

PMC-EF2a

(2.01.02)

**U.S. DEPARTMENT OF ENERGY  
EERE PROJECT MANAGEMENT CENTER  
NEPA DETERMINATION**



RECIPIENT: University of South Florida

STATE: FL

**PROJECT TITLE :** Development and Demonstration of an Innovative Thermal Energy Storage System for Baseload Solar Power Generation

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0000104	DE-EE0003590	GFO-10-473	EE3590

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**

## Description:

- B3.6** Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).
- A9** Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

## Rational for determination:

The University of South Florida (USF) would demonstrate the feasibility of a thermal energy storage (TES) system made from phase change materials (PCM) to meet utility-scale base-load solar plant requirement economically. The location of the laboratory work would take place at the Clean Energy Research Center and Nanomaterials, and Nanomanufacturing Research Center laboratories at the USF in the Research Park (IDRB 121), and Engineering Building (ENG 019F) and Nanotech Building (NTA 105), Tampa, Florida. The project would be divided into three Phases:

**PHASE I: FEASIBILITY STUDY AND PRELIMINARY DESIGN**

- Task 1.0) Preparation of PCM pellets and coating
- Task 2.0) Characterization of PCM pellets
- Task 3.0) Testing of PCM pellets
- Task 4.0) Numerical analysis of PCM pellet
- Task 5.0) Project Management and Reporting

**PHASE I CRITICAL MILESTONE [GO/NO-GO DECISION]**

Coated pellets will be tested for their ability to perform at a minimum of 80% of the initial value of the latent heat storage over 50 cycles.

**PHASE II: ENGINEERING DESIGN**

- Task 6.0) Numerical modeling of the TES system
- Task 7.0) Experimental measurements of the TES system
- Task 8.0) System optimization for a power plant
- Task 9.0) Project Management and Reporting

**PHASE II CRITICAL MILESTONE [GO/NO-GO DECISION]**

1. Coated pellets will be tested to perform cyclically over 1000 cycles without physical and structural degradation.
2. Storage capacities and costs of the two concepts described in Task 6 will be compared and one concept will be selected to go forward to Phase III.

**PHASE III: PROTOTYPE BUILD, TEST AND EVALUATION**

- Task 10.0) Fabrication of system
- Task 11.0) Testing at USF Power Plant
- Task 12.0) Design of TES system with base load power generation
- Task 13.0) Project Management and Reporting

The USF claims that there would be no generation of air emissions associated with this proposal; no permits are needed for this proposal; all toxic waste and effluent is disposed of properly via third party contractor; a Safety Operating and Chemical Hygiene Plans (also in compliance with OSHA and industry standards) are in place. This project comprises of laboratory operations and actions to promote research and development of solar technology; therefore this project is categorized as CX A9 and B3.6.

**NEPA PROVISION**

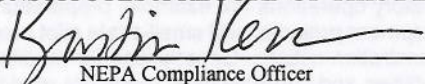
DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

None Given.

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature:  Date: 9/9/2010  
NEPA Compliance Officer

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Field Office Manager