As the Selection Official, I select the Applications noted above for negotiation of award,
☐ without conditions. **[OR]** ☒ with conditions, as specified in the Negotiation Strategy.

☐ As the Selection Official, I have selected Applications, noted above, not deemed technically acceptable by the Merit Review Committee. Rationale supporting this selection is attached and Assistant Secretary for Renewable Energy and Energy Efficiency (ASEE) approval has been obtained as evidenced by ASEE signature below.

Jacques Beaudry-Losique Selection Official	12/3/09 Date	**Cathy Zoi** Assistant Secretary for Energy Efficiency and Renewable Energy	Date

Topic Area 5

Selection Statement - Topic Area 5 (Pilot Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (20% minimum)		1	2	3	4	5
APPLICATIONS DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE (SELECTION RANGE)											
Alternate	MeadWestvaco Corporation	Exemption 4 Exemption 5 (deliberative process)	$25,000,000			Exemption 4 Exemption 5 (deliberative process)					
Exemption 4 Exemption 5 (deliberative process)			$25,000,000								
Yes	Amyris Biotechnologies, Inc.		$25,000,000								
Alternate	Citrus Energy, LLC		$7,593,753								
Exemption 4 Exemption 5 (deliberative process)			$18,000,000								
Yes	Solazyme, Inc.		$21,765,738								
Exemption 4 Exemption 5 (deliberative process)			$16,582,171								
Alternate	Sundrop Fuels, Inc		$25,000,000								
Exemption 4 Exemption 5 (deliberative process)			$24,997,969								

Selection Statement - Topic Area 5 (Pilot Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (20% minimum)		1	2	3	4	5
APPLICATIONS DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE (SELECTION RANGE)											

Exemption 4

Exemption 5 (deliberative process)

Selection Statement - Topic Area 5 (Pilot Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (20% minimum)		1	2	3	4	5
APPLICATIONS NOT DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE											

Exemption 4

Exemption 5 (deliberative process)

Selection Statement - Topic Area 5 (Pilot Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (20% minimum)		1	2	3	4	5
APPLICATIONS NOT DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE											

Exemption 4

Exemption 5 (deliberative process)

Selection Statement - Topic Area 5 (Pilot Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (20% minimum)		1	2	3	4	5
APPLICATIONS NOT DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE											

Exemption 4

Exemption 5 (deliberative process)

As the Selection Official, I select the Applications noted above for negotiation of award,
☐ without conditions. **[OR]** ☒ with conditions, as specified in the Negotiation Strategy.

☐ As the Selection Official, I have selected Applications, noted above, not deemed technically acceptable by the Merit Review Committee. Rationale supporting this selection is attached and Assistant Secretary for Renewable Energy and Energy Efficiency (ASEE) approval has been obtained as evidenced by ASEE signature below.

Jacques Beaudry-Losique Selection Official	12/3/09 Date	**Cathy Zoi** Assistant Secretary for Energy Efficiency and Renewable Energy	Date

Topic Area 6

Selection Statement - Topic Area 6 (Demonstration Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (50% minimum)		1	2	3	4	5
APPLICATIONS DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE (SELECTION RANGE)											
Alternate	Biofine Technology, LLC	Ex. 4 Ex. 5 (deliberative process)	$50,000,000	Exemption 4 Exemption 5 (deliberative process)							

Exemption 4

Exemption 5 (deliberative process)

Selection Statement - Topic Area 6 (Demonstration Scale, Biofuels, Any renewable biomass except corn starch)											
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (50% minimum)		1	2	3	4	5
APPLICATIONS NOT DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE											

Exemption 4

Exemption 5 (deliberative process)

Selection Statement - Topic Area 6 (Demonstration Scale, Biofuels, Any renewable biomass except corn starch)										
Selected	Applicant	Consensus Score (* - Score After Oral Presentation)	DOE Cost Share	Non-Federal Cost Share		Total Cost	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)	Program Policy Factor ("X" if used)
Yes/No/ Alternate				$	% (50% minimum)		1	2	3	4	5
APPLICATIONS NOT DEEMED TECHNICALLY ACCEPTABLE BY THE MERIT REVIEW COMMITTEE											
Exemption 4 Exemption 5 (deliberative process)											

As the Selection Official, I select the Applications noted above for negotiation of award,
☐ without conditions. **[OR]** ☒ with conditions, as specified in the Negotiation Strategy.

