



Sun+Lab Website

www.eren.doe.gov/csp

The screenshot shows a web browser window displaying the Sun+Lab website at <http://www.eren.doe.gov/sunlab/>. The page title is "Energy Efficiency and Renewable Energy Network (EREN) U.S. Department of Energy". The main banner features the text "CONCENTRATING Solar Power" with images of solar panels and a solar tower. On the left, a sidebar lists "CSP Technologies" including SolarPACES, FAQs, Photographs, Documents, Contacts, and TroughNet. A "Feature" button is also present. The central content area discusses "DOE's Concentrating Solar Power Program" with bullet points: "Distributed Power", "Dispatchable Power", "Advanced Components & Systems", and "Major CSP Projects". It also mentions "Sun+Lab: The Sandia/NREL Partnership" and "CSP Inc.: The CSP Industry". A link to download the Sun+Lab screen saver is available. At the bottom, there are links for the DOE's CSP Program, Technology Paths, SNL HOME, NREL HOME, OPT HOME, FEEDBACK, and EREN Home.

Bookmarks Location: http://www.eren.doe.gov/sunlab/

SunLab SunLab Int Photo Database SolarPACES PVWeather Weather ftp.sandia V

Energy Efficiency and Renewable Energy Network (EREN) U.S. Department of Energy

Security Notice

CONCENTRATING
Solar Power

CSP Technologies

- SolarPACES
- FAQs
- Photographs
- Documents
- Contacts
- TroughNet

Feature

DOE's Concentrating Solar Power Program

- Distributed Power
- Dispatchable Power
- Advanced Components & Systems
- Major CSP Projects

Sun+Lab: The Sandia/NREL Partnership

CSP Inc.: The CSP Industry

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**CONCENTRATING
Solar Power**



DOE's Concentrating Solar Power Program

- Distributed Power
- Dispatchable Power
- Advanced Components & Systems
- Major CSP Projects



Sun•Lab: The Sandia/NREL Partnership

CSP Inc.: The CSP Industry

Feature

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Document: Done

SunLab Website Documents & Photos

Bookmarks Location: <http://www.energylan.sandia.gov/sunlab/documents.htm>

SunLab SunLab Int PhotoDatabase SolePACES PVweather Weather It's sandia Visuals

Solar Power and Sun•Lab

Photographs

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A picture says a thousand words, especially on the World Wide Web. Both Sandia National Laboratories and the National Renewable Energy Laboratory (collectively known as "Sun•Lab" within the CSP Program) maintain extensive databases of photographs, many of which are available for public use.

These photos illustrate the world-class research being conducted at the national laboratories and showcase the cutting edge technologies that are shaping the way energy will be produced in the 21st century.

[Concentrating Solar Power Photo & Document Database](#)
(login required)

This database of downloadable photographs related to concentrating solar power technology allows searches based on program, technology, project, industry involved, location, and photographer. Search for keyword "Classic" and see our 50 best images!

[NREL PIX Photo Database](#)
(no login required)

The Photographic Information Exchange (PIX) photo database consists of renewable energy and energy efficiency technology photographs that can be downloaded. Searches can be conducted visually or by location or subject.



Bookmarks Location: <http://www.energylan.sandia.gov/sunlab/documents.htm>

SunLab SunLab Int PhotoDatabase SolePACES PVweather Weather It's sandia Visuals

Solar Power and Sun•Lab

Documents

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You can view these publications as text-only (HTML) or as fully formatted documents with graphics (Adobe PDF). [Learn about PDFs](#).

Concentrating Solar Power Photo & Document Database
A database of downloadable photographs and documents related to concentrating solar power technology. [Click here](#).

CSP Program SnapShots (Fact Sheets)

10-kW Solar Dish/Stirling Remote Power System for Native American Applications ([HTML format](#); [PDF format 240KB](#))
SAIC/STM Utility-Scale Joint Venture Project ([HTML format](#); [PDF format 255KB](#))
[The Boeing/SES DECC Project](#) (PDF format only 164KB)
[The Nevada 1-MW Solar Dish-Engine Project](#) (PDF format only 180KB)
[UMV Solar Dish-Engine Demonstration](#) (PDF format only 260KB)
[Solar Dish-Engine Systems](#) (PDF format only 200KB)
[Big Solutions for Big Problems... Concentrating Solar Power](#) (PDF format only 240KB)
[Solar Two Demonstrates Clean Power for the Future](#) ([HTML format](#); [PDF format 557KB](#))
[Solar Power Towers](#) ([HTML format](#); [PDF format 313KB](#))
[Solar Trough Power Plants](#) ([HTML format](#); [PDF format 231KB](#))
[SunLab Advancing CSP Technologies](#) ([HTML format](#); [PDF format 109KB](#))
[SunLab Test Facilities](#) ([HTML format](#); [PDF format 101KB](#))
[National Solar Thermal Test Facility](#) ([HTML format](#); [PDF format 364KB](#))
[Markets for Concentrating Solar Power](#) ([HTML format](#); [PDF format 82KB](#))
[The Solar Thermal Manufacturing Technology Initiative \(SoMaT\)](#) ([HTML format](#); [PDF format 92KB](#))
[CSP Program Overview](#) ([HTML format](#); [PDF format 151KB](#))
[CSP Program Highlights, 1998](#) ([HTML format](#); [PDF format 241KB](#))
[CSP Program Highlights, 1997](#) ([HTML format](#); [PDF format 319KB](#))
[CSP Program Highlights, 1996](#) ([HTML format](#); [PDF format 65KB](#))

