



# AgriPower

INCORPORATED

## FROM MEGAWASTE TO MEGAWATTS®

### PRODUCT AND TECHNICAL DESCRIPTION BOOKLET

**Our Systems.** AgriPower, Inc.™ is a Delaware (U.S.) corporation established in 2004. We custom design, manufacture, install, maintain and service a wide range of unique, proprietary, modular and transportable, Waste-to-Energy “Heat Only” and “Combined Heat & Power” (“**CHP**”) systems (the “**Systems**”). AgriPower also manufactures a broad line of grinders and provides consulting and project development services including those involving anaerobic digestion units. The Systems, which contain numerous *advanced technology* features and space age materials, are designed and engineered to be fueled by a wide variety of wet and dry (or mixed) customer waste materials including “**Biomass**” (all types of wood, wood debris, cardboard, paper, agricultural by-products, forest residuals and animal manure), with up to a 50% moisture content, and many types of plastic (see list on page 4). In addition to Biomass and plastic, the Systems, when integrated with the “MSW Sorting Unit” described below, can use Municipal Solid Waste (“**MSW**”) as fuel. Using these different types of waste as fuel, the Systems can cleanly produce low-cost, on-site, base load, hot water, heated air and steam and, with the addition of the add-on units described below, electricity and air conditioning and refrigeration (without the need for electric power). The Systems can also provide a variety of “**Co-Generation**” applications including water purification, making ice and low-grade heat for heating buildings and pre-heating cold water. They can also satisfy numerous high-temperature heating needs including producing ultra-hot air for drying various materials such as paint, lumber and excessively wet fuel and bonding numerous materials. The Heat Only Systems can process, and dispose of, from 1 to 60 tons of waste per day in an environmentally-friendly manner and produce from 500,000 to 25,000,000 BTUs/hour (net) of heat energy. With the addition of a custom designed, waste heat steam boiler (the “**Steam Boiler**”) and a state-of-the-art, high efficiency, steam powered electric generator (the “**Generator**”), both of which are manufactured for AgriPower, the CHP Systems, using their heat outputs, can generate from 100 kW to 7.5 MW (gross) and from 75 kW to 7.0 MW (net) of continuous, low cost “behind the fence” electric power by combusting from 12 to 300 tons of suitable waste per day. By using these high efficiency, high output, lower cost Generators instead of higher cost steam turbines and Organic Rankine Cycle (“**ORC**”) units to generate power, we can offer our CHP Systems at extremely attractive prices. The Systems have a long history of reliable, robust and low-maintenance performance. More than 60 Heat Only Systems have been placed in commercial operation, some for more than 10 years, primarily at schools, hospitals, factories, jails and prisons, where heat, hot water and steam are in great demand and expensive to produce and where there is a continuous supply of waste that can be used as fuel instead of being trucked to a landfill at significant cost.

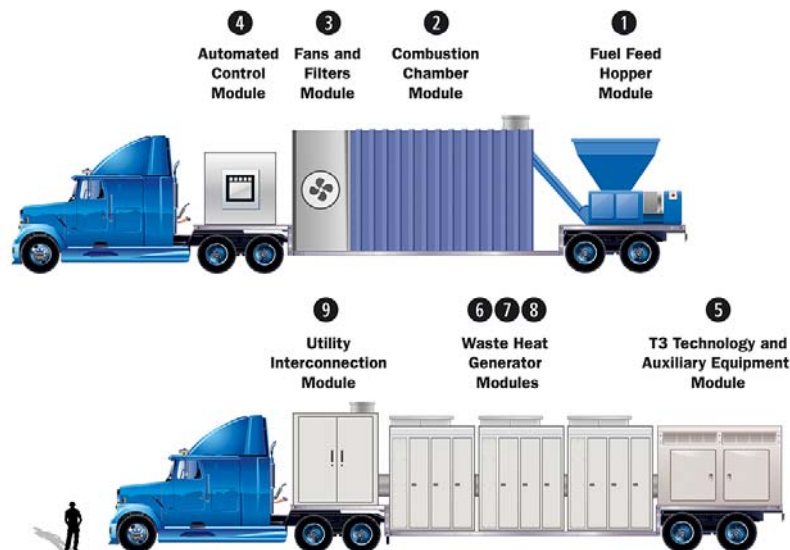
**Municipal Solid Waste (“MSW”).** For enterprises that want to dispose of their MSW by using it as fuel in the Systems to generate low-cost, on-site electric power, reduce their need to use diesel generators and substantially lower the amount of their MSW that goes to their landfill, AgriPower can provide a “**MSW Sorting Unit**” specially designed and produced for it by the foremost MSW sorting equipment design and production company. This unit utilizes state-of-the-art scanners and ultra-fast computers to accurately sort the raw waste into its primary categories: Biomass, fiber, plastic, organics, recyclables, glass and miscellaneous materials. The unit can rapidly identify and remove virtually all of the small pieces of glass and stone so that the Biomass, fiber and plastic can be cleanly combusted in our Systems to generate heat energy and electric power and the organic waste can be used as fertilizer and compost. The unit enables about 99% of the valuable recyclables to be recovered and about 90% of the MSW to be productively used and thereby diverted away from going to the landfill (a 90% diversion rate). The MSW Sorting Unit is designed to process from 200 tons per day up to 1,000 tons per day of MSW. Multiple 1,000 tons per day MSW Sorting Units and 7.5 MW CHP Systems can be operated in tandem.

