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U.S. DEPARTMENT OF ENERGY - NETL

CATEGORICAL EXCLUSION (CX) DESIGNATION FORM

ARRA ☒ Yes ☐ No Grant No.: DOE-FOA-0000115
Recipient Name: TIAX LLC
DOE Sponsoring Org. (FE, OE, EE, etc.): EE
Action or Project No.: DE-EE0003922
NETL Sponsoring Org.: BETD
FY: 2009
NETL Contact: Paul Giles x4811 Pgh.
Performance Period: 7/1/10 - 3/30/12
Brief Title of Proposed Action:
Location: 15 Acorn Park Cambridge, MA 02140

Energy Efficient Commercial Refrigeration with Carbon Dioxide Refrigerant and Scroll Expanders

Brief Description of Proposed Action:

Develop a scroll CO2 expander with an isentropic efficiency of 75% at design conditions and integrate the expander with a semi-hermetic CO2 compressor.

THE PROPOSED ACTION FALLS WITHIN THE FOLLOWING CATEGORICAL EXCLUSION(S) FROM APPENDICES A AND B OF DOE NEPA IMPLEMENTING PROCEDURE:

General Administration/Management
- ☐ A1 – Routine business actions
- ☐ A2 – Administrative contract amendments
- ☐ A7 – Transfer of property, use unchanged
- ☐ A8 - Award of technical support/M&O/personal service contracts
- ☐ A9 – Info gathering, analysis, documentation, dissemination, and training
- ☐ A11 – Technical advice and planning assistance
- ☐ A12 – Emergency Preparedness planning
- ☐ A14 – Approval of technical exchange arrangements

Facility Operations
- ☐ B1.2 – Training exercises and simulation
- ☐ B1.3 – Routine maintenance and custodial services
- ☐ B1.4 – Air conditioning installation for existing structures
- ☐ B1.5 – Cooling water system improvements in existing structures
- ☐ B1.7 – Communication system and data processing equipment acquisition, installation, operation, removal
- ☐ B1.13 – On-site pathway or short access road construction/acquisition
- ☐ B1.15 – Support building or structure, non-waste storage, construction/ operation
- ☐ B1.16 – Removal of asbestos in accordance with regulations
- ☐ B1.22 – Building relocation to developed area/demolition/disposal
- ☐ B1.23 – Demolition/disposal of buildings, equipment, and structures
- ☐ B1.24 – Transfer, disposition, or acquisition of uncontaminated structures or equipment, environmental quality maintained
- ☐ B1.25 – Transfer, disposition, or acquisition of uncontaminated land for habitat preservation/wildlife management
- ☐ B1.26 – Small (<250,000 GPD) WWT facility const/oper/decom
- ☐ B1.27 – Disconnection of utilities
- ☐ B1.28 – Placement of unused facilities in environmentally safe condition
- ☐ B1.29 – Small on-site const/demolition waste disposal facility const/oper
- ☐ B1.30 – Transfer/transportation actions
- ☐ B1.31 – Relocation/operation of machinery or equipment, similar use
- ☐ B1.32 – Traffic flow adjustments, existing roads

Safety and Health
- ☐ B2.1 – Modifications to enhance workplace habitability
- ☐ B2.2 – Installation/improvement of building/equipment instrumentation
- ☐ B2.3 – Installation of equipment for personnel safety and health
- ☐ B2.5 – Facility safety and environmental improvements, replacement or upgrade of facility components, no change in useful life

General Research
- ☐ B3.1 – Site characterization/environmental monitoring
- ☐ B3.3 – Research related to conservation of fish and wildlife
- ☒ B3.6 – R&D or pilot facility construction/operation/decommissioning
- ☐ B3.7 – New infill exploratory, experimental oil/gas/geothermal well construction/operation construction/operation
- ☐ B3.8 – Outdoor ecological/environmental research in small area
- ☐ B3.9 – Certain CCT demonstration activities, emissions unchanged
- ☐ B3.11 – Outdoor tests, experiments on materials and equipment components

Power Resources Distribution/Facilities/Generation/Operations/Management
- ☐ B4.1 – Acquisition/utilization of excess electric power without: integration of new generation source(s), major physical changes to transmission system, or changes to normal generation operating limits
- ☐ B4.4 – Power service storage, load shaping, seasonal adjustments
- ☐ B4.6 – Transmission support addition/modifications at developed facility site
- ☐ B4.8 – Transmission agreements/modifications using one transmission system to transfer power to and from another system, without new generation sources or major physical changes to transmission systems
- ☐ B4.11 – Construction of power substations/support equipment/facilities with power delivery at < 230kV to include project power lines develop ment <10 miles or power line relocation <20 miles; no integration of major new generation resources into a main transmission system.

Conservation, Fossil, and Renewable Energy Activities
- ☐ B5.1 – Actions to conserve energy, no indoor air quality degradation
- ☐ B5.2 – Modification to oil/gas/geothermal pumps and piping, no flow changes or air emission effects
- ☐ B5.3 – Modification (not expansion)/abandonment of oil storage access/ brine injection/gas/geothermal wells; no site closure
- ☐ B5.4 – Repair/replacement of pipeline sections within maintenance provisions of a Section 404 permit
- ☐ B5.5 – Short crude oil/gas/steam/geothermal pipeline const/oper within a single industrial complex/existing right-of-way
- ☐ B5.12 – Workover of existing oil, gas, geothermal wells to restore production

Environmental Restoration/Waste Minimization
- ☐ B6.1 – Cleanup actions: small-scale, short-term (< $5M and 5 years)
- ☐ B6.3 – Environmental control system improvements in existing structures, recycle/release/disposal within permitted facility

Other
- ☐ Specify category:

This action would not (1) violate applicable ES&H requirements, (2) require siting of waste TSD or recovery facilities, (3) disturb hazardous substances (excluding substances that are naturally occurring in the project area), or (4) adversely affect environmentally sensitive resources. Furthermore, this action (1) would not present any extraordinary circumstances such that the action might have a significant impact upon the human environment; (2) is not connected to other actions with potentially significant impacts; (3) is not related to other actions with cumulatively significant impacts; and (4) and is not inconsistent with 10 CFR 1021.211 or 40 CFR 1506.1. Therefore, the proposed action may be categorically excluded from further NEPA review.

DOE INITIATOR SIGNATURE: Paul Giles — Digitally signed by Paul Giles DN: cn=Paul Giles, o=BETD, ou=BETD, email=paul.giles@netl.doe.gov, c=US Date: 2010.07.21 15:20:52 -04'00'

DATE: 07 / 21 / 2010 (month day year)

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DATE: 7 / 29 / 2010 (month day year)

NCO Comment: