

POSITAL

FRABA

SINGLE AXIS SOLAR TRACKER



Machine Category:

Single Axis Solar Tracker / CSP Utility Size Installation
(480units)

Industry: Solar

Country: USA, India

Product Series: ACS

Specification:

- ACS 360deg
- Industrial design with M12 connector
- Analog-Current (just RS232 used)
- Custom cable as Accessory (M12 to DB9 plus wires)

Competing Technical Solution:

US Digital Inclinator with RS485

Benefits of Technical Solution:

Wear free, non-contact solution with absolute position output. IP69k for outdoor use. Simple serial interface option (RS232).

Reasons for Choosing POSITAL:

Good support in the US and India, flexibility to provide a custom cable with short lead time, price and Rockwell Encompass reference (system uses Rockwell PLC).



Confidential! For internal use and training of authorized sales partners of POSITAL only.
Information may not be disclosed to third parties!

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POSITAL

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SINGLE AXIS SOLAR TRACKER



Additional Information:

- Lauren Solar Brochure attached
- Installation Fact Sheet attached
- Lauren Installation Video (different location): <http://youtu.be/A5YpBmZ4ZQQ>
- Related Press releases:
<http://investingreenenergy.com/lauren-jyoti-receives-epc-contract-award-for-50-mw-concentrated-solar-power-plant/>
http://www.solarnovus.com/index.php?option=com_content&view=article&id=5423:rockwell-automation-wins-indian-solar-thermal-contract&catid=37:business-news&Itemid=241

Author: Christian Fell

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T H E

E X P E R I E N C E

LAUREN



Core Beliefs

Lauren Vision

Lauren's vision is to be a light to the world and the contractor of choice through constructive and caring relationships with customers, suppliers and peers.

Lauren Mission Statement

Lauren helps our customers succeed by providing innovative solutions and by designing and building the highest quality facilities with timeliness, integrity and skill.

Core Values

- We believe that our primary purpose is to love and honor God and to serve others.
- We strive to be the very best at whatever we choose to do.
- We strive to develop extreme loyalty through exceptional performance.
- We challenge and help every worker to reach their full potential.
- We realize people are more important than activities or things.
- We will be good stewards of our time, talents and treasures.
- We encourage innovation, reward responsible risk taking and forgive mistakes.

In the same way, let your light shine before others, that they may see your good deeds and glorify your Father in heaven.
Matthew 5:16



ABOUT US



"Designing & Building Success"

Company Profile

Lauren Engineers & Constructors began over 25 years ago as a small specialty construction company and has grown into a fully integrated provider of professional engineering, procurement and construction services. Due to our success, we are able to focus on recruiting and developing highly regarded professionals, refining internal processes and adding capabilities. Continually developing our full range of in-house services allows Lauren to offer innovative and cost-effective solutions to our clients in our core markets:

- Alternative Energy
- Power Generation
- Chemical and Polymers
- Oil & Gas
- Transmission & Distribution
- Pulp & Paper
- Refining
- Metals & Mining

Lauren's business model is centered on developing long-term relationships with our clients. We excel at working as a team (both internally and with our alliance partners) and it shows. Our reputation for high quality, cost competitive work has earned us repeat business with such clients as LS Power, Black Hills Energy, Calpine, Texas Utilities, Monsanto, Eastman Chemical, Mobil, Alstom Power, Rohm & Haas, Anhueser Busch, Georgia Power, American

Electric Power Company, Central and South West Corporation, DukeSolutions, KoSa, Phillips Petroleum, El Paso Energy, Oryx Energy, ITW/Signode, Navajo Refining, Nuclear Fuels, Horsehead Corporation and many others.

Lauren offers the following services through our Corporate Office in Abilene, Texas, our regional offices in Irving, Texas, Atlanta, Georgia, Knoxville, Tennessee, and our Canadian subsidiary offices in Calgary, Vancouver, and Montreal:

- Engineering
- Procurement
- Construction
- Industrial Fabrication

In short, Lauren is a company that is known for helping our customers succeed by designing and building the highest quality facilities with timeliness, integrity and skill.