**System Benefits.** The Systems enable commercial, industrial, agricultural, governmental, charitable and other organizations, to productively and responsibly dispose of the waste they generate by cleanly converting it to low-cost heat energy, electricity and/or Co-Generation, thus ensuring their own “energy independence”, “sustainability” and “resilience”. The Systems solve several significant problems many enterprises face on a daily

basis: disposing of their waste materials in an economic and environmentally responsible manner, reducing the quantity of MSW going to their landfills, obtaining low-cost heat energy, electricity and/or Co-Generation, reducing the amount and cost of diesel fuel purchases and ensuring on-site heat and power reliability. The Systems usually provide significant savings and attractive payback periods of 2½ to 4 years from reduced fees for waste disposal, transport and taxes, and from lower diesel fuel costs of producing heat energy, electricity and Co-Generation. They enable our customers to resolve these problems while improving their operating efficiency and bottom line performance and enhancing their environmental credentials. Some customers generate extra cash flow from tipping fees by accepting waste from their neighbors and using it as fuel in their Systems.

### AGRIPOWER'S TRANSPORTABLE SYSTEM

As shown in the below graphic, the Systems are prefabricated, modular, skid mounted and contain quick-connect fittings, making them easy to handle, ship and transport to the fuel source. Their transportable design enables them to be used at a wide variety of on-grid and remote off-grid sites and for numerous applications (see list on page 4). They can be placed on barges or trailers (not included) and transported to where they are needed, removed from the trailers, rapidly placed into service and utilized on-site for as long as necessary. If they need to be moved, they can be easily and quickly dismantled, re-mounted on trailers and re-deployed to other sites. The Systems are not designed to be operated while on a trailer bed; they should be installed and operated inside of a suitable enclosure on a cement or gravel lay-down pad. AgriPower's modular, skid mounted Steam Boilers, Generators and air conditioning and refrigeration units (see photos on page 3) can also be easily transported in the same manner as shown. **Prefabrication, modularity, skid mounting, ease of transport and rapid set-up, installation, dismantling and short redeployment times are significant benefits of the System.**



**Ease of Permitting.** Unlike other combustion units, AgriPower's Systems use a dual combustion chamber, clean technology design. During the combustion process, all of the combustion gasses and volatile chemicals on or in the waste (such as paint on wood or glue in plywood) are directed from the lower combustion chamber into the upper (extended) combustion chamber where the additional 1.5 to 2 seconds of extended dwell time enables the gasses to be completely combusted. This unique, two chamber design avoids the release of troublesome emissions into the atmosphere, enabling the Systems to comply with applicable air permit requirements. As a result, they can usually operate without the need for expensive emission control equipment and are frequently exempt from applicable air permitting requirements and their associated delays and costs.

