U.S. Department of Energy
Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Abengoa Solar, Inc. (Abengoa) - High-Efficiency Solar Electric Conversion Power Tower

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Albuquerque, NM

Proposed Action Description:

This award is a continuation of research performed by Abengoa to develop a high-efficiency solar electric conversion tower to enable low-cost, fully dispatchable solar energy generation.

Project work will consist of: (1) delivery of Abengoa's solar device developed under the first ARPA-E award to Sandia's testing facilities; (2) installation of the solar device on Sandia's existing power tower test site; and (3) performance testing to establish proof of concept and to ensure that the solar device meets established performance metrics.

Project work will take place at Sandia National Laboratories' testing facilities in Albuquerque, NM.

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)

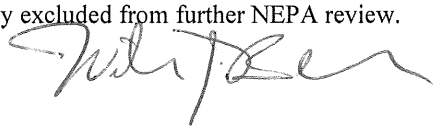
☑ The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

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: 

Date Determined: 09/25/2012

U.S. Department of Energy
Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: (0471-1514) Abengoa Solar Inc. - High Efficiency Solar-Electric Conversion Power Tower

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Colorado, Massachusetts

Proposed Action Description:
Funding will support development of a high efficiency solar-electric conversion power tower that utilizes a novel phase change material architecture to enable low cost, fully dispatchable or base load solar energy generation and thermal energy storage. This objective will be accomplished through a two-phased project. The objective of Phase I is to design, test, and optimize critical system components in order to develop a robust, efficient, low cost technology. The objective of Phase II is to rollout this design as a small scale prototype tower. As testing facilities and methodology have not been identified for Phase II at this time, this determination covers only the work to be performed in Phase I.

The proposed work in Phase I will focus on design, development, and testing of system components, including a geometric receiver and a closed-loop prilling direct contact heat exchanger (DCHX) with supercritical carbon dioxide working fluid. Project work will also involve design of an integrated prototype system for outdoor testing in Phase II. Specific project tasks include (1) geometric receiver design; (2) lab-scale slurry testing; (3) tube material corrosion testing; (4) liquid metal receiver tube testing; (5) tube material fatigue testing; (6) DCHX testing and computational fluid dynamics validation; (7) computational design and simulation of power cycle layout; (8) integrated prototype design for Phase II, including the receiver and DCHX; (9) design of a system-level testing methodology; and (10) levelized cost of energy analysis.

Research and development work in Phase I will take place at indoor industrial laboratory and testing facilities at Abengoa Solar Inc. (Lakewood, CO) and Impact Technology Development Inc. (Lincoln, MA). Computational modeling and simulation work will take place in office facilities at Barber-Nichols Inc. (Arvada, CO). Project work in Phase I does not contemplate any R&D or testing work outside of indoor facilities.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

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: Matt Dunn

Date Determined: 12/08/2011