

**EXPLORATION
PROCESSING**
WINTER 2010



quasar energy group recycles organic waste to produce electricity and thermal heat, natural gas or CNG.

MAKING USE OF WASTE

AT quasar, WHAT OTHERS CONSIDER WASTE IS RECYCLED INTO AN EFFICIENT SOURCE OF ENERGY FOR MULTIPLE USES.

On November 10, 2009, Cleveland-based Schmack BioEnergy announced a formal decision to change the company name to quasar energy group. "Our systems represent an aggregation of the best available technologies from over 30 European providers," President Mel Kurtz says.

A quasar is an extremely distant object from a planet with energy output several thousand times that of our galaxy. "The name quasar more accurately reflects our technological approach and symbolizes the contribution our systems will make to the national renewable energy portfolio," Kurtz says.

Since 2006, the leadership of quasar has invested significant efforts in bringing proven anaerobic digestion technology to the United States and sourcing components through local suppliers. In 2007, quasar's first facility in Akron, Ohio, began processing 27,777 wet tons of municipal biosolids each year. This accounts for approximately one-third of Akron's annual biosolids. The company says the facility produces 335 kilowatts of electricity that offsets energy consumed each year by Akron's compost facility – operated by Kurtz Bros. Composting Services Inc. The facility is located between Akron's compost facility and wastewater treatment plant.

Recently, quasar relocated its laboratory to The Ohio State University's (OSU)

Ohio Agricultural Research and Development Center (OARDC) campus in Wooster, Ohio, to collaborate with the largest agricultural bioscience research center in the nation. The laboratory is managed by Dr. Yebo Li of OSU, lending it a valuable third party oversight. Building on this relationship, quasar began construction on the first ecoFARMsystem 550 (F550) facility in Wooster on the OARDC campus in the BioHio Research Park. The project is being built with support from OARDC, the Ohio BioProducts Innovation Center (OBIC), the Ohio Department of Development and the United States Department of Agriculture. quasar plans to commission the facility in December 2009. In November, quasar broke ground on another project in Zanesville, Ohio.

Anaerobic Digestion

quasar anaerobic digestion systems recycle energy from biomass waste that would usually be incinerated or hauled to landfills. Anaerobic digestion is a natural process where microorganisms break down organic waste materials in the absence of oxygen. This process produces biogas, which is composed of approximately 60 percent methane. The company uses manure, municipal wastewater treatment plant biosolids, alcohol and ethanol waste, crop waste and food waste as feedstock for the system.

Anaerobic digestion is not new technology, as Europe is home to approximately 8,000 anaerobic digestion facilities, with more than 3,800 located in Germany alone. "Our continuous mix, high-solids anaerobic digestion technology is proven, reliable and advanced," quasar says.

The industry is only just now gaining a foothold in the United States. According to the EPA AgSTAR directory, only 125 anaerobic digestion facilities operating in an agricultural setting are producing renewable energy. This does not include systems operating at public or private wastewater treatment plants.

The biogas produced by quasar systems can be cleaned, separated and dried using patent pending technology provided by Biogas Technologies Unlimited (BTU). BTU

The Alpha Group was, and continues to be, excited to serve as the full service insurance agency Mel Kurtz and quasar energy group turned to five years ago when quasar was one of the first companies to bring this exciting renewable energy technology to the United States. quasar's insurance needs are as unique as their industry and Alpha is able to provide quality, innovative insurance products ranging from liability and property insurance to employee benefits. Alpha is proud to be associated with quasar energy group's success story.

is a division of quasar that holds exclusive rights to the sales of the technology that was developed by Maryville, Tenn.-based Aircel LLC for converting biogas to pipeline quality natural gas.