☐ As the Selection Official, I have selected Applications, noted above, not deemed technically acceptable by the Merit Review Committee. Rationale supporting this selection is attached and Assistant Secretary for Renewable Energy and Energy Efficiency (ASEE) approval has been obtained as evidenced by ASEE signature below.

Jacques Beaudry-Losique — 12/03/09

Jacques Beaudry-Losique
Selection Official

Date

Cathy Zoi
Assistant Secretary for Energy Efficiency
and Renewable Energy

Date

NEGOTIATION STRATEGY

Specify any additional negotiation strategies or conditions of selection:

Exemption 5 (deliberative process)

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

December 23, 2009

MEMORANDUM FOR MATTHEW A. BARRON
DIRECTOR
FINANCIAL ASSISTANCE (RE)

JAMES P. DAMM
DIRECTOR
FINANCIAL ASSISTANCE (EE)

FROM: RITA L. WELLS
HEAD OF CONTRACTING ACTIVITY (HCA)
GOLDEN FIELD OFFICE

SUBJECT: Review and Approval of Financial Assistance Awards Exceeding $25 Million, Funded through the American Recovery and Reinvestment Act of 2009 (ARRA)

In accordance with the delegated authorities set forth in paragraph 2(A)(ii) of the memorandum dated September 19, 2008, from Edward R. Simpson, Director, Office of Procurement Assistance Management, Subject: Delegation of Authority/Designation as Head of Contracting Activity (HCA) for the Golden Field Office, this Memorandum constitutes HCA review of each conditional award identified in Attachment A that has a total project value exceeding $25 million, and HCA approval of each conditional award with a total project value exceeding $25 million but less than $50 million.

More specifically, this Memorandum constitutes HCA preliminary review and approval of all conditional ARRA financial assistance awards with total project budgets greater than $25 million, scheduled for award by the Golden Field Office on or before January 31, 2010. The conditional nature of these awards is necessitated as a result of unprecedented exigencies dictated by the ARRA. By making these awards on a fully conditional basis, recipient access to ARRA funding will be restricted until such time as the award is fully negotiated. Non-tailored, standard terms and conditions will be incorporated at this time into each of the awards identified on Attachment A. As HCA, I reserve the right to further exercise my delegated authority to approve each of the conditional awards identified on Attachment A, with total project budgets greater than $25 million but less than $50 million, at such time as individual award terms and conditions are fully and successfully negotiated between the Golden Field Office and the recipients, and award definitization is complete.

Federal Recycling Program Printed on Recycled Paper

Attachment A-Recovery Act Awards Scheduled through January 31, 2010 with Total Project Costs > 25 million

Program	Description	Recipient	Federal Share	Cost Share	Award Status
Biomass	Modify Integrated Biorefinery Solicitation	Bluefire	$81,200,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Enerkem Corporation	$50,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	INEOS New Planet BioEnergy,LLC	$50,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Sapphire Energy, Inc	$50,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Amyris Biotechnologies, Inc.	$25,000,000	REDACTED EXEMPTION 4	Conditional
Biomass	Modify Integrated Biorefinery Solicitation	HALDOR TOPSOE, INC.	$25,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	UOP LLC	$25,000,000		Conditional
Water	Hydroelectric Modernization	Alcoa	$13,000,000		Conditional
Wind	Large Dynamometer Testing Facility	Clemson University	$44,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Algenol Biofuels Inc.	$25,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	LOGOS TECHNOLOGIES, INC.	$20,455,849		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Archer Daniels Midland	$24,834,592		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	American Process Inc.	$17,944,902		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	BioEnergy International, LLC	$50,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Clearfuels Technology Inc	$23,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	ICM, Inc.	$25,000,000		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Renewable Energy Institute International	$19,980,930		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	Solazyme, Inc.	$21,765,738		Conditional
Biomass	Modify Integrated Biorefinery Solicitation	ZeaChem Inc.	$25,000,000		Conditional
Geothermal	Enhanced Geothermal Systems	Naknek Electric	$12,376,568		Conditional

