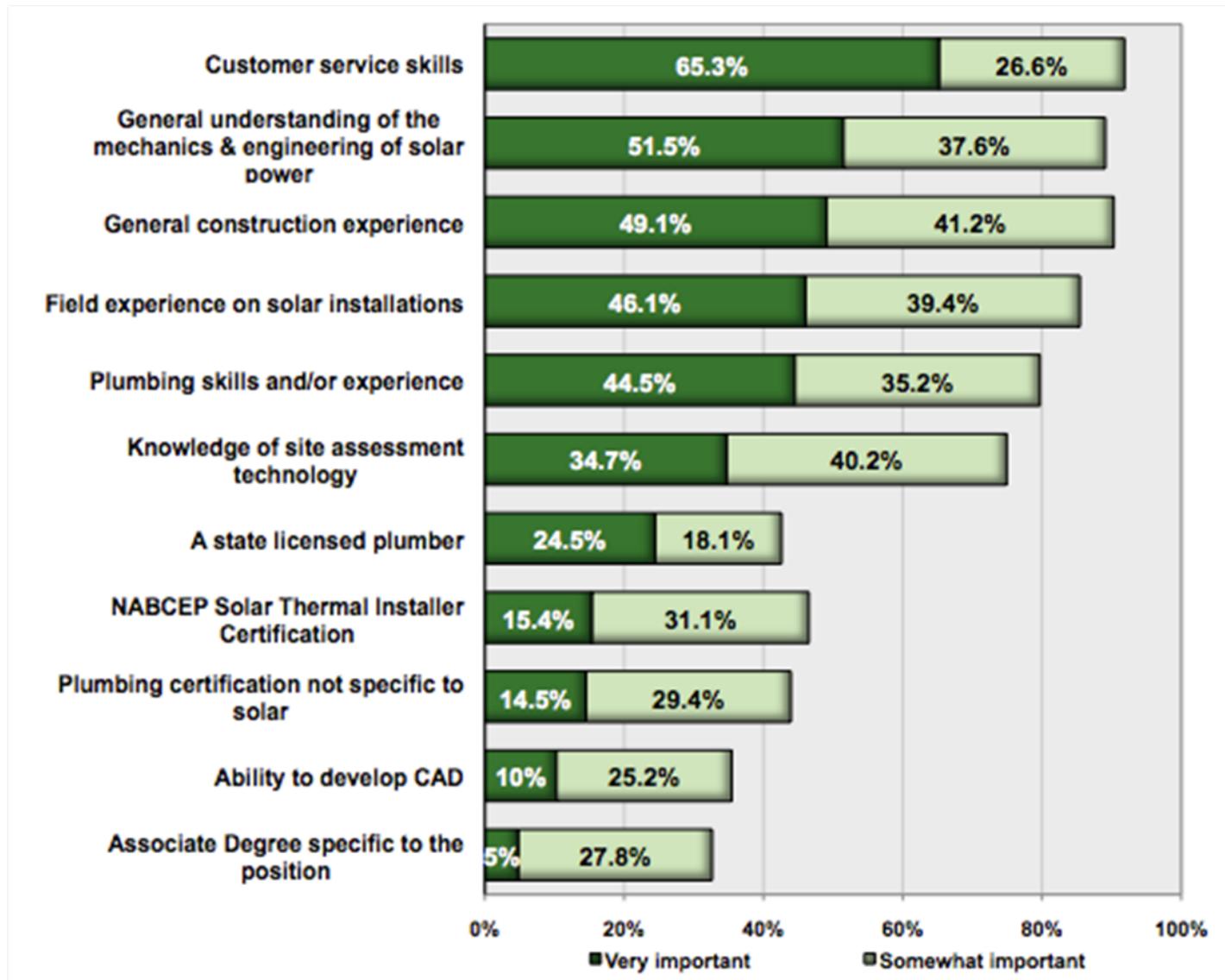
# Training Preferences



# Skills, Areas of Knowledge, and Educational Certifications Needed for Employment at Solar Photovoltaic Installations



# Skills, Areas of Knowledge, and Educational Certifications Needed for Employment at Solar Heating or Cooling Installations



