



# Reflections on the First Solar Hybrid Power Facility

## *Martin Next Generation Solar Energy Center*

In Southeast Florida, on the banks of Lake Okeechobee, more than just alligators are soaking up the hot Florida sun. Florida Power and Light's recently-completed Martin Next Generation Solar Energy Center is now online and is tracking the sun from dawn till dusk. Beyond providing clean, renewable energy, this project has helped to reach new heights for solar power as the first hybrid solar power facility in the world and as the second largest solar power plant in the world currently in operation.

This project was commissioned in 2008 by Florida Power & Light under the name "Martin Next Generation Solar Energy Center," and began commercial operation in December 2010. Abilene-Texas-based Lauren Engineers & Constructors served as the Engineering- Procurement- Construction (EPC)

contractor for this landmark solar project, which was built on a 500-acre plot of land directly adjoining FPL's existing Martin Power Plant.

FPL's Martin Plant is the nation's largest fossil-fuel burning power plant, sourcing its 3,800 MW of power from natural gas.

**As the first Hybrid Solar Power Facility in the world,** the 75 MW Martin Solar Energy Center is the first to connect to a combined cycle power plant. This revolutionary solar plant reduces natural gas usage and offsets carbon dioxide emissions by replacing a percentage of Martin's natural gas power production with clean, renewable solar energy.

Concentrated Solar Power has erupted onto the scene in the United States over the last five years with two utility scale projects – the second and third largest solar plants in the world – completed in Nevada and Florida. Lauren Engineers & Constructors served as the EPC contractor on both of these projects and helped to validate utility-scale solar power production. Now, the future of Solar continues to look bright with \$3.35bn in loan guarantees having been announced by the DOE in 2011 for four mega-projects (1GW, 110MW, 280MW, 250MW).

**Projects of this magnitude present many challenges on the construction front. On the Martin Next Generation Solar Energy Project, Lauren Engineers & Constructors had to come up with creative ways to recruit and mobilize a 1,000+ workforce, while providing a safe work environment for all employees.**

Lauren began the Martin project with a commitment to maintain a majority of the craft workforce from local labor and continued this commitment throughout the entire project. In order to recruit qualified candidates,

Lauren hosted a recruitment fair in Indiantown, FL., which was attended by over 8,000 job-seekers. Lauren drew heavily upon these local resources to build the project and maintained employment staffed, primarily, by the local workforce throughout the



duration of the project.

The construction phase of the project involved a coordinated effort between various disciplines, each taking primary responsibility for a major component on the project site.

For example, the project was split into two main work areas: the power block and the solar field. These two areas were further broken down, by discipline, into work crews in the solar field and power block. Work crews in the solar field had primary responsibility for setting pylons, building frames, installing glass mirrors, and installing solar tubes and HTF (Heat Transfer Fluid) piping throughout the solar field, while various discipline-specific teams worked synchronously to complete the various component of the power block.

The immensity of this project and the complexity of these efforts can be brought into proportion when considering the number of installed components for this project. During the Martin Solar Project, teams of craft workers installed 6,816 twelve-meter Gossamer frames, 1,136 Solar Collector Assemblies, approximately 190,000 mirrors (464,908 m<sup>2</sup> of mirrors), and 142 solar field loops.

The mechanical package alone involved the installation of over 200,000 LF of pipe, including all interstitial and crossover piping, main supply and return headers to the solar field, as well as all power block piping, which included the HTF system, steam system, feedwater system and BOP utilities. Additionally, the power block scope included equipment setting for the main pumps, super heaters, expansion vessels, preheaters, ullage skid, and turbines.

One of the most important commitments on the project site was maintaining a safety program that ensured that each employee left the project site safe at the end of each work day. Through a rigorous safety program based on a Behavior Based Safety culture, Lauren was able to complete the FPL Martin Solar Project with 1,849,132 work hours without a lost time injury.

To put this number in perspective, The Bureau of Labor Statistics cites that a typical construction site in the

United States experiences one lost day of work every 118,000 hours. In light of this statistic, if Lauren's safety commitment was typical – in line with the industry average – more than 50 individuals would have missed work due to a work-related injury or illness over the life of the project. Instead, Lauren completed the project with no lost time injuries.

This safety achievement is commendable due to the fact that the project spans several years and involves the participation of thousands of employees. Cleve Whitener, Lauren's president and CEO, highlights the importance of this achievement: "Working safely throughout a project is noteworthy. Working safely for a year is commendable. But working safely year after year and project after project is truly remarkable, and it underscores a conscious effort each and every day by management and all employees to make sure that safety remains a key focus of our organization."

**FPL's Martin Solar Energy Center is not only a great story of engineering and construction success; it is also a success for the environment. For example, the Solar Power production will produce enough power to serve about 11,000 homes annually. More impressive still, over 30 years this plant will prevent more than 2.75 million tons of greenhouse gas, which is the equivalent of removing almost 19,000 cars from the road every year.**

This project helped to pioneer new technological frontiers in solar power production and served to expand our ability as a global society to harness the power of the sun. As new solar technologies are created to support an increased number of solar projects, the future indeed looks very bright.

**To learn more about Lauren, visit the website at: [www.laurenec.com](http://www.laurenec.com)**