Industry Associations

Lauren is heavily involved with industry associations for construction and engineering. These associations allow Lauren to stay in tune with industry best practices and establish meaningful peer relationships with key owners and vendors through events and committees.

Lauren is an active member of the following associations:



CII – Construction Industry Institute

CII is a consortium of leading owners, engineering and construction contractors, and suppliers who have a singular mission: to improve the cost effectiveness of the capital facility project life cycle, from pre-project planning through completion and commissioning. By collaborating on important industry issues and by providing guidance on best practices discovered through research, the CII members are collectively an industry forum for the engineer-procure-construct process. Lauren is proud to be a member of the Construction Industry Institute and serves as an active participant on several of the best-practice research panels.



Accredited Training Sponsor

NCCER – National Center for Construction Excellence

NCCER is a not-for-profit 501(c)(3) education foundation created in 1996 to develop standardized construction, maintenance, and pipeline curricula with portable credentials and help address the critical skilled workforce shortage. NCCER's training process of accreditation, instructor certification, standardized curriculum, national registry, assessment, and certification is a key component in the industry's workforce development efforts. NCCER also drives multiple initiatives to enhance career development and recruitment efforts for the industry. Lauren is one of a limited number of contractors in the US that has qualified as an accredited training sponsor with NCCER.



ABC – Associated Builders and Contractors

Associated Builders and Contractors (ABC) is a national association with 75 chapters representing 23,000 merit shop construction and construction-related firms with nearly two million employees. ABC's membership represents all specialties within the U.S. construction industry and is comprised primarily of firms that perform work in the industrial and commercial sectors of the industry. Lauren is an active participant in ABC events and maintains a presence on the ABC Health and Safety Committee. Lauren has also received ABC merit awards for outstanding projects in the industrial sector.



CURT – Construction Users Round Table

The Construction Users Roundtable (CURT) was founded in the fall of 2000 by construction and engineering executives representing major corporations all across the United States and the world. Continuing the 30-year effort of the Construction Committee of the Business Roundtable, CURT provides a national and international forum for the exchange of information, views, practices and policies of construction users from an array of industries. Lauren maintains membership with CURT as a Contractor Subscriber Affiliate.



Cornerstone Commitments

Integrity

Lauren's commitment to integrity can be summarized as, "We do what we say!"

Many companies today claim to be committed to integrity, but their actions are not in line with their commitments. For Lauren Engineers & Constructors our commitment to integrity involves more than just words - our actions confirm our commitment.

We maintain an unwavering commitment to integrity throughout all levels of our company, which translates to peace of mind and value for our customers.

Safety

Safety is our #1 priority and we have developed a safety program that is second to none to support this commitment. Our goal is zero accidents, achieved through constant training, rigorous enforcement of safety procedures by all of our employees and accountability.

We understand that the success of a project is only achieved through strict implementation of our safety program, and this philosophy has allowed us to consistently maintain a safety rating well below the industry average.

Our safety program includes more than just promises and good intentions. We are committed to fulfilling our commitments to our customers to provide safe, cost-effective, quality work.

As a testimony to this commitment Lauren has received numerous safety awards, including The Governor's Award of Excellence, ABC - Safety Excellence Award, and ABC - STEP Diamond Award.

Quality

Lauren understands that the quality of work we provide is directly related to the people we hire. Therefore, we hire only the most competent, experienced and trained individuals. Additionally, we make sure that all of our employees are involved in regular training. Through this focus on continuous improvement, we have developed a reputation for providing quality work. Yet, our paramount concern continues to be not only meeting our customer's expectations of quality but also exceeding them.

Performance

Lauren is known as a contractor that performs. With qualified craft professionals, we are prepared to perform in accordance with our commitments to meet the demands and schedule of each project. We understand the importance of limiting setbacks and delays, and we employ every means possible to perform responsibly, efficiently, and quickly to meet the demands of our customers.



