



The City of Wooster, Ohio

Water Resource Recovery Facility

Through Public Private Partnership

- HQ: Cleveland, OH
- Over \$150M in Executed Projects
- 13 Operational Digesters (OH, NY, MA)
- Capacity to annually manage 700,000 tons of organic waste
- Municipal, Industrial & Agricultural ADs
- Mature US Supply Chain

Anaerobic Digestion Technology Leader



Full Suite of Services



Waste Management

Foodwaste



WWTP
Biosolids



Fats, Oil &
Grease



Nutrients



Natural fertilizer and
animal bedding

Renewable Energy

Electricity



Compressed
Natural Gas



Heating &
Cooling



- Treatment plants are facing capital, technical, and regulatory challenges.
- Federal funding to address these challenges has decreased 90% since the 1980's.¹
- Wastewater is rich in natural resources – water, nutrients and energy
- Treatment plants consume 3% of the total US energy demand.
- Biosolids have the potential to produce 12% of the US electric demand!¹

quasar partnered with the City of Wooster (Ohio) to turn their Water Pollution Control Plant into a Water Resource Recovery Facility.

1. Source: NACWA, WERF, and WEF [The Water Resources Utility of the Future](#) pages 25 and 14



The Challenges

Regulatory Issues:

- EPA Compliance
- Discharge Limits
- Sewer Capacity Restrictions

Process Issues:

- Solids Handling
- Antiquated Digesters
- Insufficient Biogas Production

Disposal Issues:

- Land Application Restrictions
- Nutrient Value Verification
- Value Proposition for Farmers



Water Pollution Control Plant Prior to quasar Project

Projects can involve a Feasibility Study which at a minimum includes:

- Identify additional regional organics
- Evaluate energy potential
- Effluent management
- Location/ Logistics
- Engineering package



Challenges:

- Old Facility
- Existing Footprint
- Plant Operations Maintained

Scope of Work:

- Retrofit three 1960s Digesters
- Construct Biomass Tank
- Building for Belt Thickener
- Solids Receiving Station
- Install 1100 kW Generator



Public-Private Partnership

Public-Private Partnership can be the new direction for municipal projects. **But what does it really mean once the bid process is over?**

In Wooster PARTNERSHIP means collaboration;

- Treatment plant continued operating during construction,
- Detailed daily communication between entities
- Integration of operations
- Retrofit completed; no change order invoices to City
- Relationship continues long after the initial project was completed.

