

The Site Selection Energy Report



A publication of **SITE**
Selection



Solar Energy and the Disproportionate Importance of Incentives

by Don Schjeldahl and Margaret Grissom
editor@conway.com

Virtually no individual or industrial sector will be untouched by what's coming from renewable energy, smart grid and energy conservation initiatives over the coming decades. New energy is an economic development dream that will create millions of jobs in thousands of new facilities. When it comes to locating those facilities, site selection professionals know incentives can't make a bad location good. Under normal circumstances, if incentives take precedence over operating costs, development costs and risk management, the notion that location matters is turned on its head.

Yet these are extraordinary times, and as illogical as it seems, incentives are taking center stage, if only selectively and in a narrow time window, in shaping the economic landscape. This article explores the unique position of solar in today's incentives landscape and sheds light on what companies give up when they let incentives dictate location decisions, which jurisdictions are most aggressive with incentives and how this may change over time, and finally what solar companies must salvage from an incentive-focused strategy to remain viable.



Don Schjeldahl is Vice President of Cleveland, Ohio-based [Austin Consulting](#); Margaret Grissom is Principal of [Peake Consulting LLC](#), Villa Hills, Ky.

Once-in-a-Century Opportunity

How we produce and use energy will be a dominant force for shaping life in the 21st Century, much in the way transportation defined the 20th Century. It is not surprising, therefore, that state, regional and local jurisdictions are eyeing incentives to help them carve out a share of the coming prosperity. There is a lot at stake.

The U.S. Department of Energy National Renewable Energy Laboratory (NREL) defines eight categories of renewable energy: solar, wind, ocean, hydropower, biomass, geothermal, bio-fuel and hydrogen. Each is expected to grow a robust value chain of raw materials, component manufacturing, distribution, installation, maintenance and finance.

To gain the full advantage of renewable energy the way in which electricity is delivered will need to be overhauled. This "smart grid" will modernize the electricity industry by overlaying digital communications on an updated transmission and distribution grid. At the same time, a culture of energy conservation is taking hold as industrial and residential consumers recognize a watt saved is the cheapest and cleanest kind of power. New standards for building design, mechanical and electrical

systems, and building materials will harmonize people with nature to save energy. There is no end to the number of new and innovative products in support of this movement.

In Pursuit of Jobs from Wind and Solar

In combination, renewable energy, smart grid and energy conservation will create a virtual endless string of new jobs. Recognizing long-term job creation potential, states, regions and local jurisdictions are in hot pursuit of wind and solar companies that will contribute to cluster development. Incentives are the lure.



"Of the renewable energy types, solar and wind will likely account for 80 percent of all capital expenditures over the next 20 years."

Of the renewable energy types, solar and wind will likely account for 80 percent of all capital expenditures over the next 20 years. Their value chains are comparable in terms of cluster development potential, similar to supplier networks that come with automobile assembly plants. However, when it comes to the role of incentives in influencing investment decisions, it is important to note that wind and solar follow different pathways.

Generating electricity from wind is a proven technology. Investments now taking place in the wind value chain are in response to strong demand and production capacity constraints. Acting like a mature industry, location selection decisions are predictably driven by cost and risk factors. Incentives play the traditional role of luring producers to states and communities that lie within the company's favorable geographic region. Among the states at present with the best incentives for wind manufacturing are Colorado, Arkansas, Iowa, Michigan and Kansas.

Only a few forwarding-looking states and communities are seriously targeting solar manufacturing. They are expending political capital to attract investment from an industry that is not yet viable. Solar won't see wind's rapid deployment of systems and build-up of profitable manufacturing facilities until the cost of solar-produced electricity becomes competitive with grid-supplied power.

Today, wind energy is competitive with grid-supplied power in many U.S. markets, costing in the range of 5 cents to 8 cents per kilowatt hour (kWh). This compares to a U.S. grid average industrial rate of 6.9 cents. On the other hand, solar is competitive only in a few markets. The current cost of solar photovoltaic (PV) generated electricity is 18 cents to 23 cents per kWh, concentrated solar power (CSP) a little less. National industrial rates generally range from a high of 20 cents per kWh in Hawaii to just over 4 cents per kWh in Kentucky.

In the next five years, it is conceivable that [solar will achieve "grid-parity"](#) (when solar and grid costs are equal) in many areas of North America. This will be driven by manufacturing operations that transition from technology-testing pilot plants to full-scale production. As this happens unit costs are reduced through scale-economies, increased automation and improved supply chain. Greater competition among solar manufacturers will squeeze profit margins, further commoditizing products. Solar electricity costs could reach 10 cents per kWh by 2015, making solar energy competitive with grid electricity in a dozen or more states. More states will follow as the costs for solar and grid electricity continues to converge.

Two Sides to Solar Incentives

The North American market can support perhaps 12 to 15 solar manufacturing clusters at maturity. This is based on a formula that balances competing forces, including market size and market access, local operating costs, government incentives and tax policies, competition and the output capacity and profitability of best-practices solar module factories.

