BRIEFINGS
April 2011

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This report was initially released electronically at www.FloridaTaxWatch.org

Benefits of the Sunshine State's Investment in the Solar Renewable Energy Sector

As Florida experiences budget deficits and historic unemployment rates, decision-makers must look toward market trends, identify Florida's strategic advantages, and position the State to capitalize on its resources to achieve sustainable growth and prosperity. During these difficult fiscal and economic times, the solar renewable energy sector continues to exhibit strong steady growth in an expanding market. The Sunshine State is poised to create a strong market for this renewable energy sector due to its strong solar resources that would create new jobs and economic growth.

Market Trends and Opportunity

Currently, the solar energy sector exhibits unrivaled growth nationally and globally. In the U.S. alone, solar panel installations increased by 61 percent in 2007 and 84 percent in 2008. Even with the effects of the Great Recession beginning in the final months of 2008, U.S. solar installations increased by another 40 percent in 2009.[1] This high growth is also displayed far beyond U.S. markets. From 2007 to 2008, global solar panel installations increased by 152 percent.[2] Private-sector investors have taken notice of this flourishing nascent market.[3] From 2009 to 2010, the U.S. solar market grew from $3.6 billion to $6.0 billion – a 40 percent increase in investment in a year.[4]

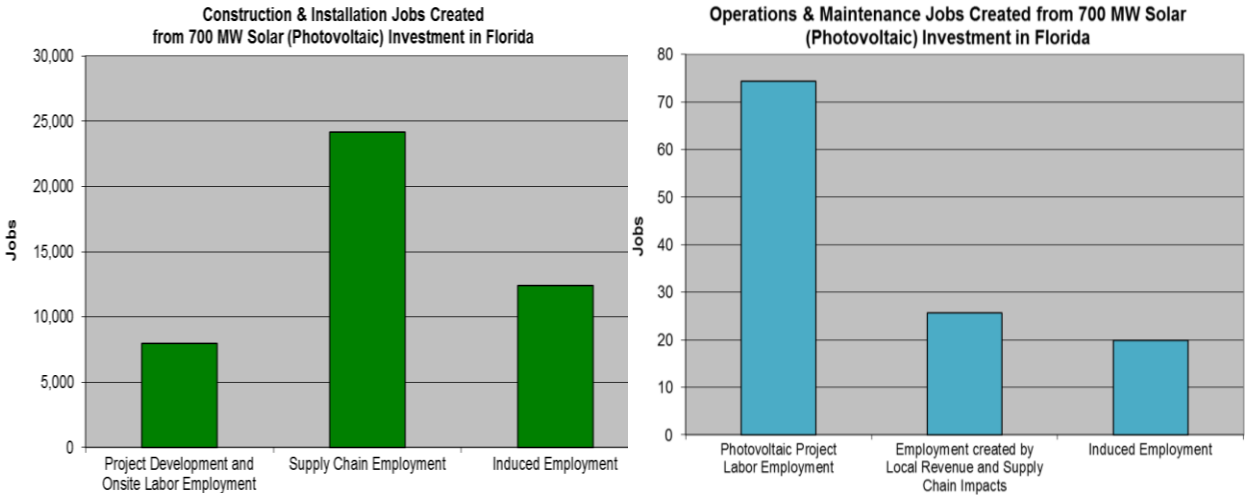
The opportunity for the solar energy industry to create jobs is significant and it has not gone unnoticed. As of August 2010, 50 percent of all U.S. solar companies were offering new job openings and planned to continue to actively hire over the next 12 months. Only 2 percent of solar companies are planning on cutting staff.[5] Through prudent investments, leaders could catalyze significant job creation and achieve tremendous direct and indirect benefits with the growth of the solar energy industry, strengthening their economies.

Florida Job Creation

Investment in 700 MW of solar energy (photovoltaic modules) would send a strong market signal, to attract this high growth sector and manufacturing base to Florida. According to an economic impact model, the U.S. Department of Energy's *Jobs and Economic Development Impact (JEDI) Model*, **an investment in Florida of 700 Megawatts of solar energy (photovoltaic modules) over a three year period would generate 44,699 new jobs in the state**[6].