Safety

Engrained within the Lauren culture is a firm commitment to providing our employees, subcontractors, vendors and other customers a workplace free of recognizable hazard. With safety being our first priority, we have developed a safety program that is second to none in support of our commitment. Our program is augmented by extensive on-going employee training, policy and regulatory enforcement by all levels of management, and through an accountability process. To further enhance our program, we have created and implemented a Behavior Based Process, where in part, supervision participates in the recognition of Safe vs. At-Risk behaviors of workers.

In part, our safety program encompasses:

- Responsibility and Accountability for Accident and Fire Prevention
- Behavior Based Safety Processes
- Safety Education and Training
- Occupational Health
- Substance Abuse Program
- Accident Investigations, Trends, Reporting and Analysis
- Major Loss Causes, Reviews, and Remedial Actions
- Accident Prevention Procedures
- Hazardous Substance Communication

We understand that the success of a project and organization as a whole is only achieved through strict implementation of our safety and training program. Through this philosophy coupled with our commitment, Lauren Engineers & Constructors, Inc. has consistently maintained a safety rating below the industry average.

Our safety program includes more than just promises and good intentions; We are committed to fulfilling our commitments to our customers to provide safe, cost-effective, quality work.



Major Project Timeline

	2001	Modern Continental Las Vegas, NV	Cogeneration Project \$150,000,000	
	2002	Navajo Refining Artesia, NM	Install Gas-Oil Hydrotreater \$25,000,000	
	2003	DAK Charleston, SC	New Polymers Facility \$28,000,000	
	2004	Dominion Possum Point, VA	Combined Cycle Power Unit \$250,000,000	
	2005	Wellman Bay St. Louis, MS	P.E.T. Expansion Project \$45,000,000	
	2006	Acciona Energy Boulder City, NV	64 MW Solar Power Facility \$230,000,000	
	2007	Bosque Power Laguna Park, TX	Combined Cycle Power Unit \$175,000,000	
	2008	FP&L Martin Solar Energy Center Indiantown, FL	Martin Hybrid Solar Power Plant - 75MW \$400,000,000	
	2009	Holly Refining Artesia, NM	New ROSE Unit \$60,000,000	
	2011	Godawari Green Energy Rajasthan, India	New CSP Solar Plant 50 MW \$130,000,000	
	2012	BAE Solution Kingsport, TN	Modernization of Chemical Plant \$ 140,000,000	

ABOUT US



"Designing & Building Success"

Our Offices



Corporate Headquarters

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Phone: 325-670-9660
Fax: 325-670-9663

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Calgary, AB, Canada

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Fabrication Office

550 South 18th Street
Abilene, Texas 79602
Phone: 325-734-3704
Fax: 325-671-5455

Modular Assembly Shop

28 First Street NW
Choteau, MT 59422
Phone: 406-466-5124
Fax: 406-466-5127

OUR CLIENTS



“Designing & Building Success”



SERVICES & CAPABILITIES



“Designing & Building Success”

Engineering

Project Development & Controls

- Feasibility Study
- Power Cycle Design
- Major Equipment Selection
- Environmental Permitting Support
- Site Development
- Financial Modeling & Support
- P & ID Development
- General Facility Layout
- Project Schedule
- Project Scope Definition
- Budget Installed Cost Estimate

Mechanical Engineering

- Equipment Specifications
- Equipment Layouts
- Piping Design and Layout
- Piping Isometrics
- Pipe Support/Hanger Design
- Process Skid Design
- Steam System Design

Civil/Structural/Architectural

- Industrial Steel Design
- Foundation Design
- Site Development
- Architectural Building Development

Electrical Engineering

- Primary Power Service
- Electrical Distribution
- Facility Lighting
- Communication Systems
- Fire Detection Systems
- Alarm Systems
- Energy Analysis
- Emergency Electrical Power

Instrumentation Engineering

- Control System Design
- Instrument Loop Diagrams
- Instrument Specifications
- PLC & DCS Systems
- System Programming

