



# U.S. Department of Energy Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Integration and Optimization of Novel Ion-Conducting Solids (IONICS) Program (FOA No. DE-FOA-0001478)

Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): CA, CO, CT, DE, IA, MA, MN, MO, NY, PA, SC, TN

Proposed Action Description:

This is a Supplemental Determination to the IONICS Program Determination issued November 3, 2016 (See Attachment A). The three remaining projects under the IONICS Program (Prime Recipients Iowa State Univ., Oak Ridge National Lab, and PolyPlus Battery Co.) are hereby added to the Program Determination as they fit within the classes of actions identified under the DOE Categorical Exclusion(s) identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project.

Project tasks for all 16 projects under the IONICS Program (listed in Attachment B) 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:

A9 - Information gathering, analysis, and dissemination

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

B3.15 - Small-scale indoor research and development projects using nanoscale materials

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:

(This form will be locked for editing upon signature)

Date Determined: 12/02/2016



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Program or Field Office: Advanced Research Projects Agency - Energy (ARPA-E)

Location(s) (City/County/State): CA, CO, CT, DE, IA, MA, MN, MO, NY, PA, SC, TN

Proposed Action Description:

The IONICS Program supports development and testing of technologies aimed to improve energy storage and conversion in transportation batteries, grid-level storage, and fuel cells by creating high performance separators and electrodes built with solid ion conductors. The IONICS Program is composed of 16 small-scale research and development projects that will be conducted by universities, non-profit and for-profit entities, and federal laboratories. 13 of the 16 projects in the IONICS Program are covered by this Determination and fit within the classes of actions identified under the DOE Categorical Exclusion(s) identified below and do not involve any extraordinary circumstances that may affect the significance of the environmental effects of the projects (the three remaining projects -- Prime Recipients Iowa State Univ., Oak Ridge National Lab, and PolyPlus Battery Co. -- had not provided all the required information and certifications at the time this Determination was signed). This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. Prime Recipients for 12 of the 13 projects have provided written assurances that they have obtained all necessary permits and approvals applicable to proposed actions in accordance with local, state, and federal requirements. One Prime Recipient (Ionic Materials) has not yet obtained all necessary permits or approvals and is prohibited from commencing applicable project work before (1) obtaining the necessary permits and approvals and (2) providing written assurances to ARPA-E of the same.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

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

B3.15 - Small-scale indoor research and development projects using nanoscale materials

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:

*[Signature]*  
(This form will be locked for editing upon signature)

Date Determined: 11/03/2016

## Attachment B: Projects in the IONICS Program

Prime Recipient	Project Title
The Pennsylvania State University	Cold Sintering Composite Structures for Solid Lithium Ion Conductors
United Technologies Research Center	Synergistic Membranes And Reactants for a Transformative Flow Battery System” (SMART FBS) (P.400.0449)
The Washington University	Reinforced AEM Separators Based on Triblock Copolymers for Electrode-decoupled RFBs
Rensselaer Polytechnic Institute	Channeling Engineering of Hydroxide Ion Exchange Polymers and Reinforced Membranes
University of Colorado Boulder	Anion channel membranes
University of Delaware	Highly conductive, stable and robust hydroxide exchange membranes based on poly(aryl piperidinium)
Polyplus Battery Company	Flexible Solid Electrolyte Protected Lithium Metal Electrodes for Next Generation Batteries
Colorado School of Mines	Hybrid Polyoxometalate Membranes for High Proton Conduction with Redox Ion Exclusion
24M Technologies, INC.	Large-Area Lithium Electrode Sub-Assemblies (LESAs) Protected by Self-Forming Microstructured Polymer-Inorganic Single-Ion Conducting Composites
Oak Ridge National Laboratory	Metastable And Glassy Ionic Conductors (MAGIC)
3M Company	Low Cost, Durable Anion Exchange Membranes
American Manufacturing, Inc.	Flash Sintering System for Manufacturing Ion-Conducting Solids
Iowa State University	Strong, High Li+ Ion Conductivity, Li-Impermeable Thin-Ribbon Glassy Solid Electrolytes
Sila Nanotechnologies Inc.	Melt-Infiltration Solid Electrolyte Technology for Solid State Lithium Batteries
Ionic Materials	Novel Polymer Electrolyte for Solid State Lithium Metal Battery Technology
University of California, San Diego	Self-Forming Solid State Batteries