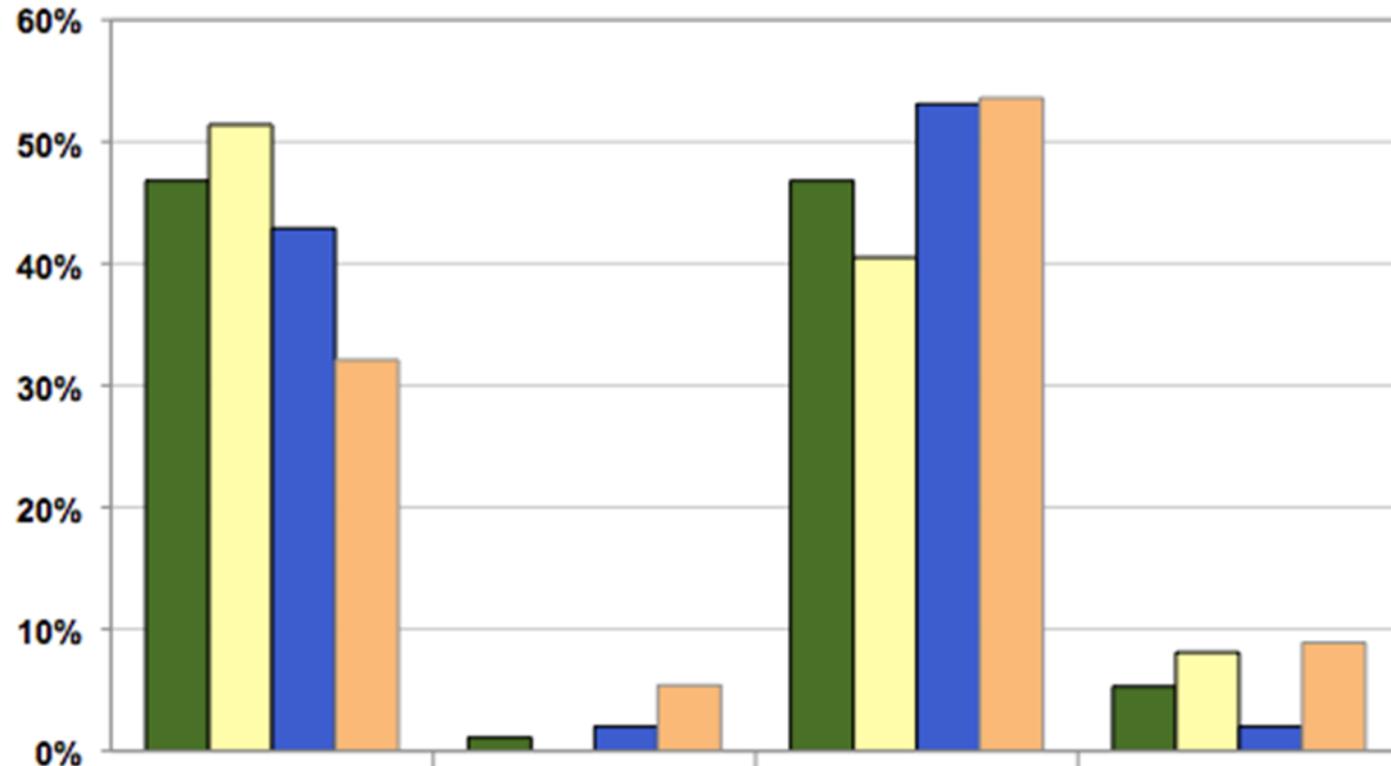
# Regional Overview

	Current Permanent Employment by Solar Employers	Current Solar Employment (At Least 50% of Employees' Time)	12-Month Expected Solar Employment	12-Month New Solar Employees
Installer	147,501	43,934	53,793	9,859
Region 1: NY, VT, RI, CT, MA, NH, ME	4,932	2,282	2,821	539
Region 2: WV, PA, DE, NJ	10,356	4,888	6,269	1,381
Region 3: SC, NC, VA, DC, MD	8,664	3,995	5,116	1,121
Region 4: MS, AL, GA, TN, KY, FL	12,793	2,101	2,594	493