**Small Footprint; Attractive Payback Periods.** The Systems' compact design, with typical footprints of 50' by 100', enables them to be located where the waste is produced and where the heat energy and electric power are needed. This results in a highly efficient conversion of waste streams into usable heat and power and eliminates the cost of waste disposal and the carbon footprint from trucking the waste to a landfill. Our use of high efficiency, lower cost Generators means a lesser capital outlay and a typical net payback period of about 2½ to 4 years. A 60 ton per day AgriPower 1.2 MW (gross) CHP System can convert two tons (costing about \$40.00 per ton) of inexpensive scrap wood (costing about \$80) into 1 MW/hour (net) of electricity, compared to the 70 gallons (costing about \$4.00 per gallon) of expensive diesel fuel (costing about \$280) which contains the same usable energy required to produce an equivalent amount of electricity. This represents a saving in diesel fuel costs of about \$1,680,000 per year (at 8,400 operating hours) without taking into account the reduced waste disposal costs, the value of free heat energy and the possible generation of carbon credits and Renewable Energy Certificates. As a result, at current prices, the CHP Systems are expected to save at least \$50 million from avoided diesel purchases compared to a similarly sized diesel generator over their expected 30+ year useful lives.

**Proven Software; Low Repair and Maintenance Costs; Superior Technology; World Class Manufacturers.**

The Systems, which are computer controlled and fully-automated, are run by customized and proven software and Programmable Logic Controllers. Their operations are constantly monitored and function with minimal operator input. Their remote monitoring capability enables our customers (and/or AgriPower) to continuously monitor and control their operation from distant locations. There is no need for expensive on-site technical or safety personnel, as they require only unskilled and inexpensive labor to prepare and load the fuel. The Systems are affordable to acquire, inexpensive and quiet to operate and come in a wide range of heat and power outputs that can be configured for each customer's specific requirements. They are designed to operate continuously (i.e., 24/350) and safely, to achieve an uptime rate of greater than 95%, to require minimal and inexpensive maintenance, and to provide a low total cost of ownership. Their unique extended, dual combustion chambers, extended dwell time, use of over-, under- and mid-fire air distribution systems and screw augers for fuel handling ensure a consistent and an extremely thorough and "clean" combustion process with minimal (1% - 3%) residual ash. Their variable temperature technology (they can operate from 2,200°F down to 1,000°F) enables them to use problematic waste materials, such as plywood (with glue), painted and creosote-treated wood, high alkali palm waste and high silica rice waste, as fuel by operating below their respective chemical reaction levels. The integrated Steam Boiler, Generator, MSW Sorting Unit and the air conditioning and refrigeration units are produced for AgriPower by world-class manufacturers in the U.S., Europe and China.

**Complete Turn-Key Solutions and Numerous Financing Options.** AgriPower can provide a complete turn-key solution for each project and uses several well-known international, environmental services, engineering, procurement and construction companies ("EPCs") to handle permitting, installation, start-up, maintenance and servicing of the Systems on a virtually worldwide basis. Multiple purchase, lease and other financing options are available including AgriPower's **no-risk, no-capital outlay**, "Shared Savings Program" for qualified customers. Under this Program, AgriPower provides its customers with substantial annual savings of waste disposal and diesel fuel costs without the customers having to use their own capital or assume any operating risks. AgriPower uses its own funds to install and operate the System at the Customer's site and with its fuel and shares the savings obtained from the System's operation, and from any carbon credits generated, with the customer.



**AgriPower In-Line Hot Water System**



**Fully Automated Control Unit**



**Example of a User Friendly Screen Shot**



**Customized Steam Boiler**



**Waste Heat Electric Generator**



**Air Conditioning and Refrigeration Units**

## OUR SYSTEMS CAN USE A WIDE VARIETY OF WASTE MATERIALS AS FUEL

The Systems can use Biomass, most types of plastic and many other waste materials as fuel, including:

### Municipal Solid Waste (When used with the MSW Sorting Unit)

#### Commercial Waste

- wood, woodchips, pellets, sawdust and sanding dust
- cardboard and paper
- construction, demolition, storm and other wood debris (even if it contains nails and screws) including plywood (with glue) and painted and creosote treated wood (if permitted), rig mats and pipeline skids
- other wood waste including pallets, crates and boxes (even if they contain nails and screws)
- discarded fruits and vegetables and other plant based food waste (with up to 50% moisture content)
- forest residuals (stumpage and slash) including bark and brush
- bark beetle-infected and fire damaged trees
- “Green Waste” including grass clippings, vines, brush and tree trimmings (twigs, branches and leaves) even if they contain high amounts of bark
- rapidly growing renewable fuel crops including jatropha, poplars, willows, bamboo and switchgrass
- nuisance plant materials such as invader and thorn bush
- many types of plastic waste including bottles, diapers, containers and pallets (if permitted)

