

**U. S. DEPARTMENT OF ENERGY, OFFICE OF SCIENCE
INTEGRATED SUPPORT CENTER—CHICAGO OFFICE**

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM**

To be completed by "Applicant," i.e., organization with responsibilities for a "Federal action" involving application to DOE for a permit, license, exemption or allocation, or other similar actions. For assistance with this Form, refer to "Instructions for Preparing ISC-CH F-560, Environmental Evaluation Notification Form."

Solicitation/Award No. (if applicable): DE-SC0013233

Organization Name: E3Tec Service, LLC

Proposed Action Title: Conversion of CO₂ to Alkyl Carbonates using Ethylene Oxide as Feedstock

Total DOE Funding/Total Funding: \$991,718

I. Project Description: (Use explanation pages if additional space is required)

A. Proposed Project/Action (if applicable, delineate Federally funded/Non-Federally funded portions)

E3Tec has developed a process for utilization of carbon dioxide (CO₂) for manufacturing of high-value specialty chemicals alkyl carbonates with competitive market value. CO₂ captured from utility plants and industry is captured and converted to dimethyl carbonate (DMC), which is used to produce polycarbonate, used as environmentally friendly solvent, used as electrolyte in lithium-ion batteries and production of polyurethane. The process development is advanced to technology-readiness level (TRL) of 5, and the proposed Phase IIB is expected to advance the technology to commercialization.

B. Would the project proceed without Federal funding?

Yes No

If "yes," use explanation page.

II. Description of Affected Environment: (Use explanation pages if additional space is required)

The major environmental benefits are a) abatement of CO₂ emissions by replacing coal-gasification derived syngas-based dimethyl carbonate (DMC) production; b) replacing phosgene-based polycarbonate processes in the US; c) using DMC as green solvent replacing ketone-based solvents; d) potential diesel-fuel additive to reduce pollution; and e) deploying modular DMC plants that can be integrated with distributed CO₂ sources. One specific environmental benefit of the proposed membrane-based integrated DMC process to the US Coal Utility plants is that by capturing 40% to 50% of CO₂ from flue gas will meet the environmental regulations of meeting with natural gas turbine combined cycle (GTCC) CO₂ emissions with relatively low capital and operating costs.

III. Preliminary Questions:

- A. Is the DOE-funded work routinely administrative or *entirely* advisory or a "paper study?" Yes No

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

- B. Is there any potential whatsoever for: (Provide an explanation for each "Yes" response)

- | | | | |
|-----|---|--------------------------|-------------------------------------|
| 1. | Work to be performed outdoors? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. | Major modification of a building interior? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. | Threat of violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. | Siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. | Disturbance to hazardous substances, pollutants, or contaminants preexisting in the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. | The presence of any environmentally-sensitive resources? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. | Any potential whatsoever for high consequence impacts to human health or the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. | The work being connected to another existing/proposed activity that could potentially create a significant impact? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. | Nearby past, present, and/or reasonably foreseeable future actions such that collectively significant impacts could result? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. | Scientific or public controversy, uncertainty over potential impacts, or conflicts regarding resource usage? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "No" to ALL Section III.B. questions, go directly to Section V.

IV. Potential Environmental Effects: (Provide an explanation for each "Yes" response)

- A. Environmentally Sensitive Resources: Could the proposed action potentially result in changes and/or disturbances to any of the following resources?

- | | Yes | No |
|--|--------------------------|-------------------------------------|
| 1. Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds, Pollinators) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Cultural or Historic Resources | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Important Farmland | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Class I Air Quality Control Region | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Sole Source Aquifer) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Navigable Air Space | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Coastal Zones | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Floodplains and/or Wetlands | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated items or activities?

- | | | | |
|-----|--|--------------------------|-------------------------------------|
| 13. | Natural Resource Damage Assessments | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. | Invasive Species or Exotic Organisms | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. | Noxious Weeds | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. | Clearing or Excavation greater than one acre or Removal of Trees Governed by Local Requirement | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. | Dredge or Fill (under Clean Water Act, Section 404, greater than one acre) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated Items or activities? (continued)

- | | Yes | No |
|---|--------------------------|-------------------------------------|
| 18. Noise (in excess of regulations) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 19. Asbestos Removal | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 20. Polychlorinated biphenyls (PCBs) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 21. Import, Manufacture, or Processing of Toxic Substances | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 22. Chemical Storage/Use | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 23. Pesticide Use | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 24. Hazardous, Toxic, or Criteria Pollutant Air Emissions | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 25. Liquid Effluents | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 26. Spill Prevention/Surface Water Protection | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 27. Underground Injection | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 28. Hazardous Waste | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 29. Underground Storage Tanks | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 30. Radioactive or Radioactive Mixed Waste | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 31. Radiation Exposure | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 32. Nanoscale Materials | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 33. Genetically Engineered Microorganisms/Plants or Synthetic Biology | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 34. Ozone Depleting Substances | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 35. Greenhouse Gas Generation/Sustainability | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 36. Off-Road Vehicles | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 37. Biosafety Level 3-4 Laboratory | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 38. Research on Human Subjects or other Vertebrate Animals | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 39. Facility footprint exceeds 5,000 Square Feet | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

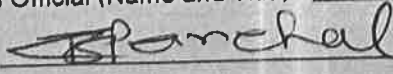
C. Other Relevant Information: Would the proposed action involve the following?

- | | Yes | No |
|--|--------------------------|-------------------------------------|
| 40. Disproportionate Nearby Presence of Minority and/or Low Income Populations | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 41. Existing, Modified, or New Federal/State Permits | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 42. Involvement of Another Federal Agency (e.g. license/permit, funding, approval) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 43. Action in a State with NEPA-type law | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 44. Expansion of Public Utilities/Services | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 45. Depletion of a Non-Renewable Resources | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 46. Subject to an Existing Institutional Work Planning and Control Process | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 47. Other Pertinent Information Which Could Impact Human Health or the Environment | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

V. Applicant certification that to the best of their knowledge all information provided on this form is accurate:

Does this disclosure contain: classified, sensitive business, or other exempt information that DOE would not be obligated to disclose pursuant to the Freedom of Information Act. Yes No

A. Organization Official (Name and Title): Dr. Chandrakant B Panchal

Signature:  Date: 05/23/2019

e-mail: cpanchal@e30tec.com Phone: 443 812 5930

B. Optional Secondary Approval (Name and Title): _____

Signature: _____ Date: _____

e-mail: _____ Phone: _____

Remainder to be completed by DOE

VI. DOE Concurrence/Recommendation/Determination:

A. DOE Project Director/Program Manager or Contract/Grant Management Specialist:

Has the Applicant completed this Form correctly?
Does an existing generic categorical exclusion apply?

Yes No

If yes, indicate:

Name and Title: Michael Passo Contract Specialist

Signature: Mike Passo Date: 5/28/19

B. DOE NEPA Team Review (if requested):

Is the class of action identified in the DOE NEPA Regulations (Appendices A-D to Subpart D (10 CFR § 1021))?

Yes No

If yes, specify the class(es) of action: B3.C

Name and Title: _____

Signature: _____ Date: _____

C. DOE Counsel (if requested):

Name and Title: _____

Signature: _____ Date: _____

D. DOE NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR § 1021.410.

Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.

Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.

Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/limitations if any:

NEPA Compliance Officer:

Name: Peter R. Siebach

Signature: Peter R. Siebach Date: 5/28/2019