DEPARTMENT OF ENERGY
Washington, DC 20585
December 28, 2009

MEMORANDUM FOR: MATTHEW A. BARRON
DIRECTOR
FINANCIAL ASSISTANCE DIVISION
GOLDEN FIELD OFFICE

FROM: DAVID J. LEOTTA
DIRECTOR
ACQUISITION PLANNING AND LIAISON DIVISION
OFFICE OF CONTRACT MANAGEMENT
OFFICE OF PROCUREMENT AND ASSISTANCE
MANAGEMENT

SUBJECT: Approval of Special Terms and Conditions for use in awards under Funding Opportunity Announcement (FOA) number DE-FOA-0000096, entitled: "Recovery Act: Demonstration of Integrated Biorefinery Operations."

Pursuant to Department of Energy Acquisition Guide Chapter 71, the Special Terms and Conditions for the awards pending under the subject FOA, as submitted on December 22, 2009, and with revisions on December 23, 2009 have been reviewed and conditionally approved. The approval is conditioned on your coordinating the Intellectual Property (IP) provisions that are to be negotiated into the definitized awards with the Office of the Assistant General Counsel for Technology Transfer & Intellectual Property (GC-62). The point of contact in GC-62 is Mr. Paul Gottlieb, he may be reached on (202)586-3439 or via e-mail at: Paul.Gottlieb@hq.doe.gov.

No further review by this office is required prior to issuance of the awards. If any changes are made to the Special Terms and Conditions which are substantially different from the approved document then you are required to contact this office for further review prior to issuance of the document.

If you have any questions related to this matter, please contact Steven C. Jones at (202)287-1474.

DEPARTMENT OF ENERGY
Washington, DC 20585
December 28, 2009

MEMORANDUM FOR: MATTHEW A. BARRON
DIRECTOR
FINANCIAL ASSISTANCE DIVISION
GOLDEN FIELD OFFICE

FROM: DAVID J. LEOTTA
DIRECTOR
ACQUISITION PLANNING AND LIAISON DIVISION
OFFICE OF CONTRACT MANAGEMENT
OFFICE OF PROCUREMENT AND ASSISTANCE MANAGEMENT

SUBJECT: Approval of Special Terms and Conditions for use in awards under Funding Opportunity Announcement (FOA) number DE-FOA-0000096, entitled: "Recovery Act: Demonstration of Integrated Biorefinery Operations."

Pursuant to Department of Energy Acquisition Guide Chapter 71, the Special Terms and Conditions for the awards pending under the subject FOA, as submitted on December 22, 2009, and with revisions on December 23, 2009 have been reviewed and conditionally approved. The approval is conditioned on your coordinating the Intellectual Property (IP) provisions that are to be negotiated into the definitized awards with the Office of the Assistant General Counsel for Technology Transfer & Intellectual Property (GC-62). The point of contact in GC-62 is Mr. Paul Gottlieb, he may be reached on (202)586-3439 or via e-mail at: Paul.Gottlieb@hq.doe.gov.

No further review by this office is required prior to issuance of the awards. If any changes are made to the Special Terms and Conditions which are substantially different from the approved document then you are required to contact this office for further review prior to issuance of the document.

If you have any questions related to this matter, please contact Steven C. Jones at (202)287-1474.

DOE F 4220.10
(01-99) All Other Editions Are Obsolete

U.S. Department of Energy

Office of Congressional and Intergovernmental Affairs (CI)

CONGRESSIONAL GRANT/CONTRACT NOTIFICATION

TO: Office of Congressional & Intergovernmental Affairs
ATTN: Contract Notification Coordinator (CI-40)
U.S. Department of Energy
1000 Independence Avenue, SW Room 8G-070
Washington, DC 20585

Telephone: 202-586-2764
Fax: 202-586-5497

1. Informing Office: Golden Field Office (GFO)
Name: Melissa Wise
(Contracting Office Representative)
Phone: 303-275-4907