#### Agricultural Waste

- crop residuals such as corn stover (stalks, cobs), shells, husks, pits, bagasse and oil palm and rice waste
- most types of animal manure (poultry, cows, cattle and horses)

#### Municipal and Utility Waste

- wood, tree waste, discarded furniture, tires and carpeting
- highway department and local utility tree trimming waste and storm debris
- gardening and lawn waste

## OUR SYSTEMS HAVE A WIDE VARIETY OF APPLICATIONS

The Systems can be used at **on-grid and off-grid** sites. They are of special interest when expensive to operate diesel generators are being used. They have a wide variety of applications including:

- Indigenous and other remote communities, and small and mid-size villages and towns (especially those that operate diesel generators for heat, hot water and power)
- factories, warehouses, cold storage units, supermarkets, “Big Box” stores, malls and shopping centers
- hotels, casinos, colleges and universities (especially those with guest rooms and dormitories)
- municipal buildings such as hospitals, correctional facilities, libraries, schools, garages and town halls
- industrial parks (especially those that have unreliable or “dirty” power)

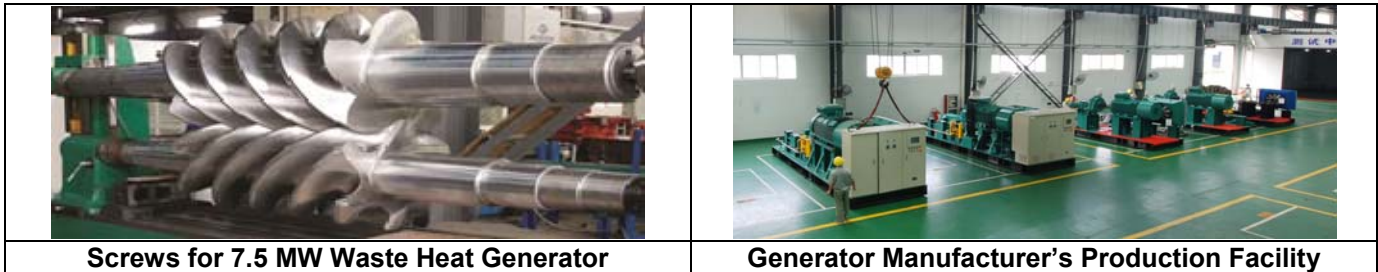
- lumber mills, paper and pulp companies, corrugated cardboard producers, furniture manufacturers and food processors and greenhouses (especially those that need hot water, electricity and refrigeration)
- farms, ranches, plantations, workforce camps, mining sites, military bases and disaster sites (especially those that operate diesel generators for heat, hot water and electric power)
- municipal and private landfill sites especially those that want to increase their diversion rate up to 90%
- resort hotels, especially those that operate their air conditioners and food storage refrigerators 24/7
- on-grid and off-grid electrification projects by governmental and charitable organizations

### **OUR HIGH EFFICIENCY ELECTRIC GENERATORS HAVE MANY ADVANTAGES WHEN COMPARED TO STEAM TURBINES AND ORGANIC RANKINE CYCLE (“ORC”) UNITS**

Over the past several years, waste heat electric generators have demonstrated themselves to be a well proven industrial technology for application in small, decentralized Combined Heat and Power plants (up to 7.5 MW). The main advantages resulting from using AgriPower’s Systems and their customized and integrated Steam Boilers and state-of-the-art Generators are the greater customer value and other benefits they provide from the following:

