



# Solar Trough Performance Evaluation

## Cooperative Research and Development Final Report

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In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: 08-00289

CRADA Title: Solar Trough Performance Evaluation

Parties to the Agreement: Luz Solar

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	NREL Shared Resources
Equipment Value	\$51,971.00
Technical Support	\$75,000.00
TOTALS	\$126,971.00

Abstract of CRADA work:

New HCEs were installed on the hot sides of the thermal loops at SEGS VIII and IX from mid-2007 to mid-2008. Due to significant increases in plant performance, an interest in a further increase performance by installing new HCEs on the cold portions of the loop developed. Although it was assumed that the plant performance would increase, the exact amount was unknown. The objective of this project was to estimate the performance improvements with new HCEs installed on the cold sides of the loop, with performance being evaluated as potential increases in electrical power production (megawatt-hours). A comparison of performance prior to and post installation of new HCEs on the hot sides of the loops was done. For completeness, an estimate of performance losses—such as the optical efficiency, mirror reflectivity, and optical accuracy—was also included in this analysis. National Renewable Energy Laboratory's (NREL's) HCE Survey System was used to determine if the HCEs were hot or cold.

Summary of Research Results:

This study evaluated the potential performance improvement after replacing the heat collector elements (HCE) at two concentrating solar power (CSP) plants—Solar Energy Generating Stations (SEGS) VIII and IX. Energy production in MWh (thermal and electric) was used as the measure of performance. The performance data before and after the installation of new HCEs on the hot sides of the solar loops were compared to evaluate the performance improvement. The Solar Advisor Model (SAM) was used to estimate the increase in performance that would result from replacing the HCEs on the cold side of the loops. The National Renewable Energy Laboratory's (NREL's) HCE Survey System was used to provide

information on conditions of the field after hot-side HCE replacement and to assist in evaluating potential production increases after installation of new HCEs on the cold side.

Subject Inventions listing: None

Report Date: August 2009

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