TETRA TECH is a leading provider of consulting, engineering, program management, construction, and technical services addressing the resource management and infrastructure markets. The Company supports government and commercial clients by providing innovative solutions focused on water, the environment, and energy. With approximately 13,000 employees worldwide, Tetra Tech’s capabilities span the entire project life cycle.

For all sectors, Tetra Tech offers the full suite of engineering and environmental services, including assessment, planning, development, permitting, design, build, and operation & maintenance of biogas capture and use technologies. For all sectors, we offer analyses of available incentives or grants for project development and direct interface with utilities to explore cooperation opportunities.

AGRICULTURE
Tetra Tech has extensive experience with anaerobic digestion technologies ranging from simple systems such as bag digesters and covered anaerobic lagoons, to more complex technologies such as complete mix digesters, plug flow digesters, and UASBs. Our services include: resource assessments at country or regional level; technical and financial feasibility studies; project development, including design, EPC and EPCM, maintenance and monitoring, capacity building through technical demonstrations and advanced training on anaerobic digestion, as well as waste-to-energy projects.

WASTEWATER
Tetra Tech offers analysis of opportunities that promote self-generation of electricity, heat to dry biosolids, chilled water, Renewable Natural Gas (RNG), and Renewable Compressed Natural Gas (RCNG), optimization of underutilized or flared biogas; support local environmental operational management responsibilities.

LANDFILL
Tetra Tech specializes in the fabrication and construction of gas extraction and treatment systems, and environmental control systems. This includes construction of the following: landfill gas wells and probes; landfill gas header systems; landfill gas collection and conveyance piping; landfill gas treatment systems; condensate management systems; trenching and earthwork; instrumentation and controls; groundwater treatment systems; leachate treatment systems; and drilling of landfill gas wells, and monitoring probes.

Company Facts and Rankings

1st in WATER eight years running (since ENR 2004)

- Annual revenue of USD $2.6 billion (FY11)
- Assets totaling USD $1.6 billion
- Publicly traded on NASDAQ (TTEK)
- Geographic reach of 330 offices worldwide (200 in the US)

GLOBAL PRESENCE
North America: Canada, United States
Asia: Afghanistan, China, India, Japan, Kazakhstan, Philippines, Republic of Korea, Thailand
Pacific: Australia, Guam
Europe: France, Germany, United Kingdom
Latin America: Chile, Panama
Middle East: Qatar, United Arab Emirates
Methane emissions and the environment

Waste management in agriculture, wastewater and landfills is a major source of methane, a greenhouse gas (GHG) which accounts for 14 percent of all anthropogenic methane emissions worldwide. Tetra Tech is working in these three sectors to reduce global methane emissions, improve the environment and provide a clean source of energy.

Selected Projects

**SANTA MONICA, MEXICO**
- 6,100 pigs
- Covered anaerobic lagoon
- Mitigation of 1,050 tons CO2e/yr
- Biogas: 522 m³/day
- Digester volume: 4,800 m³

**LA JOYA, MEXICO**
- 35 pigs
- Mitigation of 13 tons CO2e/yr
- Biogas: 4 m³/day
- Digester volume: 36 m³

**HAIDONG, CHINA**
- 13,000 pigs
- Covered anaerobic lagoon
- Mitigation of 4,200 tons CO2e/yr
- Biogas: 1,300 m³/day
- Digester volume: 15,000 m³

**27TH AVE. LANDFILL AND 23RD AVE. WWTP, ARIZONA**
- Feasibility study to blend landfill gas and digester gas for electricity generation processing facility

**GLENDALE LANDFILL, ARIZONA**
- 8 MT of waste in place
- 73 vertical wells and 6 horizontal collectors
- 1,200 scfm, 42% CH4
- 2 psig
- 2.8 MW engines

Tetra Tech’s technical skills and understanding of biogas systems help our clients to effectively implement waste to energy programs and projects in a diverse range of industries and environments.

**BIOGAS BENEFITS**

Tetra Tech's biogas projects in the agriculture sector through anaerobic digestion provide the following main benefits to our clients:
- Use of biogas as fuel in boilers or for electricity generation
- Reduction of noxious odors present in wastewater through waste stabilization
- Use of digester effluents as fertilizer for field irrigation
- Reduction of the amount of organic matter and pathogens in farm effluents
- Reduction of the farm or agro-industry's carbon footprint through greenhouse gases emissions reductions

Anaerobic digestion systems installed at wastewater treatment plants can:
- Self-produce up to 60% of electricity and 100% of heat needs
- Significantly reduce operational costs
- Increase level of involvement within local community by offering heat and fuel at lower costs
- Accept various waste products with the potential to increase energy production while contributing to cleaner water resources locally

Capturing and using landfill gas provide the following main benefits:
- Generate revenues for the landfill through electricity savings, electricity sales, and carbon credits
- Generate local renewable energy available 24/7
- Mitigate climate change through methane emissions reduction
- Reduce air pollution through organic compounds destruction

Tetra Tech has completed more than 150 bioenergy projects across the world since 2000. For example, we work at the gas-to-energy system at Glendale Landfill that provides power for the equivalent of 1,600 homes.
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- Mechanical and electrical design for landfill gas to energy projects at 13 landfills

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Biogas Services
Agriculture, Wastewater and Landfill Sectors