# AgriPower INCORPORATED

## Unique 21ST Century Waste To Energy ("W2E") Technology Uses Biomass To Produce Clean, Combined Heat And Power ("CHP")

### THE COMPLETED 250kW/hr DEMONSTRATION UNIT


This photo shows the completed 250kW test Unit in AgriPower's current assembly and testing facility in Sacramento, California. The automated feeder hopper module (1) on the left is connected to the combustion chamber module (2). The heat exchanger module (3) is in the right rear. The control panel (4) is in the center, the operating computer (5) is in the immediate front and the turbine generator set (6) is behind the computer.

**FOR FURTHER INFORMATION, PLEASE CONTACT:**

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**THE PRODUCT**: AgriPower has developed a Biomass-fueled, low operating cost, modular, transportable, environmentally-friendly, safe and reliable 300kW/hr power plant Unit. The Unit provides great flexibility regarding the materials it can use for fuel and can utilize wood, sawdust, cardboard, paper and most agricultural and animal wastes such as almond, coconut, nutmeg, peanut and walnut shells, sugar cane bagasse, etc. and manure ("**Biomass**") as fuel in an "open" Brayton Cycle process to generate electricity and clean hot air available for Co-Generation and thermal energy. It uses clean hot air (the working fluid) to drive the turbine. It is highly efficient; 4 BTUs of fuel yields approximately 1 BTU of electricity, 1 BTU of Co-Generation and 1 BTU of thermal energy for heating and drying (a total of 3 BTUs or 75% efficiency). The Unit's ability to use virtually free or low cost fuel makes it an attractive method of power production for businesses that use diesel fuel or that produce waste that can used as fuel and thereby avoid paying expensive tipping fees to have their waste brought to a landfill.

**PROPRIETARY TECHNOLOGY**: The Unit uses a unique, proprietary and patented heat exchanger design, space age ceramics and metals and a proprietary PC-based software operating system. There is no comparable Biomass fueled, transportable technology on the market. Other biomass systems use steam (which need ultra-clean water to operate) or gasifiers (that coat the turbine blades with contaminants) and increase maintenance costs and down-time to drive their turbines. By contrast, AgriPower's clean "hot air" technology contains no contaminants that can coat its turbine blades; hence, a highly-reliable, relatively maintenance-free power generation system.

**THE FUEL AND OPERATION**: Biomass fuel is fed into the furnace by a system of automated augers from a large fuel hopper. Its PC-based software system (using various embedded monitoring devices) controls the Unit and regulates its fuel intake, furnace temperature and inlet air temperature to the turbine. The system's high-temperature (1,950°F) technology provides a clean burn and minimizes ash.

**SUMMARY OF BENEFITS.**

The Unit provides numerous significant benefits:

