



March 2009

Report No. 09-17

Florida Solar Energy Center Conducts Research and Development; Legislature Could Direct Fee Increases and Drop Certification Requirement

at a glance

The Florida Solar Energy Center is a research institute of the University of Central Florida that conducts research on solar and other alternative energy technologies; provides continuing education programs for teachers, students, and industry; and certifies the performance of solar energy systems manufactured or sold in the state. The center also certifies solar energy systems for manufacturers throughout the nation through a contract with the Solar Rating and Certification Corporation, a private nonprofit industry organization funded by the U.S. Department of Energy and the industry to develop national standards for solar thermal systems.

The center has a two-year backlog in testing and certifying solar systems, which adversely affects both manufacturers and citizens. The center's current testing and certification fees also recover only 30% of its costs, thus requiring a state subsidy of \$256,255. The Legislature could direct the center to charge sufficient fees to eliminate the backlog and state subsidy; alternatively, the Legislature could eliminate the state certification requirement.

Scope

As directed by the Legislature, this report reviews the Florida Solar Energy Center's activities. This report addresses two questions.

- What are the Florida Solar Energy Center's major activities?
- How well is the center performing in testing and certifying solar energy systems?

Background

The Florida Solar Energy Center is an energy research institute of the University of Central Florida that was created by the Legislature in 1976. The center's mission is to research and develop energy technologies that enhance Florida's and the nation's economy and environment, and to educate students, practitioners, and the public on the results of this research.

The center's campus, which is located in the City of Cocoa, includes laboratories, testing facilities, and buildings that are used to demonstrate alternative energy and energy saving technologies. In Fiscal Year 2007-08, the center's reported expenditures were \$13.6 million, and it employed 146 researchers and administrators.

As shown in Exhibit 1, its funding sources included contracts and grants (62%); state Education and General funds allocated to the center by the University of Central Florida (28%); and other sources including fees charged for certifying and testing solar energy systems, fees from workshops and training, and fees from software sales.

Exhibit 1

The Florida Solar Energy Center Was Funded Primarily by Contracts and Grants in Fiscal Year 2007-08

Source of Funds	Amount (in Millions)	Percentage of Total
Contracts and Grants	\$ 8.4	62%
State Appropriations ¹	3.8	28%
Other	1.4	10%
Total	\$13.6	100%

¹ Allocation of Education and General funds from the University of Central Florida.

Source: Florida Solar Energy Center.

Questions and Answers —

Question 1: What are the Florida Solar Energy Center's major activities?

As shown in Exhibit 2, the Florida Solar Energy Center's major activities can be grouped into four categories: energy research and development; education and outreach; testing and certifying solar energy systems; and technical assistance.

Exhibit 2

The Florida Solar Energy Center's Major Activity in Fiscal Year 2007-08 Was Research and Development

Major Activities	Expenditure (in Millions)	Percentage of Total
Research and Development	\$ 6.8	50.0%
Education and Outreach	2.2	16.2%
Testing and Certification	0.7	5.1%
Technical Assistance ¹	2.7	19.9%
Support Activities		
Facilities Support	0.6	4.4%
General Administration	0.6	4.4%
Total	\$13.6	100%

¹ Amounts include both direct and indirect testing and certification costs.

Source: Florida Solar Energy Center.

The center's energy research and development activities primarily involve developing and testing solar energy technologies, alternative fuels such as hydrogen, and technologies for improving building energy efficiency. As shown in Exhibit 3, the majority of the center's reported expenditures during Fiscal Year 2007-08 supported research projects on developing alternative fuels and improving building efficiency. A minority (12%) of the center's basic and applied research expenditures during this period focused on solar energy technologies.

Exhibit 3

Most Research Expenditures in Fiscal Year 2007-08 Were for Alternative Fuels and Building Efficiency¹

Research Area	Basic Research (in Millions)	Applied Research (in Millions)	Total (in Millions)	
Alternative fuels	\$0.48	\$2.55	\$3.03	44%
Building efficiency		2.50	2.50	37%
Solar	0.19	0.64	0.83	12%
Other	0.16	0.31	0.47	7%
Total	\$0.83	\$6.00	\$6.83	

¹ This exhibit does not include the center's expenditures for technical assistance and other non-research activities that were funded by contracts and grants.

Source: Florida Solar Energy Center.

The center has received 66 patents for new technologies its researchers have developed since the center's creation in 1976. The University of Central Florida's Office of Research and Commercialization has licensed 10 of these technologies to private companies, and received \$111,968 in royalties from four companies that used the licensed technologies in Fiscal Year 2007-08.

