

# **A Bibliography of Reports of the Sandia Solar Thermal Distributed Receiver Systems Project**

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A BIBLIOGRAPHY OF REPORTS OF THE  
SANDIA SOLAR THERMAL DISTRIBUTED  
RECEIVER SYSTEMS PROJECT

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## SOLAR THERMAL TECHNOLOGY FOREWORD

The research and development described in this document was conducted within the U.S. department of Energy's (DOE) Solar Thermal Technology Program. The goal of the Solar Thermal Technology Program is to advance the engineering and scientific understanding of solar thermal technology, and to establish the technology base from which private industry can develop solar thermal power production options for introduction into the competitive energy market.

Solar thermal technology concentrates solar radiation by means of tracking mirrors or lenses onto a receiver where the solar energy is absorbed as heat and converted into electricity or incorporated into products as process heat. The two primary solar thermal technologies, central receivers and distributed receivers, employ various point and line-focus optics to concentrate sunlight. Current central receiver systems use fields of heliostats (two-axis tracking mirrors) to focus the sun's radiant energy onto a single tower-mounted receiver. Parabolic dishes up to 17 meters in diameter track the sun in two axes and use mirrors or Fresnel lenses to focus radiant energy onto a receiver. Troughs and bowls are line-focus tracking reflectors that concentrate sunlight onto receiver tubes along their focal lines. Concentrating collector modules can be used alone or in a multi-module system. The concentrated radiant energy absorbed by the solar thermal receiver is transported to the conversion process by a circulating working fluid. Receiver temperatures range from 100°C in low-temperature troughs to over 1500°C in dish and central receiver systems.

The Solar Thermal Technology Program is directing efforts to advance and improve promising system concepts through the research and development of solar thermal materials, components, and subsystems, and the testing and performance evaluation of subsystems and systems. These efforts are carried out through the technical direction of DOE and its network of national laboratories who work with private industry. Together they have established a comprehensive, goal directed program to improve performance and provide technically proven options for eventual incorporation into the Nation's energy supply.

To be successful in contributing to an adequate national energy supply at reasonable cost, solar thermal energy must eventually be economically competitive with a variety of other energy sources. Components and system-level performance targets have been developed as quantitative program goals. The performance targets are used in planning research and development

activities, measuring progress, assessing alternative technology options, and making optimal component developments. These targets will be pursued vigorously to insure a successful program.

Sandia National Laboratories in Albuquerque manages the Distributed Receiver Technology and Applications Projects of the U.S. Department of Energy's Solar Thermal Technology Program. The project generally covers R&D on parabolic troughs and dishes. Technical information developed by these projects is disseminated through technical publications, workshops, presentations at technical meetings, and contractor reports. This document, which is a bibliography of solar thermal distributed receiver reports and publications by Sandia National Laboratories and its contractors is provided as a convenient reference for those interested in solar thermal technology.

Reports that have not been published in a journal or proceedings (i.e., those bearing SAND or ALO document numbers) are generally available from the National Technical Information Service (NTIS) in McLean, VA, or the U.S. Department of Energy Technical Information Center (TIC) in Oak Ridge, TN.

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