

PMC-EF2a

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



(20102)

RECIPIENT: University of Oregon

STATE: OR

PROJECT TITLE : Novel Carbon(C)-Boron(B)-Nitrogen(N)-Containing H2 Storage Materials

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0000421	DE-EE0005658	GFO-0005658-001	0

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:

**A9 Information gathering, analysis, and dissemination**

Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)

**B3.6 Small-scale research and development, laboratory operations, and pilot projects**

Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

## Rational for determination:

The University of Oregon (UO) would utilize funding to support lab-scale research on novel carbon-boron-nitrogen (CBN) materials for hydrogen storage. The project would seek to develop a new class of chemical compounds that would potentially meet DOE's vehicular technical targets with the possibility of being applied to near-term market applications. Laboratory work would take place at facilities located on the UO campus in Eugene, Oregon and at Protonex (subrecipient) facilities located in Southborough, Massachusetts. Computational analysis support (no laboratory work) would be provided by the University of Alabama in Tuscaloosa, Alabama.

## Phase 1

1. Synthesis of Materials – Materials containing carbon, boron and nitrogen would be used to synthesize potential hydrogen storage media.
2. Experimental Characterization of the Proposed Materials – characterization of the CBN materials developed in Task 1.
3. Theory – computational analysis of prospective materials for synthesis.

## Phase 2

4. Scale Up Synthesis, Fuel Cell Testing – A selection of promising candidate materials would be scaled up and evaluated using a PEMFC (proton exchange membrane fuel cell) supplied by Protonex. Materials that test favorably for a storage medium would be scaled up to multi-gram quantities.
5. Project Management

Tasks 1 through 3 would continue throughout Phase 2 with a renewed focus on one or two of the most promising materials.

According to the R&D Laboratory Questionnaire for UO, there is a Chemical Hygiene Plan in place and chemical storage would be handled according to this plan. The chemicals would be disposed of by Environmental Health and Safety personnel at UO. Toxic and/or flammable materials would be handled within exhausted enclosures. Safety and fire equipment, as well as a trained staff are available. The laboratory would collect and store waste according to RCRA regulations governing Large Quantity Generators. Gaseous materials (mostly small amounts of organic solvent vapors) would be expelled through laboratory fume hoods. Quantities would be kept below emission standards. Any liquid effluent generated from the project would be from a condensate liquid that is greater than 70% of water.

According to the R&D Laboratory Questionnaire for Protonex, no additional permits are needed for the project work

beyond permits that are already in place. Gases and chemicals would be handled, segregated and stored according to published safety standards and standard practices. Chemicals, liquid effluent, and/or toxic waste would be disposed of through a licensed third party disposal company. Protonex has a gas detection system (with redundant gas detection systems integrated into certain pieces of equipment), a ventilation system specific to the work to be performed, a fire suppression system, and personal safety equipment including portable fire extinguishers, fire blankets, eye wash stations, and chemical showers that are available throughout the facility.

Project Budget: \$2,020,942 (DOE) \$505,664 (cost share)

All project work is composed of information gathering, analysis, and dissemination; and conventional laboratory operations; therefore the DOE has categorized this proposal into Categorical Exclusions A9 and B3.6.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

EF2a prepared by Casey Strickland

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

NEPA Compliance Officer Signature: \_\_\_\_\_

  
NEPA Compliance Officer

Date: \_\_\_\_\_

2/13/2012

**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: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_