U.S. Department of Energy
Categorical Exclusion Determination Form

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Proposed Action Title: University of California, Berkeley -- IceNet for FireBox -- A Berkeley Warehouse-Scale Computer

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Berkeley, CA

Proposed Action Description:

AMENDED NEPA DETERMINATION: (See attached original Determination, dated June 12, 2017)
This Amended Determination follows changes to the project team and the approval of additional funds and milestones to support the project team's small-scale, research and development activities to produce fully packaged 16x16 microelectromechanical system (MEMS) silicon photonic switches that can be tested in real high-performance computing (HPC) and datacenter network architectures. Specifically, the project team will develop an electrically packaged 16x16 switch with electrical control through flex cables and verify switching operation voltage. If successful, the appropriate packaging of the chip would enable sub-microsecond switching times, 10x faster than thermo-optical switches. This would allow real-time flow control of the interconnect networks in datacenters, HPC, artificial intelligence workloads, and machine learning accelerators, significantly reducing the time required to complete complex tasks thus reducing overall energy consumption.

Project activities will be conducted at existing facilities at University of California Berkeley (Berkeley, CA) designed for the applicable activities. Project tasks continue to fit within the class of actions identified under the DOE Categorical Exclusion identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the project. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements.

Categorical Exclusion(s) Applied:

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

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of 10 CFR Part 1021.

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

☑ The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

☑ There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

☑ The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: Geoffrey Goode Digitally signed by Geoffrey Goode Date: 2020.12.17 11:14:50 -05'00' Date Determined:

(This form will be locked for editing upon signature)