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Arizona's Solar Energy Potential Rests with Collaboration

By Jeffrey Luth, Az4Solar.org

Blessed with abundant solar radiation, Arizona and its neighboring states will, over the next two decades, help reshape the nation's energy economy. With the country's greatest solar radiation, Arizona has an extraordinary opportunity to become the "solar capital" of the U.S. Capitalizing on this opportunity requires an historic collaboration amongst a broad base of stakeholders, including private industry, local & regional governments, educational institutions and our workforce. (Arizona's [semiconductor experience](#) provides an excellent example of how an industrial ecosystem can develop and thrive.)

The Emerging Solar Economy

During the past half-dozen years, the solar energy industry has enjoyed outstanding growth. Because of the technology similarities between photovoltaics and semiconductors, this growth has driven a substantial migration of resources from the semiconductor industry to the solar energy industry. As the world's leading producer of solar energy, Europe is looking for investments in Solar and other renewable energies to supplant a declining semiconductor industry. European companies, notably those in Germany and Spain, are building on their reputations as world leaders in design, development, engineering and manufacturing to enable next generation solar energy components and systems.

As a result, in the U.S. many of the groundbreaking solar projects under consideration are being developed by European companies. In Arizona, for example, Spain's Abengoa and Albiassa are developing two utility-scale CSP projects representing a combined 480 MW of solar energy.

Industry analysts predict that the U.S. will eventually become the world's largest producer of solar energy. When considering the amount of electricity consumed in the U.S., the improving cost structure of solar energy and the pending arrival of grid parity, this prediction is not surprising.

Arizona's Solar Imperatives

This dynamic has critical implications for Arizona and the Southwest U.S. because our region enjoys the highest amount of solar radiation in the nation. This comparative advantage in solar resources forms the basis for two distinct, yet related solar energy imperatives.

The first is our environmental obligation to produce and consume more solar energy. The good news is that hardly a week goes by without a seminar or forum extolling the virtues of solar energy and the benefits of installing solar panels and water heaters. Slowly but surely, this environmental message is achieving broad acceptance.

The second imperative deals with our economic development obligation to help ensure prosperity for current and future generations of Arizonans. This is not about going green or capitalizing on Federal efforts to stimulate the state's economic recovery. It is about taking a strategic approach to managing Arizona's long-term economic growth, and acknowledging that creating a solar energy ecosystem should be a central element of this strategy.

Imagine . . . we're in a hot-air balloon gliding over Camelback Mountain. The warm air floats us up and over Phoenix. The Valley of the Sun stretches around us for two thousand square miles, threatening to merge with Tucson. Down below is a sea of solar panels . . . on the roofs of houses, commercial establishments, schools, offices and warehouses. For every swimming pool there is a residential solar system. Off to the south and west are vast fields filled with utility-scale photovoltaic and solar thermal installations.

All of these solar systems are generating power. They are uniting to reduce our carbon footprint. They are helping to restore our atmosphere.

This scenario does not require a considerable leap of faith. It most likely will happen.

We flare up the burners and our balloon rises. The houses blur, and the great transportation arteries of our interstate highways and railroads come into focus. These arteries are filled with trucks and trains carrying millions of solar panels, the structural iron that will form installation grids, and the inverters and other components for the interconnect.

We rise higher and notice these arteries extend well beyond Arizona's borders.

Then we run the imaginary film in reverse. We see the trucks and trains backing away from Arizona into factory loading docks in New Mexico, Nevada, Colorado, Texas and Oregon, and at the port of Long Beach in California. They are taking delivery of panels and iron destined for Arizona.

Reverse even more, and we can sense the wages and associated benefits accruing to workers and families in those regions. We see this economic wealth multiplying across their local economies, helping to create better schools, medical care and social services, and reducing pressure to raise taxes.

We see economic growth and prosperity. Unfortunately, far too little of this prosperity is occurring in Arizona.