[1] U.S. Solar Market Trends 2009. Interstate Renewable Energy Council. Larry Sherwood, July 2009.
[2] 2008 Solar Technologies Market Report. U.S. Department of Energy, January 2010.
[3] Global Trends in Sustainable Energy Investment 2010. Bloomberg New Energy Finance, 2010.
[4] 2008 Solar Technologies Market Report.
[5] Global Trends in Sustainable Energy Investment 2010.
[6] Jobs and Economic Development Model (JEDI) Photovoltaics (PV1.10.03). National Renewable Energy Laboratory, US Department of Energy (2011)

An investment of this scale and magnitude has a high probability of stimulating a new energy economy in Florida with strong growth potential. A new energy economy would localize supply and value chains in Florida to meet this new demand, which would generate jobs and stimulate economic growth. **The construction, installation labor, and installation labor related services for 700 MW would create 8,000 new jobs alone.** Even after installation, the impact of such an investment in Florida could create new manufacturing activity and jobs in the production of solar panels (including photovoltaic wafer, cells, and modules).



Source: Jobs and Economic Development Model (JEDI) Photovoltaics (PV1.10.03), 2011.

Florida's manufacturing industry is also significantly boosted with investment in solar energy. As demand has grown in this sector, new solar energy companies have raised production levels for solar panels while existing companies have entered into and begun producing within this market. Where this has occurred, the area's manufacturing sector has been bolstered significantly. Nationally, manufacturing in the upstream production of solar photovoltaic components increased dramatically in 2010 due to strong global demand, the doubling of domestic demand, and increases in manufacturing production and capacity.[7] Nations and U.S. states that have promoted this industry are able to use solar energy as an alternative technology sector that expands and strengthens their manufacturing base.

Solar manufacturing facilities also stimulate additional production of equipment and materials, such as rails, clamps, fittings, connectors, breakers, laminates, and inverters. The localization of the upstream supply chain for manufacturing of solar energy in Florida would also grow the downstream supply chain of distribution and installation. The downstream effects facilitate the growth of Florida's small businesses, such as solar installers, electricians, wholesale trade firms, and specialized roofers. Furthermore, solar energy plants require an extensive network of suppliers for its equipment and materials. These suppliers can create new business clusters in Florida, spurring additional manufacturing of products such as glass, physical vapor deposition machines[8], and advanced wire saws.

[7] 2008 Solar Technologies Market Report.
[8] See Mustang Vacuum Systems located in Sarasota, FL: http://www.mustangvac.com. /
* This does not include solar water heating components.

Florida's Current Position: Advantages and Investment Opportunity

There are over 2,000 companies in the U.S. that exist in the solar supply chain. In addition, 39 facilities are actively manufacturing solar photovoltaic components (polysilicon, wafers, cells, modules and inverters*).**While its strategic advantages are significant, Florida does not have one solar manufacturing facility and lacks a strong clean energy economy like other states such as Texas and Arizona**. Solar Energy facilities have principally located in California, Arizona, and Oregon. However, solar manufacturing facilities are on the move and looking to penetrate new markets. For example, while the Midwest has historically been dormant in solar production, recent plant announcements, show a new shift toward the region.[9]

Florida has several advantages to attract a high growth solar energy market. One of the most apparent advantages is Florida's strong solar resource. The solar resource is of great importance because it affects the level of electricity generated from solar technologies, which directly impacts an investor's return on investment. The Sunshine State's strong solar resource allows the state to cost-effectively deploy solar technologies and creates the potential for a strong local market.

Furthermore, Florida has an established mature solar installation market, which reflects the state's availability of skilled labor that can produce and deliver these products with quality control. This is a key indicator that solar manufacturers assess when selecting a location for production. Florida also has a highly trained workforce suitable for this industry. For example, with the termination of the U.S. space program, its employees will need to transition to highly skilled jobs, such as solar development.