2. Program Office/Project Office:
Name: Fred Gerdeman
Phone: 303-275-4928

3. Contractor, Grantee or Offeror:
Name: Algenol Biofuels, Inc.
Street: 28100 Bonita Grande Drive, Suite 200
City: Bonita Springs State: FL Zip: 34135-6220

4. Place of Performance: (Required if different from #3)
Street:
City: Freeport State: TX Zip: 77541

5. Proposed date of award: No later than 09/30/2010
Date of Public Announcement: 12/04/2009 (if any)

6. Contract, Grant, or Other Agreement No.:
DE-EE0002867
(Specify Type of Instrument)
☒ New ☐ Renewal
☐ Modification – Total to date: $

7. Obligated Cost or Price of this Action: $25,000,000
Estimated Cost or Price of Total Contract: $REDACTED
Recipient Cost Sharing (if applicable): $EXEMPTION 4
(For incrementally funded contracts only. Report the Initial obligation and total estimated contract value.)

Does this award result from an Invitation for Bid?
☐ Yes ☒ No

8. Duration of Contract, Grant, or Other Agreement:
From: 01/01/2010 To: 12/31/2014

9. Brief Description. (Please use non-technical/plain English language/no acronyms.)
This project will make ethanol directly from carbon dioxide and seawater using hybrid algae in 1200-gallon specialized bioreactors. The facility will have the capacity to produce 100,000 of fuel-grade ethanol per year.

TO BE COMPLETED BY OFFICIAL RESPONSIBLE FOR SUBMISSION

10. Method of Submission:
☒ PDF, Upload
Date: DEC 03 2009 Time: 3:54 pm dw

Name: Molly Hames
Title: Grants and Agreements Specialist
Signature: Molly R Hames
Office: Golden Field Office

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 Version 02

* 1. Type of Submission:	* 2. Type of Application:	* If Revision, select appropriate letter(s):
☐ Preapplication	☒ New	
☒ Application	☐ Continuation	* Other (Specify)
☐ Changed/Corrected Application	☐ Revision	

* 3. Date Received:	4. Applicant Identifier:
Completed by Grants.gov upon submission.	

5a. Federal Entity Identifier:	* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:	7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Algenol Biofuels Inc.

* b. Employer/Taxpayer Identification Number (EIN/TIN):	* c. Organizational DUNS:
REDACTED EXEMPTION 6	800399904

d. Address:

* Street1:	28100 Bonita Grande Drive, Suite 200
Street2:	
* City:	Bonita Springs
County:	
* State:	FL: Florida
Province:	
* Country:	USA: UNITED STATES
* Zip / Postal Code:	34135-6220

e. Organizational Unit:

Department Name:	Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:	Dr.	* First Name:	Craig
Middle Name:			
* Last Name:	Smith		
Suffix:			

Title: Chief Operating Officer

Organizational Affiliation:

* Telephone Number:	239-498-2000	Fax Number:	

* Email: craig.smith@algenolbiofuels.com

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 Version 02

9. Type of Applicant 1: Select Applicant Type:

Q: For-Profit Organization (Other than Small Business)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Golden Field Office

11. Catalog of Federal Domestic Assistance Number:

81.087

CFDA Title:

Renewable Energy Research and Development

*** 12. Funding Opportunity Number:**

DE-FOA-0000096

* Title:

Recovery Act - Demonstration of Integrated Biorefinery Operations

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

*** 15. Descriptive Title of Applicant's Project:**

Integrated Pilot-Scale Biorefinery for Producing Ethanol from Hybrid Algae

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 Version 02

16. Congressional Districts Of:

* a. Applicant FL-014 * b. Program/Project TX-014

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2010 * b. End Date: 12/31/2014

18. Estimated Funding ($):

* a. Federal	25,000,000.00
* b. Applicant	
* c. State	
* d. Local	
* e. Other	
* f. Program Income	
* g. TOTAL	

REDACTED
EXEMPTION 4

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)**

☐ Yes ☒ No Explanation

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Dr. * First Name: Craig

Middle Name:

* Last Name: Smith

Suffix:

* Title: Chief Operating Officer

* Telephone Number: 239-498-2000 Fax Number:

* Email: craig.smith@algenolbiofuels.com

* Signature of Authorized Representative: Completed by Grants.gov upon submission. * Date Signed: Completed by Grants.gov upon submission.

