

# Emerson Total Solution for Concentrated Solar Power - Parabolic Trough Plants

## Challenges

In today's global economy, utilities are faced with intense pressure to improve their operations while lowering costs.

Government policies to increase renewable usage and meet environmental protection standards intensifies the economic challenges for power generators.

With escalating competition and the burden to produce better, faster and cheaper, businesses of all sizes are searching for partners who understand these demands and have the technology and expertise to deliver.

## Consider it Solved.

Time and again utilities with concentrated solar power plants using parabolic trough technology turn to Emerson. With our world-class brands, deep category expertise, broad industry experience, and extensive global presence, Emerson is uniquely positioned to deliver proven instrumentation, automation, and optimization solutions to the growing solar industry.



*Emerson has developed a broad array of capabilities, from consulting expertise to industry-transforming products and comprehensive service platforms. As a technology leader, we recognize that the key to customer satisfaction and our long-term success is to anticipate customer needs and develop new technologies and innovative solutions that provide our customers with a distinct competitive advantage.*

***Learn how Emerson technology and industry leadership can help you increase productivity, improve quality, and meet the needs of today's marketplace.***

# Emerson Offerings for Concentrated Solar Power - Parabolic Trough Plants

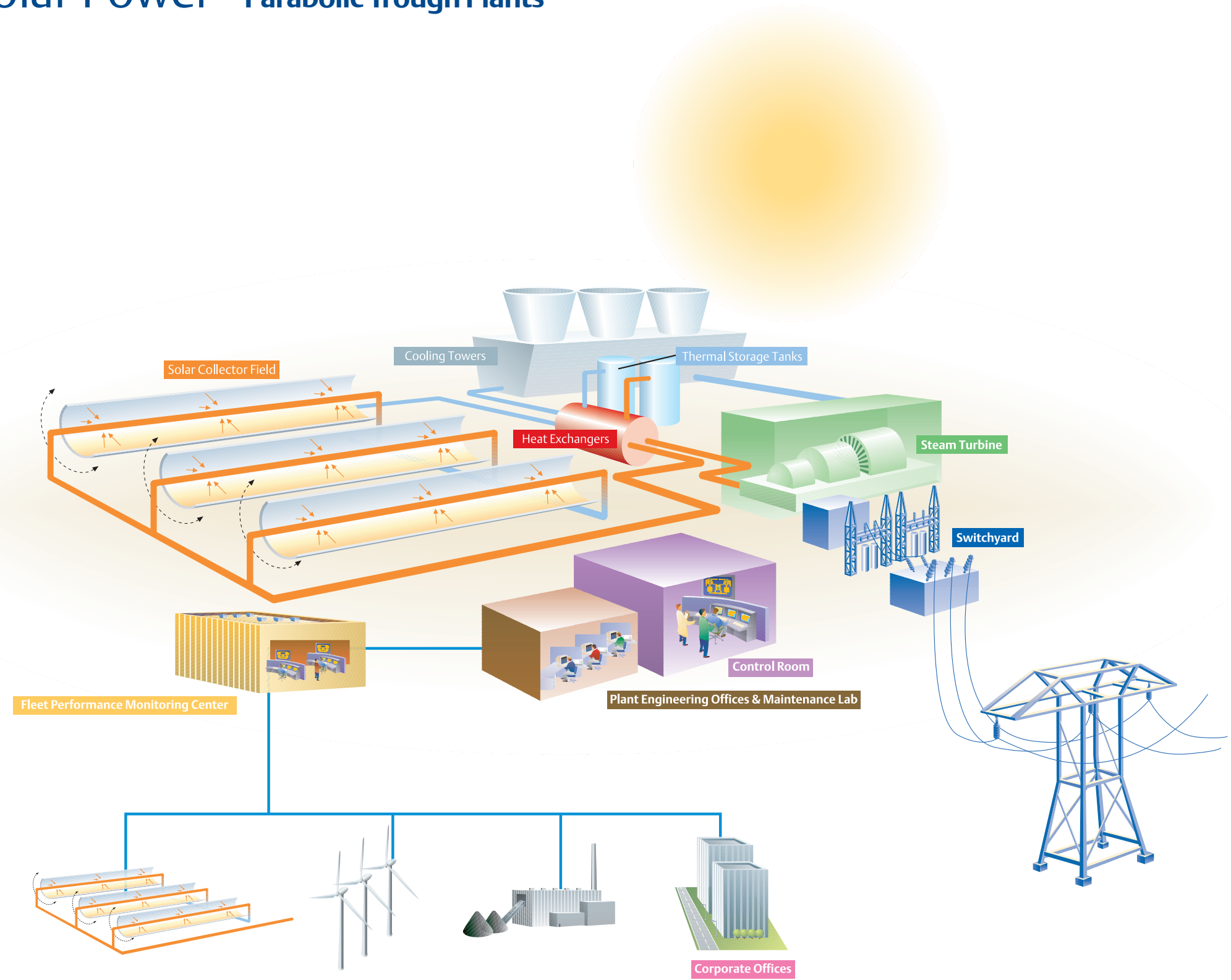
- Fleet/Enterprise Management & Optimization**
- Enterprise-wide systems integration
  - Fleet financial performance optimizer
  - Fleet emissions optimizer
  - Fleet performance monitoring and visualization
  - Fleet-wide asset management reliability programs

