

NEXGEN ENERGY SYSTEMS INC

Your Partner For A Sustainable Energy Future

One of North America's most experienced photovoltaic (PV) system integration groups. Since 1981 Nexgen Energy Systems has been a supplier and installer of grid connected and remote solar electric systems for commercial and Government customers. They specialize in remote power systems and use high quality components from a wide range of sources. Nexgen also designs and supplies solar water pumping systems, and has designed and supplied over 500 solar water pumping systems over the years. Their roots go back over 20 years in the photovoltaic industry. They started off in 1981 – 1996 as Applied Power builds industry-recognized global experience in PV applications; then in 1996 Applied Power was purchased by Idaho Power, then in 2000 Applied Power was purchased by Schott GMBH, and in 2003 RWE Schott Solar joint venture was formed. Finally in 2005 RWE Schott Solar spins off their project design and implementation group as Nexgen Energy Systems, Inc.

Nexgen does not do any work in the private residential market, they specialize in the industrial and commercial sectors. Nexgen is incorporated out of California and most of their work is currently done in California but their management office is in Olympia Washington. Nexgen is making a conscious effort to help combat climate change not just in the fact that they install green energy technology but one of their main focuses is to replace diesel generator operations, help companies offset their energy operating costs by doing energy audits and work with climate change organizations to help fight for clean energy initiatives in the political sector.

For this project we interview Mike McGoey the company director. Mike has been in the photovoltaic business for 31 years. Historically Mike started out as an electrician with a two year degree in electromechanical engineering, and got into the residential electrical trade, leading him to an opportunity to work for Motorola to install a remote system in Alaska in the late 1980's. Ever since the motorola project, installing a remote photovoltaic energy system, Mike desired to make this line of work his new career. Mike wanted to be on the frontier of the photovoltaic business, and so he began his future with what is now known as Nexgen Energy Systems Inc.

Nexgen has gone worldwide in the sale, design, installation, maintenance and repair of photovoltaic systems. Their major projects range in locations from the Arctic to the South Pacific. These projects were done for a variety of clients such as AT&T, Bechtel Nevada, Bureau of Land Management, Johnson Controls, National Park Service, Southern California Edison, State and County Government Agencies, US Fish and Wildlife Service, and US Forest Service. They have also installed a photovoltaic system at our states capitol building here in Washington state. Their latest project in progress is the installation of a 21 kW solar array on the roof of the Ash Mountain warehouse for Sequoia National Park. Nexgen does a lot of remote communication systems which vary a lot in size. For example in Alaska the only way to communicate long distances is through these remote communication systems. The remote communication systems consist of a small solar panel hooked to a battery that runs a transmitter. These systems are strung out over hundreds of miles to assist the communication systems for seasonal remote off the grid stations.

Nexgen Energy Systems works a lot in facility power systems mostly in the government sector where they have remote facilities out in the middle of nowhere. For example there are some small islands off the coast of San Francisco where Fish and Wildlife has a research facility that is manned year around. This facility used to be run by the Coastguard who ran the whole facility off of diesel generators year round. Nexgen installed a 10 kW photovoltaic power system on the island to service all their energy needs. Before Nexgen installed its alternative energy system this facility's diesel generators were consuming about 5500 gallons of diesel a year to generate the power needs of the facility. A year after the installation of the photovoltaic system the facility only consumed 492 gallons of diesel a year, showing the cost effectiveness is a convincing selling point for Nexgen Energy Systems. Nexgen has done similar projects in Alaska, and on an island about 500 miles West of Honolulu where these facilities are so remote that it is impractical to ship enough fuel to the facility to be powered by generators. These systems run the entire facility's needs from computers, to lights, and refrigerators. Photovoltaic systems are the best solutions for these places because they have no moving parts so they only need light maintenance about once a year with a far superior reliability than generators.

The market for photovoltaics today has shifted more from remote facilities to commercial facilities like big box stores and even transit bus stations in major cities where they are putting solar panels on top of their buildings. This offsets power that the building uses that they would be buying from the utility company.