Region 5: MN, IA, WI, IL, IN, MI, OH	15,885	1,303	1,423	120
Region 6: NM, TX, OK, LA, AR, MO	9,769	4,309	5,219	910
Region 7: AK, AZ, NV, UT, CO, KS, NE , WY, SD, ND, MT, WA, OR, ID	22,858	7,521	9,017	1,496
Region 8: CA, HI	56,044	15,592	18,911	3,320
Other/ Data provided across regions (more than one location)	6,201	1,944	2,422	478
<b>Total</b>	<b>147,501</b>	<b>43,934</b>	<b>53,793</b>	<b>9,859</b>

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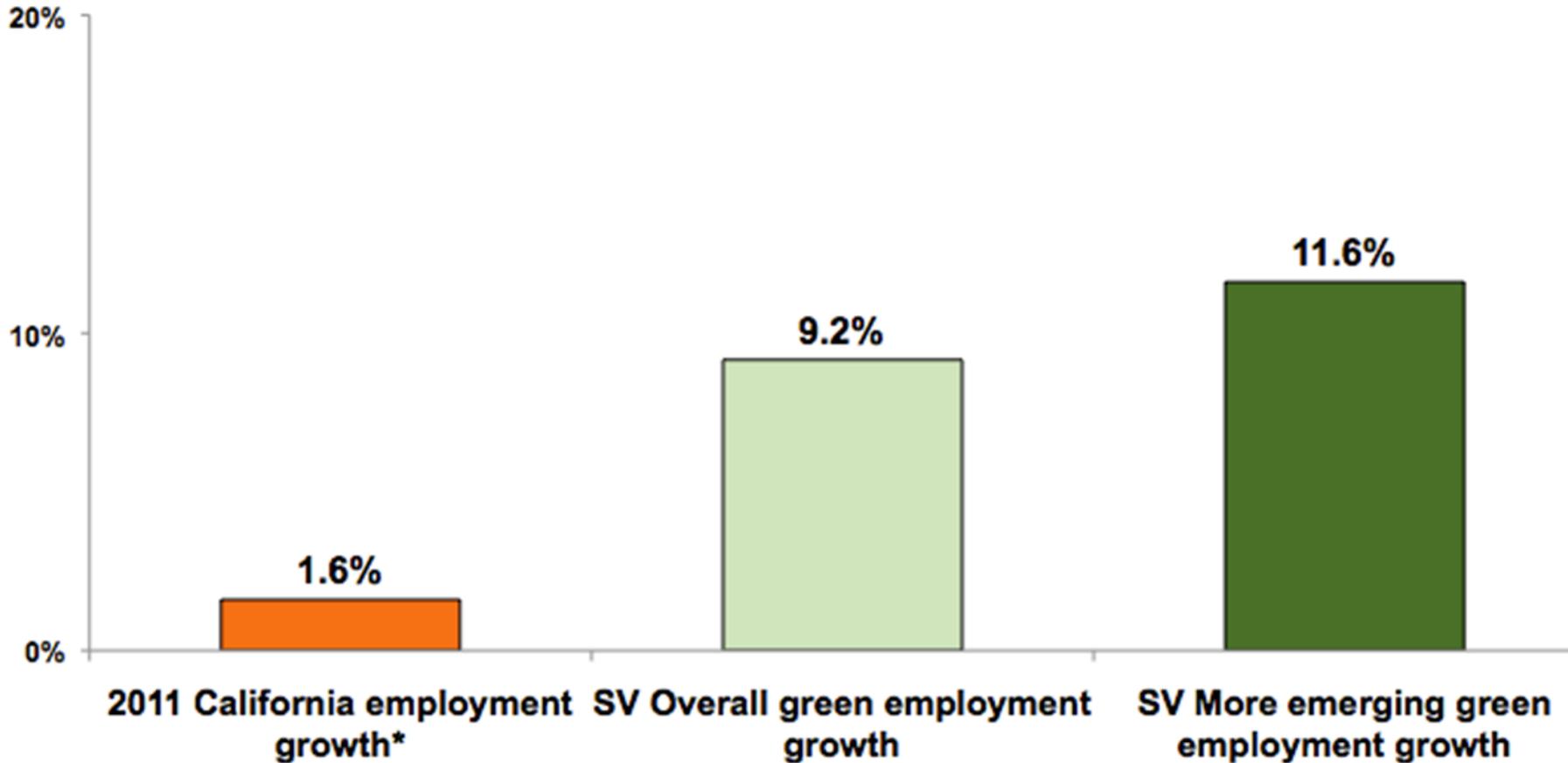
Silicon Valley Emerging Green  
(w2f)

