

# algaewheel®

CLEAN WATER. CLEAN AIR. CLEAN ENERGY.

CLEAR CHOICE.

[www.algaewheel.com](http://www.algaewheel.com)



# CLEAR CHOICE.

Algaewheel is a closely-held company based in Indianapolis, Indiana. Our company's mission is to provide reliable and cost efficient algae systems that enable our customers to develop and apply algae-based technologies for clean water, clean air, and clean energy. Our vision is to integrate algae with visionary technologies in order to develop innovative systems that serve mankind in an environmentally responsible manner.

To learn more about our company, visit our web site at [www.algaewheel.com](http://www.algaewheel.com) or call us at [877.algaewheel](tel:877.algaewheel).

## REVOLUTIONARY TECHNOLOGY

The algaewheel system is capable of producing substantial amounts of algae for a variety of uses, including electricity generation, biofuels production, emissions sequestration (particularly CO<sub>2</sub> or greenhouse gas), fertilizers, and feed supplements. Furthermore, algaewheel solves two of the fundamental problems with algae – efficient production and practical harvesting. Even though many are currently developing algae-based technologies and products, nobody offers a reliable and cost efficient method of producing and harvesting algae. Algaewheel is the answer. The patented algaewheel system grows more algae, more efficiently than any other system available.

For several years Algaewheel has focused the use of its algaewheel system exclusively on wastewater treatment and aquaculture. However, the algaewheel system offers enormous potential beyond wastewater and aquaculture.

## CLEAN WATER

### Algae in Wastewater Treatment

The algaewheel system is not a substitute for a wastewater treatment plant. Rather, it replaces the typical equipment used in the biological process of a conventional plant. The algaewheel system provides conventional biological wastewater treatment as well as advanced nutrient removal utilizing algae. The algae also serve to supply the oxygen required by the bacteria and likewise the bacteria supply the carbon dioxide required by the algae. The algaewheel system is energy efficient and in many applications can produce surplus energy for onsite use or sale to the power grid. Because algae uptake vast quantities of carbon dioxide, the algaewheel system provides a carbon negative wastewater treatment process.

### Waste to Energy

In conventional wastewater treatment facilities the main objective of solids management is to minimize or eliminate sludge. Sludge disposal is a costly part of operating conventional plants because conventional designs use large amounts of energy to reduce sludge to a minimum, and then more energy to dispose of the leftovers.

In an algaewheel wastewater treatment facility the main objective of sludge management is to maximize algae biomass production. The algae and sludge mixture created by algaewheel is a btu-rich biomass that can be refined to create steam, heat, electricity, or biofuels. Depending on site conditions, the energy generated by the system either eliminates or significantly reduces the facility's need to purchase energy. In fact, there is excellent potential for creating excess energy that could be sold to offset the cost of operations.





With algaewheel, there is no leftover “sludge” that has to be disposed of which eliminates the cost of sludge disposal and the contamination of food crops with pharmaceuticals and pathogens. Lastly, the EPA has identified conventional wastewater treatment plants as major contributors to greenhouse gases. The algaewheel plant, however, is actually carbon negative because the algae use more CO<sub>2</sub> to grow than the plant emits.

## CLEAN AIR

### Algae for Emissions Sequestration

Algae can be used to capture CO<sub>2</sub> emissions from coal plants, ethanol plants, concrete plants, and any other industry that has CO<sub>2</sub> emissions. The algaewheel production process will reduce greenhouse gases and allow the user to obtain tax credits and to sell or utilize carbon credits. If energy is also produced the project may be eligible for Renewable Energy Certificates.

## CLEAN ENERGY

### Electricity

Algae biomass generated in the algaewheel system can be directly processed or further refined to produce electricity. Technologies available for electricity production include biomass co-firing, combined heat and power (CHP), pyrolysis, gasification, and anaerobic digestion. In co-firing and CHP the heat generated is used as a prime power source. Other technologies produce biogas or other biofuels which can be used as a fuel source for a combustion chamber or internal combustion engine.

### Biofuel

Algae can be utilized for production of many types of biofuels including bio-diesel, ethanol, bio-butanol, gasoline, jet fuel, and others. Algae are found in many types of environments throughout the earth and are capable of producing vastly more biofuel per acre than terrestrial plants. In today's environment of volatile oil supplies largely controlled by hostile countries, the current social, political, and economic environments have combined to yield some very meaningful incentives from the federal government and many state governments, which can significantly offset biofuels production and facility costs.

## CLEAR PROCESS

Algae require very basic elements to grow: CO<sub>2</sub>, nutrients, water, and sunlight. The key to algaewheel is that it maximizes algae production by creating an environment whereby the algae can efficiently uptake and process these elements. The three-dimensional shape of the algaewheel provides a much greater surface area than a two-dimensional pond or raceway.

The most significant advantage of the algaewheel is the ease in which algae is harvested. Suspended algae are captured as they flow through the system. Attached algae are naturally “sheared” off the algaewheel when they reach a certain mass. This combination of processes allows automatic harvesting of the algae downstream of the algaewheels.



# WE HAVE REINVENTED THE WHEEL, AND IT'S GREEN.

## ALGAEWHEEL PRODUCT LINE

Algaewheel has three product lines. At the core of each of our products is the basic algaewheel system, but each product varies by purpose, and therefore design. Our three product lines include:

- Packaged Algae Production System
- Customized Algae Production System
- Multi-functional Algae Production System

### Packaged Algae Production System

Intended for customers who want a small-scale system to reliably produce algae. Our system will automatically harvest the algae, and can also be engineered to dry the algae to your specifications. The harvested algae is then available for use in whatever application you desire. For example, if you are researching and developing a process for making bio-diesel this system would supply you with a constant flow of algae for use in your process. Or, if you are researching and developing a process for capturing certain emissions, this system would provide you the means to deliver the emissions to the algae and supply you with a constant flow of algae for experimentation. This is a quick, simple, turnkey packaged system, and multiple systems can be placed in succession if you require greater amounts of algae. Your site must have a nutrient-rich water source available, such as pond water or wastewater, in order for the algae to thrive.

### Customized Algae Production System

Intended for customers who want to design and build an algae system with greater specificity than the packaged system. The system will be designed to accommodate your exact needs. For example, if you require a very specific footprint or size for your system we can customize a solution to meet your needs. These systems can be used for any singular purpose, such as carbon dioxide capture, water treatment, algae for biofuels, or biomass production. You should note that our systems are subject to significant economies of scale (i.e. the larger the system the lower the average price per unit).

### Multi-Functional Algae Production System

Intended for customers who want to design and build an algae system that will serve two or more purposes simultaneously. For example, if a municipality seeks to treat wastewater and generate electricity simultaneously within one system our engineering staff will design an algae system that fulfills both of these goals. Or, if an electric utility seeks to sequester carbon dioxide and create biomass to be used to co-generate electricity along with coal, our engineering staff will design an algae system that accomplishes both of these goals. On larger projects, we provide engineering only with respect to our algae systems, and customers should engage their own engineering firm for the remaining aspects of their project.



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