The center's education and outreach activities provide information on alternative energy technologies and energy saving methods to stakeholders.

The center provides information to the K-12 educational system through teacher professional development workshops. During the last three years, the center reports that 522 teachers participated in these workshops. The center also operates a U.S. Department of Energy-sponsored demonstration program in three Florida counties (Brevard, Orange, and Seminole counties) that allows students to monitor their schools' energy use.

- The center provides information to the state's building and manufactured home industries by participating in industry conferences to demonstrate energy efficient building technologies. It also trains builders and local government building code enforcement officials on changes to the energy sections of the state's building codes. According to the center, it conducted 197 continuing education programs for 2,820 participants during the last three years.
- The center conducts training for Florida's solar energy industry workers. It reports that it trained almost 600 builders and their employees in how to install solar thermal water heaters and photovoltaic products over the last three years. Additionally, the center is serving as the lead organization in the Alternative Energy Employ Florida Banner Center created by Workforce Florida, Inc. The center was created to train workers in the skills needed by the state's alternative energy industries. This training will be offered at Broward Community College, Brevard Community College, Tallahassee Community College, and Westside Technical High School in Orlando.

The center also provides information to the general public on alternative energy technologies through its website, www.fsec.ucf.edu/en. This website has information on improving building energy efficiency and solar and alternative energy technologies.

The center's solar energy testing and certification activities are conducted on behalf of the state and a national solar rating and certification corporation. Section 377.705, *Florida Statutes*, requires the center to develop standards for solar energy systems manufactured or sold in Florida and to certify that these systems meet these standards.

The center also tests and certifies solar energy systems for manufacturers throughout the nation through a contract with the Solar Rating and Certification Corporation, a private nonprofit organization partially funded by the U.S. Department of Energy and the industry to develop national standards for solar thermal systems. Purchasers of solar thermal systems can qualify for federal tax credits if the systems are certified by the Solar Rating and Certification Corporation.

Florida and corporation standards for solar thermal energy systems are similar, and the center uses the same laboratory facilities to test systems manufactured or sold in Florida and systems whose manufacturers are seeking certification by the corporation. In Fiscal Year 2007-08, the center reports that it certified 12 solar systems to Florida standards and 80 solar systems to national standards. During the same period, it tested 8 solar collectors and certified 13 additional collectors based on previous test results; all 21 of the collectors were certified for use in Florida.^{1,2}

The center's technical assistance services include providing advice and assistance in designing energy systems and buildings and developing energy codes and standards.

¹ Solar collectors are the part of a solar system that gathers the sun's energy and transforms its radiation into heat, then transfers that heat to water.

² Section 377.705, *F.S.*, allows the center to certify solar energy systems based on test results of other organizations using the center's standards. The center also certifies previously tested collectors if the size of the collector changes.

Question 2: How well is the center performing in testing and certifying solar energy systems?

The Florida Solar Energy Center faces two challenges in testing and certifying solar energy systems—it has a long testing backlog, which negatively affects businesses seeking to sell these systems; and fees charged to manufacturers for this activity cover only 30% of its reported costs, with state funds making up most of the shortfall. The Legislature should determine whether it wishes to eliminate the requirement that solar energy systems sold or manufactured in Florida be certified by the center.

Section 377.705, *Florida Statutes*, requires the center to maintain the capabilities to test or evaluate the performance of solar energy systems manufactured or sold in Florida. The center also tests solar energy systems for manufacturers seeking national certification. Center staff reports that the testing process is extensive and that it takes an average of 227 days to complete tests on a system. For example, in order to determine if a system meets durability standards, the center exposes the system to varying weather conditions over time.

As manufacturers cannot legally sell solar energy systems that have not been certified, it is important that this testing occur in a timely manner. However, center administrators report that the center currently has a backlog of 32 testing requests that they estimated would take two years to eliminate. This backlog adversely affects both the businesses that cannot legally market their products in Florida as well as consumers who are restricted to purchasing systems that have finished the lengthy testing and certification process.

Center managers report that a key factor contributing to the backlog is that staff manually performs certain data collection tasks such as recording the results of pressure tests to identify leaks. Center administrators contend that automating these tasks and implementing other process improvements would reduce the amount of time taken to test solar systems. However, the center has not developed cost estimates for the

equipment and personnel needed to reduce the time taken to complete testing activities.