# Growth Expectations for Green Employers I



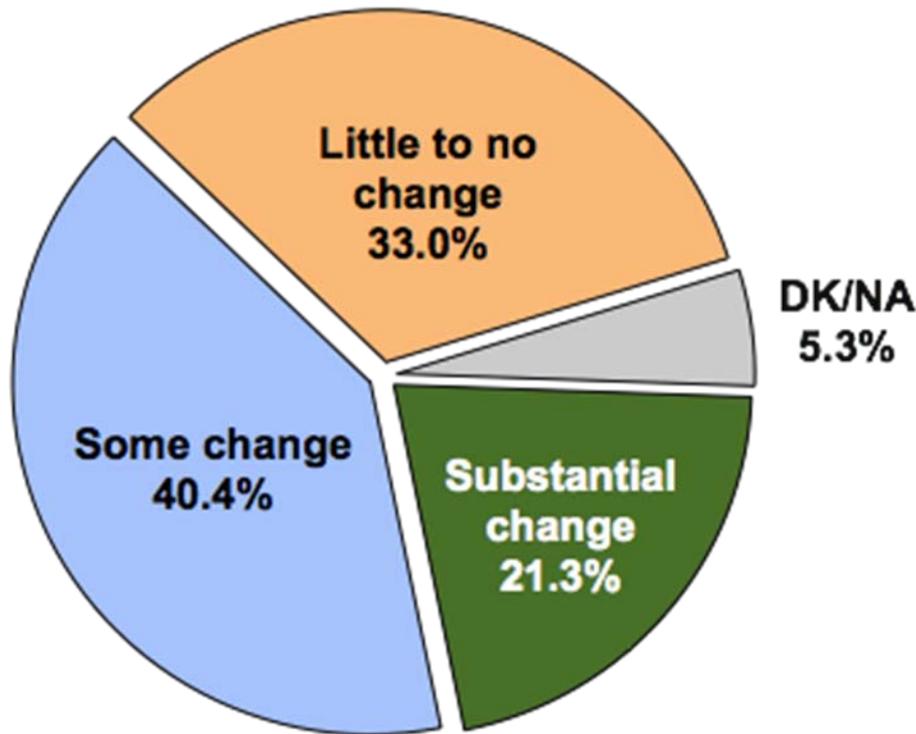
 Green Employers	46.8%	1.1%	46.8%	5.3%
 -More Emerging Green	51.4%	0.0%	40.5%	8.1%
 -More Established Green	42.9%	2.0%	53.1%	2.0%
 Non-Green Employers	32.1%	5.4%	53.6%	8.9%

