

# UNISON SOLUTIONS, INC.



Since 2000, Unison Solutions has been a leader in distributed generation and waste-to-energy systems utilizing traditional internal combustion engines, Capstone MicroTurbines or STM Stirling engines. These systems are operating on biogas from landfills, wastewater treatment facilities and other livestock or food processing anaerobic digesters.

Because of our experience with biogas applications, we also provide our customers with complete gas compression, conditioning and filtration systems. These systems include moisture, H<sub>2</sub>S and siloxane removal and management.

One of our projects was awarded the **EPA Project of the Year** for 2003. The waste-to-energy project converted raw landfill gas to power and heat a large high school in Illinois. The methane gas from the closed *Superfund* site was previously being burned off in a flare.

*Unison Solutions, Inc.*

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## DISTRIBUTED GENERATION

Capstone MicroTurbine is the industry leader in micro-turbine technology, launching their first commercial unit in 1998. Since then Capstone has sold over 3,500 micro-turbines and has accumulated 6.5 million hours of operation. Capstone is 100% micro-turbine focused, has developed third and fourth generation products and secured 74 U.S. and foreign patents. No other micro-turbine manufacturer has this level of experience.

Capstone MicroTurbines are presently available in two sizes, 30 kW and 60 kW. Each is about the size of a refrigerator and can generate enough electricity and thermal energy to power a small business.

The MicroTurbine is based on the same technology as a jet engine but integrates patented air bearings and state-of-the-art electronics. The results: a versatile, reliable, environmentally beneficial solution for power generation that is virtually maintenance-free. The MicroTurbine requires no oils or coolants and has only one moving part.

The Capstone MicroTurbine uses natural gas, methane, diesel or a variety of other liquid and gaseous fuels. Unison has successfully installed these turbines in the following applications:

- Waste-to-Energy (Landfill, Wastewater Treatment, Livestock, Food Processing)
- Combined Heat and Power
- Peak Saving
- Stand-by-Power



STM Power, the world's leading developer of external combustion engine technology, harnesses energy from virtually any heat source and turns it into valuable electrical power and hot water for commercial and industrial applications.

Established on the principles of the Stirling Cycle, STM Power has developed an innovative engine that has revolutionized the way energy is produced, distributed and consumed.

STM Power's solution, the PowerUnit, provides customers with one of the most cost-effective, low-emission and low-maintenance distributed generation technologies on the market today. The integrated engine/generator unit provides 55 kilowatts of continuous electric power, yet with a fraction of the emissions and maintenance of comparable internal combustion engines.

Complete turnkey installations are available for combined heat and power, biogas, hydrogen and waste heat applications. Unison also manufactures a completely packaged STM gas compression and conditioning skid to simplify installations.



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## WASTE-TO-ENERGY SYSTEMS



### Gas Conditioning and Compression

At Unison Solutions, we custom engineer and fabricate each biogas compression and conditioning system based on site-specific data. Our pre-assembled, skid-mounted design can support micro-turbines, internal combustion engines and Stirling engine generator installations.

Our systems compress biogas using the highest quality regenerative blowers or compressors on the market. Moisture removal is accomplished utilizing moisture scrubbing technologies in conjunction with either glycol chilling or refrigerated drying. The most field proven H<sub>2</sub>S or siloxane filtration methods are also included as necessary. Our systems are fully automated with Allen Bradley PLC's and include several built in safety features.

### Siloxane Removal

Siloxanes are becoming a greater challenge for operators of boilers and waste-to-energy systems because of their increasing use in consumer products. Siloxanes are silicon particles that buildup in boiler tubes and combustion chambers from heat and pressure that cause increased maintenance and equipment failures.

Unison Solutions is a distributor of Applied Filter Technology Siloxane removal systems. AFT is the world leader in siloxane removal design and filtration media and supply.

Unison/AFT can provide the complete siloxane removal package from gas testing and analysis, system design, fabrication, installation and service. Unison/AFT also stocks replacement media and can provide financing.

AFT is the only organization in the industry that will provide a 5-year siloxane removal performance guarantee.



### Vessel Design and Fabrication

Unison Solutions designs and fabricates stainless steel vessels in sizes up to 10 feet in diameter. Vessel design can include manways, nozzles, internal media support structures and OSHA approved access.

Our vessels can be constructed for pressures up to 15psig and down to absolute vacuum. Although our vessels are not code stamped, they are designed to the latest ASME pressure vessel standards.



# UNISON SOLUTIONS, INC.

## PARTS & SERVICES

*Unison Solutions can provide any of the following services to support your needs.*

- Capstone MicroTurbine sales, installation and maintenance
- STM PowerUnit sales, installation and maintenance
- Vessel Design and Fabrication
- Remote monitoring and troubleshooting
- Technical field engineering and support
- Turnkey installations and project management
- Feasibility studies
- Biogas compression and moisture removal
- Gas testing and analysis
- Biogas dew point control
- Siloxane filtration and removal systems
- H<sub>2</sub>S filtration and removal systems
- AFT replacement graphite and HOX media
- Capstone MicroTurbine warranty and replacement parts
- STM Power Unit warranty and replacement parts
- Start-up & commissioning



### *Awards for Biogas Distributed Generation Projects*

- EPA Landfill Methane Outreach Program-Project of the Year 2003
- Associated General Contractors-Build Wisconsin Award
- Associated Builders and Contractors-Project of Distinction
- Capstone—Excellence in Service Award
- Minnesota Great Award
- ACEC—Engineering Excellence Grand Award

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