OMB Number: 4040-0004
Expiration Date: 01/31/2009

Application for Federal Assistance SF-424 Version 02

*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

Other Attachment File(s)

* Mandatory Other Attachment Filename: Project.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

OMB Number: 4040-0010
Expiration Date: 08/31/2011

Project/Performance Site Location(s)

Project/Performance Site Primary Location ☐ I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: Algenol Biofuels Inc.

DUNS Number: 8003999040000

* Street1: 2301 N Brazosport BLVD

Street2:

* City: Freeport County: Brazoria

* State: TX: Texas

Province:

* Country: USA: UNITED STATES

* ZIP / Postal Code: 77541-2303 * Project/ Performance Site Congressional District: TX-014

Project/Performance Site Location 1 ☐ I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name:

DUNS Number:

* Street1:

Street2:

* City: County:

* State:

Province:

* Country: USA: UNITED STATES

* ZIP / Postal Code: * Project/ Performance Site Congressional District:

Name of the Applicant: Algenol Biofuels Inc.

Principal Investigator: Dr. Craig R. Smith, Chief Operating Officer, Algenol Biofuels Inc.

Title: Integrated Pilot-Scale Biorefinery for Producing Ethanol from Hybrid Algae

Objectives: Algenol Biofuels Inc., together with The Dow Chemical Company, is proposing to construct an integrated pilot-scale biorefinery (Topic Area 1) that will convert carbon dioxide into ethanol using Algenol's proprietary DIRECT TO ETHANOL™ algae technology. The biorefinery will be located in Freeport, Texas on an existing Dow facility. The integrated pilot-scale biorefinery will consume two dry tonnes per day of carbon dioxide obtained from industrial emissions and will produce more than 100,000 gallons of ethanol per year. The project will also create or save more than 300 well-paying high-tech jobs in Texas, Maryland, and Florida and validate the commercial viability of a new breakthrough energy technology that could eventually create billions of dollars of economic value and thousands of new jobs.

Project Description: DIRECT TO ETHANOL™ technology is based on over-expressing in blue-green algae the genes for fermentation pathway enzymes found widely in nature. The resulting metabolically enhanced hybrid algae actively carry out photosynthesis and utilize carbon dioxide to make ethanol inside each algal cell. The ethanol diffuses through the cell wall into the culture medium and then evaporates, along with water, into the headspace of an enclosed, sealed photobioreactor. The ethanol-water vapor is then condensed, collected as a liquid, and distilled into fuel grade ethanol. Algenol currently has hybrid algae that produce ethanol at a rate equivalent to about 6,000 gallons per acre per year. The productivity of these algae is currently being evaluated

REDACTED
EXEMPTION 4

Potential Impact of the Project: Once the pilot biorefinery is fully functional, Algenol intends to construct multiple commercial production facilities that will each have a production capacity of more than 250 million gallons of ethanol per year. Based on an analysis by a premier economic consulting firm, during the three-year construction period of a commercial production facility, the project would generate over $1 billion in total economic output and would reach a peak employment of approximately 3,000 jobs. At completion, the project would annually generate over $700 million in total economic output and create approximately 2,800 permanent jobs. Algenol's DIRECT TO ETHANOL™ process has several advantages over competing methods for ethanol production. Algenol's process does not use food as a feedstock, does not require arable land and does not use large amounts of fresh water. Most importantly, it consumes large amounts of carbon dioxide, has a large positive net energy balance, and can substantially reduce net green house gas emissions. Once the Algenol process has been demonstrated to work at pilot-scale, it can be expanded to produce ethanol in very large amounts sufficient to allow the United States to reduce its dependence on imported oil.

Major Participants: Algenol has collaborative agreements with The Dow Chemical Company, the National Renewable Energy Laboratory, Membrane Technology & Research Inc., and The Georgia Institute of Technology. Dow will provide land on its facility in Freeport, Texas, assist in the development of specialized plastics, evaluate various ethanol-water separation technologies, evaluate and test various water treatment, handling and disposal options, provide engineering, analytical, EH&S, and administrative support, and supply all saltwater requirements.