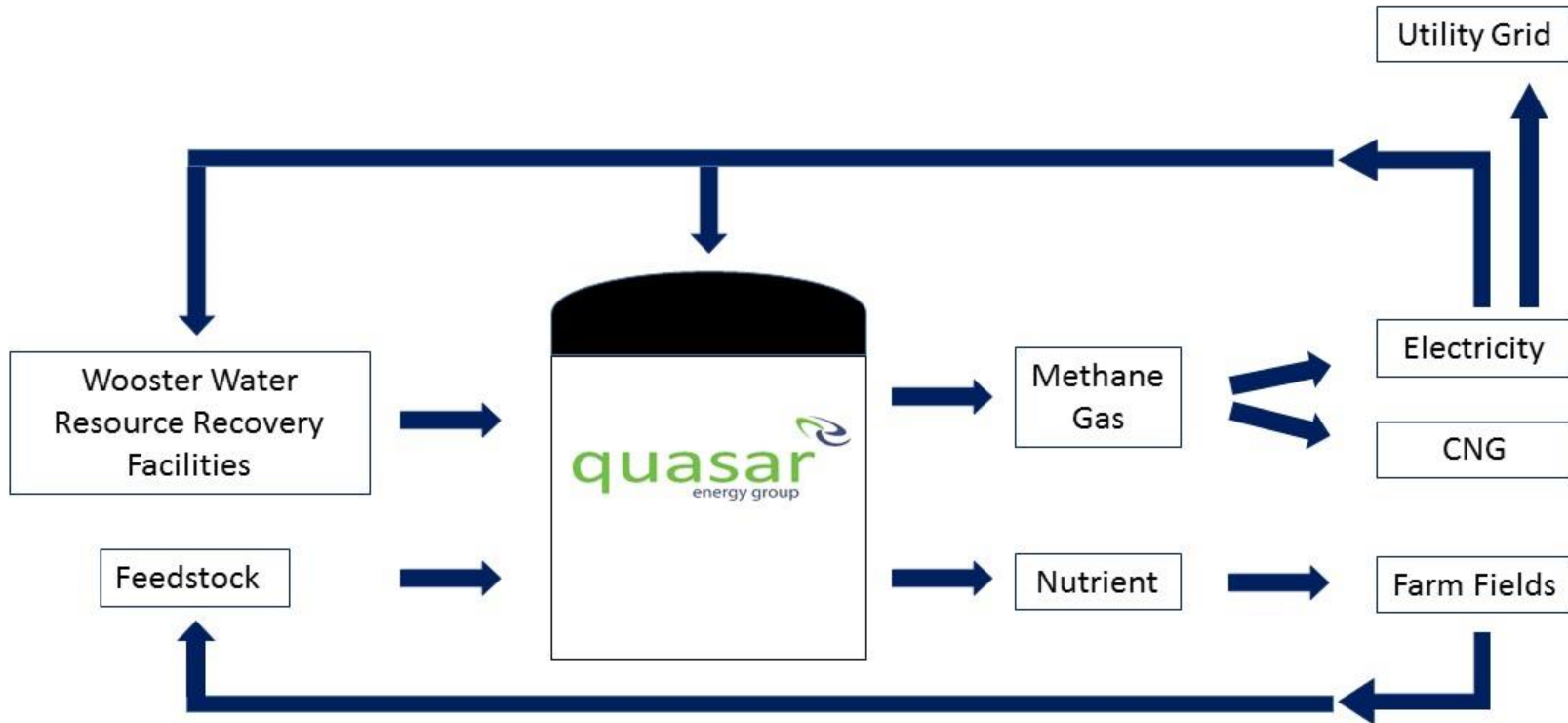


Project Results

- ✓ Address OEPA Findings & Orders
- ✓ Run the WPCP on renewable energy
- ✓ Manage the City's biosolids at a reduced rate
- ✓ Reduce overall operating expenses
- ✓ Increase WPCP capacity
- ✓ Contribute to local economic development



