





Your Renewable Energy Partner



# South Side Landfill LFG Recovery and Utilization: A Look at the Past with An Eye to the Future



# Early Project Development

## Well field installation



Well Drilling at South Side



Gas Well at South Side

**Experimental Phase: First Wells Drilled in 1985**

# Early Project Development

## LFG Extraction Station



Hoffman 30 HP Blowers

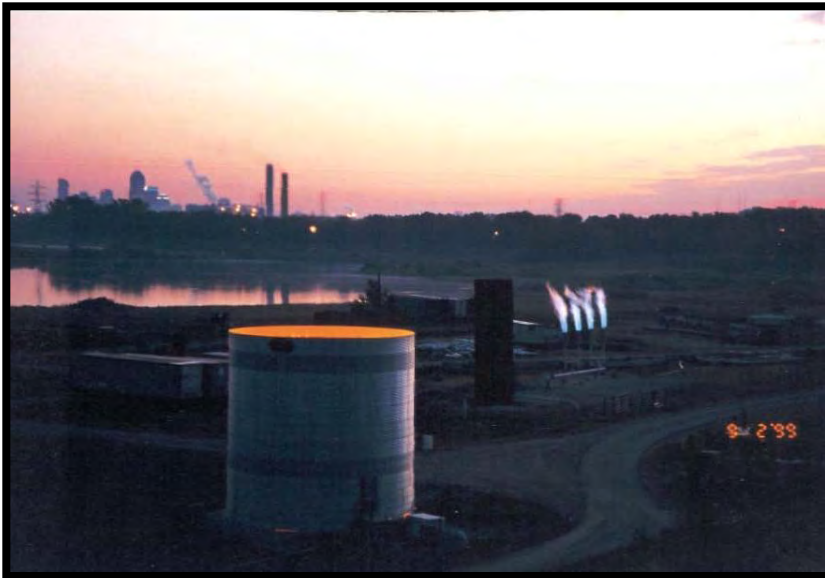


Watching the First Start

**Investigative Phase:  
First Blower Station Installed in 1989**

# Early Project Development

## Flare installation



Flares at South Side Landfill

**Investigative Phase: Began Flaring in 1989**

# Early Project Development

## Greenhouse boilers



Aerial View of Greenhouse

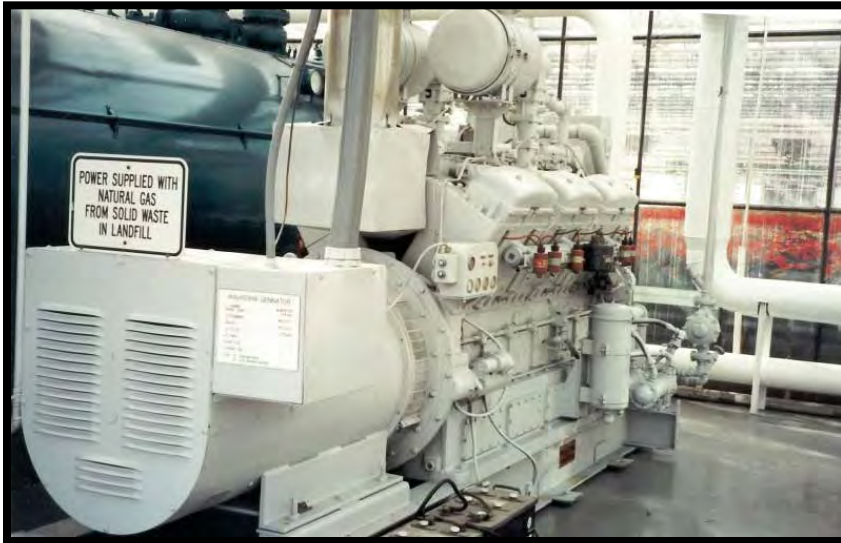


Cleaver Brooks Boiler at Greenhouse

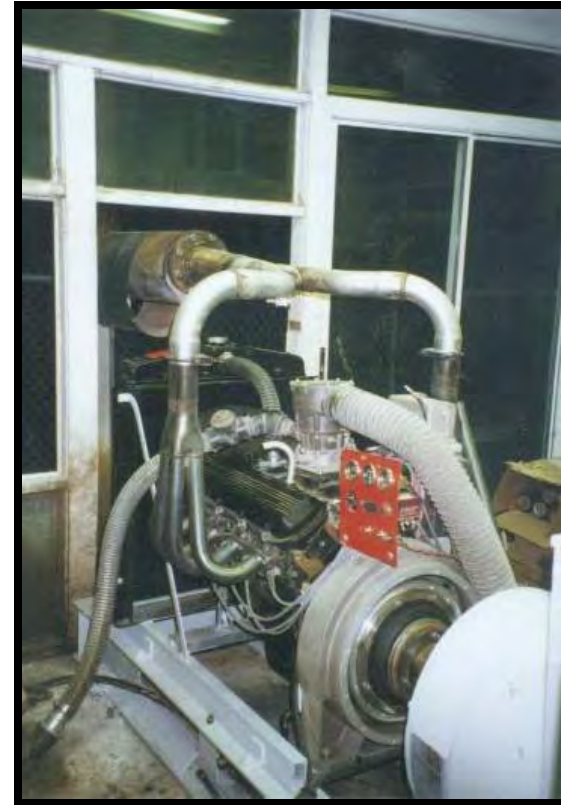
**1<sup>st</sup> Commercial Phase: Boilers Installed in 1989  
First Flowers Delivered in 1990**