# Growth Expectations for Green Employers II



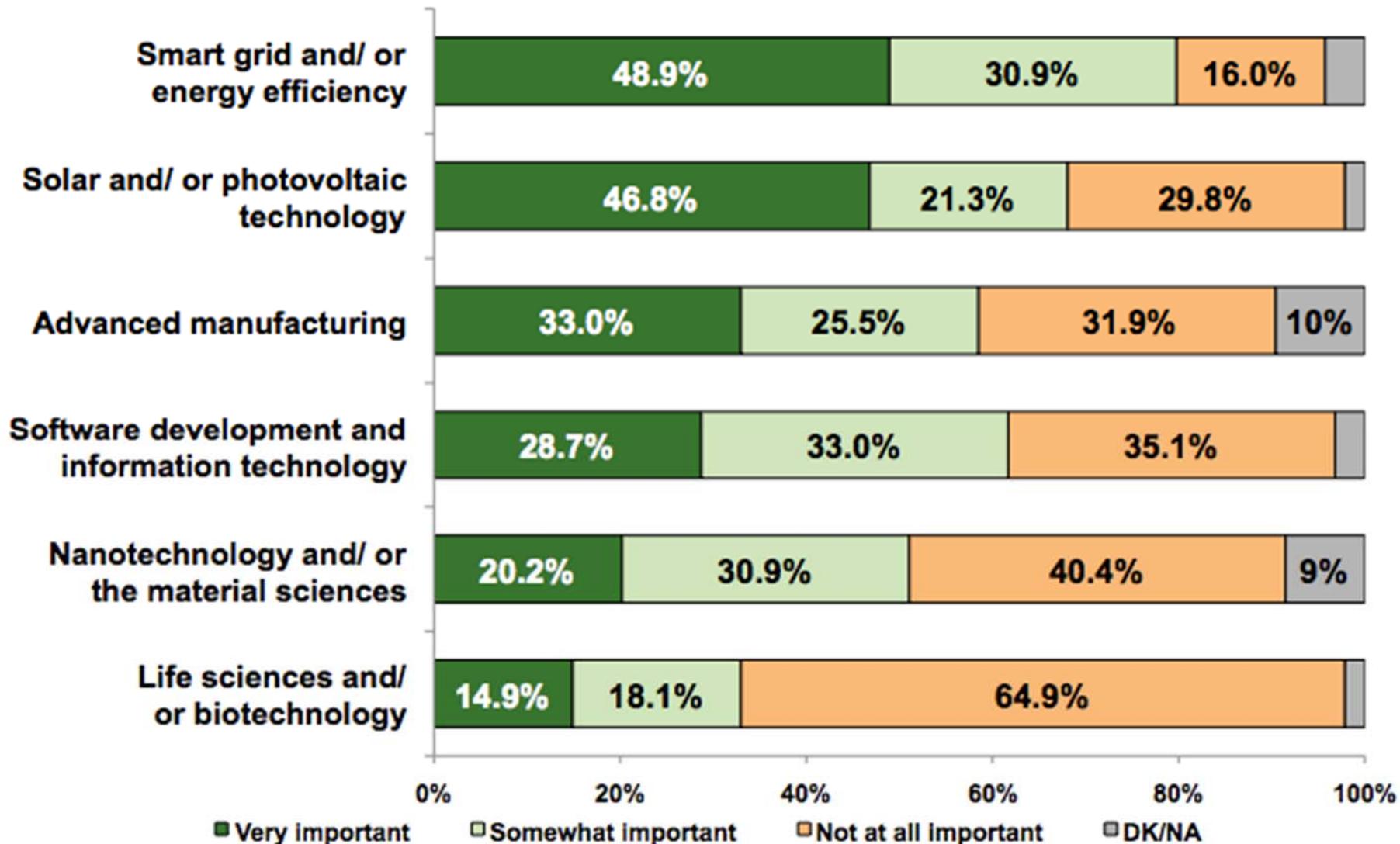
\*Laying the Groundwork for California's Economic Recovery. UCLA Anderson Forecast. Jerry Nickelsburg. 2010

# Changing Composition of the Workforce for Green Employers



Even within emerging green industries, green firms are three times as likely to have substantial changes in the composition of their workforce. Green manufacturers are even more likely to see substantial changes (33%).