Startup & Commissioning

- Registered Professional Engineers
- Power Plant Testing

Autocad Drafting

- Three Dimensional Modeling
- Microstation

Chemical Process Engineering

SERVICES & CAPABILITIES



“Designing & Building Success”

Construction

Registered Professional Engineers

***ASME Code Stamps “A”, “PP”, “U”,
“S” - National Board “R” Stamp***

Licensed Electricians

Conceptual and Budget Estimates

Preliminary and Detailed Construction Engineering

- Civil
- Structural
- Mechanical
- Piping
- Electrical
- Instrumentation

Shop Fabrication

- Modular Equipment Skids
- Modular Piperack Assemblies
- Alloy Pipe Fabrication
- Pressure Vessels
- Custom Control Panels
- Specialty Platform Assemblies
- Specialty Plate Assemblies

Prime Contractor for Wide Spectrum of Process Industries

- Electric Power Generation
- Polymers and Fibers
- Oil and Gas Production/Refining
- Pulp and Paper
- Chemical Processing
- Industrial Manufacturing
- Special Metals
- Alternative Energy

Direct Hire - Construction and Maintenance Services

- Millwrights
- Boilermakers
- Pipe Fitters & Welders
- Heavy Rigging
- Electricians
- Heat Tracing
- Instrument Fitters
- Instrument Technicians
- Ironworkers

Calibration, Startup, Commissioning

SERVICES & CAPABILITIES



“Designing & Building Success”

Electric Power Generation

- Full Turn-Key EPC
- Solar Thermal Power Plants
- Gas Turbine/Generators
- Gas Turbine Combined Cycle Plants
- Steam Turbine/Generators
- Distributed Control Systems
- Ash Handling Systems
- Turbine Water Induction Prevention
- Power Piping Installation
- Auxiliary Power Utility Boilers
- Burner Management Systems
- Baghouse & Flue Gas Duct Systems
- Condenser Replacement
- Scrubber & Precipitator Systems
- Plant Water Supply Systems
- Substation Design/Build

Oil and Gas

- Kerosene Unit Crude Pumping Stations
- Rheinformer Absorption Units
- Amine Units
- Well Metering and Injection
- Sulfur Recovery Units
- Water Reclamation Facility
- Natural Gas Gathering System
- Oily Water Treatment Plant
- Refinery Distributed Control Systems
- Asphalt Plant Piping
- Hydrotreater Units
- Naphtha Units
- Liquefied Petroleum Gas Terminal

Industrial Manufacturing

- Equipment Setting & Calibration
- Process/Production Lines
- Utility Systems
- Boiler & Pipe Fabrication
- Instrumentation
- Full Scope Construction
- Detail Design & Engineering
- Budget Estimating
- Grass Roots or Retrofits
- Plant Relocations

Chemicals and Polymers

- Polymer Semi-Works Facility
- Polymer Solid Stating Facility
- Esterification Process Addition
- Fiber Optic Plant Expansion
- Activated Carbon Plant Upgrade
- Drying Kilns
- Distributed Control Systems
- Iodides Production Facility

Pulp and Paper

- Complete Pulp Mills
- Steam Generating Plants
- Bleach Plants
- TMP Plants
- De-Inking Facilities
- Paper Machines
- Pulping Group
- Steam and Cogen Plants
- Environmental

SERVICES & CAPABILITIES



“Designing & Building Success”



Alternative Energy

Lauren is a leading EPC contractor serving the alternative energy sector. Lauren served as the EPC contractor for FPL's Martin Solar Power Project, a 75 MW Hybrid Solar Plant located in Indiantown, FL. The Martin Solar Power Plant is the second largest solar power plant in the world. Lauren also served as the EPC contractor for the 64 MW Nevada Solar One parabolic trough solar thermal power generating facility near Boulder City, Nevada. At completion in 2007, Nevada Solar One was the largest solar thermal project to be built in over 17 years and the third largest in the world. Lauren is also active in biodiesel process design, freshwater recovery from brine, and oil sand process plant construction.

