

U. S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE - CHICAGO OFFICE

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM

To be completed by "financial assistance award" organization receiving Federal funding. For assistance (including a point of contact), see "Instructions for Preparing SC-CH F-500, Environmental Evaluation Notification Form".

Solicitation/Award No. (if applicable): DE-SC0005212
Organization Name: Brayton Energy LLC
Title of Proposed Project/Research: Modular Undersea Compressed Air Energy Storage
Total DOE Funding/Total Project Funding: DOE Funding 396,868 / Project Funding 170,086

I. Project Description (use additional pages as necessary):

A. Proposed Project/Action (delineate Federally funded/Non-Federally funded portions)

See attachment
Project Description

B. Would the project proceed without Federal funding?

Yes

No

If "yes", describe the impact to the scope:

II. Description of Affected Environment:

See attachment: Section II

III. Preliminary Questions:

A. Is the DOE-funded work entirely a "paper study"?

Yes No

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

B. Will the work to be performed take place entirely in existing buildings?

And NOT:

- | | | | |
|----|---|-------------------------------------|--------------------------|
| 1. | Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. | Require the siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. | Disturb hazardous substances, pollutants, or contaminants preexisting in the environment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. | Adversely affect environmentally-sensitive resources identified in Section IV.A? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. | Be connected to another existing/proposed activity that could potentially create a cumulatively significant impact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. | Have an inherent possibility for high consequence impacts to human health or the environment (e.g., Biosafety Level 3-4 laboratories, activities involving high levels of radiation)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

If "Yes" to Question III.B. and ALL six subsequent questions, ensure the descriptions in Sections I and II reflect this and go directly to Section V.

IV. Potential Environmental Effects:

Attach/insert an explanation for each "Yes" response.

A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

- | | Yes | No |
|--|--------------------------|-------------------------------------|
| 1. Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Archaeological/Historic Resources | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Important Farmland | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Class I Air Quality Control Region | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Safe Source Aquifer) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Navigable Air Space | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Coastal Zones | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Floodplains and Wetlands | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated items or activities?

- | | Yes | No |
|---|--------------------------|-------------------------------------|
| 13. Natural Resource Damage Assessments | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. Exotic Organisms | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. Noxious Weeds | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. Clearing or Excavation (indicate if greater than one acre) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. Dredge or Fill (under Clean Water Act, Section 404, indicate if greater than ten acres) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated items or activities? (continued)

	Yes	No
18. Noise (in excess of regulations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20. PCB's	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22. Chemical Storage/Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26. Underground Injection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27. Hazardous Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Underground Storage Tanks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29. Radioactive Mixed Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Radioactive Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31. Radiation Exposure	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32. Surface Water Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Pollution Prevention Act	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Off-Road Vehicles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input checked="" type="checkbox"/>

C. Other Relevant Information: Will the proposed action involve the following?

	Yes	No
37. Potential Violation of Environment, Safety, or Health Regulations/Permits	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. Siting/Construction/Major Modification of Waste Recovery, or Waste Treatment, Storage, or Disposal Facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39. Disturbance of Pre-existing Contamination	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40. New or Modified Federal/State Permits	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41. Public Controversy	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42. Environmental Justice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43. Action/Involvement of Another Federal Agency (e.g. license, funding, approval)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44. Action of a State Agency in a State with NEPA-type law. (Does the State Environmental Quality Review Act apply?)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45. Public Utilities/Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46. Depletion of a Non-Renewable Resource	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47. Extraordinary Circumstances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
48. Connected Actions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
49. Exclusively Bench-top Research	<input type="checkbox"/>	<input checked="" type="checkbox"/>
50. Only a Laboratory Setting	<input checked="" type="checkbox"/>	<input type="checkbox"/>

V. Financial Assistance Award Organization Concurrence:

A. Organization Official (Name and Title): Brayton Energy LLC - James Kesseli - president

Signature: James Kesseli Date: 9/21/2011

e-mail: kesseli@braytonenergy.com Phone: (603) 601-0450

B. Optional Concurrence (Name and Title): _____

Signature: _____ Date: _____

e-mail: _____ Phone: _____

Remainder to be completed by SC-CH

VI. SC-CH Concurrence/Recommendation/Determination:

A. SC-CH Office of Acquisition and Assistance or Office of Safety, Technical & Infrastructure Services:

Project Director or Contract Specialist (Name and Title): GREG CARLSON CONTRACT SPECIALIST

Signature: _____ Date: 9/22/11

B. SC-CH NEPA Team Review:

Is the project/activity appropriate for a determination or a recommendation to the Head of the Field Organization by the NEPA Compliance Officer (NCO) under Subpart D of the DOE NEPA Regulations?