# Importance of Related Technologies for Green Employers



# Silicon Valley's Green Employers

Emerging Green Sector	SV Firms	SV Employees	% SV Emerging Green Sector Employment
Energy	331	4,499	31.2%
Materials & Manufacturing	310	3,710	25.8%
Specialized Suppliers & Support Industries	479	4,783	33.2%
Transportation	30	1,243	8.6%
Water	8	166	1.2%
<b>Total</b>	<b>1,158</b>	<b>14,401</b>	<b>100%</b>

# Emerging Green Firms (VC) 2004 - 2010

As of July 2010, Silicon Valley firms accounted for almost 1/3 of emerging green firms in California based on VC funding

<u>Industry Sector</u>	<u>California</u>		<u>Silicon Valley</u>	
	VC deals	%	VC deals	%
Agriculture	27	3.3%	6	2.3%
Air & Environment	40	4.9%	13	4.9%
Energy Efficiency	129	15.7%	57	21.5%
Energy Generation	310	37.7%	101	38.1%
Energy Infrastructure	27	3.3%	11	4.2%
Energy Storage	61	7.4%	26	9.8%
Manufacturing/ Industrial	44	5.4%	7	2.6%
Materials	40	4.9%	15	5.7%
Recycling & Waste	19	2.3%	5	1.9%
Transportation	73	8.9%	14	5.3%
Water & Wastewater	52	6.3%	10	3.8%
<b>Total</b>	<b>822</b>	<b>100%</b>	<b>265</b>	<b>100.0%</b>