- **VIRTUALLY FREE / LOW COST FUEL**: Instead of using diesel fuel oil that is expensive and difficult to obtain, transport and store, and dirty to burn, the Unit burns most types of Biomass including wood, sawdust and most agricultural and animal waste products. One of its best fuels is the leftover residue of whatever crops are being grown locally. This provides an abundant, renewable and virtually free or low cost fuel source.
- **SIGNIFICANT FUEL COST SAVINGS**: Biomass fuel represents a dramatic fuel cost savings versus diesel fuel oil. Fuel savings with the 300kW/hr Unit provide a financial payback period of less than two years. Fuel savings are estimated to be $10 ─ $15 million or more over its useful life of 20 years compared to the fuel costs of a comparably sized diesel generator set or from avoided tipping fees and taxes by using Biomass as fuel in the Unit.
- **ENVIRONMENTALLY FRIENDLY**: The Unit is virtually pollution free. Certain types of contaminated materials (such as wood waste containing paint and creosote treated wood) can be used for fuel by adding an inexpensive scrubber to the Unit that captures the contaminants during the combustion process and enables their proper disposal.
- **MOBILITY; REDUCED FUEL TRANSPORT COSTS; RAPID ASSEMBLY; SIZE AND WEIGHT**: The Unit is prefabricated, modular and shipped pre-assembled and pre-tested in standard 20' or 40' shipping containers making it easily and inexpensively transportable to even the most remote areas or to where the fuel is located (thereby reducing or eliminating fuel transport costs). It contains bolted fittings for rapid assembly and can be installed on site and producing electricity only two days after delivery. When the four modules are assembled, it measures 16' wide by 40' long and weighs less than 80,000 pounds (40 tons).
- **CO-GENERATION AND THERMAL ENERGY**: The heat generated to power the turbine is about 1,950°F. The clean hot air available for Co-Generation is approximately 550°F. Using Co-Gen Converters, the Co-Generation and other thermal energy (approximately 350°F) produced by the Unit are available as additional and free energy sources to operate distillation, desalinization and water purification equipment; ice machines, refrigeration and air conditioning units; to produce hot water and steam; and for industrial heating, bonding and drying processes, such as drying paint and wood prior to shipment or drying extremely wet Biomass prior to its being used as fuel.
- **EASE OF USE; REMOTE MONITORING; DIGITAL PROOF**: The Unit has been designed to be easily and safely used by unskilled and inexpensive labor and is extremely user friendly. The proprietary fully-automated start-up and control system, with its developed PC-based software program, and embedded sensors installed throughout the Unit, constantly monitors key control parameters (i.e., fuel feed and speed, load requirements, fan speeds, oxygen levels, etc.) resulting in a fully automated power plant thus eliminating the need for an on-site technician. The Unit can be remotely monitored by the customer or AgriPower to confirm it is being properly operated and digital proof can be obtained and used for carbon credit billing and payment purposes. Software upgrades can be easily installed via telephone or satellite.
- **PROVEN AND RELIABLE TECHNOLOGIES; LOW OPERATING COSTS**: The Unit uses proven fluidized "bubbling" bed and gas turbine technologies that have been widely used for power and aircraft propulsion and for combusting a variety of low quality fuels for more than 40 years. The reliability of these proven technologies translates into extremely low operating and maintenance costs and reduced down-time.
- **PROPRIETARY AND UNIQUE TECHNOLOGY PROVIDES CONSIDERABLE BENEFITS**: The Unit separates the Biomass fuel combustion products from the gas turbine cycle thereby reducing turbine wear and down-time and maintenance and operating costs. AgriPower's patented air-to-air technology accommodates low quality fuels and provides lower emissions than comparable furnace technologies.
- **HIGH EFFICIENCY**: The Unit's use of proprietary technology and space age metals and ceramics enables it to be highly efficient. Its high operating temperatures enable it to completely combust the fuel and produce high output for its size and weight; for each four BTUs of fuel it consumes, it produces approximately one BTU of electricity, more than one BTU of thermal energy that can be used for Co-Generation and one BTU of thermal energy that can be used for heating, drying and bonding (a total of more than three BTUs, or more than 75% efficiency).
- **DISTRIBUTION AND SERVICE CHANNELS.** The Unit's proprietary technology has few moving parts and uses standard off the shelf components (several readily available fans and blowers) that can be inventoried and easily repaired or replaced by our extensive network of authorized sales agents, distributors, strategic partners and repair technicians. This network provides our customers with an immediate, virtually worldwide sales, installation, maintenance, repair and service capability.

**AGRIPOWER'S BIOMASS FUELED UNIT PROVIDES A CLEAN AND RELIABLE SOURCE OF ELECTRICITY, CO-GENERATION AND THERMAL ENERGY AT A SIGNIFICANT FINANCIAL SAVINGS (AT LEAST $10 ─ $15 MILLION) COMPARED TO A COMPARABLY SIZED DIESEL GENERATOR SET OR FROM AVOIDED TIPPING FEES AND TAXES OVER ITS 20 YEAR USEFUL LIFE. CARBON CREDITS MAY ALSO BE AVAILABLE.**