

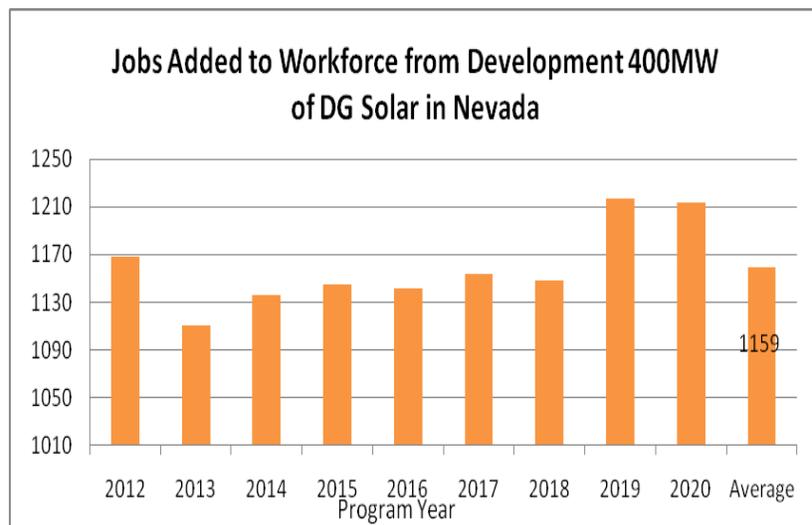
Economic and Job Creation Benefits of the Nevada Solar Jobs Now Proposal of 2011

Prepared by the Vote Solar Initiative and Clean Energy Project Nevada

March 2011

Nevada is beginning to reap the economic benefits of a new solar energy economy. The solar industry is rapidly expanding across the state. Solar companies, many of them homegrown in Nevada, have put hundreds to work and generated local and state revenues. Their success is the direct result of Nevada's transparent and long-term policy commitment to building its large-scale renewable market. With its abundant sunshine and a trained construction workforce, Nevada is well-positioned to harness the full economic potential of a strong solar energy market. While the state's commitment to developing large-scale solar can be verified by looking at policies passed by the state legislature over the past few years, the state's rooftop solar or "distributed generation" (DG) industry is less developed. Policy changes are needed to harness this in-state renewable market opportunity. This report details the economic and job creation benefits of expanding Nevada's DG solar market from its current size of approximately 35 MW to 400 MW by the year 2020.

Nevada's SolarGenerations¹ rebate program is currently the predominant policy driver of the state's DG solar market. The rebates available through this program have consistently been oversubscribed with many home owners waiting months if not years to be allowed into the program. The pace at which Nevada electric customers have signed up to receive this relatively limited

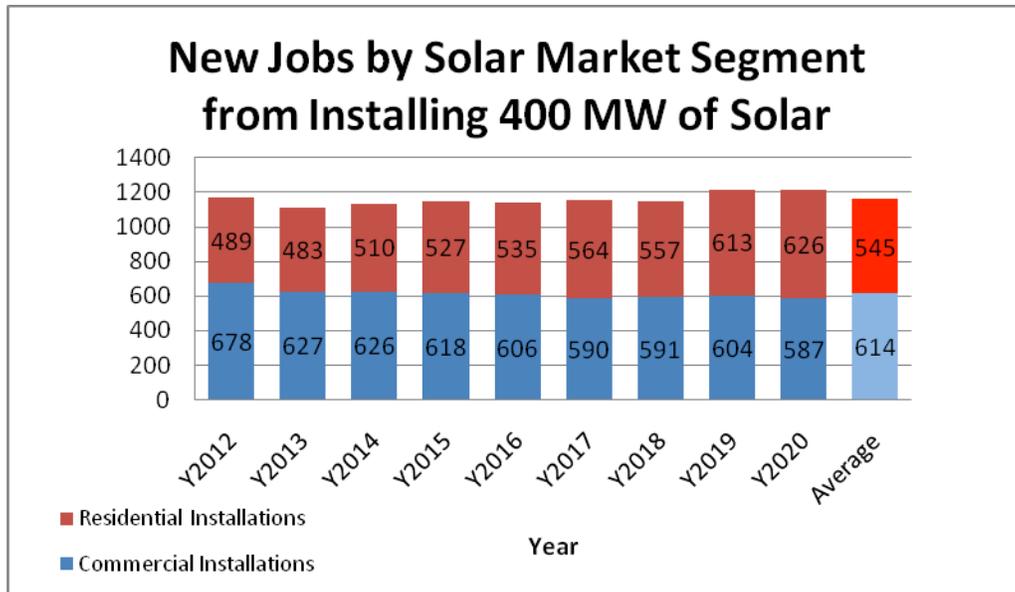


pool of rebate resources indicate significant pent-up demand for solar energy. The Solar Jobs Now proposal seeks to build on Nevada's SolarGenerations framework by expanding the program size, opening incentives to all commercial and industrial utility customers, and allowing for continuous program operation. The existing program does not give commercial and industrial utility customers access to solar incentives. That means the state is turning away

