

**U. S. DEPARTMENT OF ENERGY, OFFICE OF SCIENCE**  
**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)**  
**ENVIRONMENTAL EVALUATION NOTIFICATION**

**To be completed by "Applicant," i.e., organization with responsibilities for a "Federal action" involving application to DOE for a permit, license, exemption or allocation, or other similar actions. For assistance, refer to "Instructions for Preparing Environmental Evaluation Notification."**

Solicitation/Award No. (if applicable): DE-SC0024200

Organization Name: Zap Energy, Inc.

Proposed Action Title: DEVELOPMENT OF A FUSION PILOT PLANT DESIGN BASED ON A  
SHEARED-FLOW-STABILIZED Z PINCH

Total DOE Funding/Total Funding: \$5,000,000 / \$141,000,000

**I. Project Description: (Use explanation pages if additional space is required)**

**A. Proposed Project/Action (if applicable, delineate Federally funded/Non-Federally funded portions)**

In this initial period (Budget Period 1), Zap Energy will be focused on maturing the core technologies to inform a pilot plant preconceptual design. The core technologies that must be developed include a high-performance fusion plasma, repetitive pulsed power to energize the plasma, and materials that achieve suitable lifetimes within the harsh fusion energy environment. In addition, Zap Energy will refine key commercialization plans and establish concrete, measurable objectives as the basis for workforce development, diversity, equity & inclusion, and community benefits programs.

Beyond this initial Budget Period and on the path to a fusion pilot plant, Zap Energy will develop, build, and test an integrated fusion energy demonstration system based on their sheared-flow-stabilized (SFS) Z-pinch plasma technology. The scope beyond Budget Period 1, if funded by the Department of Energy, would be subject to a separate National Environmental Policy Act Review.

B. Would the project proceed without Federal funding? Yes  No

***If "yes," use explanation page.***

**II. Description of Affected Environment: (Use explanation pages if additional space is required)**

All physical aspects of this project will take place within industrial buildings already leased by Zap Energy in Everett and Mukilteo, WA. Other potential locations for future hardware installations will be considered and assessed during this project, but no environments will be affected beyond the existing leased space.

III. Preliminary Questions:

- |   | Yes                      | No                                  |
|---|--------------------------|-------------------------------------|
| A. <u>Is the DOE-funded work routinely administrative or <i>entirely</i> advisory or a “paper study?”</u> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

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

- B. Is there any potential whatsoever for: (*Provide an explanation for each “Yes” response*)

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| 1. Work to be performed outdoors?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 2. Major modification of a building facade or interior?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 3. Threat of violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health?        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 4. Siting, construction or major expansion of waste treatment, storage, or disposal facilities?                                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Disturbance to hazardous substances, pollutants, or contaminants preexisting in the environment?                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 6. The presence of any environmentally-sensitive resources?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 7. Any potential whatsoever for high consequence impacts to human health or the environment?                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 8. The work being connected to another existing/proposed activity that could potentially create a significant impact?          | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9. Nearby past, present, and/or reasonably foreseeable future actions such that collectively significant impacts could result? | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Scientific or public controversy, uncertainty over potential impacts, or conflicts regarding resource usage?               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

***If “No” to ALL Section III.B. questions, go directly to Section V.***

IV. Potential Environmental Effects: (*Provide an explanation for each “Yes” response*)

- A. Environmentally Sensitive Resources: Could the proposed action potentially 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, Pollinators)            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Tundra, Coral Reefs, or Rain Forests  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Cultural or 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., Sole 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/or Wetlands  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated Items or activities?

- |  |                          |                                     |
|--|--------------------------|-------------------------------------|
| 13. Natural Resource Damage Assessments  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. Invasive Species or Exotic Organisms   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. Noxious Weeds  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. Clearing or Excavation greater than one acre or Removal of Trees Governed by Local Requirement | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. Dredge or Fill (under Clean Water Act, Section 404, greater than one acre)                     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Would 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. Polychlorinated biphenyls (PCBs)	<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 Including Emerging Chemicals (e.g., PFAS)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26. Spill Prevention/Surface Water Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27. Underground Injection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Hazardous Waste	<input checked="" type="checkbox"/>	<input type="checkbox"/>
29. Underground Storage Tanks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Radioactive or Radioactive Mixed Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31. Radiation Exposure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
32. Nanoscale Materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Genetically Engineered Microorganisms/Plants or Synthetic Biology	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Greenhouse Gas Generation/Sustainability	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Off-Road Vehicles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. Research on Human Subjects or other Vertebrate Animals	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39. Facility footprint exceeds 5,000 Square Feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