- Plant Optimization Software and Plant Performance Monitoring**
- Plant financial performance optimization
  - Steam temperature optimization
  - Unit response optimization
  - Real-time on-line monitoring
    - Plant heat rate & unit efficiencies performance calculations
    - Controllable losses
    - Equipment performance deviations from design
  - Web-based remote equipment performance monitoring of:
    - Turbines, heat exchangers, condensers, solar tracking, cooling towers, thermal storage tanks, desuperheaters, pumps, etc.

- Unit Controls & Monitoring System**
- Distributed control systems (HMIs, controllers, I/O, networks, etc.) for:
    - Balance of plant
    - Burner management
    - Cooling tower
    - Heat transfer fluid
    - Heat exchanger
    - Solar tracking
    - Steam turbine
    - Switchyard
  - SCADA systems
  - Unit historian and report generator
  - Electronic documentation
  - Integration with other systems and intranet/Internet
  - Fieldbus solutions (HART, Foundation Fieldbus, Profibus, DeviceNet, ASibus, etc.)
  - Wireless

- Simulation**
- First-principle high-fidelity
  - Algorithmic
  - Tie-back
  - Virtual technology

- Equipment Condition Monitoring**
- Online/portable vibration monitoring
  - Motor diagnostics
  - Infrared thermography
  - Laser alignment/balancing
  - Oil analysis



- Intelligent Device Management**
- Management software for HART & Foundation Fieldbus devices for:
    - Health monitoring
    - Calibration
    - Configuration
    - Audit trails

- Intelligent and Analog Field Devices**
- Transmitters
    - Pressure, temperature, flow, and level
  - Valves and valve actuators
    - General, severe, and specialty services

- Electrical Auxiliaries**
- UPS, power conditioning, and distribution
  - Precision cooling
  - Motors
  - Variable frequency drives (VFDs)
  - Couplings
  - Gear-reduction drives
  - Backup power generators

- Services**
- Installation, commissioning, and start-up services
  - Support, reliability, and maintenance services
    - Mechanical equipment
    - Electrical equipment
    - Process equipment
    - Control systems
    - Instrumentation and valves
  - Optimization programs
    - Operations
    - Automation and information systems
    - Reliability-centered maintenance
  - Educational services
    - Asset optimization, reliability, and safety
    - Process control and automation
    - Engineering, operations, maintenance and management of field devices, control systems, electrical equipment, etc.

**Legend**

- Cooling Towers
- Control Room
- Corporate Offices
- Fleet Performance Monitoring Center
- Heat Exchangers
- Plant Engineering Offices & Maintenance Lab
- Solar Collector Field
- Steam Turbine
- Switchyard
- Thermal Storage Tanks



## Emerson Solutions for Your Concentrated Solar Power Parabolic Trough Plant

Emerson Brand	Function	Plant Location
PlantWeb®	Digital plant architecture	Control Room
Ovation®	Distributed monitoring and control system, SCADA	Control Room Solar Collector Field Cooling Towers Thermal Storage Tanks Steam Turbine Heat Exchangers Maintenance & Engineering Building Fleet Performance Monitoring Center
AMS® Suite	Predictive maintenance software	Control Room Maintenance & Engineering Building
Smart Wireless	Wireless field and plant networks	Solar Collector Field Cooling Towers Thermal Storage Tanks Steam Turbine Heat Exchangers Control Room
Scenario®	Plant simulation	Control Room Maintenance & Engineering Building Fleet Performance Monitoring Center
SmartProcess®	Plant optimization and performance monitoring	Control Room Maintenance & Engineering Building Fleet Performance Monitoring Center
ControlWave®	Remote terminal units for SCADA applications	Solar Collector Field Remote Controls
Fisher®	Control valves and severe service valves	Solar Collector Field Cooling Towers Thermal Storage Tanks Steam Turbine Heat Exchangers
Machinery Health™ Management	Predictive and protective technology and services for mechanical equipment	Steam Turbine
Rosemount®	Pressure, temperature, level, and flow measurement	Solar Collector Field Cooling Towers Thermal Storage Tanks Steam Turbine Heat Exchangers
Control Techniques	Power conversion, drives, and control	Solar Collector Field Thermal Storage Tanks Heat Exchangers
Leroy®-Somer	Motors and generators	Thermal Storage Tanks Heat Exchangers
Browning	Power transmission products – drives and gears	
U.S. Electrical Motors	Industrial motors	Solar Collector Field Thermal Storage Tanks Heat Exchangers
Liebert	UPS and precision cooling	Control Room Maintenance & Engineering Building Fleet Performance Monitoring Center

For more information visit [www.EmersonProcess-PowerWater.com](http://www.EmersonProcess-PowerWater.com)