# Early Project Development

## On-site IC generators



**Waukesha Generator**



**Chevy Generator**

**1<sup>st</sup> Commercial Phase:  
Generators Installed in 1989**

# *The Project Expands With Granger*

LFG Compression Station

⊕ **Production capacity: 175,000,000 cu ft/month**



**LFG Compression and Treatment Facility**



**Pneumatech Refrigerated Gas Dryer**

**2<sup>nd</sup> Commercial Phase:  
Plant Started in August 1999**



# *The Project Expands With Granger*

Rolls Royce Plant 5

⊕ **Consumption range:**  
**68,000,000 – 175,000,000 cu ft/month**



**Pipeline to Rolls Royce**  
7200 ft. 12 inch HDPE



**Rolls-Royce Boilers**

**2<sup>nd</sup> Commercial Phase:**  
**First Fire on LFG in October 1999**

# *The Project Expands With Granger*

Award winning project



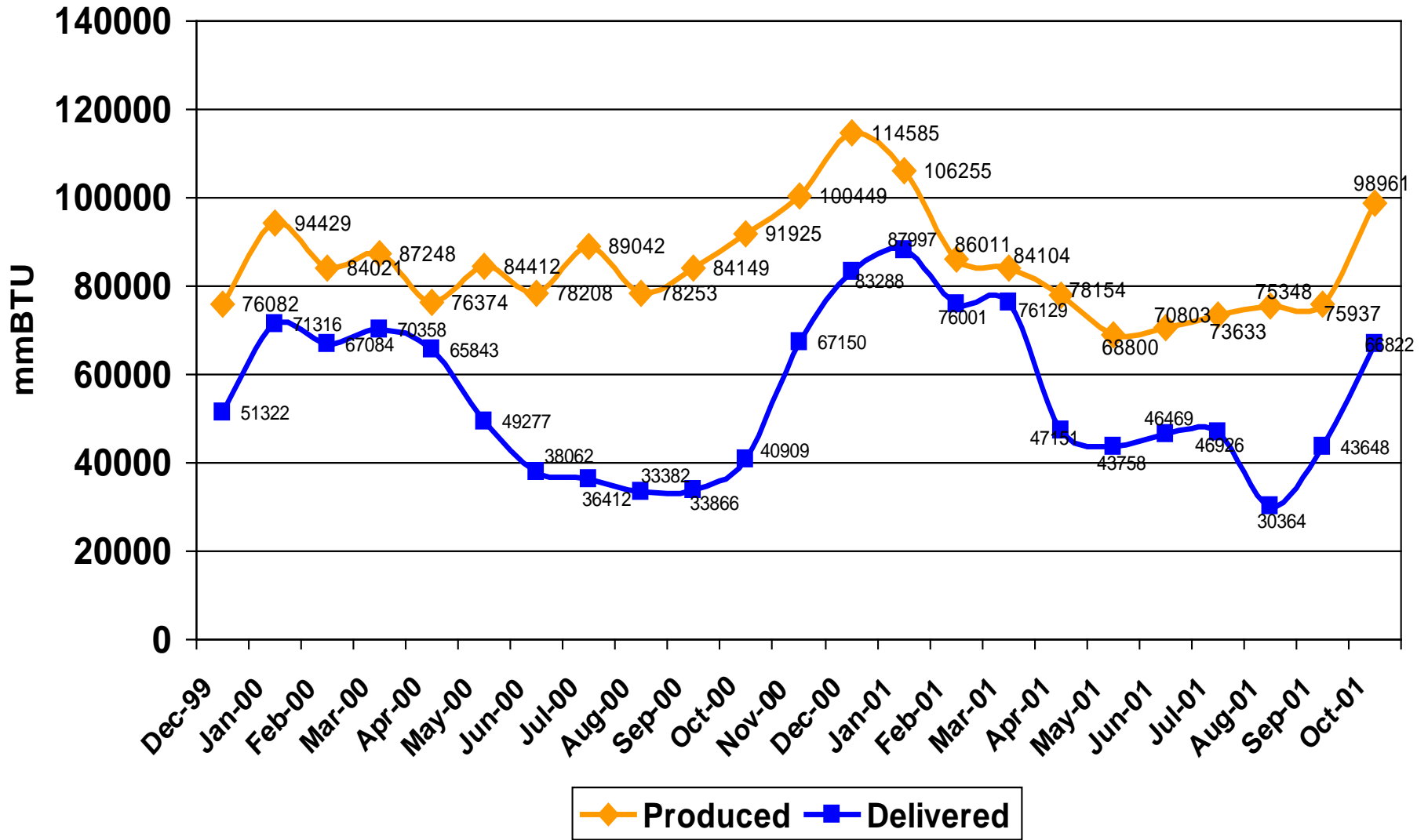
**2000 Indiana Governor's Award for  
Excellence in Pollution Prevention**



**2001 EPA Landfill Methane Outreach  
Program – Industry Ally of the Year**

**Rolls Royce Receives Recognition  
For Being Environmentally Friendly**

# Gas Production at South Side Landfill



# *One Solution for Seasonal Consumption at Rolls Royce*

Electrical Generation with  
Rolls Royce Gas Turbine



