


Next-Generation Solar Collectors for CSP

3M COMPANY		
PROGRAM:	SunShot CSP R&D 2012	
TOPIC:	Advanced Collectors	
LOCATION:	St. Paul, Minnesota	
AWARD AMOUNT:	Up to \$4.9 million	
PROJECT TERM:	2012–2015	



3M is producing high-flux, lightweight reflectors with lightweight, high-precision panels combined with unique multilayer optical film technology. *Photo from 3M Company*

MOTIVATION

For concentrating solar power (CSP) to become a significant contributor to utility-scale baseload power, the industry must achieve dramatic cost reductions and performance increases. The aim of this project is to replace the heavy glass mirrors, which currently represent the most expensive component of a CSP system, with long-lasting reflective films supported by a lightweight, rigid structure.

PROJECT DESCRIPTION

3M is developing new solar collector base technologies for next-generation heliostats used in power tower systems. Specific project objectives include:

- Developing a new set of technology elements, including advanced reflective films, optically accurate reflector panels, low-cost space frames, adaptive optics, and accurate tracking drives
- Designing and building a large-format heliostat design with these new elements that is suitable for high and ultra-high concentrating power tower systems
- Installing and field testing the heliostat design at the National Solar Thermal Test Facility at Sandia National Laboratories.

CONTACTS

Project Leader:

Dr. Attila Molnar
aamolnar@mmm.com

Partnering Organizations:

- Gossamer Space Frames
- National Renewable Energy Laboratory
- Sandia National Laboratories

IMPACT

If successful, this project will result in a 50% reduction in solar field equipment cost and a 30% reduction in field installation cost compared to existing heliostat designs. In addition, a 15% improvement in optical efficiency over existing heliostat designs and a potential two-fold increase in solar flux density is possible.

For more information, visit the project page at: www.solar.energy.gov/sunshot/csp_sunshotrnd_3m.html.