In the hope of igniting a solar manufacturing cluster, many states and Canadian provinces have initiated incentive programs aimed at one or both sides of the cluster equation – incentives that target market development and those that target job creation.

New programs designed to stimulate the solar market are announced almost daily. The Web site www.dsireusa.org tracks these programs, including grants, interconnection standards, loans, net metering, property-tax incentives, public-benefits funds, rebates, renewable portfolio standards, sales-tax incentives and tax credits.

Among these programs are production payments based on the amount of solar electricity delivered to the grid. Called feed-in tariffs (FiTs), utilities provide a premium payment for solar electricity delivered to the grid by individuals or businesses. Germany's FiT, which pays roughly double the retail rate for solar power produced from grid-tied systems, is the foundation for German dominance of the global solar industry.

In a dramatic move, the Ontario legislature passed the Green Energy Act on May 14, 2009. The Act is modeled after the German program and is the first North American jurisdiction with a program of this dimension. The proposed tariff is to pay up to ~64 cents (Canadian) for every kilowatt-hour of solar power generated guaranteed for 20 years. This is the most favorable incentive currently available in the world.

In the U.S., Gainesville, Fla., passed a FiT ordinance in February 2009, the first in the United States. TVA also offers a plan to purchase the output of a qualifying solar system at 12 cents per kWh above the retail rate. TVA retains sole rights to any renewable energy credits. In addition to the payment for excess generation, TVA also provides participants a \$1,000 grant to offset the upfront cost of the system.



"The North American market can support perhaps 12 to 15 solar manufacturing clusters at maturity."

Incentives for Manufacturers

Market incentives are meant to seed development of regional manufacturing clusters as producers from across the solar value chain locate facilities in response to increased demand. Unlike wind manufacturing which is responding to existing demand, solar companies are in pursuit of tomorrow's market. Following the tradition of other manufacturing sectors, the best locations for solar in the long run are those that optimize inbound logistics for things like volatile gases, sheet glass and back panels and can supply labor requirements at a low to moderate cost. Outbound logistics for finished products are likely to be the most significant clustering force.

A few states are aggressively pursuing manufacturing jobs with targeted incentives. Some are asking that companies substitute lucrative incentives for logical location strategy. Solar companies facing years of unprofitable or marginally profitable operations while waiting for the market and a regional supply chain to develop are responding by locating in these locations.

[Schott Solar located in Albuquerque, N.M.](#), with an initial investment of \$130 million and expecting to reach \$450 million. Schott's initial 350 jobs will scale up to 1,500. Schott received \$8 million in 2008 for infrastructure and will receive \$4 million more in 2009 along with another \$120 million in training funds, energy and high-wage tax credits and bonds. More examples:

- First Solar in Ohio utilized unknown incentives to [expand their facility in Perrysburg](#), adding 134 jobs to its current workforce of 700. Interestingly, First Solar's original market was Germany.
- [Signet in New Mexico](#), with an investment of \$840 million and 600 jobs, received \$185 million in tax incentives including New Mexico's manufacturing, high-wage, rural jobs and energy jobs credits along with



"Unlike wind manufacturing which is responding

to existing demand,
solar companies
are in pursuit of
tomorrow's market."

training funds.

- [SolarWorld AG](#) and Solaix in Oregon received Oregon's Business Energy Tax Credit (BETC) which offers 50 percent of the cost of renewable energy manufacturing facilities and 50 percent credit for installed panels in Oregon. BETC also allows companies to sell their tax credits, which provide up-front cash incentives.
- United Solar Ovonic in Michigan received \$37 million in state and local incentives for a solar manufacturing facility that will employ 400 in Greenville.

Salvaging Longevity From Sub-optimal Strategy

Lucrative incentives and ties to historic technologies are linked to decisions to select sub-optimal locations for manufacturing. There are currently six emerging manufacturing clusters in North America, maybe more depending on who defines them. These include Portland, Ore.; the San Francisco Bay Area; Albuquerque, N.M.; Boston, Mass.; Phoenix and Tucson, Ariz.; and Toledo, Ohio. To some extent all but Toledo grew out of local semiconductor research and manufacturing (solar PV and semiconductors have ultra-pure silicon technologies in common).

Ironically, not all of these locations are likely to remain viable over the long term, because they have sub-optimal logistics and operating cost characteristics. Companies lured to these locations through incentives or the comfort of the semiconductor culture need to be cautious about putting too much investment in these locations. As products rapidly commoditize, location-related profit margins could be game changing.

www.siteselection.com

[TOP OF PAGE](#)

[Top of Page](#) | [Letter to Editor](#) | [Site Selection Online](#) | [SiteNet](#)

One Day Can Make a World of Difference



SAXONY-ANHALT
We are wider awake.

Site Selection Online – The magazine of Corporate Real Estate Strategy and Area Economic Development.
©2009 Conway Data, Inc. All rights reserved. SiteNet data is from many sources and not warranted to be accurate or current.