PROJECT NARRATIVE COVER SHEET
Recovery Act – Demonstration of Integrated Biorefinery Operations
Funding Opportunity Announcement Number: DE-FOA-0000096
CFDA Number: 81.087 Renewable Energy Research and Development

Applicant Information	
Applicant Name:	Algenol Biofuels Inc.
Project Title:	Pilot-Scale Integrated Biorefinery for Producing Ethanol from Hybrid Algae
Major Project Subcontractors:	The Dow Chemical Company, Georgia Institute of Technology, NREL, MTR Inc.
Major Project Vendors:	Exemption 4
Key Individuals:	Craig Smith, Ed Legere, Steve Gluck, John Coleman, Ron Chance

Topic Area (Select ONLY one)

Each applicant is allowed to submit only one application to this FOA. Applicants that submit to none or more than one topic area will be excluded from further review. Select one and only one topic area below.

☒ Topic Area 1	☐ Topic Area 3	☐ Topic Area 5
☐ Topic Area 2	☐ Topic Area 4	☐ Topic Area 6

Life-cycle Greenhouse Gas Emissions Reduction (mandatory for Topic Areas 5 and 6. Important – See Note):

Technical Description		
Feedstock(s):	Carbon Dioxide	
Primary Product:	Ethanol	
Co-Products:	None	
Location of Proposed Facility:	Freeport, Texas	
Throughput of Proposed Facility (dry tonnes of feedstock per day):	Two (2) dry tonnes of carbon dioxide per day	
Conversion Technology:	☐ Biochemical	☐ Thermochemical
	☒ Algae	☐ Other (Describe)

Short Description: The proposed biorefinery will make ethanol directly from CO_2 and seawater using hybrid algae in sealed, clear plastic 4,500L proprietary flexible film photobioreactors through its patented Direct to Ethanol™ technology – all powered by the sun, with approximately 17 acres of photobioreactors and additional supporting areas for testing, distillation, and product storage in Freeport, Texas.

Project Financing Description

Exemption 4

This form is required. It must be completely filled in and be included as the cover page for the "Project Narrative" (FOA, Subpart IV.C. b.). This form may contain confidential /business proprietary information IF it properly marked, but it must not contain any Personally Identifiable Information (PII). This form will count toward the page limit stated in the FOA, Subpart IV.C.b. Non-compliant applications will not be reviewed and will not be eligible for selection.

Application Table of Contents

I. SF 424 – Application for Federal Assistance

II. Project Site Location (PPSL.doc)

III. Other Attachments

a. **Project Abstract**

b. **Project Narrative** (Project.pdf)

i. **Appendix 1** – Resume File (resume.pdf)

ii. **Appendix 2** – Budget File (SF424A.xls)

iii. **Appendix 3** – Budget Justification File (BudgetJustification.xls)

iv. **Appendix 4** – Letters of Commitment

1. Dow Chemical Company (DowLetter.pdf)
2. The Georgia Institute of Technology (GATechLetter.pdf)
3. Membrane Technology & Research Inc. (MTRLetter.pdf)

v. **Appendix 5** – Subaward Budget Files, Including Budget Justification

1. Dow Chemical Company (Dow424.xls)
2. The Georgia Institute of Technology (GATech424.xls)
3. Membrane Technology & Research Inc. (MTR424.xls)

vi. **Appendix 6** – Budget for Federally Funded Research and Development Center (FFRDC) Contractor File (NREL.pdf)

vii. **Appendix 7** – Authorization From Cognizant Contracting Officer for FFRDC (FFRDC_Auth.pdf)

viii. **Appendix 8** – Environmental Questionnaire (Enviro.pdf)

ix. **Appendix 9** – Project Management Plan (pmp.pdf)

x. **Appendix 10** - Historical, Current, and Planned Technical and Financial Data (TechandFinData.pdf)

xi. **Appendix 11** – Business and Commercialization Plan (BusComPlan.pdf)

xii. **Appendix 12** – Pro Forma (ProForma.xls)

xiii. **Appendix 13** – Intellectual Property Statement and Supporting Documentation (ProjectIP.pdf)

xiv. **Appendix 14** – Process Flow Diagram and Supporting Data (PFD_Data)

xv. **Appendix 15** – Life-Cycle GHG Emission Reduction Data (LCA_GHG.xls)

xvi. **Appendix 16** – Petroleum Displacement Analysis (Petro.doc)

xvii. **Appendix 17** – Project Execution Plan (ProjExecPlan.pdf)

