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March 27, 1997

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970391-EG

By Hand Delivery

Blanca S. Bayó, Director
Records and Reporting
Florida Public Service Commission
4075 Esplanade Way, Room 110
Tallahassee, Florida 32399-0850

**Re: Petition of Florida Power & Light Company
to Terminate its Residential Solar Water Heating
Research Project and Approve the C/I Solar
Desiccant Research Project**

Dear Ms. Bayó:

Enclosed for filing on behalf of Florida Power & Light Company are the original and fifteen (15) copies of Petition of Florida Power & Light Company to Terminate its Residential Solar Water Heating Research Project and Approve the Commercial/Industrial Solar Desiccant Research Project. Also enclosed is an additional copy of the Petition, which I request you stamp as filed and returned to our runner.

- ACK _____
- AFA _____
- APP _____
- CAF _____
- CMU _____
- CTR _____
- EAG _____
- LEG _____
- LIN _____
- OPC _____
- RCH _____
- SEC _____
- WAS _____
- YTH _____

If you or your Staff have any questions regarding this filing, please contact me at 222-2300

Very truly yours,

Charles A. Guyton
Attorney for Florida Power &
Light Company

CAG/ld
enc.

RECEIVED & FILED

FPSC-BUREAU OF RECORDS

Miami
305.577.7000
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DOCUMENT NUMBER-DATE

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Caracas
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582.950. RECORDS/REPORTING

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition to Terminate)	Docket No.
Florida Power & Light Company's)	
Residential Solar Water Heating)	
Research Project and Approve the)	
Commercial/Industrial Solar)	Filed: March , 1997
Desiccant Research Project)	

**FLORIDA POWER & LIGHT COMPANY'S PETITION TO
TERMINATE ITS RESIDENTIAL SOLAR WATER HEATING
RESEARCH PROJECT AND APPROVE THE COMMERCIAL/INDUSTRIAL
SOLAR DESICCANT RESEARCH PROJECT**

Florida Power & Light Company ("FPL"), pursuant to Section 366.82, Florida Statutes (1995), hereby petitions the Florida Public Service Commission ("Commission") (1) to terminate FPL's Residential Solar Water Heating Research Project and remove the Project from FPL's DSM Plan, and (2) contingent upon Commission's termination of the Residential Solar Water Heating Research Project, approve FPL's Commercial/Industrial Solar Desiccant Research Project, include the Project in FPL's DSM Plan, and approve recovery of the Project's reasonable and prudent expenditures in FPL's Energy Conservation Cost Recovery ("ECCR") clause. In support of this petition FPL states:

1. FPL's address is 9250 West Flagler Street, Miami, Florida 33174. Correspondence, notices, orders, motions and other documents concerning this proceeding should be sent to:

Charles A. Guyton
Steel Hector & Davis LLP
Suite 601
215 S. Monroe St.,
Tallahassee, Florida 32301

William G. Walker
Vice President, Regulatory Affairs
Florida Power & Light Company
9250 West Flagler Street
Miami, Florida 33174

2. FPL is an investor-owned electric utility regulated by the Commission pursuant to Chapter 366, Florida Statutes. FPL is subject to the Florida Energy Efficiency Conservation Act ("FEECA") Sections 366.80-.85, 413.519, Florida Statutes (1995), and its ECCR clause is subject to the Commission's jurisdiction. FPL has Commission approved conservation goals. See, Order No. PSC-94-1313-FOF-EG issued on October 25, 1994. The Commission has previously approved a FPL DSM Plan to meet the goals approved for FPL. See, Order Nos. PSC-95-0691-FOF-EG, PSC-95-1343-S-EG, and PSC-95-1343A-S-EG. As part of that DSM Plan the Commission approved FPL's Residential Solar Water Heating Research Project and authorized recovery of the costs of the Project through FPL's ECCR clause. FPL has a substantial interest in whether this project is terminated as Requested by FPL in this Petition, and whether FPL's Commercial/Industrial Solar Desiccant Research Project is approved as part of FPL's DSM Plan and authorized for cost recovery.

FPL's Residential Solar Water Heating Research Project

3. Prior to the Commission's approval of FPL's DSM Plan in November 1995, FPL had a Conservation Water Heating Program approved by the Commission as a DSM program. In FPL's 1995 DSM Plan filing, FPL revised the Conservation Water Heating Program. The program was renamed the Residential Heat Recovery Water Heating Program, with heat recovery units being offered with revised incentives. The portion of the Conservation Water Heating Program which offered incentives to support the installation of residential solar water heaters was modified and proposed as the Residential Solar Water Heating Research Project.

4. The Residential Solar Water Heating Research Project was proposed to "evaluate solar water heating technology and equipment improvements, their application and installation, and their

customer acceptance, and whether specific customer segments are more likely to benefit from the application of the technology." The total cost of the research project was estimated to be \$789,200. To perform this research FPL proposed three stages of research: (1) establishment of research parameters (\$16,500), (2) site testing of a number, not to exceed 100, of solar water heating installations on single family, detached homes in FPL's service territory (\$692,700), and (3) market segmentation research (\$80,000).

5. The research conducted in stage 1 of the Residential Solar Water Heating Research Project has led FPL to conclude that continuation of the Research Project would be wasteful and unproductive. As noted in the original project description, solar water heating technologies have experienced acceptability problems as a result of high initial costs and fewer savings than anticipated, resulting in longer, if nonexistant, payback periods. Those circumstances continue, and with the intervening decline in FPL avoided costs, the result has been smaller demand reductions per installation, and declining benefit/cost ratios. As also pointed out in FPL's original project description, residential solar water heating measures were not cost-effective under any Commission approved test, and since then their lack of cost-effectiveness has increased.

6. Through December 31, 1996, FPL had spent only \$ 12,168 on the Residential Solar Water Heating Research Project. By discontinuing the Project, FPL could save customers over \$750,000, which would otherwise be spent and wasted, for it is clearly apparent that there is no residential solar water heating technology which will prove cost-effective on FPL's system given current system avoided costs.

FPL's Proposed Commercial/Industrial Solar Desiccant Research Project

7. While residential solar water heating technologies hold no promise of a cost-effective application on FPL's system, solar desiccant technology for Commercial/Industrial applications does hold promise. The particular solar desiccant technology FPL desires to research in this project is a solar desiccant cooling system. A desiccant cooling system operates by first dehumidifying the intake air through contact with a desiccant material. The desiccant material must be heated to remove moisture, and in this particular application solar thermal flat plate collectors, such as those used for solar hot water heaters, are used to heat the desiccant. This dehumidification increases the efficiency of the remainder of the cooling process. After the solar desiccant dehumidification, currently available cooling systems (vapor compression) are used to cool the air. This hybrid system holds promise as an effective and efficient cooling system.

8. To investigate the potential of Commercial/Industrial solar desiccant applications on FPL's system, FPL proposes the Commercial/Industrial Solar Desiccant Research Project. The Project would potentially consist of three steps. The first step is a feasibility study to determine the feasibility of solar desiccant technology on FPL's system. Although FPL has reserved the right to decide upon the final design of the feasibility study, FPL will present the design of the feasibility to the Legal Environmental Assistance Foundation, Inc. ("LEAF") and solicit its comments regarding the feasibility study. The second step, which would be conducted only if the feasibility study demonstrated that the solar desiccant technology was feasible as a commercial/industrial application, would be a laboratory test of the technology. The third step, which would be conducted only if the feasibility study and the lab test show that the solar desiccant technology is promising, would be a

field test where the technology would be installed within FPL's service territory. The Commercial/Industrial Solar Desiccant Research Project is described in further detail in Appendix A.

9. FPL estimates that the total time to conduct the Commercial/Industrial Solar Desiccant Research Project will be twenty four (24) months after Commission approval. FPL estimates the total cost will not exceed \$106,000. A more detailed estimate of project costs and schedule are included in Appendix A.

10. Essentially, FPL seeks to substitute the Commercial/Industrial Solar Desiccant Research Project for FPL's Residential Solar Water Heating Research Project. FPL believes that the Commercial/Industrial Solar Desiccant Research Project holds more promise of finding a viable and feasible solar DSM application than the Residential Solar Water Heating Research Project. If the former project is terminated and the later project is approved, there is a much better prospect of a viable solar technology emerging; in addition, FPL customers will save money by avoiding a wasteful expenditure on a solar water heating technology which FPL is confident cannot be found to be cost-effective and by substituting a less costly solar research project.

11. FPL's request for approval of the Commercial/Industrial Solar Desiccant Research Project is contingent upon the Commission's approval of the termination of the Residential Solar Water Heating Research Project. FPL does not seek to conduct both research efforts. FPL respectfully suggests that research dollars for renewable solar technologies are better spent on the more promising research effort involving solar desiccant technology. In the event that the Commission does not terminate the Residential Solar Water Heating Research Project, FPL will not proceed with the Commercial/Industrial Solar Desiccant Research Project.

12. FPL has been authorized by LEAF to represent that it supports FPL's request for approval of the Commercial/Industrial Solar Desiccant Research Project and does not object to FPL's request to terminate the Residential Solar Water Heating Research Project. FPL is not aware of any disputed issues of material facts.

WHEREFORE, FPL respectfully requests that the Commission authorize FPL (1) to discontinue its Residential Solar Water Heating Research Project and drop the Residential Solar Water Heating Research Project from FPL's DSM Plan, and (2) contingent upon termination of the Residential Solar Water Heating Research Project, approve FPL's Commercial/Industrial Solar Desiccant Research Project, include the Commercial/Industrial Solar Desiccant Research Project in FPL's DSM Plan, and approve the recovery of the reasonable and prudent expenditures for the Commercial/Industrial Research Project through FPL's ECCR clause.