	Yes	No
40. Disproportionate Nearby Presence of Minority and/or Low Income Populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41. Existing, Modified, or New Federal/State Permits	<input checked="" type="checkbox"/>	<input type="checkbox"/>
42. Involvement of Another Federal Agency (e.g. license/permit, funding, approval)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43. Action in a State with NEPA-type law	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44. Action Would Require Expansion of Public Utilities/Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45. Depletion of a Non-Renewable Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46. Subject to an Existing Institutional Work Planning and Control Process	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47. Other Pertinent Information Which Could Impact Human Health or the Environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>

V. Applicant certification that to the best of their knowledge all information provided on this Notification is accurate:

Does this disclosure contain: classified, sensitive business, or other exempt information that DOE would not be obligated to disclose pursuant to the Freedom of Information Act. Yes  No

A. Organization Official (Name and Title): Ryan Umstattd, VP of Product & Partnerships

Signature: Ryan Umstattd Digitally signed by Ryan Umstattd  
Date: 2023.08.07 10:48:42 -07'00' Date: 8/7/23

e-mail: ryan@zap.energy Phone: 206-703-0606

B. Optional Secondary Approval (Name and Title): \_\_\_\_\_

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

e-mail: \_\_\_\_\_ Phone: \_\_\_\_\_

Remainder to be completed by DOE

VI. DOE Concurrence/Recommendation/Determination:

A. DOE Project Director/Program Manager or Contract/Grant Management Specialist:

Has the Applicant completed this Notification correctly?

Yes

No

Does an existing generic categorical exclusion apply?

If yes, indicate: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Signature: PAMELA BRUDER Digitally signed by PAMELA BRUDER Date: 2023.08.21 12:57:26 -05'00'

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

B. DOE NEPA Team Review (if requested):

Is the class of action identified in the DOE NEPA Regulations (Appendices A-D to Subpart D (10 CFR § 1021))?

Yes

No

If yes, specify the class(es) of action: A9, A11 and B3.6

Name and Title: Environmental Engineer

Signature: Jayashree Jayaraj Digitally signed by Jayashree Jayaraj Date: 2023.08.21 13:09:05 -05'00'

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

C. DOE Counsel (if requested):

Name and Title: \_\_\_\_\_

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

D. DOE NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR § 1021.410.

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 the SC Director of Field Operations. Recommend preparation of an Environmental Impact Statement.

Comments/limitations if any:

NEPA Compliance Officer:

Name: \_\_\_\_\_

Signature: PETER SIEBACH Digitally signed by PETER SIEBACH Date: 2023.08.21 13:53:38 -05'00'

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

Optional Additional Narrative: (add additional detail to description to Sections I and II or explanations to responses in Sections 3 and 4.

I.B. Yes, this project for designing a fusion pilot plant would be pursued by Zap Energy regardless of Federal funding. As presently funded, the Federal cost share is only a small percentage of the overall budget.

III.B.3. Zap Energy maintains necessary permits for our work that has potential to create environmental, safety, or health concerns. If Zap Energy fails to keep those permits current, there could be a violation of code.

III.B.7. In the development of fusion energy, Zap Energy will use electrical energy at voltages and currents that can be hazardous if not handled properly. Procedures for safe design and operation of such electrical systems are well-established in many laboratories and industrial facilities.

IV.B.22. In the development of fusion energy, Zap Energy will use and store a variety of chemicals commonly found in industrial or laboratory settings (e.g., solvents, adhesives, lubricants). Zap Energy maintains safety data sheets on file for such chemicals.

IV.B.24. Zap Energy maintains an active license for the minute quantities of radioactive air emissions that come from our fusion energy prototype devices.

IV.B.28. Zap Energy will generate hazardous waste that is similar to that of common industrial laboratory settings.

IV.B.31. Zap Energy maintains an active license for radiation we produce on site as well as radioactive materials we store on site. Radiation monitors are in place and provide recurring reports to monitor for potential exposure of personnel.

IV.B.39. The current Zap Energy facility footprint exceeds 100,000 square feet across 3 buildings.

IV.C.41. The additional devices Zap Energy will design, build, and operate during this project will likely require modifications or additions to our WA state Dept of Health permits.