Lauren's experience encompasses project conceptual design studies during the early project development phase through turnkey engineering, procurement, and construction. Lauren is also

well experienced in plant commissioning and start-up. Lauren routinely self-performs all aspects of project execution with a dedicated engineering group, experienced site supervision and a large direct-hire construction craft base.

Most simply, Lauren has the experience to get the job done. From beginning to end, Lauren's project approach increases value for our customer through:

- Superior technical competence
- Accessibility to top management
- Responsiveness (low bureaucracy)
- Innovative project approaches
- Industry-leading safety record
- Partnership with NCCER for craft training

SERVICES & CAPABILITIES



“Designing & Building Success”



Fabrication Facilities

- 40,000 Square Foot Enclosed Shop Area
- 3,500 Square Foot Office Area
- 40 Acres of Outside Fabrication and Storage Area
- Adjacent Rail Spur
- Automated Welding and Cutting Equipment
- In-House Full Scope Design Engineering & Detailing
- ASME Compliant Quality Assurance Program (A, PP, U, R & S Code Certifications)
- Material Purchasing and Expediting
- Computerized Scheduling and Tracking Processes
- CNC Pipe Bender up to 3" Capacity
- State-of-the Art Induction Heat Treatment Equipment
- In-house Grit Blasting and Painting

SERVICES & CAPABILITIES



“Designing & Building Success”



Fabrication Services

Assemblies

- Pipe Spools
- Pipe Supports
- Process Skids
- Pipe Rack Modules
- Control Panels
- Plate Assemblies
- Pressure Vessels
- Boiler Components
- Platforms

Services

- Automatic Welding
- Stress Relieving
- Polishing
- Painting
- Grooving
- Machining of Special End Preps
- Computerized Scheduling and Tracking
- Computerized Material Control

Lauren Engineers & Constructors is experienced with many different types of materials, including carbon steel, stainless steel, aluminum, titanium, inconel, carpenter 20, hastelloy, and chrome moly including P91. We work under our in-house quality and safety programs and maintain “A”, “PP”, “U”, “R” & “S” code stamps.

SERVICES & CAPABILITIES



“Designing & Building Success”



Modularization

In today's fast paced construction arena, scheduling and logistics can be the catalyst by which projects are made or broken. Modular construction can give a project the edge that is needed to meet the seemingly unachievable schedules that are often required.

Listed below are some primary advantages:

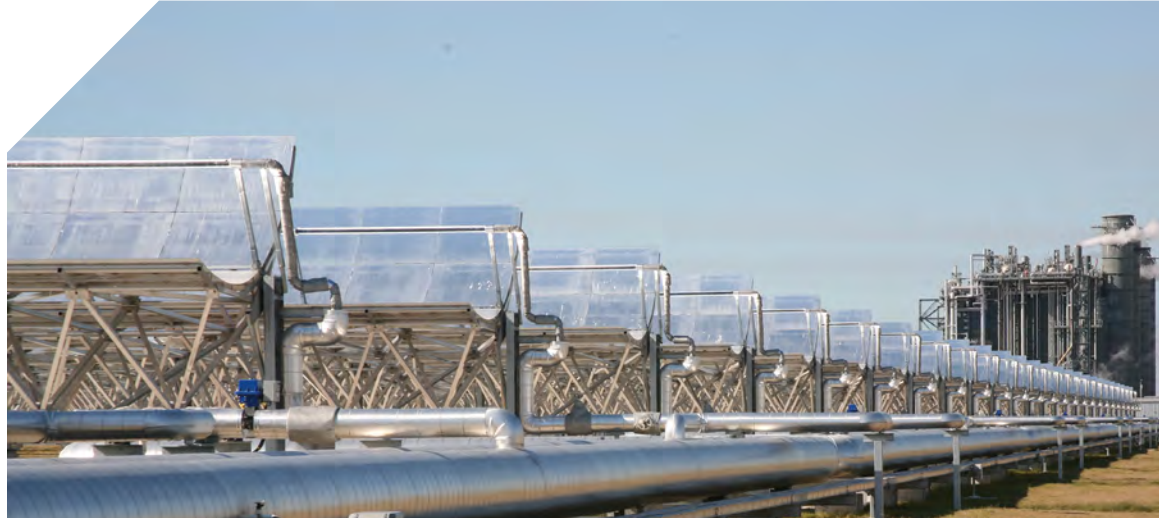
- Reduction of field manpower requirements
- Mitigation of permitting delays
- Average cost savings of 30% over on-site construction
- Simpler and safer field erection