The financial crisis of 2008 didn't affect Nexgen Energy Systems in a real negative way. Mike said that they had seen it coming and because they had a lot of maintenance

and repair projects they had a lot of work stacked up and by the time they finished that work a lot of the new stimulus money had come in, which helped carry them through the rest of the financial crisis until the markets started to return again. Mike said that his company felt very fortunate and even though they anticipated the market crash, he felt that they had a lot of luck in making it through unhindered. Mike also mentioned that even though they were thankful for the stimulus money that came in that historically stimulus money has helped as much as it has hurt because it helps get everything ramped up than it hurts because it drives the price down. Like during this last stimulus it drove the price from \$4 per watt to about \$1 per watt; helping in the moment but over a long term it leads to a vastly over built market causing extreme highs and lows in the industry. This is when a lot of companies who get too big too quickly end up crashing.

The stimulus works as a quick fix to create some jobs but then ends up in a train wreck with companies leaving the market. Another problem with the stimulus is that companies spring up to get into the market of manufacturing the different parts of the photovoltaic systems. These new companies made by the stimulus end up producing cheaper products which don't operate efficiently and end up failing after two or three years when they are supposed to have a lifespan of 5, 10 and 15 years. So many of these systems that get installed end up costing more to later repair and replace the equipment. This also has been leading to companies to fall out of the market.

The solar photovoltaic energy systems have been known about since the 1890's. Bell Labs created the first photovoltaic cells in the 1950's and became active on the global market around 1977. Photovoltaic started with the U.S. Space program during the global

space race. The Space Program's need of light and power systems to operate in space for satellites and space missions is what really pushed the production and innovation of photovoltaic cells onto the market.

Photovoltaic cell started out very expensive but then began to fall with the "energy embargo" of the 1970's push for energy storage. 1977 is when "terrestrial" photovoltaic began to become available. A 5 volt photovoltaic cell cost about \$200 where today the same size cell would cost about \$5. Mike said that this is one of the problems today that the price has plummeted a little too far, which results in an over supply in the market today. In the last few years there has been a massive interest in photovoltaics world wide. Most of this interest is being driven by the Chinese, because of their huge incentives to use photovoltaics due to them not having a national power grid like we have in the US. Mike said that in developing countries such as China, is where the future of photovoltaics as well as other green energy will be. In the US we have a strong, national energy structure so the demand is not as high for green energy alternatives and there is not as much incentive to integrate it into the already functioning system. Due to China leading the market in photovoltaics, along with China's recent economic boom, it has flooded the market with photovoltaic cells. Recently, because of this flooded market, there has been a tariff put on Chinese photovoltaic imports. This has caused a plummet in China's photovoltaic cell manufacturing leaving about 90% of the manufacturers that were active a year ago at an idle. The key component for photovoltaic systems is computer grade "silicon" which the Chinese produces over 95% of. As of right now there are over built factories, and not enough demand which has greatly dropped the price of the photovoltaic cells world wide,

leaving the global markets in an adjustment curve.

Mike said that nationally, the US's political incentives for photovoltaics in the past have resulted in a disaster. In the 1980's there was a helpful incentive in the form of tax credits for installing photovoltaic system in your business, but the problem with these incentives is that they come and go. The federal government has never developed a long term national incentive. So the result is the industry gets subsidized, the budget gets tight, then the subsidies go away and the industry crashes. It is an up and down fluctuation that makes it difficult to successfully stabilize the industry.

If you look at individual states rather than national incentives you find a different situation. Individual states, such as California have been far more successful at maintaining incentives. California started out with a fairly high incentive for solar. This incentive is based on California's energy tier system which has different utility rates based off of the time of day. If a company installs photovoltaic cells than they are able to offset those high peak tier demands causing them to have to pay a much smaller utility rate throughout the different tier rates of the day. This system of incentive stays consistent and predictable. Mike said that this type of tier system green energy incentive has been extremely successful in California for both companies and for Nexgen Energy System's business market. In conclusion the National progress has been a disaster and short lived but the state level has been surprisingly successful long term.

Mike told us that even though his company installs green energy technology, when it comes to climate change, it almost has no impact on the global warming problem because there is not a lot of incentive for energy conservation. He said that is a real discouraging

part of his job when he wants to make the world a better place with alternative energy and yet it will have little to no impact without an aggressive effort in energy conservation when it comes to fossil fuels. Mike said that when his company does a project that they will help the client in energy conservation by doing an assessment of energy the clients energy consumption and suggest ways to reduce their energy consumption.