Proprietary Information: The data contained on pages 6-10 of the Project Narrative; pages 3-6 and 12-13 of Environmental Questionnaire; pages 1-10, 16-18 and 20 of the Business and Commercialization Plan; and pages 2-4 of the IP Statement and all information contained the files named Lifecycle Energy and Greenhouse Gas Emissions, SF424A, Budget, Subaward Budget Files, Process Flow Diagram, Project Management Plant and Project Executive Plan have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award.

Paragraphs in this application's respective files that are preceded by an asterisk (*) contain proprietary information that Algenol Biofuels requests not be released to persons outside the Government, except for the purposes of review and evaluation.

I. PROJECT GOALS AND OBJECTIVES.

Algenol Biofuels Inc. ("the Company") is developing and intends to commercialize DIRECT TO ETHANOL™ technology invented by Mr. Paul Woods and Dr. John Coleman between 1984 and 1996 and patented in the U.S. in 2001 and 2004 (US Patent Nos. 6,306,639 and 6,699,696). DIRECT TO ETHANOL™ technology uses hybrid algae that make ethanol from carbon dioxide. More than $70 million in investment capital has been secured from Algenol's founders to finance the initial development of DIRECT TO ETHANOL™ technology. Over the last three years about $30 million of this capital has been invested in research and development, and the technology is now ready for advancement to a pilot-scale integrated biorefinery. By means of this response to DOE Funding Opportunity Announcement Number DE-FOA-0000096 Algenol is seeking financial support to build and operate a pilot-scale DIRECT TO ETHANOL™ integrated biorefinery.

Project Goals and Objectives:

Exemption 4

Specific Aims and Targets:

Exemption 4

II. COMPANY DESCRIPTION.

Algenol Biofuels Inc. is a Delaware corporation with headquarters in Naples, Florida. Algenol has assembled a team of more than 100 employees and consultants to develop its technology from proof-of-principle to commercialization. The Company's management team has extensive experience in the energy

and biotechnology industries and has founded, financed, and built several successful publicly traded companies. The Company employs molecular biologists, marine biologists, biochemists, mechanical engineers, chemical engineers, financial professionals and project managers, including more than 40 Ph.D.'s. The Company employs two full time patent attorneys and has retained external patent law firms to represent its interests in jurisdictions both inside and outside of the United States. Algenol has an Advisory Board of distinguished scientists and engineers that actively advise the Company and has developed a broad range of research collaborations with leading academic institutions, such as The Georgia Institute of Technology, The University of Maryland Center for Marine Biotechnology, and the University of Hawaii.

The Company has research laboratories in Baltimore, Maryland and Germany that enhance and maintain selected hybrid algae for ethanol production. Both laboratories are equipped with state-of-the-art analytical technology and specialized algal growing rooms, as well as bench-top photobioreactors of varying designs from 0.5-liter to 80-liter capacity. The Company also has an advanced engineering lab in Baltimore where development, design and testing of photobioreactor, ethanol extraction and other system components are carried out.

The Company also operates a zero discharge, licensed aquaculture facility for research and development on five acres in Palm Beach County, Florida. This facility has a fully equipped laboratory and scientific staff on site and has already tested multiple photobioreactor designs and developed expertise in growing algae at large scale for more than a year under field conditions. Algenol is currently installing a Process Development Unit with 40 prototype commercial 4,500-liter bioreactors for the next phase of scale up and process development. Installation and initial operations will be completed by August 2009.