Uses for Biogas

Quasar says biogas has a positive impact on not only energy security, but also the economic development of both urban and rural communities. It can be used to generate electricity and thermal heat. When it is purified, reaching 97 percent methane,

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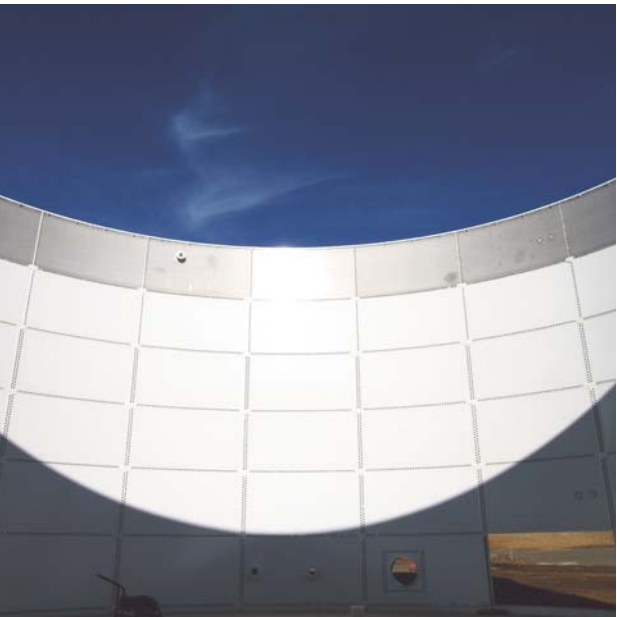
"THE NAME QUASAR MORE ACCURATELY REFLECTS OUR TECHNOLOGICAL APPROACH."

it meets national natural gas standards and can be fed into natural gas utility grids. Biomethane also can also be processed as compressed natural gas (CNG), which is considered to be CO₂ neutral. BTU Vice President Alan Johnson adds, "CNG compressed from biomethane can cost significantly less than petroleum fuels."

Quasar's process creates products that can be resold to the community or applied on farms for a closed loop. "Many fields or entire watersheds have excess nutrients that leach into the country's water resources and the result is pollution and reduced crop yields from soil compaction and salts in many regions," Bruce Bailey, vice president of technical affairs at quasar says. "Anaerobic digestion changes raw biomass such as manure into marketable products that can be moved from farms to markets for better utilization and cleaner soil and water for the country."

Virgin topsoil is limited in the United States

quasar energy group says anaerobic digested biomass is a perfect source of stable organic matter for topsoil.



causing most markets to use blended topsoil, which requires a source of stable organic matter. Bailey believes digested biomass would be of perfect use, adding, "anaerobic digested biomass produces readily marketable soils for many uses."

According to quasar, the opportunities for waste-to-energy systems are abundant. As the country's population continues to grow, so does the demand for energy and the need to dispose of waste. Quasar says their technology is a solution to this challenge.

Welcome to Wooster

The BioHio Research Park on OSU's Wooster campus is a collaborative initiative between the Wayne County Economic Development Council and OSU/OARDC. The first official tenant of the park will be quasar, which says it is "proud to contribute to this economic development initiative by bringing clean, renewable energy to this area of Ohio."

The F550 system in Wooster is considered the flagship facility of what quasar hopes to be many more to come. It has a system capacity of 550,000 gallons with annual inputs of 19,382 wet tons. It can store incoming biomass for approximately three days with a normal anaerobic digestion time of approximately 28 days. The F550 will turn out 4,252 megawatts of annual electricity and produce 2,404 MMBTU.

The company says that because of its location on the university campus, the Wooster F550 will benefit from the wealth of research and knowledge that will be available through the distinguished faculty of the OSU/OARDC.

The company adds that the F550 will contain the best possible technology for processing. "In coordination with our collaborative state-of-the-art laboratory facility, the system will feature all the latest advancements in quasar technology including patent-pending biogas upgrade equipment provided by BTU," quasar says.

To produce clean, renewable energy and valuable byproducts, the system will process regional food waste and crop waste, grass and manure from OSU/OARDC farm operations. The company says

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"INFRASTRUCTURE THAT WAS PUT IN PLACE IN THE '70S IS BEGINNING TO CRUMBLE AND THE COST TO REBUILD IS HIGH."

