



U.S. Department of Energy

Categorical Exclusion Determination Form

Program or Field Office: Advanced Research Projects Agency - Energy

Project Title: ITN Energy Systems - Low-cost Electrochromic Film on Plastic for Net-zero Energy Building

Location: *- Multiple States - Colorado, Michigan

Proposed Action or Project Description:

American Recovery and Reinvestment Act:

Funding will support development of electrochromic (EC) film manufacturing process at in-lab and pilot-scale, EC film sample analysis, and updating of commercialization impact evaluation.

Proposed work consists of (1) testing and optimizing in-lab EC film manufacturing process, (2) scaling process to pilot-scale and testing and optimizing pilot-scale process, and (3) analyzing EC film samples produced. This work will be performed at ITN Energy System's facility in Littleton, CO.

Proposed work also consists of updating the commercialization impact evaluation for the proposed process based on updated capital and production cost estimates. This work will be performed at the University of Michigan campus in Ann Arbor, MI.

Categorical Exclusion(s) Applied:

X - B3.6 Siting/construction/operation/decommissioning of facilities for bench-scale research, conventional laboratory operations, small-scale research and development and pilot projects

X - B5.1 Actions to conserve energy

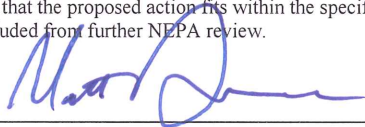
X- A9 - Information gathering/data analysis/document preparation/dissemination

*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR10 21 [Click Here](#)

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning 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: Sep 21, 2011

Comments:

Webmaster:





U.S. Department of Energy

Categorical Exclusion Determination Form

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

Project Title: 25A2284 - Low-cost Electrochromic Film on Plastic for Net-zero Energy Building

Location: *- Multiple States - Colorado, Kentucky, California, Tennessee

Proposed Action or Project Description:

American Recovery and Reinvestment Act:

There is potential for electrochromic (EC) windows to dramatically reduce building energy use through active control of light and solar heat transmission. U.S. buildings today accounts for 40% of all primary energy used and 38% of carbon dioxide emission in the United States. Energy use associated with windows alone represents 4 quads existing window installations were converted to low-E glass. New actively controlled smart windows could dramatically reduce energy lost through windows by reducing heating and cooling loads and minimize overhead lighting use. Unlike other building components, windows theoretically can be energy neutral or even net contributors to the energy balance. EC are the most promising of the three primary types of smart glass: EC, suspended particle displays (SPD), and liquid crystal technology. However, the high cost of current product offering has limited their implementation to niche markets. In response to this need, ITN Energy Systems, in collaboration with MAG Industrial Automation Systems, the Electric Power Research Institute, Southern California Edison, and the Colorado School of Mines, proposes to develop solid-state EC film on plastic substrates in order to reduce EC window cost in support of net-zero energy buildings. ITN has modeled the economics of manufacturing a number of flexible devices, including thin film photovoltaics, solid-state lithium rechargeable batteries, and EC. In all cases, product cost is dominated by the large capital investments in vacuum processing.

Categorical Exclusion(s) Applied:

X - B3.6 Siting/construction/operation/decommissioning of facilities for bench-scale research, conventional laboratory operations, small-scale research and development and pilot projects

X - B5.1 Actions to conserve energy

*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR10 21 [Click Here](#)

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning 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: /s/ William J. Bierbower

Digitally signed by William J. Bierbower
 DN: cn=William J. Bierbower, o, ou,
 email=william.bierbower@hq.doe.gov, c=US
 Date: 2009.12.15 16:17:18 -05'00'

Date Determined: 12/15/2009

Comments:

Webmaster:



25A2284 - Proposed Action or Project Description (Continued)

state lithium rechargeable batteries, and EC. In all cases, product cost is dominated by the large capital investments in vacuum processing equipment required to achieve the performance goals of these demanding technologies. Therefore, large volume manufacturing with high yield is required to effectively amortize the initial capital investment. Roll-coated plastic, with its large device area in a small volumetric vacuum chamber footprint, offers a tremendous advantage over large format glass processing to achieve this metric. Successful completion of the proposed effort will mature technology readiness levels and manufacturing readiness levels to reduce investor risk and motivate industry led strategic partnerships to commercialize EC film. There are four primary tasks (1) Optimize performance of EC devices on plastic substrates, (2) Successfully demonstrate the viability of web-coated EC film, including implementation of sensor based control algorithms to achieve high yield and uniformity, (3) Product development and durability demonstration, and (4) Market validation and development of a roadmap for industry led transition into production.