Technology Characterizations

[Overview of Solar Thermal Technologies](#) (PDF format only 296KB)
[Solar Parabolic Trough](#) (PDF format only 370KB)



Solar Thermal

CSP

Solar Thermal
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ABSTRACT

The objective of the Advanced Dish/Dish-Stirling solar power system (ADDSS) project is to demonstrate the remote power marketability of concentrating solar power systems such as water pumping plants and reliable unattended remote service requirements. The ADDSS will demonstrate the cost of alternatives to fossil fuel powerplants. The ADDSS is a test bed for early stage level testing to add value to the market. The ADDSS will demonstrate the basic design, reliability, and cost of the system at the system level, of basic design, reliability, and cost of the system at the system level, and the basic design, reliability, and cost of the system at the system level.

Solar Power Tower Design Basis Document

Revision D



Prepared by
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Prepared by
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Bids to 64 multi-megawatt inventory reported to General Coordinator,
a Lockheed Martin Company, for the United States Department of Energy
under contract DE-R004-B04-08899.

Approved for public release; further dissemination unlimited.

Research and Development Advances in

Developing Solar Power

Commercialization of Concentrating Solar Power (CSP), also known as 354 MW of commercial grid-connected solar power. Continuing Program and industry have made CSP the lowest cost solar power source and outlined the R&D path to full competitiveness of CSP

Power

ing recognition of environmental
stability, ability to deliver power
in the near-term, concentrating solar
power future.



and success of Sandia National Laboratories' concentrated and reflected optical concentrator structures, plans for all CSP technologies, commercialization, R&D over the next decade. With
nationally and internationally:

to enter the market in an
increased and energy
of compete without subsidies
by the SEGS operators
O&M procedures, reduced
at overall O&M costs were
coupled with design
for, which testing has
without increasing costs. In
validated with large-scale
Two increased annual
cost and improving durability
mirror technology, and sys-
20% improvement in system
material for better durability.

ply demonstrated the fitness
over time research has
in, completely eliminating
others. Likewise, the focus
converters, and controls,
heat pipe receivers,
to eliminate key potential

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Operating Agent
Gregory J. Kolb
Michael Geyer
Manuel Romero
er Systems

per year rapidly, using

solar systems in the world. They pro-
support, distributed and remote applica-
tions. Small between 10 and
25 kW per disk, systems can be deployed individually for water pumping or
village power applications or grouped to form megawatt-scale power plants.

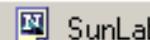
NREL



Bookmarks



Location: http://www.energylan.sandia.gov/sunlabint/index.cfm



SunLab



SunLab Int



Photo Database



SolarPACES



PVWeather



Weather



ftp.sandia



Virtually There



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Concentrating Solar Power Program

Activity Tracking System

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View

- Activities
- Milestones
- Contracts
- Reports

Input

(Password Required)

Administrative Use

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Send comments to callen@techreps.com





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Activities Milestones

CSP Program

For detailed information on an activity, click on the WBS Number.

Display activities ranging from Priority 1- [Change](#)

Display activities for Fiscal Year: [Change Year](#)

[Glossary](#)

WBS	Priority	Brief Activity Title	Responsible Staff/ Lead Lab.
Path 1: Distributed Power			
1.1.1	1	SAIC/STM O&M and Engineering Development	Mark Mehos, NREL
1.1.2	1	Boeing/SES DECC: Phase 2	Thomas Mancini, SNL
1.1.3	4	Nevada Project Planning	Thomas Mancini, SNL
1.2.1	1	Advanced Dish Development System	Richard Diver, SNL
1.2.2	3	Indian liaison and training	Richard Diver, SNL
1.3.1	1	Reliability Improvement	Mark Mehos, NREL
1.4.1	4	Small Dish Systems	Mark Mehos, NREL
1.4.2	4	CPV Technical	Allan Lewandowski

Bookmarks Location: http://www.energylan.sandia.gov/sunlabint/view/activities/activity_ea.cfm?ActivityID=43

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Sun•Lab **Activity Tracking System**

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Activities	Milestones	Contracts	Reports
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Activity WBS 1.1.1.