The second challenge facing the center in this area is that it does not charge sufficient fees to cover its costs for conducting testing and certification activities. Florida law authorizes the center to set fees at a level to fully cover its costs. However, as shown in Exhibit 4, the fees charged to manufacturers only covered 30% of the center's reported testing and certification expenditures in Fiscal Year 2007-08. The center covered its remaining costs with state Education and General university funds allocated to the center by the University of Central Florida (which paid 69% of reported costs).³ Thus, Florida taxpayers largely funded the testing and certification costs of manufacturers who wish to sell their products in Florida as well as throughout the country.

Exhibit 4
Manufacturers' Fees Covered 30% of the Center's Direct Costs for Testing and Certification in Fiscal Year 2007-08¹

Funding Sources	Testing and Certification Expenditures	Percentage of Total
Fees	\$ 111,714	30%
State funds	256,255	69%
Other	310	<1%
Total	\$368,279	100%

¹ These figures do not include the center's estimated annual cost of \$175,000 for updating and maintaining Florida's certification standards.

Source: Florida Solar Energy Center.

The Legislature could consider three options for addressing these challenges. First, it could direct the center to submit a plan that specifies strategies, timeframes, and costs for eliminating its testing backlog to the University of Central Florida and the Florida Board of Governors. Second, the Legislature could direct the center to increase its fees to a level that would eliminate the

³ Manufacturers that seek national certification of their products from the Solar Rating and Certification Corporation pay fees to the center for conducting the tests. The corporation contracts with the center to oversee the development of national standards and provide administrative services to the corporation. The corporation's contract also provides funding that helps cover some of the center's costs for testing and certification, such as the salaries of technicians.

need to subsidize its testing and certification activities with state funds, producing an annual savings of \$256,255. This would be consistent with the Legislature's intent that the fees charged for performing a regulatory service cover the direct and indirect costs of the service.⁴ Third, the Legislature could eliminate the requirement that solar systems be certified against Florida-specific standards. If this requirement was eliminated, the center could either discontinue its testing and certification activities or perform only national certification testing on behalf of the Solar Rating and Certification Corporation as a contracted testing laboratory so long as it increased its fees so that manufacturers and the corporation pay the full cost of the activities.

Agency Response ---

In accordance with the provisions of s. 11.51(5), *Florida Statutes*, a draft of our report was submitted to the Board of Governors of the State University System to review and respond.

Written responses to this report were submitted by the Board of Governors and the University of Central Florida. Both responses have been reproduced in their entirety in Appendix A.

⁴ Section 216.0236, *F.S.*

Appendix A



FLORIDA BOARD OF GOVERNORS

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(850) 245-0466 – www.flbog.edu

March 11, 2009

Gary R. VanLandingham, Ph.D., Director
Office of Program Policy Analysis
And Government Accountability (OPPAGA)
Claude Pepper Building, Room 312
111 West Madison Street
Tallahassee, Florida 32399

Dear Dr. VanLandingham:

Thank you for the opportunity to review the draft report, "Florida Solar Energy Center Conducts Research and Development; Legislature Could Direct Fee Increases and Drop Certification Requirement." As the report mentions, the Florida Solar Energy Center (FSEC) was created in 1976, and among its responsibilities is certifying the performance of solar energy systems manufactured or sold in Florida. In addition, the Center engages in alternative energy research and development activities, which make it an asset to the State University System, the State of Florida, and the nation.

We agree that the issues of fee structuring and expediting testing and certification are areas on which the University of Central Florida will want to focus as it works to continually improve FSEC. Board of Governors staff recommend a combination of Options One and Two, as suggested by your report—i.e., that the University of Central Florida prepare a plan which specifies strategies, timeframes, and costs for eliminating its testing backlog; and, second, that the Center consider increasing its fees to a level which would eliminate the need to subsidize its testing activities with state funds.

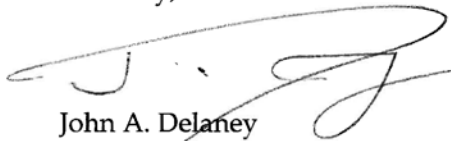
University of Florida • Florida State University • Florida A & M University • University of South Florida • Florida Atlantic University • University of West Florida
Gainesville Tallahassee Tallahassee Tampa Boca Raton Pensacola

University of Central Florida • Florida International University • University of North Florida • Florida Gulf Coast University • New College of Florida
Orlando Miami Jacksonville Fort Myers Sarasota

Gary R. VanLandingham
March 11, 2009
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We will continue to monitor the Florida Solar Energy Center for improvement. If you have any questions regarding the above information, please feel free to contact Dr. R. E. LeMon at re.lemon@flbog.edu or by telephone at (850) 245-0466. Thank you once again for the opportunity to review this report.

