

# Heath and Associates

Uniquely qualified to guide you

**Heath and Associates, Inc. is a relationship oriented firm, which has led us to:**

- Work for over 60 Natural Gas Utilities since 1960.
- Engineering registration and clients in 8 states.
- Develop a well respected reputation with gas utilities, Pipeline Safety Officials, State Energy Offices, Federal Regulatory Agencies, DOT Officials, State Environmental Agencies, and Pipeline Contractors.
- Landfill Methane Outreach Program (LMOP) Industry Partner
- Develop a LOYAL customer base with unparalleled client satisfaction.

## **Experience in the Southeast:**

- Provide Engineering Design and Construction Management for hundreds of NG pipeline projects on schedule and within budget.
- We have designed more natural gas pipelines within the Carolinas than any other consultant - by a factor of ten.
- Designed and assisted landfill gas operators with pipeline and regulatory compliance issues.
- Worked for 24 of 26 municipal gas systems in the Carolinas and Virginia.
- Provide regulatory compliance plans and training for Operations and Maintenance, Operator Qualification, Integrity Management, and Public Awareness.
- Worked with various Industrial Customers throughout the Southeast.



Heath and Associates, Inc.

Founded in 1960

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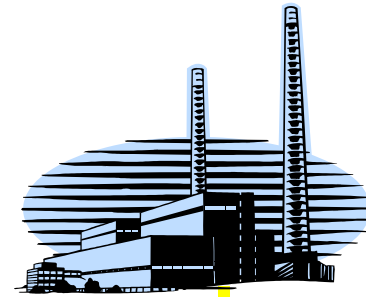
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We are using our vast experience of the natural gas industry to facilitate and advance LFGE projects.



Heath and Associates, Inc.  
Engineers and Consultants

## **LANDFILL GAS-TO-ENERGY PROJECTS**



**ENGINEERING THE  
FUTURE OF ENERGY**

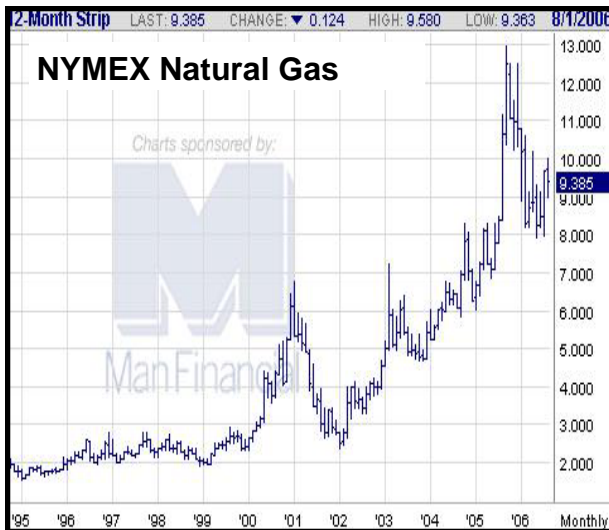
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[www.heathweb.com/landfillgas.html](http://www.heathweb.com/landfillgas.html)

# Why Landfill Gas to Energy Projects Now?

# Evaluating Landfill Potential

# Positive Outcomes



**METHANE IS WORTH MORE THAN EVER!**

**A 1,000,000 ton landfill may produce 500 MCF per day of Landfill Gas which can generate Annual Revenues:**

**Onsite Power Generation = \$547,500**

**Direct Gas Sales = \$1,370,000**

**Projects selling 500+ MCFD landfill gas generally support pipeline projects of 15+ miles from the landfill site.**

**Revenue excluding capital and O&M:**

**When sold for \$0.03/Kilowatt = \$3.00/MCF**

**When sold for 30% discount to industrial natural gas rates yields \$7.50/MCF**

Landfill Gas-to-Energy (LFGE) projects are dependent upon many variables - financial, operational, and physical locations of the landfill and potential energy users. Heath and Associates, Inc. can help initially evaluate the potential for a successful LFGE Project and if the potential exists, provide the details necessary for obtaining financial and political approval.

## General Feasibility Study

- ◆ A review of the landfill's methane generation potential and value.
- ◆ Proximity evaluation of potential end-users and sales opportunities.
- ◆ Project Economics: identifying revenues, capital and operational costs, financing alternatives, and rate of return.
- ◆ Identification of LFGE opportunities and risks. Recommendations on how to commission project if feasible.

## Detailed Project Study

- ◆ Summary of end-user contacts, interest, and potential.
- ◆ Preliminary off-site route selection:
  - Construction cost estimate
  - Right-of-way necessary for construction
  - Highway, railroad, and environmental permits necessary
- ◆ Economic evaluation for financing
  - Capital and O&M estimates for project
  - Commodity Revenue projections
  - Project performance projections suitable for obtaining financing.
  - Assessment of financing alternatives.
  - CO<sub>2</sub> emission offsets value
- ◆ Detailed conclusions, recommendations, and action items.

## Project Design, Construction Management, and Operations

- ◆ Prepare detailed plans and specifications to solicit developers or contractors to construct and operate the project.
- ◆ Preparation of permits for project construction.
- ◆ Construction management and operations assistance services.



WIN - WIN

**Successful LFGE projects have the following characteristics:**

### Locally

- ◆ **Converts landfill expenditures into a new revenue source**
- ◆ **Industry recruitment and retention**
- ◆ **Reduce local industry's energy costs and provide price stability**
- ◆ **Reduces air pollution**
- ◆ **Positive public relations**

### Nationally

- ◆ **Counteract increasing energy prices**
- ◆ **Offset the use of non-renewable resources**
- ◆ **Reduction of methane emissions (21 X more harmful than CO<sub>2</sub>) reducing smog, global warming, and possible health hazards.**