- Inexpensive Waste is the Fuel. Biomass and many other types of waste, including MSW (when integrated with the MSW Sorting Unit) and most kinds of plastic, can be used as fuel and cleanly combusted in our Combustor Unit to produce steam which is directed into the Steam Boiler and then into the Generator which uses the highly efficient steam to generate electricity.
- Effective in High Temperature Environments. The steam is used as a highly efficient heat transfer medium that is not materially affected by ambient air conditions. As a result, unlike some ORC units that only operate at 60% of their rated capacity when they are used in high ambient temperature locations (up to 100°F), our Generators’ net output is about 95% of their gross rated output in the same conditions.
- No Need for Expensive Safety or Operating Personnel and Ease Of Use. AgriPower’s Generators can use low-, medium- or high-pressure steam to produce electricity. As a result, in many jurisdictions they are permitted to operate without the need for an on-site safety engineer. In addition, they only require unskilled and inexpensive labor to prepare and load the fuel. The Systems and their integrated Steam Boilers and Generators are fully automated. Their user friendly software enables them to operate without the need for any full time operating, technical or maintenance personnel.
- Smaller, Lighter and Less Expensive. We use the latest waste heat, steam powered Generators that are smaller, lighter and less expensive to acquire, maintain and operate than more costly steam turbines and ORC units in the same size range. Their size, weight and footprint are about 50% of an ORC unit with comparable electrical output. As a result, our Systems can be purchased at a substantially lower price than comparable steam turbines and ORC units.
- More Efficient Operation. Our Generators provide Isentropic Efficiency rates of up to 70% compared to 55% efficiency for steam turbines and about 20% for ORCs, with ours generating up to 30% more power.
- Scalable. The AgriPower Generators’ flexible design enables them to be operated in parallel which means we can offer our customers customized Systems in increments of 100 kW, from 100 kW to 7.5 MW gross and about 75 kW and 7.0 MW net.
- Reliability and Long Operational Life. Our Generators use rotating screws to generate electricity instead of high speed turbine blades that are constantly subjected to “Water Impact” damage when water droplets hit them. This feature substantially reduces normal wear and tear, lowers repair and maintenance costs, makes possible a 98% average functioning time and a longer useful life. The Generators are specifically designed for long duration operation, with over-sized components and safe design margins.
- Manufacturing Capacity and Rapid Production and Delivery. The Generator’s manufacturer is a major international company with more than 800,000 square feet of manufacturing capacity. As a result, our Generators can usually be manufactured in 3 to 4 months, compared to approximately 1 year for an ORC unit with comparable electrical output.

- Financial Strength, Experience and References. The Generator’s manufacturer is a publicly traded company with more than \$230 million in annual revenue. It has been in business since 1956, has an excellent reputation, and its products enjoy widespread customer satisfaction. They have more than 50 Generators in current operation.
- Cutting-Edge Technology and High-Quality Products. The Generator manufacturer’s Research and Development center in the U.S. conducts continuing research and has been issued more than 100 patents. Its products’ consistent high quality results from careful production methods and constant testing at its production facility.
- After-Sales Service and Support. The Generator’s manufacturer and AgriPower both offer remote monitoring, extendable warranties and flexible maintenance programs.



**OUR SYSTEMS PROVIDE MANY ENVIRONMENTAL (“GOOD NEIGHBOR”) BENEFITS**

Using our System **on-site** means the Beneficial Use of Waste that:

- reduces up to 90% of the MSW going to landfills and allows the landfills to have a longer operating life
- substantially reduces the amount of harmful methane gas that would otherwise be produced at the landfill
- reduces truck traffic, road wear, emissions and accidents and driver and truck expenses (salaries, fuel, oil, repairs, fees, insurance)
- reduces outdoor burning (or decomposing) of Biomass waste, and resulting air pollution and methane gas
- reduces the use and expense of diesel and other hydrocarbon-based fuels to produce heat, hot water, steam, electricity, air conditioning and/or refrigeration
- uses waste in a productive, responsible, environmentally-friendly and sustainable manner
- enhances environmental credentials with customers, stakeholders, the public and regulatory authorities and creates an attractive “Clean Energy” Demonstration Site that enables continuing favorable publicity from site visits by school children, the public, customers, stakeholders, public officials, etc.
- facilitates local job creation (local workers are required to prepare and load the fuel) and enables funds that would otherwise be used to purchase diesel fuel from foreign sellers to remain in the community for local business development and community programs
- can create valuable Carbon Credits and Renewable Energy Certificates

**FOR FURTHER INFORMATION, PLEASE CONTACT:**

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