

**Pilot-Scale Integrated Biorefinery
Simplified Process Flow Diagram**

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**Detailed blueprints for the Algenol pilot-scale integrated biorefinery
are located in the final four pages of the PFD_Data document:**

Sheet 1: Site Layout and Notes

Sheet 2: Operations Layout

Sheet 3: Detailed Process Flow Diagram

Sheet 4: Notes and Electrical Loads

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Process Flow Diagram Step 1

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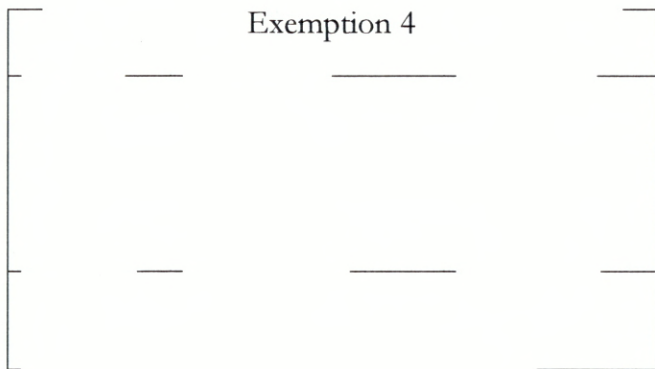
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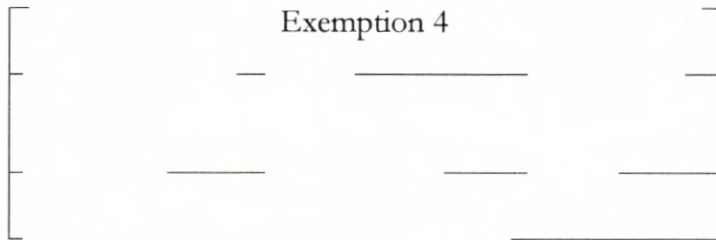
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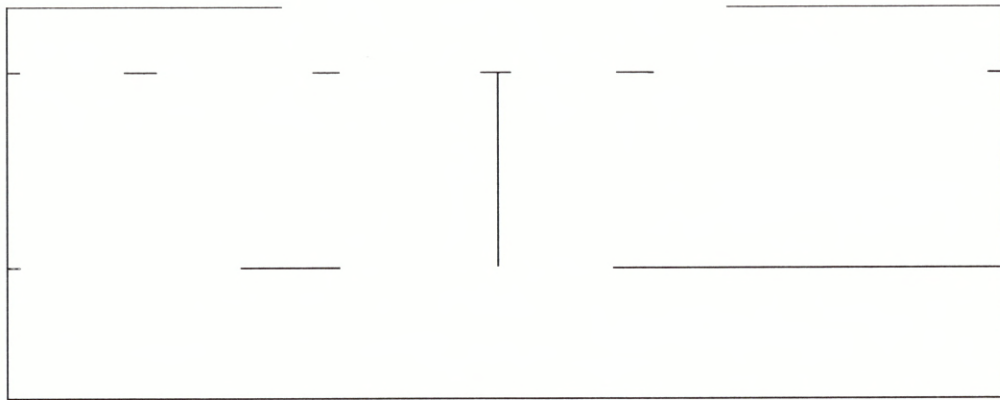


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Algenol Lifecycle Energy and Greenhouse Gas Emissions

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Georgia Institute of Technology

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*Principal Investigators

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1. Introduction

This report is a summary of the lifecycle energy and greenhouse gas emissions of the Algenol ethanol production system. The Algenol system aims at large-scale fuel ethanol production using genetically enhanced photoautotrophic cyanobacteria (algae). This analysis applies to the current vision of a full-scale commercial system.

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Table 1. LCA Data and Sources

Stage	Content	Data	Unit	Reference
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Algenol Biofuels Inc.

Petroleum Displacement Analysis

	Product	BTU or Joule Content per Gallon	Annual Output of Facility (in gallons)	BTU of Total Output per Year	Equivalent Barrels of Oil
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