Process skids and pipe-rack modules can be ready to set in place and connected to adjacent processes with ease. Our staff of engineers, designers, fabricators and constructors can help to make your next project's scheduling manageable.

From the conceptual stage through engineering, fabrication and installation, we are ready to meet the challenge. With our multiple craft disciplines and nearly 40 acres of fabrication and storage space at our facility, we are able to meet the needs of industry no matter what the requirements. Whether you need equipment skids or pipe rack modules, we can custom build to your specific project requirements. We have the experience to pull it all together.

Other capabilities include:

- Process Control Systems
- Automation of Custom Material Handling Systems
- PLC Programming
- Control Panel Design, Fabrication and Circuit Verification



Florida Power and Light

*75 MW Hybrid Solar Power Generating Facility
Alternative Energy, Indiantown, Florida*

Lauren was selected as the EPC contractor to build a 75 MW power generating facility in Indiantown, FL - the largest-capacity solar thermal plant to be built in the last two decades and the second largest in the world. The project was located on 500 acres of land adjacent to FPL's Martin Plant. Using Parabolic Trough Technology to capture heat from the sun, this project includes approximately 190,000 parabolic mirrors, generating 155,000 MWh of power annually – enough power for 11,000 homes or 26,000 people.

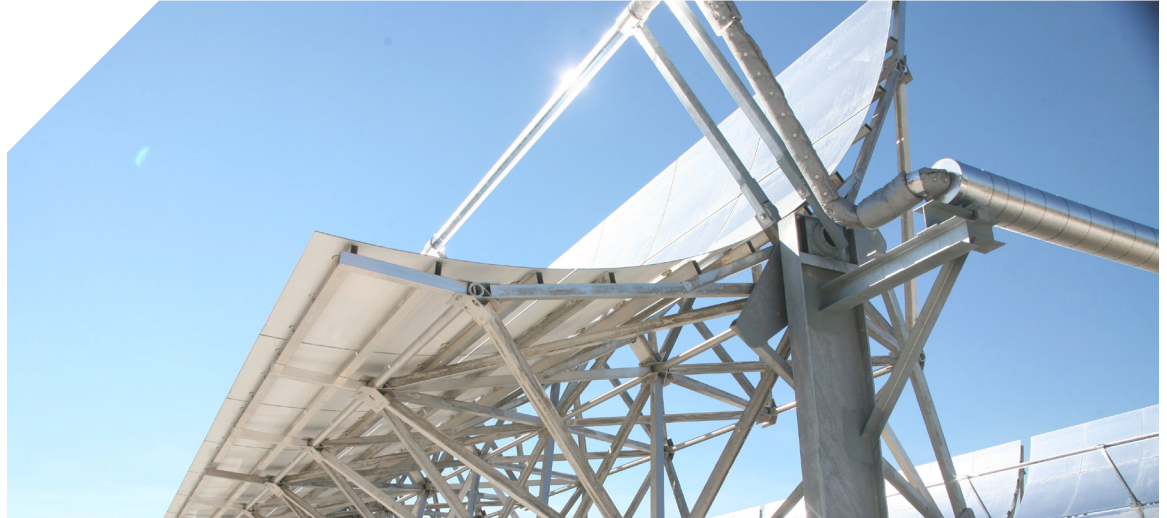
- The second largest solar thermal powerplant in the world
- The largest solar thermal plant outside of California
- The first hybrid solar facility in the world to connect to an existing combined-cycle power plant