Sincerely,



John A. Delaney
President in Residence

c: President John Hitt, University of Central Florida
Vice President M.J. Soileau, University of Central Florida



Office of the Vice President for Research & Commercialization

March 10, 2009

Gary VanLandingham, Ph.D., Director
Office of Program Policy Analysis and Government Accountability
Claude Pepper Building, Room 312
111 W. Madison Street
Tallahassee, FL 23299-1475

Dear Dr. VanLandingham:

Attached is the final OPPAGA draft report regarding FSEC and our response. Thank you and the OPPAGA staff for all your help and effort in ensuring the accuracy of the OPPAGA FSEC report.

Sincerely,

A handwritten signature in blue ink, appearing to read "M.L. Soileau".

M.L. Soileau
Vice President for Research & Commercialization

attachments: OPPAGA draft report
response

DRAFT SUS Response to

OPPAGA Draft Report (No. 09-xx) on the Florida Solar Energy Center

March 9, 2009

The University of Central Florida believes that independent, third-party testing and certification has extensive 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. Independent, third-party certification provides not only protection for consumers, but also much needed consumer confidence. 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. For example, we have recently seen significant and dangerous quality problems with a series of Chinese products, including children’s toys, dog food, baby milk products and, most recently, construction drywall.

To be eligible for federal tax credit authorized in the 2005 Energy Policy Act for solar thermal systems, the consumer must purchase a solar thermal system certified by the Solar Rating and Certification Corporation (SRCC) or FSEC. Since this federal tax credit has been extended through 2016, solar thermal testing and certification will continue to be required. While SRCC or FSEC may accept test results from other testing laboratories for certification, today, FSEC is the only accredited solar thermal testing laboratory in the U.S.

For these reasons, UCF believes that the best way to move forward is by adopting the first option presented in the fourth paragraph on page 4 of the OPPAGA report – “direct the center to submit a plan that specifies strategies, timeframes and costs for eliminating its testing backlog to UCF and the Florida Board of Governors.”

The University has directed FSEC to take the following actions:

- Effective immediately, revise the fee schedule for collector testing and collector and system certification to recover all testing and certification costs
- Effective immediately, provide priority service to Florida manufacturers first and non-Florida U.S. manufacturers second in all efforts to overcome the backlog in the testing and certification process
- Develop and submit a solar testing and certification plan to UCF that will, within six months time, increase FSEC’s collector testing capacity to handle the surge in demand and the expected continued demand for solar thermal hot water systems. Capacity will move from the current 10 collectors per year to 40 collectors per year.
- Pursue with all deliberate speed another collector certification mechanism that ensures collector durability and quality but allows *time-limited provisional collector performance ratings* such that new collectors and systems can enter the marketplace within 3 months of application.

The FSEC testing and certification plan shall be designed to reduce certification time through improved data acquisition capabilities, acquisition of additional test stands, automated reporting and the consideration of a new, time-limited provisional collector performance rating.

FSEC's backlog for Florida certifications shall be reduced by increasing its testing and certification capacity and by providing preference to Florida and U.S. manufactures. The current backlog of Florida testing and certification requests is as follows:

Manufacturer Class	Awaiting Collector Testing	Awaiting Collector Certification	Awaiting System Certification
Florida	0	28	0
Non-Florida U.S.	17	3	0
Foreign	21	0	5

The increased capacity will allow FSEC to finish the testing and certification of the above collectors and systems by the following time frame:

Manufacturer Class	Collector Testing Backlog	Collector Cert. Backlog	System Cert. Backlog
Florida		1 month	
Non-Florida U.S.	9 months	2 months	
Foreign	16 months		2 months

While a testing capacity of 40 collectors per year would meet the current anticipated demand, the backlog could be reduced faster if funding was provided to increase the staffing and number of test stands.

There are two types of collector tests: durability tests and performance tests. The proposed provisional collector rating would apply only to the performance portion of collector testing. Collector durability and quality tests would still be required. The provisional collector rating would be based on historical test data for similar collectors. FSEC estimates that such a provisional certification could be accomplished in 90 days.

As part of the effort to improve testing throughput, FSEC staff will conduct research to develop accelerated testing methods. The staff will also work toward development of accelerated state, national and international solar thermal testing and certification standards.

The Florida Legislature

Office of Program Policy Analysis and Government Accountability



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Gary R. VanLandingham, Ph.D., OPPAGA Director