Florida has ports that serve as international hubs that readily export and import materials and product, which lower transportation costs – one of the most important decisions of a manufacturer when deciding to relocate.[10] Furthermore, Florida is also advantageously positioned to serve emerging economies in South America where solar technology is a cost-effective alternative.

A Sunsetting Opportunity

While competition and growth opportunities in distribution and installation markets will exist far into the future, the opportunities to establish solar manufacturing and renewable energy manufacturing and business clusters within Florida are closing. As manufacturers begin to open, move, and relocate, the opportunity to attract them will not be long-lasting as manufacturers have large fixed assets and are not transient. If Florida does not attract these industries now, companies will establish their facilities and networks in other states – creating new jobs and economic prosperity at the expense of Florida's competitiveness. In order to take advantage of this opportunity before it vanishes, manufacturers will need a greater commitment by Florida that the Sunshine State is taking substantial steps to become a leader in this new dynamic, high growth market.

Overall, a strong solar renewable energy sector in Florida would create thousands of new jobs – approximately 45,000 for 700 Megawatts – and significant activity in a key economic sector like manufacturing. The potential for high-technology clusters also exists within the solar renewable energy sector in Florida, which would bolster strong, sustainable economic growth that would benefit suppliers, business, and Floridians alike.

[9] 2008 Solar Technologies Market Report.
[10] Area Development, "25th Annual Corporate Survey",Winter 2011.

Appendix A: The Jobs and Economic Development Impact Model

The **Jobs and Economic Development Impact (JEDI) Model** was developed to demonstrate the economic benefits associated with photovoltaic systems in the United States. The primary goal in developing the state level model was to provide a tool for system developers, renewable energy advocates, government officials, decision makers and other potential users, to easily identify the local economic impacts associated with constructing and operating these systems. The second goal was to facilitate broad access and usage of the model by making it adaptable to a web based application that can be put on a web site.

Consistent with these goals, a strong emphasis was placed on designing the model in a user-friendly format that could be easily modified - reflecting different levels of project specific information and user skill. This insures the greatest flexibility, for inexperienced spreadsheet users, those unfamiliar with economic impact analysis, and more experienced and knowledgeable users who have a need for this specific type of analysis.

Persons wishing more information on how and/or where the model is being used or the role of the National Renewable Energy Laboratory in analyzing photovoltaics and other renewable technologies should contact Robert Margolis at:

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Washington, DC 20024
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The model was developed by Marshall Goldberg of MRG & Associates, under contract with the National Renewable Energy Laboratory. Persons wishing more information on the methodology or data in the model should contact him at:

MRG & Associates
17798 Starduster Dr.
Nevada City, California, 95959
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The JEDI model utilizes multipliers derived from IMPLAN data using the IMPLAN ProfessionalTM Version 2.0 Social Accounting & Impact Analysis Software. Persons wishing more information on the IMPLAN data or the software should contact the Minnesota IMPLAN Group.

Minnesota IMPLAN Group, Inc.
1725 Tower Drive West
Suite 140
Stillwater, Minnesota 55082
www.implan.com

Appendix B: Data Summary of JEDI Model

Photovoltaic - Project Data Summary	
Project Location	FLORIDA
Year of Construction or Installation	2011
Average System Size - DC Nameplate Capacity (KW)	25000.0
Number of Systems Installed	28
Project Size - DC Nameplate Capacity (KW)	700,000
System Type	Utility
Total System Base Cost ($/KW$_{DC}$)	$5,000
Annual Direct Operations and Maintenance Cost ($/kW)	$12.00
Money Value - Current or Constant (Dollar Year)	2008
Project Construction or Installation Cost	$3,666,176,818
Local Spending	$3,666,176,597
Total Annual Operational Expenses	$414,400,000
Direct Operating and Maintenance Costs	$8,400,000
Local Spending	$6,636,589
Other Annual Costs	$406,000,000
Local Spending	$0
Debt Payments	$0
Property Taxes	$0