[Glossary](#)

Responsible Staff:	Mark Mehos, NREL	Alternate:	Thomas Mancini, SNL
Lead Lab Organization:	NREL	Priority:	1
Fiscal Year:	FY01		
Brief Activity Title:	SAIC/STM O&M and Engineering Development		
Activity Title:	SAIC/STM O&M and Engineering Development		
Key Activity:	Grid Reliability Systems		
Path:	1 - Distributed Power System Development		
Background:	<p>In FY00, NREL let a two-phase subcontract to SAIC/STM with the following objectives:</p> <ul style="list-style-type: none"> - Achieve 200 hours of autonomous operation for each system without incident - Achieve 90% system availability for all three systems (70% for a single system by mid-year), and - Collect reliability and O&M cost and performance data for input to SunLab dish/engine reliability database. <p>As of the end of July, SAIC has achieved 2187 hours of on-sun solar operation on all three; achieved hybrid operation on all three systems (25 kW demonstrated on APS West); demonstrated low emissions while operating on hybrid; and improved availability over prior years</p>		
Objectives:	<p>FY01 Objectives</p> <ul style="list-style-type: none"> - Achieve 90% system availability (as measured over a single, continuous four-week period) for a solar-only Golden-based system - If successful (90% availability of Golden-based system), install one solar-only system in Nevada - Continue O&M of the SRP-based hybrid dish/Stirling system 		

 **SunLab**
CSP ATS Home

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CSP Program

Each column can be sorted by milestone number (MS No.), edit.

For more detailed information on a milestone, click on the m

Display milestones ranging from Priority 1-

Display contracts for Fiscal Year: [Change Ye](#)

Glossary

MS No.	Priority	Milestone Title	Responsible Staff
1.1.1.a	3	Issue RFP for FY01 activities	Mark Mehos, NREL
1.1.1.b	3	Award subcontract for SAIC O&M and engineering development	Mark Mehos, NREL
1.1.1.c	1	Achieve 90% availability of Golden-based solar-only dish/Stirling system	Mark Mehos, NREL
1.1.1.d	3	Complete installation of SAIC dish at Nevada Test Site	Mark Mehos, NREL
1.1.2.a	1	Place Phase 2	Thomas

Bookmarks Location: http://www.energylan.sandia.gov/sunlabint/view/milestones/view_milestone.cfm?wBS=1.2.1&mslID=11

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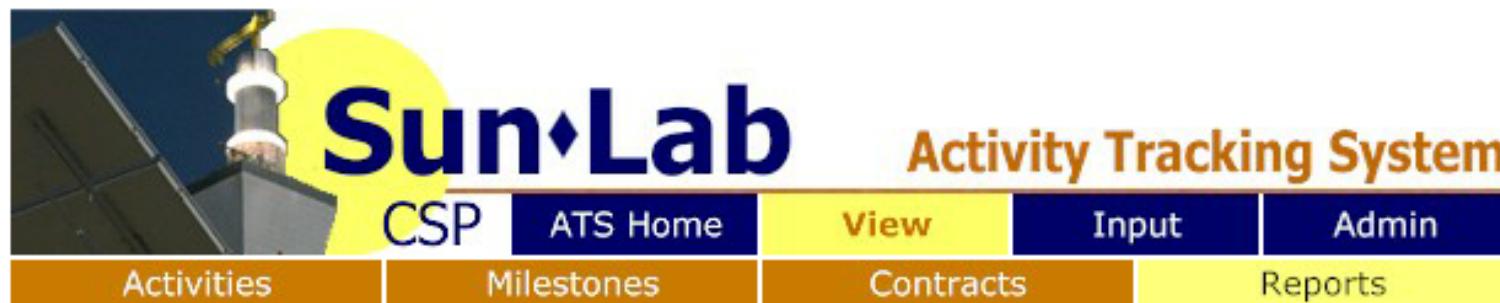
Activities Milestones Contracts Reports

Milestone 1.2.1.c

Glossary

Last Edit:	10-23-01	Edited by:	Richard Diver
Title:	Improve system efficiency to over 20% (net) peak	Priority:	5 (1 = critical)
Due Date:	Jun-2001	Status:	Completed
Responsible Staff:	Richard Diver, SNL	Alternate:	No Alternate
HQ Contact:	Rueckert		
Contractor:			
Detailed Status:	On August 2, 2001 during a 10-minute period near solar noon the Mod 1 system converted over 20% of the direct normal insolation incident on the mirrors to net electricity into the grid. This benchmark includes all parasitic power required to operate the system, including pumps, drives, fans, controls, and data acquisition and is normalized for ambient temperature. Although demonstration of 20% net system efficiency has been a goal of the ADDS project, our planned primary approach has been to substitute hydrogen for the helium engine working fluid. (Power and efficiency are typically 15% higher with hydrogen compared to helium.) Unfortunately, the internal bottle in the SOLO 161 Stirling engine was determined to be incompatible with hydrogen and it has taken more time than expected to find a safe alternative. To meet the 20% objective, our approach has been to "tweak" performance improvements on several fronts. Improvements in concentrator and engine controls, mirror alignment, receiver cavity design, and a new regenerator all contributed. We currently have a suitable hydrogen bottle and fittings on order and hope to demonstrate even better system efficiency by September.		
Notes & Issues:	Milestone achieved even without conversion to H ₂ , which ultimately will allow even higher performance.		
1st Quarter Update:	Little progress on this milestone because of a shortage of personnel and technical issues.		
2nd Quarter Update:	A shortage of personnel and difficulties with other project caused resources to be diverted.		

In August:



Display reports for Fiscal Year:

Report Options:

CSP Budget Report

SMS Milestone

SMS Spend Plan

SMS Project

FY01 FY02