¹ SolarGenerations has offered rebates since 2004.
<http://www.nvenergy.com/renewablesenvironment/renewablegenerations/solargen/>

potential private investment in its local solar economy. By simply including non-residential customers, Nevada’s solar industry growth rate will increase substantially.

The key findings of this study identify the number of jobs created annually by the increase in solar installations as well as the increased dollars that will circulate throughout the state’s economy.



Projected Economic Benefits 400 MW DG Solar	Total Benefits (\$2010)
Lifetime Earnings	\$564 Million
Lifetime Economic Output	\$1.34 Billion
Lifetime Sales Taxes Collected by the State	\$68.1 Million

The Solar Jobs Now Proposal

The Solar Jobs Now proposal is a roadmap to 400 MW of ‘rooftop’ or distributed generation solar capacity by 2020. 400 MW and the economic benefits outlined in this report can be achieved by implementing several changes to the currently successful, but limited program. Investing in the development of a state solar industry comes at a small cost to ratepayers but one that many will agree is outweighed by the significant benefits presented here and the additional clean air and infrastructure benefits such as avoided lines losses, deferred upgrades to the transmission and distribution system. Solar Jobs now proposal details and program costs details are explained in the proceeding paragraph.

The proposal recommends switching from upfront rebates to performance based incentives tied directly to system performance and output for larger solar generators maximizing cost-benefit for the ratepayers. Other changes include increasing the program capacity for

residential customers allowing more homeowners to take advantage of the program. In the SolarGeneration’s program history, solar developers have experienced onerous stop and start cycles, this problem is being addressed by removing a reference to ‘program year and allowing for a capacity based, step down of incentives. This will decrease the risks for our Nevada Solar businesses in planning their yearly operations stabilizing the job market for solar installation jobs. The proposal also seeks to remove constraints on the state solar industry by increasing program capacity for residential customers and developing a commercial solar market through expansion of participation to all commercial customers such as retailers and the hospitality units, up to the state system size limit of 1 MW. Finally, the proposal has modeled program growth to 400 MW with a total program cost of less than 2% of utility retail rate revenues. The monthly cost to residential ratepayers starts at \$0.24 per month in the first program year and climbs to a highest monthly cost of \$2.23 in 2020 before declining back to a \$0.26 by 2029. This is below the current rate of the renewable energy rider².

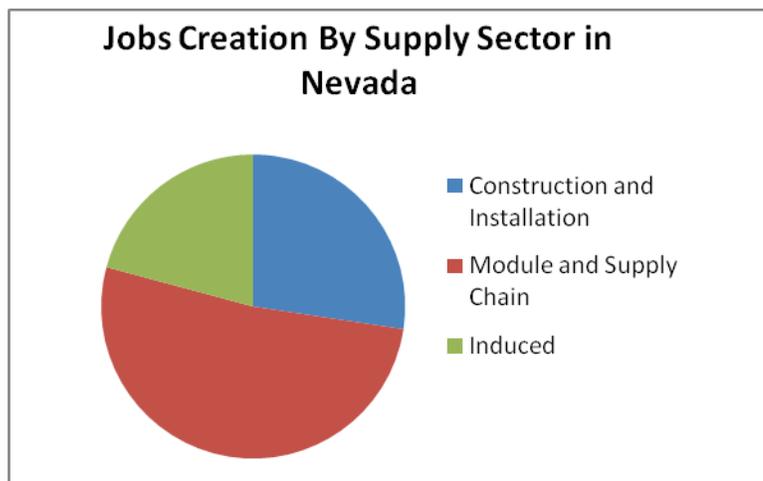
Methodology

In assessing the size of Nevada’s solar economic opportunity, Vote Solar employed an economic model developed by the Department of Energy’s National Renewable Energy Laboratory (NREL). The Jobs and Economic Impacts (JEDI) model uses the IMPLAN input-output economic impact software system to show the effects of a series of expenditures throughout the economy in a given region³. In this instance, the model shows the approximate magnitude of the job creation, earnings and economic output created by the installation and operation of distributed photovoltaic solar projects in Nevada. Vote Solar ran the model with inputs and assumptions specific to the Nevada Solar Jobs Now proposal for each year of the proposed program (2012 through 2020). See full set of assumptions in Appendix A.

