

**UNIVERSITY OF CENTRAL FLORIDA**  
***Enhanced and Expanded Solar Thermal Test Capabilities***  
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**Description:** The Florida Solar Energy Center (FSEC) serves the State of Florida by providing independent, third-party testing and certification of solar equipment for the main purposes of providing product value in the marketplace, especially for products that are not widely “proven” with consumers such as solar water heating systems and solar electrical (photovoltaic) systems. Even more important, third-party certification provides protection to reputable manufacturers, ensuring that lower quality products, often from foreign markets, do not compete head-to-head with Florida and U.S. products unless they meet the same standards.

In addition, due to the resurgence of the solar industry, FSEC has received a significant increase in demand for solar collector and solar system testing and certification. This occurrence has resulted in requiring the Center to correspondingly amplify its capabilities to respond to the increased demand. This project has the objective of increasing FSEC’s solar thermal testing and certification activities by upgrading and expansion of testing and analysis equipment and software, integration of the solar collector and system laboratories, enhancing documentation and reporting methods and streamlining and devising more comprehensive client test and certification application documents.

**Budget:** \$809,295

**Universities:** UCF/FSEC

### **Progress Summary**

The enhanced and expanded solar thermal testing capabilities are close to completion and significant progress has been achieved. The project’s objective was to improve the capabilities and output of the thermal test facility by improving the testing equipment and procedures and by increasing the number of test platforms. This objective was achieved by the purchase of equipment and the setting up of data collection procedures. Accomplished during the past year are as follows.

Ten (10) major sub-tasks were identified to attain the objective. A brief sub-task summary is as follows.

1. Tasks that are completed:
  - Interim Test and Report for Certification – Provides a process that allows collectors to get to market quickly while maintaining consumer protection for quality.
  - Mobile Tracking Platform (MTP) Unit 2 Wind System – Provides wind source for collector testing to meet wind requirements on demand.
  - MTP Unit 1 Wind System – Provides wind source for collector testing to meet wind requirements on demand.
  - MTP Unit 1 Conversion to Dual Flow – Provides for test platform to have the capability to process the predominant collector type like the other platforms.
  - LabVIEW® based Collector Testing – Provides updated data logging automation for improved reliability and data transfer and automated testing for differential pressure testing, RTD calibration & flow calibration.
  - Sensor Improvement – Provides implement of new sensors and applications of sensors for more reliable and precise data measurement.



- MTP Unit 4 – capacity increase – Brings into production a new test platform that has all the improvements to date with respect to sensors, automation, and wind systems.
2. Tasks that were discontinued:
- MTP Unit 3 – The unit was to increase capacity, but 15 U. S. test facilities have come on-line in the last year. This fact has significantly reduced the industry demand for FSEC’s thermal test services, thus, the unit was not built.
  - Fixed Stand Configuration – This task was to provide a permanent or semi-permanent test platform to improve throughput by reducing the set up and take down time associated with mobile platforms. Demand has reduced need for configuration, thus, the unit was not built.
3. Remaining task:
- Finish the development of an information control system by creating application for storage and retrieval of test data in a database. The Test Application Data Analysis system provides a more efficient method for data review and generation of summary data related to the tests. Also under development is an information control system that allows customer and user access to determine material status and report on material testing with the ultimate goal of automatically generating the test reports and certifications. This task is approximately 50% completed.
  - The other sub-task of this project is the disassembly and moving of FSEC’s solar thermal system test facilities. The solar systems test facilities are located in FSEC’s fuel cell laboratory and for space and research needs, the systems test equipment is being moved to the newly enclosed Solar Systems Testing Facility. The Solar Systems Testing Facility is reported in a separate FESC project of the same name. For this equipment move, new storage tanks and test stands have been constructed, but the disassembly part of the old lab is not yet completed. The estimated indicator of completion of the move is 35%.

With the above equipment and new procedures in place, the measurable results are:

<u>Year</u>	<u>Test Rate</u>	<u>Report Rate</u>	<u>Certification Rate</u>
2008 (before project)	4 collectors/year	4 reports/year	4 per year
2009	14 collectors/year*	22 reports/year*	-
2010	27 collectors/year*	20 reports/year*	195 per year †

\* These rates include the interim test and report category which allows collectors to get to market prior to performance testing while still protecting the consumer from poor quality product. For 2010 the rate is based on number of units through end of September projected for the year.

† The certification rate was actually the number of certification for FY2010. Thus the absence of data in year 2009. The rate is expected to increase as the information control system is implemented.

**Industry Support:**

This task will be strongly supported by the solar thermal manufacturers, who must have certification (FSEC within Florida, and FSEC-contracted SRCC nationwide) to effectively sell their products and qualify those products for various state and federal incentives and rebates. The Solar Rating and Certification Corporation (SRCC) currently contracts with FSEC for \$500,000 of annual work in testing and certification.

