

Green Jobs from Action on Global Warming
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Introduction

Thank you for the opportunity to testify before this committee. As a result of my work in the solar industry since the '70s, founder of one of the leading solar installation companies in the U.S., and president of the California Solar Energy Industries Association, I look forward to providing the Committee with a real hands-on perspective of the job creation benefits of renewable technologies. I have divided my remarks into three categories – jobs created by Akeena Solar, jobs created by our industry in California, and jobs created on a national basis.

Akeena Solar Jobs

First, the direct jobs created at Akeena Solar are tangible and not subject to speculation. As of the end of July, Akeena Solar employs 159 full time and 11 part time people. Of this 170, 9 are based in New Jersey (the second best solar state in the country), and the remaining 161 are spread out over the seven offices we currently have in California.

101 of these jobs, or 63%, are on the operation side of the business. However, only 62 of these jobs, or just over 36% of our workforce, are actual rooftop installers. The balance of our operational jobs are for highly paid engineers, technicians, documentation specialist and project managers. The balance of the 59 employees at Akeena Solar are in sales, marketing, finance and administration.

Although I do not have any specific data on the indirect jobs that we create, I do think that it is certainly consistent with the job multiplier that was calculated in the UC. Berkeley study noted below. As we do our work our employees are substantial consumers of construction materials, solar panels, vehicles, parts, supplies and subcontractor services. Additionally, our employees are members of the community and spend much of their salaries locally. Anecdotally, the hot dog vendor down the street from our office has certainly seen a jump in business from our lunchtime crowd.

California Solar Jobs

In 2005 Akeena Solar, in conjunction with the California Solar Energy Industries Association, authored a White Paper entitled "The Economics of Solar Power for California." One of the key findings of this White Paper was that the renewable energy industry is a powerful job creation engine.

California's investments in solar generation since 2001 have helped stimulate the development of a significant new high technology industry. Continued state support for the solar industry is crucial if the industry is to grow to the point that it is self-supporting. Importantly, investments by consumers and the state in solar generation will produce greater benefits for the California economy than will investments in the gas-fired CCGT and CT plants that they replace.

Several studies have attempted to quantify the economic benefits of the accelerated development of solar resources. The California Solar Energy Industries Association has used an input-output model (E3AS) developed by The Goodman Group (TGG). The E3AS software estimates the regional economic impacts of a new technology by tracing the industries involved through successive rounds of supply linkages. At each step, the program traces the portion of the inputs required from each industry that are supplied within the regional economy being modeled. The study concluded that each \$1 invested in new solar generation would result in an additional \$0.50 of economic activity in California, compared to producing the same power through conventional means. Included within this increased economic activity are more jobs for Californians: each megawatt of solar generation would produce an additional 40 person-years of employment.

Professor Dan Kammen of U.C. Berkeley has also studied the incremental economic benefit associated with renewable energy. In an April 2004 review of the available studies on the jobs created by photovoltaic generation, Dr. Kammen cites estimates of 1.6 to 2.2 additional jobs created per MW of PV installed, over the life of a facility, compared to the jobs created by conventional electric generation.¹ Assuming a 20 to 25-year facility life, this results in very similar numbers to Cal SEIA's result of an additional 40 person-years of employment per megawatt installed.

Why will the solar industry produce more jobs and more economic benefits than comparable spending on conventional electricity supplies? The majority of the costs of natural gas-fired power production are fuel costs. California obtains only 15% to 17% of its gas supplies from in-state sources, so most of the spending for fuel does not benefit the California economy. In contrast, installing solar generation requires skilled local labor, and many solar components are manufactured in the state. If the state provides long-term support for the solar industry, suppliers will be encouraged to locate plants in the state, close to a major long-term market.

Renewable Energy Jobs

In 2006 Renewable Energy (RE) contributed to 6% of the US energy market. Of this 6% solar PV held a 1% market share. There were 194,000 RE jobs in 2006

which powered a \$39.2 B industry while creating an additional 446,000 jobs directly and indirectly. Most of these jobs that were created were scientific, technical, professional and skilled positions. Additionally, 95% of the jobs were in the Private Sector.

In 2006 Solar PV accounted for 6,800 jobs, \$1 B in revenue and helped create an additional 15,700 jobs directly and indirectly. The following diagrams outline the growth of renewable energy jobs and revenue between 2006 and 2030.

U.S. Estimated Revenue in 2030		
	Renewable Energy	Photovoltaics
Base Case	\$95 Billion	\$14 Billion
Moderate Case	\$227 Billion	\$30 Billion
Advanced Scenario	\$1,305 Billion	\$48 Billion

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U.S. Estimated Jobs in 2030		
	Renewable Energy	Photovoltaics
Base Case	1.305 Million	200,000
Moderate Case	3.138 Million	450,000
Advanced Scenario	7.935 Million	750,000

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In an aggressive scenario RE Jobs would increase 1,700% from 2006 to 2030 and at the same time the revenue would increase by 1,400%. The increase in jobs and revenues would have a significant positive impact for each state as displayed below:

Benefits to States

1) New Investments	6) Stimulation of the manufacturing Sector
2) Total Industry Sales	7) State & Fed Tax Revenues
3) Industry Profits	8) Technology development and spinoffs
4) Creation of Direct/Indirect Jobs	9) Revitalization of depressed regions
5) Specific jobs created by occupational skill	

One of the greatest benefits of RE and PV is the potential to revitalize depressed regions of employment. Nowhere has this been more effective than in Eastern Germany. Through state assistance, federal aid and EU funding for regional development Eastern Germany has utilized the manufacturing of solar power technology to become a model for economic rehabilitation. For example, the Eastern German state of Thuringia has more than 15 companies that cover the entire PV Value Chain. One company, Solon, has 150 employees producing 60 MW of panels each year on 6 production lines that run off 3 shifts a day/24 hours

a day. The boom of RE in Germany has spurred the employment level to increase 36% in two years.

While Germany has been very successful in RE in the past, the US has even greater potential due to higher demand, more opportunity and better resources, for example better solar radiation. One state very similar to Eastern Germany is Ohio. In the last 10 years Ohio manufacturing jobs have decreased by 23%. In fact, the total share of U.S. jobs decreased in Ohio from 4.6% to 4.0%. Through the wide scale deployment of RE and specifically Solar PV states like Ohio would be able to secure well paying, highly skilled employment that would not be subject to foreign outsourcing.

Conclusion

Generating electricity from clean, renewable sources is the future. Our early investments in this future are already paying off in the form of cleaner and less expensive energy.

You may have heard that solar power is not cost effective. That statement is certainly not true for rooftop solar power. The typical small residential solar power system costs \$24,000 and will generate 4,300 kwh of electricity per year, virtually maintenance free for 30 years. These energy costs work out to about 19 cents per kwh. I am confident that most of the California residents in here today pay much more than that for electricity – probably closer to 34 cents! With current incentives for solar power, these costs work out to about 11 cents per kwh – less than a third of the top marginal electricity costs in California.

When we add the extra economic benefits of strong domestic job creation – instead of increasing payments to foreign countries for fossil fuels – it becomes an economic imperative to move as quickly as we can to these new energy sources.

Sources:

Akeena Solar and the California Solar Energy Industries Association, “The Economics of Solar Power for California.” August 23, 2005

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