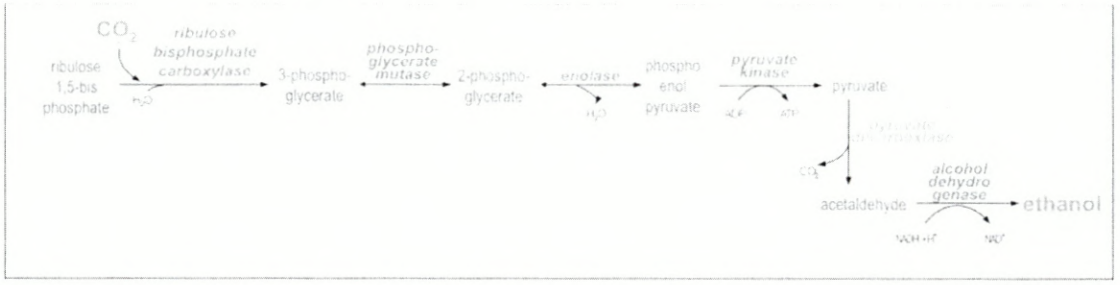
Figure 1: Algenol's Process Development Unit currently under construction in Florida

Exemption 4

III. TECHNOLOGY AND PROCESSES.

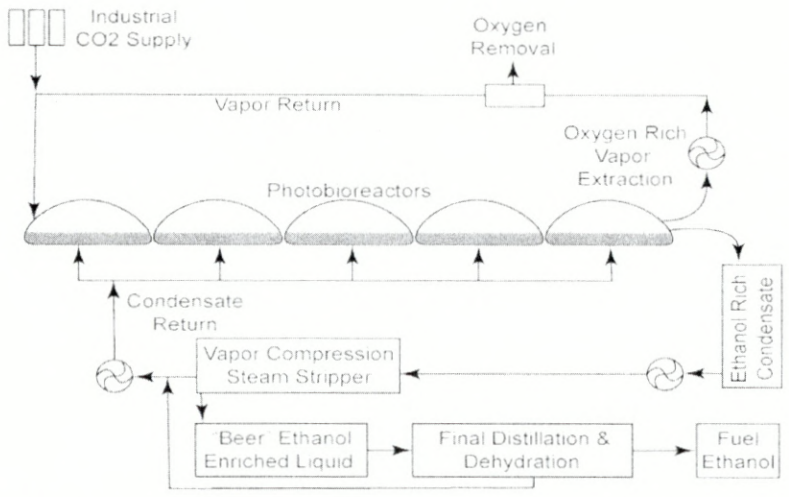
DIRECT TO ETHANOL™ technology involves over-expressing in blue-green algae the genes for fermentation pathway enzymes found widely in nature. These enzymes are pyruvate decarboxylase and alcohol dehydrogenase. The resulting metabolically enhanced hybrid algae actively carry out photosynthesis and utilize carbon dioxide as the feedstock for making ethanol inside each algal cell. The biochemical pathway for producing ethanol in the hybrid algae is shown in Figure 2.

Figure 2: Metabolic Pathway for Ethanol Production



The ethanol made inside the cell diffuses through the cell wall into the culture medium and then evaporates, along with water, into the headspace of an enclosed, sealed photobioreactor. The ethanol-water vapor condenses on the inner surface of the bioreactor headspace and is collected by gravity, concentrated, and then distilled into fuel grade ethanol.

Figure 3: Simple diagram of the DIRECT TO ETHANOL™ process



The central component of the DIRECT TO ETHANOL™ process is a proprietary 4,500 liter 5' x 50' flexible film photobioreactor made of polyethylene film with special additives and coatings. The photobioreactor contains seawater that has been treated to remove particulates and contaminants, added nutrients, and a large headspace above the seawater. The photobioreactor is inoculated with several gallons of a dense hybrid algae culture produced from stocks maintained in greenhouses on site. After hybrid algae inoculation, carbon dioxide from industrial emissions is introduced into the photobioreactor. The outdoor photobioreactor is exposed to sunlight that causes the algae to undergo photosynthesis, absorb carbon dioxide and produce ethanol. Because of the solar heat that accumulates in the photobioreactor, ethanol along with water evaporates into the headspace. Upon contact with the plastic film, the vapor condenses, runs down the sides of the