Project Contact

► **Mark Rawlings**

325-734-3951

Mark.Rawlings@laurenec.com



Godawari Green Energy
50 MW Solar Power Generating Facility
Alternative Energy, Gujarat, India

The Godawari (guh-d-awe'-ree) Solar Project, located in the Indian state of Rajasthan, about 50 km from the Pakistan border, is an EPC contract with Godawari Green Energy Ltd and includes the design, procurement and construction of a 50 MW Concentrated Solar Power (CSP) facility.

The Godawari Solar Project utilizes 12m Euro Trough frames with over 161,000 mirrors,

combining for a total of 120 loops, which will circulate 1,100 metric tons of HTF fluid. The project is located on 400 acres of land and will provide 130 GWh of power to the national grid annually. The Godawari Solar Project is one of six projects in Phase 1 of the National Solar Mission.

Project Contact

► **Clint Rosenbaum**

325-734-3717

Clint.Rosenbaum@laurenec.com



64 MW Solar Power Generation Facility Project

Solargenix Energy, 64 MW Solar Power Generating Facility Project
Alternative Energy, Boulder City, Nevada

Lauren was selected as the EPC contractor to build Nevada Solar One (NSO) - a 64 MW power generating facility in Boulder City, Nevada - the largest-capacity solar thermal plant to be built in the last 17 years and the third-largest in the world. The project uses the latest in concentrating solar technology.

The plant consists of a Power Block area and a 400-acre field of mirror arrays that focus the heat of the desert sun into a heat transfer fluid system. Completion date was the third quarter of 2007.

- \$250 Million Solar Plant
- 64 MW of Solar Power
- Power for 48,000 Homes
- 3rd Largest Solar Plant in the World
- 219,000 Parabolic Mirrors
- 1.5 Million Man-hours
- 14 Month Fast-track EPC Project
- 700 Craft Personnel During Peak Construction Efforts

Project Contact

► **Clint Rosenbaum**
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Clint.Rosenbaum@laurenec.com

**National Renewable Energy Laboratory
Concentrating Solar Power: Projects****Godawari Solar Project**

This page provides information on Godawari Solar Project, a concentrating solar power (CSP) project, with data organized by background, participants, and power plant configuration.

Project Overview

Project Name:	Godawari Solar Project
Country:	India
Location:	Naukh (Rajhastan)
Owner(s):	Godawari Green Energy Limited (100%)
Technology:	Parabolic trough
Turbine Capacity:	Net: 50.0 MW Gross: 50.0 MW
Status:	Under construction
Start Year:	2013

[Do you have more information, corrections, or comments?](#)

Status Date: August 30, 2012

Background

Technology: Parabolic trough
Status: Under construction
Country: India
City: Naukh
Region: Rajhastan
Land Area: 400 acres
Electricity Generation: 130,000 MWh/yr (Estimated)
Contact(s): [SolarPACES](#)
Start Production: March 2013
PPA/Tariff Rate: 12.2 Rs per kWh
PPA/Tariff Period: 25 years
Project Type: Commercial

Participants

Developer(s): Godawari Green Energy Limited
Owner(s) (%): Godawari Green Energy Limited (100%)
EPC Contractor: Lauren-Jyoti

Plant Configuration**Solar Field**

Solar-Field Aperture Area: 392,400 m²
of Solar Collector Assemblies (SCAs): 480
of Loops: 120
of SCAs per Loop: 4
SCA Aperture Area: 817 m²
SCA Length: 144 m
of Modules per SCA: 12
Mirror Manufacturer (Model): Flabeg (RP3)

Power Block

Turbine Capacity (Gross): 50.0 MW
Turbine Capacity (Net): 50.0 MW
Turbine Manufacturer: Siemens (Germany)
Turbine Description: SST-700

Thermal Storage

Storage Type: None

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Content Last Updated: August 30, 2012

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