# Occupational Profile for Emerging Green Industries

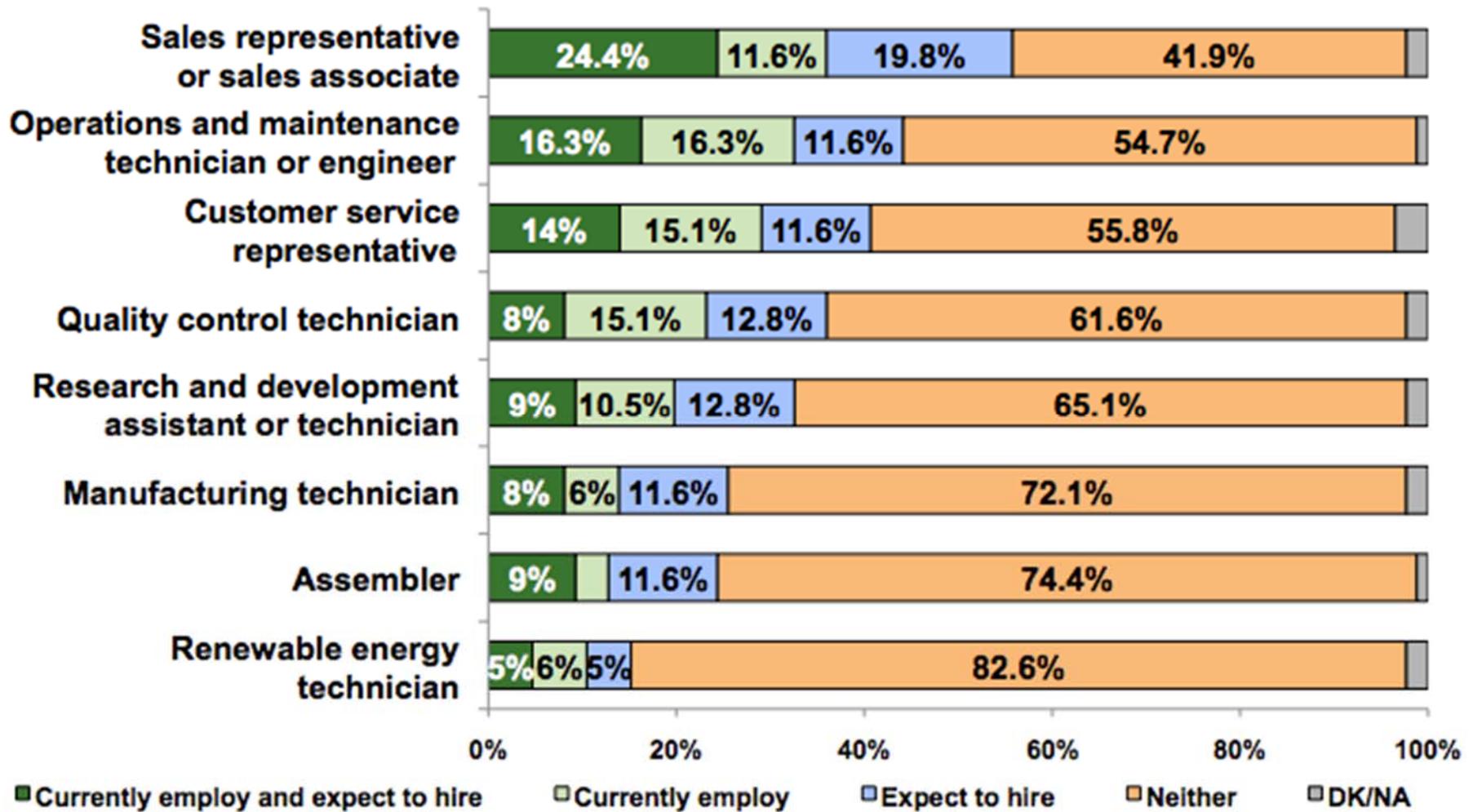
	Avg. Wage per hour (CA)	California Workforce	Silicon Valley Workforce	Emerging Green Industries Workforce
Tier 1 Occupations	\$ 43.84	22.4%	34.0%	60.9%
Tier 2 Occupations	\$ 20.53	58.6%	50.0%	38.7%
Tier 3 Occupations	\$ 11.99	19.0%	16.0%	0.4%

**Tier 1 Occupations = Manager, Professional & Science**

**Tier 2 Occupations = Sales, Administrative & Production**

**Tier 3 Occupations = Food service, personal care & cleaning positions**

# Occupations of Interest for Green Employers



# Conclusions

# Conclusions I

## Strong Growth

Recent studies show strong growth, with over half of employers expecting to increase staffing levels.

## Conclusions II

# Opportunity & Challenge

SV's emerging green occupational profile is:

- 61% high wage/ high skill occupations
- 38% middle wage/ middle skill occupations
- virtually no low skill/ low wage occupations

## Conclusions III

### Change is Constant

More than 3/5 of employers expect at least some change in the composition of their workforce.

1/5 expects substantial change.

# Conclusions IV

## Growth Sectors

Energy efficiency and energy infrastructure are two high growth energy sector segments seeing increased venture capital.

“Smart grid & energy efficiency” was rated as the most important technology of the six tested among green employers locally and more solar employers indicate providing comprehensive services than stand-alone ones.

# Recommendations

# Recommendations I

## **Continuing Feedback from Employers**

Develop better relationships with employers.

Identify and examine metrics and indicators that inform the continued assessment of the clean energy industries.

## Recommendations II

### **Experience is Key for Job-seekers**

Develop new training models that provide opportunities for industry experience and greater understanding of operations in key segments.

## Recommendations III

**Workforce Needs are diverse,  
Training Cohorts should be as  
well**

Workforce investment boards and training providers should focus on meeting specific workforce needs by providing more varied and specialized training to smaller cohorts of trainees.



# National and Regional Clean Energy Trends: **Workforce Implications**

**Thank you very much!**

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