Process Flow Chart

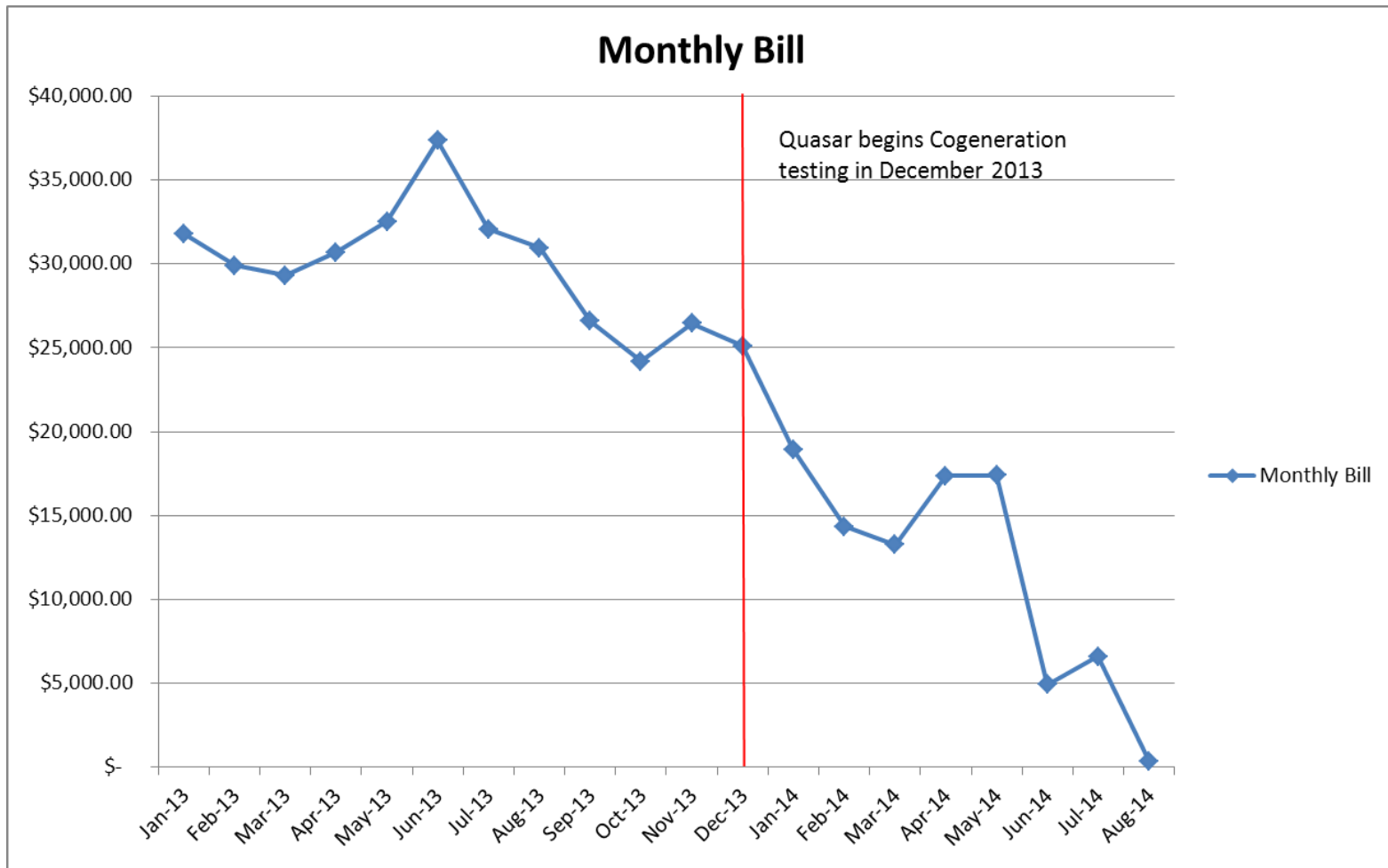


Welcome to the Future...



How Quickly did the City benefit?

Monthly Electric Bill City of Wooster (Ohio)