Arizona's Solar Challenge

Thanks to our abundant sunshine and progressive Renewable Portfolio Standards, Arizona is poised to accelerate the deployment of solar energy. However, "Demand" is only half of the equation and does not an ecosystem make. Faced with an extraordinary opportunity, Arizona's greatest solar challenge is forging a collective will that will allow the state to aggressively attract industry, nurture technology development, and foster a broad set of synergistic relationships. In so doing, Arizona can build a critical mass of solar talent, expertise and manufacturing capability.

Creating a vibrant solar energy economy in Arizona requires strong, visionary leadership and a commitment to reshape our economy. It requires a broad-based collaboration amongst private industry, community organizations, educational institutions and workforce development groups.

It requires a willingness on the part of our utilities and municipalities to make it easier for homeowners, commercial enterprises and developers to pursue their solar strategies. It also involves the realization that manufacturers will not be attracted to Arizona simply because the state offers an admirable slate of economic incentives and 250 golf courses.

Bringing Together the Right Players

Az4Solar focuses on bringing together a critical mass of people and resources to create a sustainable solar energy ecosystem that will support thousands of high-wage jobs. Our activities are based on a three-part platform:

- **Educate** consumers, business leaders, policy makers and the emerging solar workforce
- **Advocate** our solar energy imperatives
- **Facilitate** business-to-business interaction and workforce development

Our Arizona Solar Manufacturing Symposium is taking place January 27 in downtown Phoenix. Featuring an impressive contingent of industry leaders, community voices and policy makers, this full day, high-level event targets companies and executives who want to capitalize on Arizona's extraordinary solar opportunity. For more information go to: www.az4solar.org.

Background on Arizona's Semiconductor Industry

The foundation for Arizona's semiconductor economy was laid in 1949 when Motorola decided to create a research and development center in Phoenix.

Back in 1949 Motorola produced radios and televisions. There was no semiconductor industry. There were no cell phones. No computers. No video games. No iPods. But thanks in part to the work accomplished in Arizona, Motorola broke new ground in advanced electronic technology, and in 1955 the company introduced the world's first electronic transistor. As semiconductor technology evolved in the 1950's and 60's, Motorola expanded its operations and ultimately established a sizable presence in metro Phoenix.

In 1980 Arizona took another major step toward creating a semiconductor economy when Intel established a manufacturing operation in Chandler. During the 1980's and 1990's the semiconductor industry enjoyed considerable growth, and this led to significant job creation – for Motorola, for Intel, and ultimately for others.

As the manufacturing base grew, there developed an Arizona-based semiconductor food chain that included support services, engineering & design houses, suppliers of chemicals and other materials, equipment companies and testing operations. This direct food chain was further supported by a growing base of research and development resources in the universities, and by independent industry organizations that either started in Arizona or located here.

By the late 1990's, Motorola was Arizona's largest private employer, with over 25,000 associates. At its peak, Intel employed nearly 10,000 in Arizona. Eventually, Arizona became home to a semiconductor ecosystem with close to 50,000 direct employees plus thousands more in supporting roles. In this fashion, Arizona was the third largest semiconductor state, trailing only California and Texas. However, over the past ten years, the health of Arizona's semiconductor economy has suffered a dramatic decline. There are several reasons for this.

- Semiconductor industry expansion has slowed considerably from the double-digit growth rates of the previous two decades.
- Companies have adopted new business models involving a significant amount of off-shoring and outsourcing.
- Market pressures have led to large-scale reorganizations, impacting Motorola and its derivative operations, and many smaller companies.

By 2009, semiconductor industry employment in Arizona had fallen to around 20,000, and this number continues to decline in the face of a global economic recession.

Arizona's emerging solar industry has the potential to "reverse" this decline by capitalizing on an extraordinary set of resources:

- The highest solar radiation in the U.S.
- Aggressive standards for distributed energy generation
- A large and highly –skilled workforce
- Universities that are conducting world-class solar research
- The world's leading photovoltaic testing group
- Ample available factory space for production
- Ample available land for utility scale solar farms
- Existing suppliers of chemicals and electronic materials

Through careful and deliberate collaboration amongst its stakeholders, Arizona can build a world-class solar energy ecosystem.