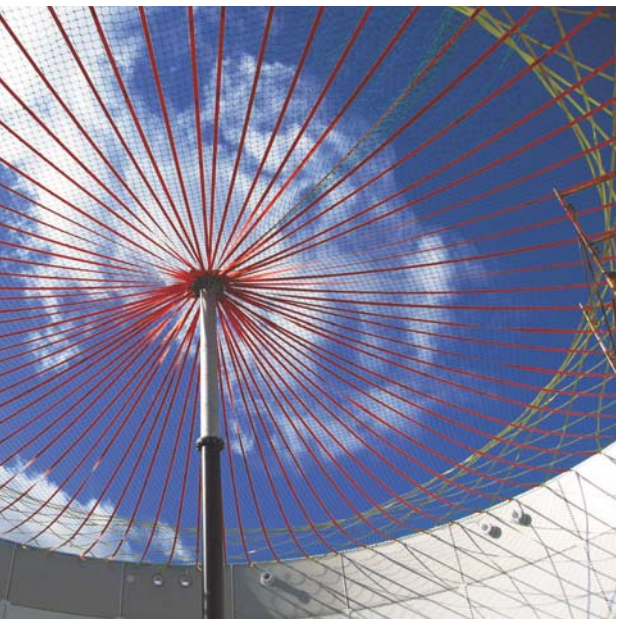
the F550 will have environmental benefits as well, such as reduced greenhouse gas emissions and nutrient management.

A Cleaner City

As people become more aware of the negative effects actions can have on the environment, quasar has adopted a mission to produce renewable energy from commercial and municipal organic biomass, while improving the environment.

The company says its facilities provide a green alternative to the traditional waste management practices. Because it creates a closed loop, quasar says its systems "help to balance the delicate ecosystems of American farms and cities." With its ecoFARMsystem and ecoCITYsystem, renewable energy will be produced to encourage sustainable economic development and protect the environment, according to the company.

quasar is developing technologies to help cities turn biomass and food waste into renewable energy.



The ecoCITYsystem 2250 (C2250) manages municipal biosolids and food waste while generating sustainable renewable energy to be used by a city community. The C2250 has a tank capacity of 2,250,000 gallons and intakes a minimum of 150 wet tons a day. Its incoming biomass storage is approximately six days and has an anaerobic digestion period of approximately 30 days.

Quasar believes it is time for cities to eliminate old waste management practices. "Cities across America have been incinerating and landfilling their biomass for centuries," quasar says. "Landfilling and incinerating biomass generates greenhouse gas emissions and odors."

It continues, "At this moment, many large municipal wastewater treatment facilities are facing difficult choices – infrastructure that was put in place in the seventies is beginning to crumble and the cost to rebuild is high," quasar says. "Expensive construction costs will translate to significant increases for rate payers who are becoming increasingly aware of the negative environmental impacts of such practices."

Through a quasar system, cleaner air is produced because municipalities do not need to incinerate their biosolids. "Incineration sends polluting emissions into the air we breath and generates ash, which is landfilled," quasar says.

"Anaerobic digestion significantly reduces odors around wastewater treatment plants, food processing facilities and farms – giving these operations the opportunity to act as a 'good neighbor' to the community," it adds.

Also, the company adds that carbon credits are a way to reduce greenhouse gas emissions on a world-wide scale and benefit a city. "For cities, carbon credits generated by transitioning from incineration to anaerobic digestion as a waste management system can be used for economic development in a number of ways," it says.

"For cities that are home to a large manufacturing industry, carbon credits could help businesses expand their operations while maintaining their carbon footprint," the company adds. "Carbon credits can also be used as a tool to attract new businesses anxious to settle in an environmentally conscious community."

quasar says its systems also can clean up water to produce products such as concentrated fertilizer and potable water. ■

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