In most cases job data is presented as ‘job years’. Each job represents one full time employee or the equivalent 2080 employment hours. Solar installations additionally create a smaller number of on-going jobs in the form of operation and maintenance. These jobs have been included in the annual totals.

Nevada’s DG Solar Job Opportunity

Solar creates more jobs per megawatt-hour than any other



² Rate payer impacts and programs costs come from an analysis performed by CrossBorder Energy in March 2011.

³ Model available at http://www.nrel.gov/analysis/jedi/about_jedi.html

energy technology.⁴ These are high quality jobs accessible to Nevadan's with a broad range of education levels, salary requirements and fields. The majority (approximately three-fourths) of the projected jobs are related to solar energy project development and installation, representing local jobs that are by their nature not easily outsourced. A recent study undertaken by The American Solar Energy Society for the state of neighboring state of Colorado highlights the robust range of employment opportunities a DG solar program would support. Growth in the solar industry means direct jobs for electricians, builders, contractors, engineers, technicians, financiers, lawyers, marketers and salespeople.

The remainder of the solar job creation opportunity is in the manufacturing sector. While the solar industry has a global manufacturing base, proximity to market is one significant factor in siting new manufacturing plants. It is likely that such an investment in DG solar could bring solar supply chain manufacturing to Nevada. The economic impact of such manufacturing development is not included in this analysis, but would add significant additional benefits for the state.

Our analysis indicates that Nevada can expect an impressive stabilization of job creation under the Solar Jobs Now Proposal. Specifically, the state can realize an average of 1159 high quality clean energy jobs per year over the 9-year program. Additionally, the program would create nearly 45 jobs that would last for at least 25 years (the average lifespan of an installed system) in maintenance and operations work.^{5 6}

The permanent jobs number reflects the essentially solid state technology of photovoltaic panels. The PV panels themselves have no moving parts, and are designed to withstand adverse weather conditions and, more importantly, warranted by the manufacturers for 20 years of life. A solar PV system is comprised on an electricity inverter that requires replacing on average every 10 years with associated maintenance costs. Dust or debris can potentially accumulate on panels requiring annual cleaning. However, typically it is only the larger commercial projects where the value proposition for the cost of cleaning is positive.

⁴ *Testimony before the US Senate Hearing on Environment and Public Works*, Prof. Dan Kammen, University of California - Berkeley (Sept. 25 2007).

⁵ Analysis assumes that construction period jobs are inherently short-term. One construction period job is defined as one 2,080-hour working period or one full-time job for 1 year. The annual construction period employment impact varies depending on the length of the construction/installation process and the number of individuals employed. Two construction period jobs can be satisfied by one worker working two years or two workers 1 year. Construction period jobs include direct, indirect and induced employment opportunities.

⁶ Employment benefits are presented as 'gross jobs.' If other fuel sources are displaced, there may be a correlated loss of jobs in other energy sectors. This analysis does not look at net job creation.

