



PV's Strategic Value to the Electric Utility Industry

by Scott Sklar, June 2002

So many times, electricity experts have tried to compare photovoltaics to the cost of generation of traditional baseload electricity at the bus bar rate. Obviously this makes no sense for many reasons. And in fact, at present PV has immense economic value to electric utilities and their customers.

Photovoltaics produces electricity when the sun shines which is normally the higher cost period for utilities to generate electricity. This premium power or "peak" power sells for more in electric power markets at usually 3- 10 times the bus bar generation rate. Since photovoltaic modules are minimally warranted for 20 years, PV should be compared to the price of a 20 year fixed-rate contract for comparable peak or premium power. This can be a problem to compare because most utilities or power marketers will not offer a 20 year electricity contract with no fuel escalation clauses, particularly if these potential increases are not passed on to the consumer.

Photovoltaics can also address electric power reliability in two ways: 1) strengthening the electric grid, or 2) at the consumer side of the meter.

Most utilities are experiencing their greatest potential for power failure when their electric distribution lines are nearing their maximum capacity usually to meet summer time midday air-conditioning demand. In fact from 25 - 50 percent of grid capacity, depending on the utility service territory, is reserved to meet this capacity. A majority of our electric distribution lines and a significant part of our transmission lines have suffered underinvestment by utilities who are unsure of electric deregulation policies. An immediate and short term approach is to promote PV use either by utilities or their customers to offset this electric demand during midday summer periods. One of the nation's largest municipal utilities, the Sacramento Municipal Utility District (SMUD) has surpassed 10 megawatts of PV capacity in its service territory in 2002. The New York State Energy Research and Development Administration (NYSERDA) has preferred RFP's for this kind of PV electric power with short term installation deadlines this past summer to alleviate summertime midday overcapacity.

For transmission and distribution lines that run long distances, utilities generally utilize diesel engines or battery banks to augment power along these power lines to maintain pressure known as preventing "islanding": -- where electricity does not move fluidly along the power lines thus causing intermittent brownouts. PV is ideally suited to provide incremental power such as this. Several utilities also utilize PV as a way to provide low-power electricity such as for lighting at bus stops or playgrounds, where the cost of burying wires or adding step-down transformer costs more than using PV. But in most cases., our nation's utilities still pay more for conventional

The Stella Group, Ltd. (www.thestellagroupltd.com) is a strategic technology optimization and policy firm advancing the utilization of clean, distributed energy applications such as advanced batteries and controls, energy efficiency, fuel cells, geoexchange, heat engines, microhydropower, minigeneration (natural gas), modular biomass, photovoltaics, small wind and solar thermal (air-conditioning, water and industrial process heat, and power generation), and water energy; with blended financing and customer facilitation.



practices rather than using photovoltaics.

Offering consumers options to meet power reliability, power quality or green power is being practiced by over 90 utilities throughout the United States. Some utility actually offer customers rebates to use PV primarily to address midday power supply needs. Others allow a premium rate for either green power or reliable power. Some utilities offer farmers and businesses PV systems paid for on their utility bill rather than having to string electric wires and maintaining those wires over long distances, over farmland, shoreline, marsh or mountains. And electric utilities are making profits doing so, because PV is less expensive than stringing or burying power lines, adding transformers, and maintaining those lines.

Photovoltaics can address power quality which is probably the largest market benefit. The electric surges, sags and transients on the grid now account for an ever increasing amount of "downtime" in the commercial and governmental sector. These electricity differentials along distribution lines were not a bother until more sophisticated digital equipment is being used by a majority of business for controls, communications, computing and security.

Photovoltaics may be the least cost approach for power generation to meet air quality requirements. Rather than adding costly emissions control equipment on older generating plants, offsetting the need to actually run those peak power plants, PV may be many times more cost effective in providing zero emissions solutions. State air quality programs are beginning to seriously consider these options.

Photovoltaics is the least cost approach to residential and small business on-site electric generation AND the only mass-produced approach for on-site commercial on-site electric generation. While microturbines, fuel cells, small wind turbines, microhydropower systems all are quite promising, none of those industries have automated production of these units as does the photovoltaics industry. At least 5 automated or semi automated manufacturing plants for photovoltaics have been coming on-line in the United States every year for the last five years, and this trend is expected to continue.

We live in an industrialized society where innovation takes time to become common place in markets. Photovoltaics is now commonplace in highway infrastructure, military, space and telecommunications. It is only a short time for this technology to become more evident in the electric utility markets as they become more deregulated and consumers become less patient about power quality, electricity reliability, pollution, and energy rate stability.

The Stella Group, Ltd. (www.thestellagroupltd.com) is a strategic technology optimization and policy firm advancing the utilization of clean, distributed energy applications such as advanced batteries and controls, energy efficiency, fuel cells, geoexchange, heat engines, microhydropower, minigeneration (natural gas), modular biomass, photovoltaics, small wind and solar thermal (air-conditioning, water and industrial process heat, and power generation), and water energy; with blended financing and customer facilitation.