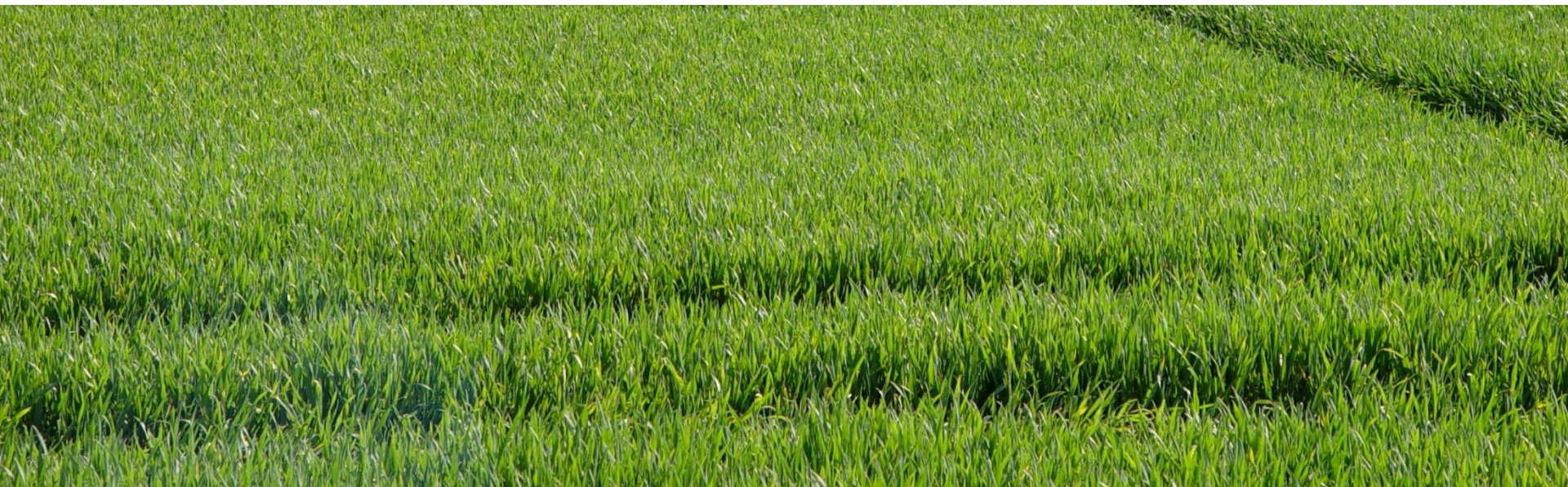
Next Steps

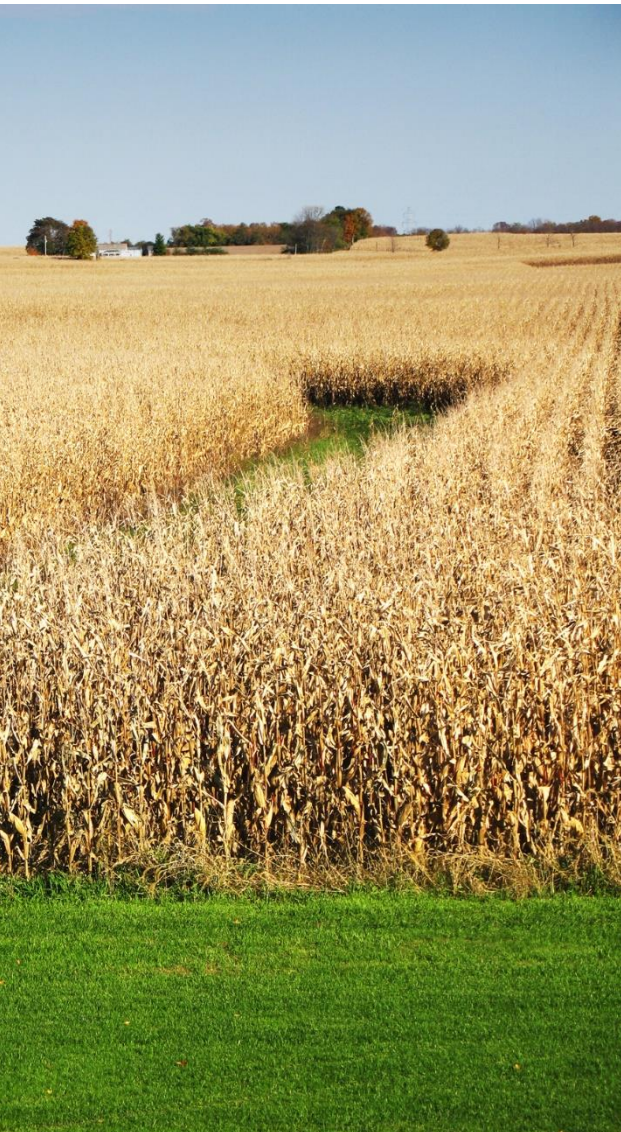


- Interconnection between WRRF and Water Treatment Plant to take advantage of excess power generation and utilize 2.2 MW backup generator
- Future CNG Fueling Station
- Conversion of Utility vehicle fleet and eventually City vehicles

The Future is Now

- Exceptional Quality Class A effluent
- Water Cleaning
- Nutrient Recovery





Exceptional Quality (EQ) Class A effluent

- Created from the blending of organic waste during anaerobic digestion (food waste, FOG, & municipal biosolids).
- Additional treatment process allows **EQuate** to meet Exceptional Quality classification by USEPA (United States Environmental Protection Agency) standards.
- **EQuate** is ideal for a wide range of agricultural uses including:
 - Agricultural application
 - Soil reclamation
 - Soil remediation
 - Soil amendment

- **quasar** has developed a proprietary back-end technology to cost effectively clean digester effluent to “cleaner water”.
- Cleaner water is very affordable if the goal is to discharge to the sewer,
- Further processing can produce “clean water” that can be discharged to a stream affordably.





- Anaerobic digester effluent is a valuable nutrient rich soil amendment that can significantly reduce farmers' costs.
- NPK Value: 10-6-1
- Land application is a safe and beneficial use of digested material

- High-volume/low-solids
- Weather conditions
- Crop cycles/seasonal
- Storage
- Local Opposition to Land Application of Biosolids
- Back-end technologies that present an alternative to land application have traditionally been too expensive or are unproven.

So what is the solution?

- Dewatering is the first step in a nutrient recovery/cleaner water solution.
- Liquid is discharged to WWTP
- Solids can be land applied or blended with compost for beneficial use
- Reduction in solids minimizes transportation usage and overhead cost



To achieve and transport the same amount of solids -

- **4 truckloads of material before dewatering.**
- **1 truckload of material after the dewatering process.**

- It may be necessary, or financially prudent, to further process liquids in order to achieve discharge levels for sewer.

Target Levels in Sewer Quality Discharge Liquid	
Phosphorus	< 5 ppm
Ammonia	< 250 ppm
TSS	< 250 ppm
BOD	< 300 ppm

- Concentrated nutrients are captured and sold or can be infused back into the solids

Proof of Concept

- Columbus, Ohio.
- Cleveland, Ohio.
- Wooster, Ohio.
- Broad implementation over the next year.





Private/Public partnership;

- * reduced costs by over \$300,000 per year,
- * attracted new businesses to the region,
- * achieved Ohio EPA compliance,
- * made EQ Class effluent possible,
- * established clean water,
- * enabled nutrient recovery,
- * and expanded the facility's capacity.

Public/Private partnership is a real solution for municipal treatment plants.

Questions & Contact Information



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