Local Economic Impacts - Summary Results

	Jobs	Earnings	Output
During construction and installation period		**$000 (2008)**	**$000 (2008)**
Project Development and Onsite Labor Impacts	7,995.0	$479,542.8	$696,159.5
Construction and Installation Labor	4,258.6	$335,072.4	
Construction and Installation Related Services	3,736.4	$144,470.4	
Module and Supply Chain Impacts	24,172.5	$1,332,172.8	$4,387,527.8
Induced Impacts	12,411.3	$494,708.8	$1,535,127.4
Total Impacts	**44,578.7**	**$2,306,424.4**	**$6,618,814.7**

	Annual Jobs	Annual Earnings $000 (2008)	Annual Output $000 (2008)
During operating years			
Onsite Labor Impacts			
PV Project Labor Only	74.3	$4,941.3	$4,941.3
Local Revenue and Supply Chain Impacts	25.6	$1,327.7	$3,935.5
Induced Impacts	19.9	$793.2	$2,462.3
Total Impacts	**119.9**	**$7,062.1**	**$11,339.1**

Notes: Earnings and Output values are thousands of dollars in year 2008 dollars. Construction and operating period jobs are full-time equivalent for one year (1 FTE = 2,080 hours). Economic impacts "During operating years" represent impacts that occur from system/plant operations/expenditures. Totals may not add up due to independent rounding.

Detailed PV Project Data Costs	FLORIDA		
Installation Costs	**Cost**	**Purchased Locally (%)**	**Manufactured Locally (Y or N)**
Materials & Equipment			
Mounting (rails, clamps, fittings, etc.)	$193,568,521	100%	Y
Modules	$1,884,348,711	100%	Y
Electrical (wire, connectors, breakers, etc.)	$220,701,040	100%	Y
Inverter	$181,632,745	100%	Y
Subtotal	$2,480,251,018		
Labor			
Installation	$335,072,365	100%	
Subtotal	$335,072,365		
Subtotal	$2,815,323,383		
Other Costs			
Permitting	$53,251,922	100%	
Other Costs	$87,283,951	100%	
Business Overhead	$544,140,744	100%	
Subtotal	$684,676,617		
Subtotal	$3,500,000,000		
Sales Tax (Materials & Equipment Purchases)	$166,176,818	100%	
Total	$3,666,176,818		

PV System Annual Operating and Maintenance Costs	Cost	Local Share	Manufactured Locally (Y or N)
Labor			
Technicians	$5,320,000	100%	
Subtotal	$5,320,000		
Materials and Services			
Materials & Equipment	$3,080,000	100%	N
Services	$0	100%	
Subtotal	$3,080,000		
Average Annual Payment (Interest and Principal)	$406,000,000	0%	
Property Taxes	$0	100%	
Total	$414,400,000		

Other Parameters			
Financial Parameters			
Debt Financing			
Percentage financed	80%	0%	
Years financed (term)	10		
Interest rate	10%		
Tax Parameters			
Local Property Tax (percent of taxable value)	1%		
Assessed Value (percent of construction cost)	100%		
Taxable Value (percent of assessed value)	100%		
Taxable Value	$3,500,000,000		
Property Tax Exemption (percent of local taxes)	100%		
Local Property Taxes	$0	100%	
Local Sales Tax Rate	6.70%		
Payroll Parameters	Wage per hour	Employer Payroll Overhead	
Construction and Installation Labor			
Construction Workers / Installers	$27.49	37.6%	
O&M Labor			
Technicians	$25.00	37.6%	

About Florida TaxWatch

Florida TaxWatch is a nonpartisan, nonprofit research institute that over its 30-year history has become widely recognized as the watchdog of citizens' hard-earned tax dollars. Its purpose is to provide the citizens of Florida and public officials with high quality, independent research and education on government revenues, expenditures, taxation, public policies and programs. The three-pronged mission of Florida TaxWatch is to improve taxpayer value, government accountability, and citizen understanding and constructive participation in their government.

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