Yes No

Specific class(es) of action from Appendices A-D to Subpart D (10 CFR 1021): B5.1, B3.11

Name and Title: _____

Signature: _____ Date: _____

C. SC-CH Counsel (if necessary):

Name and Title: _____

Signature: _____ Date: _____

D. SC-CH NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR 1021.400.

- Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.
- Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.
- Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/Limitations if necessary:

Signature: Peter R. Slabach
Peter R. Slabach
SC-CH NEPA Compliance Officer

Date: 9/26/2011

Modular Undersea Compressed Air Energy Storage (UCAES) System

PROJECT DESCRIPTION

A. Proposed Project/ Action

The majority of the engineering on the subject project is focused on the design of the UCAES membrane, anchoring system, and power conversion system. To validate the integrity of the air system design, Brayton will perform verification experiments, including membrane fatigue testing on a large scale air membrane. Accelerated cycling of membrane inflation and deflation will be conducted to simulate the full life cycles (approx 10,000) of the system. This testing will be performed at Brayton's facility in Hampton. Other engineering work will focus on bathymetric surveys, civil engineering planning, and cost estimating for the project.

Brayton Energy is providing 30% cost sharing on the project. The work scope performed on this project is not delineated between government and private funds. Brayton will prepare a monthly invoice for the project, based on our approved government rates, and then discount the costs when billing the DOE.

B. Would the project proceed without Federal Funding.

No. Brayton Energy is not able to absorb the costs of this very early stage research and development.

Section II Description of Affected Environment

Directions:

Identify whether the activity would occur indoor or outdoors. If indoors, discuss the building and the number/proximity of people in relationship to the action. If outdoors (or if the indoor activity could possibly create impact beyond the building), provide a general characterization of the geographic setting including pertinent population, demographic, weather, and eco-system related data.

Testing will occur both indoors and outdoors.

Indoor testing:

- Membrane strength test.
 - Brayton will perform controlled pull-tests on the selected membrane and the sealing and joining methods.
 - The Brayton Energy has three laboratory spaces and a qualified machine shop and fabrication area. The proposed testing will be performed in our qualified materials test area in the main engineering building. This facility is fully qualified for such testing, operates under a strict safety plan, and meets all OSHA, State of New Hampshire regulations.
- Wave and deployment tests

- Brayton will perform deployment and anchoring experiments in the wave tank at the University of New Hampshire.
- The tank at UNH will be rented on an hourly basis. The testing will be performed in accordance with the university safety standards,

Outdoor testing

- Membrane system fatigue test: A 40-ft square pad had been designated for this test adjacent to the building. The area will be fenced-off from the public. The air storage membrane will be subjected to cyclic pressure loading. The controls and monitoring will be inside the building, and no personnel will be permitted within 20-feet of the test area during operation.
 - Prior to initiating a qualified test plan and safety plan will be prepared and reviewed with internal personnel and our SBIR coordinator.
 - There will be no environmental impact from this test. To be clear, there are no gaseous emissions, no liquid effluent, no destruction or impact on local wild life habitats.
 - The testing and general use of Brayton's property conforms to all town and state zoning codes.
2. OTHER PROTECTED SPECIES – there are no expected impacts on protected species
 3. SENSITIVE ENVIRONMENTS – The proposed experiments will not impact the environment
 4. ARCHEOLOGICAL RESOURCES – the experiments will occur in the vicinity of archeological resources
 5. IMPORTANT FARMLAND – the experiments will not occur near farmland
 6. NAVIGABLE AIR SPACE – the experiments will not enter any airspace
 7. COASTAL ZONES – the experiments will not impact coastal wetlands
 8. AREAS OF SPECIAL NATIONAL DESIGNATION – the experiments will not be located near areas of special national significance.

Section II C. Other Relevant Information

Item 50 ONLY A LABORATORY SETTING. Indicate "Yes" if the research will be conducted within an existing laboratory that has already obtained the required waste discharge, air quality, and other permits. This implies that the facility has on-going research and the new work will be similar to work currently being done at the facility.

Brayton answered 'YES' to this question. Though the proposed experiments will emit no waste, or air pollution, we have received all relevant permits from the State or New Hampshire and the Town of Hampton for our work at this facility. The work that will be conducted over the course of this program is generally similar to other ongoing DOE and commercial work performed in our laboratory.