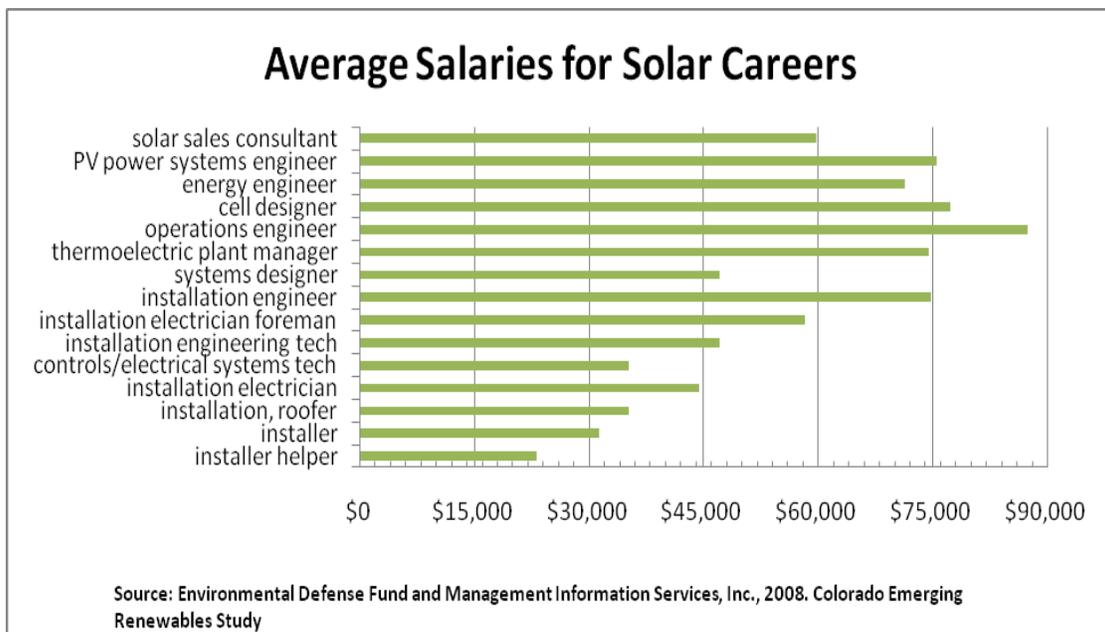
It is likely that such an investment in DG solar could bring solar and related manufacturing to Nevada. The economic impact of such manufacturing development is not included in this analysis, but would add significant additional benefits for the state.

Economic Earnings and Output

Wages and Salaries

In terms of earnings (i.e.: wages and salaries), the proposal can expect to generate, on average, over \$31.3 million per year through 2020, for a program total of over \$564 million.⁷

Projected Earnings of 400 MW DG Solar	Total Benefits (\$2010)
Average Annual Earnings	\$31.3 Million
Lifetime Earnings	\$564 Million



Again, we note that in an effort to be conservative in our assumptions, these benefits are calculated without taking into account any potential new manufacturing activities in the state. Precedent shows that states that make a clear commitment to clean energy see reciprocal investment on behalf of manufacturing companies. For example, in both Arizona and California, the states' strong and transparent policies were fundamental to the decisions of two major global solar manufacturers (China's Suntech Corporation and U.S.-based SunPower

⁷ Earnings and economic output used in this report include direct, indirect and induced benefits.

Corporation, respectively) to locate their first domestic manufacturing operations in those states.

Economic Activity

In addition to job growth, the construction/installation and ongoing operation and maintenance of the PV systems would drive significant economic activity. The state could expect another \$1.34 billion in total economic output. Economic output refers to the total value of goods and services (intermediate and final) generated in the state as a result of the installation and operation of the DG solar systems.

Projected Economic Benefits of 400 MW DG Solar	Total Benefits (\$2010)
Lifetime Economic Output	\$1.34 Billion
Lifetime Sales Taxes Paid	\$68.1 Million

Additionally, Nevada could collect over \$68 million in sales tax over the nine year build up. The total economic impact of developing a local solar industry goes beyond direct new employment opportunities. Those wages and salaries are reinvested back into the state economy, creating a significant new economic engine for Nevada.

Conclusion

The economic benefits of solar energy are indisputable. Even during the recent global economic crisis, solar has proven to be a bright spot of job creation and business opportunity in states that have aggressive solar goals in place. National lab studies show that those same state-level policies help drive down the installed cost of solar, in turn driving further demand in a virtuous cycle of market expansion.⁸

The Solar Jobs Now proposal would effectively move Nevada’s solar industry forward by stabilizing the program, alleviating the stop-start cycle that increases the risks for Nevada solar businesses. The Solar Jobs now program will also increase the private capital invested in the industry by allowing commercial customers into the program expanding the need for solar jobs. And by setting the program as a performance based program, the program will maximize the cost-benefits to the ratepayers for energy produced.

This is a critical time for Nevada’s solar industry and the policies that support it. Solar module costs have decreased more than 65 percent since 2008, and other states are racing ahead with

⁸ Tracking the Sun III: The Installed Cost of Photovoltaics in the U.S. from 1998-2008. Wiser, R., G. Barbose, C. Peterman, and N. Darghouth. LBNL-2674E. December 2009

programs that take full advantage of solar energy's increasingly favorable cost-benefit equation. Nevada can and should leverage its ready construction workforce to take advantage of these conditions that will attract private investment in our state.