Economic Development Planning, Summary 15

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Title: Arizona Solar Electric Roadmap Study

Year: 2007

Source: Navigant Consulting, Inc. of Burlington, MA

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Summary: With its many days of sunshine and existing solar electric infrastructure, Arizona has the potential to become a world leader in many areas of solar development. If solar were put on an accelerated path, by 2020 Arizona could see the creation of close to 3,000 jobs, 1,000 megawatts of solar installations and the opening of a Solar Research and Development Center of Excellence. It’s estimated such development could result in emissions being reduced by 400,000 tons per year by 2020. Arizona should pursue five initiatives to help realize this vision. They are: Establish a marketing and outreach program, create a solar zone, develop a Solar Center of Excellence, establish “sustainable partners,” and build large central solar plants.

Sectors: Solar, economic development.

Geographical impact: Arizona.

**Major challenges:** There are many potential barriers to the development of solar power in Arizona. They include the very high capital cost of solar technologies, competition from such neighboring states as New Mexico (manufacturing incentives), low utility rates here compared to other nearby states, local building codes that restrict solar development, lack of trained professionals in photovoltaics and a lack of local strong markets. In addition, some countries provide significant incentives (free land, reduced power rates, subsidies for water and plant costs and tax holidays) that could draw solar development from Arizona.

**Progress to date:** Governor Jan Brewer, the Arizona Commerce Authority, Greater Phoenix Economic Council and other economic development groups have sought to establish Arizona as the solar capital of the United States. Arizona has posted a number of positive developments in the development of solar, but the outlook is not entirely bright. Still, Arizona has already exceeded two of the key goals identified by Navigant in its study: employment and construction of solar installations.

**Among the positives in Arizona’s solar development:** The rise of Tempe-based First Solar Inc., the employment of 9,800 people, creation of 300 companies, installation of 1,097 megawatts as of December 2012 and the state ranking No. 1 in the U.S. for solar jobs per capita, according to *The Arizona Republic*. Seven solar plants are under construction and 27 have been built. The $2 billion Solana Generating Station near Gila Bend, one of the largest solar plants of its kind, opened in August. Arizona ranked No. 2 nationally in 2012 in terms of solar installation, growing from 273 megawatts of power installed in 2011 to 710 megawatts in 2012, according to U.S. Solar Market Insight Report. Arizona provides numerous incentives to encourage the use of solar.

**On the downside in Arizona:** Solar has been buffeted by international competition, it remains a small employer, First Solar never opened a $300 million Mesa plant because of the sharply declining price of solar panels, and SunTech Holdings of China closed its Goodyear factory. While solar generates numerous construction jobs, it doesn’t take many people to run an installation once it’s up and operating.
State utilities are required to obtain 15 percent of electricity from renewable sources such as solar by 2025. Both APS and SRP are close to meeting their requirements for renewable energy, which is good news. The bad news for solar proponents is that this could dampen the utility companies’ quest for further solar. On the other hand, California buys much of Arizona’s solar power and that is expected to only increase in the future as California requires greater use of renewable energy.

**Major implications:** Arizona is a national leader in solar use, but the industry has yet to become a driver of economic growth in the state. In terms of economic development, the real future for solar in Arizona may be research and development. A robust solar industry would mean thousands of new jobs for Arizona (including in manufacturing, research and development, and operations), reduced emissions, a secure supply of electric power, stable prices, and an enhanced image for Arizona as an environmentally progressive state.

**Opportunities for alignment:** The Governor’s Office and Legislature, with input from the Arizona Corporation Commission and utilities, exploring wise subsidies as well as encouraging market-driven growth of solar; GPEC and other economic development groups working with the Arizona Commerce Authority to attract employment-rich solar companies; the state’s universities further aligning with solar companies and other states, countries and universities to pursue solar research; master-plan developers and homebuilders working with municipal planners and utilities to pursue extensive use of rooftop solar. Arizona utilities form a coalition with other western utilities to develop large-scale central solar projects in Arizona.

**Background:** Arizona has significant assets that could support multiple opportunities for developing solar-related business. These include high levels of solar insolation, rapid population growth, intellectual capability, a central Southwest location and State Trust Lands, on which solar plants could be built.

While Arizona has strong assets to support a solar R&D industry, it will take investment to compete with established entities. The Department of Energy’s $170 million solar initiative is one area Arizona could leverage to develop centers of excellence.

The Solar Test and Research Center (STAR), an APS research and demonstration site in Tempe has built an international reputation. There are only two other such facilities in the world for evaluating emerging technologies – Weizmann Institute in Israel and Australian National University. STAR funding has declined in recent years and new sources should be explored to encourage further research, innovation and technology evaluation.
ASU’s capabilities also may need to be reinvigorated to support a large solar initiative in the state. ASU hosts the Power Systems Engineering Research Center, a group of 13 universities and 39 companies funded by the National Science Foundation. The University of Arizona has several research programs and facilities that could help grow the solar industry.

**Barriers and risks:** The two most important things that Arizona could do to promote solar would be to increase the potential for scale with new collaborative business models, and require that a certain percentage of new homes in a development must be solar. Beyond the challenges listed above to the development of solar, numerous threats that also could slow solar development include the collapse of natural gas prices that would reduce the competitiveness of solar, public concerns about aesthetics could influence and limit the siting of large-scale central plants, a continuing economic recession could trigger concerns about investments in initially more expensive solar options, and a shortage of modules persists so that systems cannot be obtained.

**Roadmap:** Arizona should pursue initiatives to accelerate the development and adoption of solar. They are: Establish a marketing and outreach program, create solar zones, foster leadership through a Solar Center of Excellence, establish “sustainable partners,” and build large central solar plants.

The proposed solar zones would include master-planned communities tapping rooftop or other solar that reduces costs through scale and addresses concerns about aesthetics. A large-scale central solar project could be pursued by Arizona utilities forming a coalition with other western utilities, perhaps focusing on a 250 MW project.

The “sustainable partners” approach would give awards and recognize businesses for their work in solar utilization, development or investment. This could be incorporated with the Governor’s Innovation Awards and other high-profile events. The marketing and outreach mission would market Arizona to solar manufacturers and national retail chains, and provide a state incentive package comparable to other states and countries (tax holidays for state investment or seed money to relocate a company to Arizona).

Arizona might also consider developing a Solar Center of Excellence to help establish it as a leader in solar intellectual capital. The center would tap the expertise at STAR, ASU’s Photovoltaic Testing Laboratory and the science/technology strengths of ASU and UA, as well as Science Foundation Arizona and state and congressional leaders.

By 2020, the goal would be 3,000 new solar jobs, a solar research and development Center of Excellence and 1,000 MW of solar installations.