Respectfully submitted,

Steel Hector & Davis LLP
Suite 601, 215 S. Monroe St.
Tallahassee, Florida 32301

Attorneys for Florida Power
& Light Company

By: 
Charles A. Guyton

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 27th day of March, 1997 a copy of the Florida Power & Light Company's Petition to Terminate its Residential Solar Water Heating Research Project and Approve The Commercial/Industrial Solar Desiccant Research Project was served upon the following people by First Class United States Mail or hand delivery(*):

Robert Elias, Esquire *
Division of Legal Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Jack Shreve, Esq.
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Assistance Foundation, Inc.
1115 North Gadsden Street
Tallahassee, Florida 32303

By: 
Charles A. Guyton

APPENDIX A

COMMERCIAL/INDUSTRIAL SOLAR DESICCANT RESEARCH PROJECT

I. Project Technology

The objective of the Commercial/Industrial Solar Desiccant Research Project is to determine the feasibility of, and if feasible, design, build, and measure the performance of, a solar assisted hybrid liquid desiccant air conditioning system. Desiccant cooling is an air conditioning technology that shows promise as a solar-based alternative to current systems. A desiccant cooling system operates by first dehumidifying the air through contact with a desiccant material, followed by cooling of the air. The desiccant material must be heated to remove moisture, and this heat may be supplied by solar thermal flat plate collectors such as those for solar hot water heaters. Hybrid desiccant cooling systems use currently available systems (vapor compression) to cool the dehumidified air, resulting in effective and efficient systems. Studies have shown that electrical energy savings of 60% can be achieved with hybrid desiccant cooling systems. One of the objectives of this research project is to establish the actual demand and energy contributions for this technology.

Common utilization of desiccant systems for air conditioning of commercial as well as residential buildings has not yet been realized. Although theoretical investigations of active solar desiccant cooling systems have been performed for many years, there has not been Florida solar desiccant research, and Florida specific data is desirable. Few full-scale systems have been constructed. It is recognized that full-scale hybrid desiccant systems must be demonstrated to show their feasibility, which will facilitate the introduction of this technology on the market.

II. Project Description

The project will consist of as many as three phases. Each phase builds on the prior phase. If, at the conclusion of a phase the solar desiccant technology is not shown to be feasible or promising, the project will stop, and the remaining phases will not be performed.

The first phase is to perform a study to determine the feasibility of the solar desiccant technology. Theoretical modeling of the performance and economics for applications such as a supermarket or restaurant will be conducted. The proposed work will show the feasibility of active solar cooling systems in general, and the solar hybrid desiccant systems in particular. FPL will present its feasibility study design to the Legal Environmental Assistance Foundation, Inc. for its review and comments, with FPL retaining the final design of the feasibility study.

The second phase would be a laboratory test of the technology. Through a laboratory test, the performance and cost of this system will be evaluated and compared to conventional vapor compression air conditioning systems.

The third phase would be a field test. The field test would demonstrate the cost-competitiveness of these systems and determine the attractiveness of this solar technology as an alternative to presently available air conditioning systems.

FPL will coordinate the research project. However, FPL anticipates contracting with a laboratory to design, build, and measure the performance of the solar assisted hybrid liquid desiccant air conditioning system.

If the research project shows acceptable demand and energy savings, and a permanent program can be designed cost-effectively, then a system-wide program may be developed and brought before the Commission for approval. If the results from the research project is not shown to be feasible or promising, the research project will be discontinued, and no further Energy Conservation Cost Recovery (ECCR) money would be spent on the project.

III. Project Schedule and Budget

FPL anticipates that the time to perform all three phases of the project would be for a period of least 18 to 24 months, outlined as follows:

Feasibility Study	7-9 Months
Laboratory Test	4-6 Months
Field Test	7-9 Months

The total cost for the solar desiccant research project is projected to be \$106,000. The cost will be recovered through the ECCR clause. The following is a breakdown of the cost:

	<u>Projected Costs</u>
Equipment	\$6,000
Supplies	\$14,000
Establish Research Parameters and Concepts	\$53,000
Determine Cost-effectiveness	<u>\$33,000</u>
Total Projected R&D Costs	\$106,000

IV. Cost-Effectiveness

Based on the outcome of the monitoring portion of the research project, the cost effectiveness of the potential solar desiccant technology would be determined using the Commission approved cost-effectiveness methodology. If the proposed technology can be shown to be cost-effective under the Participant and RIM tests, the results of research may be utilized for the development of a system-wide program and presented to the Commission for approval.

V. Project Monitoring and Analysis

Demand and energy impacts will be determined through monitoring. Monitoring devices will be installed during the field test. These monitoring devices will provide both energy, demand, and load shape data for the purpose of analyzing the cost-effectiveness of the solar desiccant technology.

A final report will be filed with the Commission within 90 days of the close of the research effort.