***5 MW Rolls-Royce Turbine***

Consumption: 80,000,000 – 90,000,000 cu ft/month

# 5-Megawatt Turbine Project Overview

Pipeline extension to  
Rolls-Royce Plant 8

**3400 ft. 12 inch HDPE**

High Pressure  
Compression Station

**10 psig to 300 psig**

**Sliding Vane  
Compressor in series  
with a flooded screw  
compressor**

Gas filtration

**3-Micron coalescing  
filter**



# *Another Solution for Seasonal Consumption at Rolls Royce*

Co-firing burner at  
Vertellus Specialties, Inc.



Vertellus Specialties, Inc., Indianapolis Plant

Consumption: 15,000,000 to 100,000,000 cu. ft./month

## *Other Possible Uses of LFG*

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Electrical Generation with  
I Power Energy Systems



***65 kW IPower Energy Systems Generator***

## *Other Benefits of LFG Utilization*

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### Environmental Benefits of LFG as a Fuel

**In 2009, South Side Landfill  
Captured And Sold  
About 31,000,000 Pounds of Methane  
For Beneficial Use**

**This Equates To 270 Railcars Of Coal**

**Or More Than 4.8 Million Gallons Of Oil**

**Or...291,000 Metric Tons of CO<sub>2</sub> equivalent**



South Side Landfill  
&  
Granger Energy

Transforming Waste  
Into  
Renewable Energy

Recycling at it's Best!