

Higgins Brick CHP Installation

Chino Hills, California

Project Team: Southern California Gas Co.
Energy Solutions Center
Higgins Brick and Simmax Energy
Energy and Environmental Analysis
Connected Energy Corp.



Sponsors: DOE, ORNL, SoCal Gas, and ESC DG Consortium

January 2006 ORNL Microturbine Applications
Workshop



OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

ESC DG CONSORTIUM MEMBER COMPANIES

Atmos Energy

Dominion Energy

DTE Energy/Michcon

Gas Technology Institute

Enbridge Gas Distribution

Exelon Corp. (PECO)

KeySpan Energy

National Fuel Gas

Nicor Inc.

NiSource Inc.

NW Natural

Southern Natural Gas

Southern California Gas Co.

We-Energies

Yankee Gas Services Co.

Higgins Brick Background

- Family enterprise founded in 1927, located in Chino Hills, CA
- Produced over 4 billion bricks in its 78-year history
- Total capacity is 60 million bricks annually
- Manufactured some of the largest brick projects ever undertaken in California - Including:
 - Market Street in San Francisco
 - Parkloft in San Diego

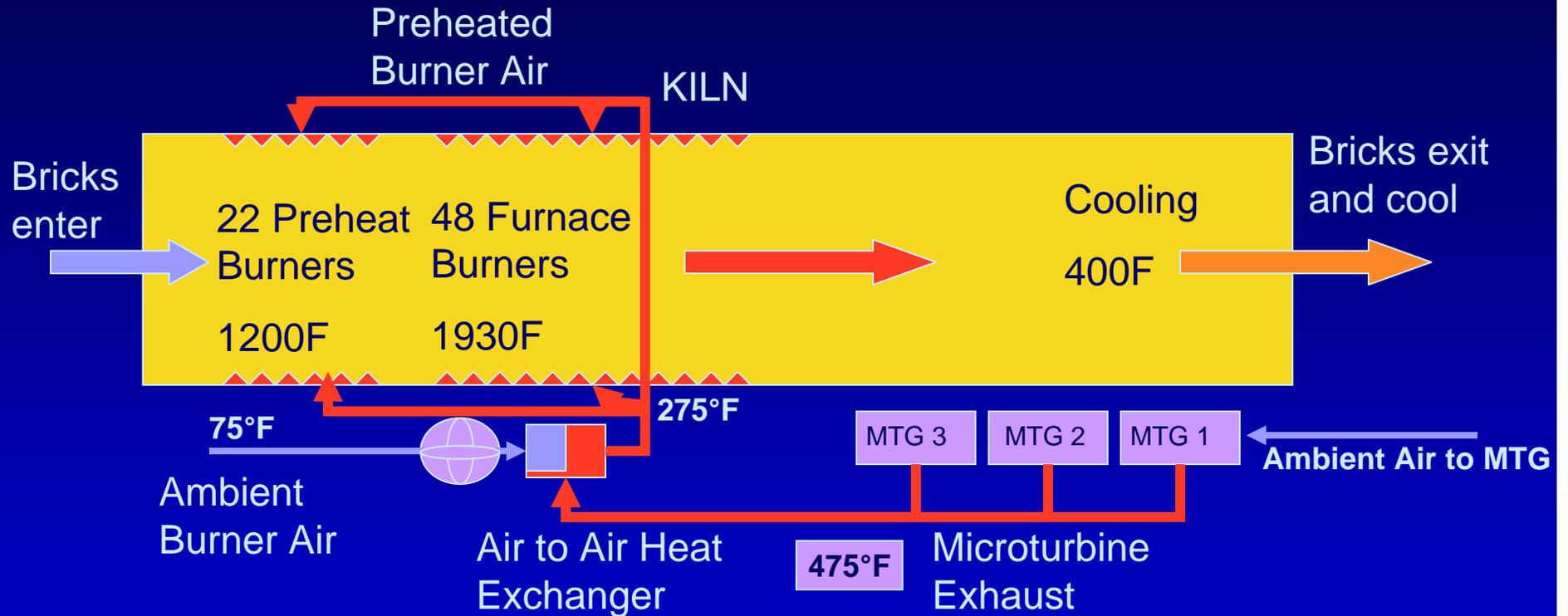
Business Plan

- Bowman designed and installed the CHP system.
- Simmax Energy operates the system to provide energy services - producing electricity and heat to achieve the desired efficiencies: start-up April '05
- Simmax Energy sells the electricity to Higgins Brick at a discounted rate from the utility prices
- Higgins purchases the necessary natural gas to fuel the microturbines

The Energy Solutions Center, DOE, and Socal Gas will collect and evaluate data for one year to validate savings and measure performance:

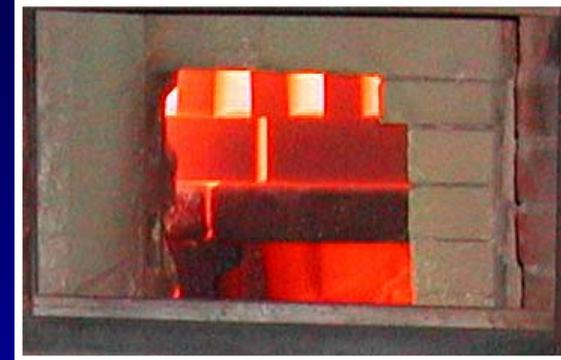


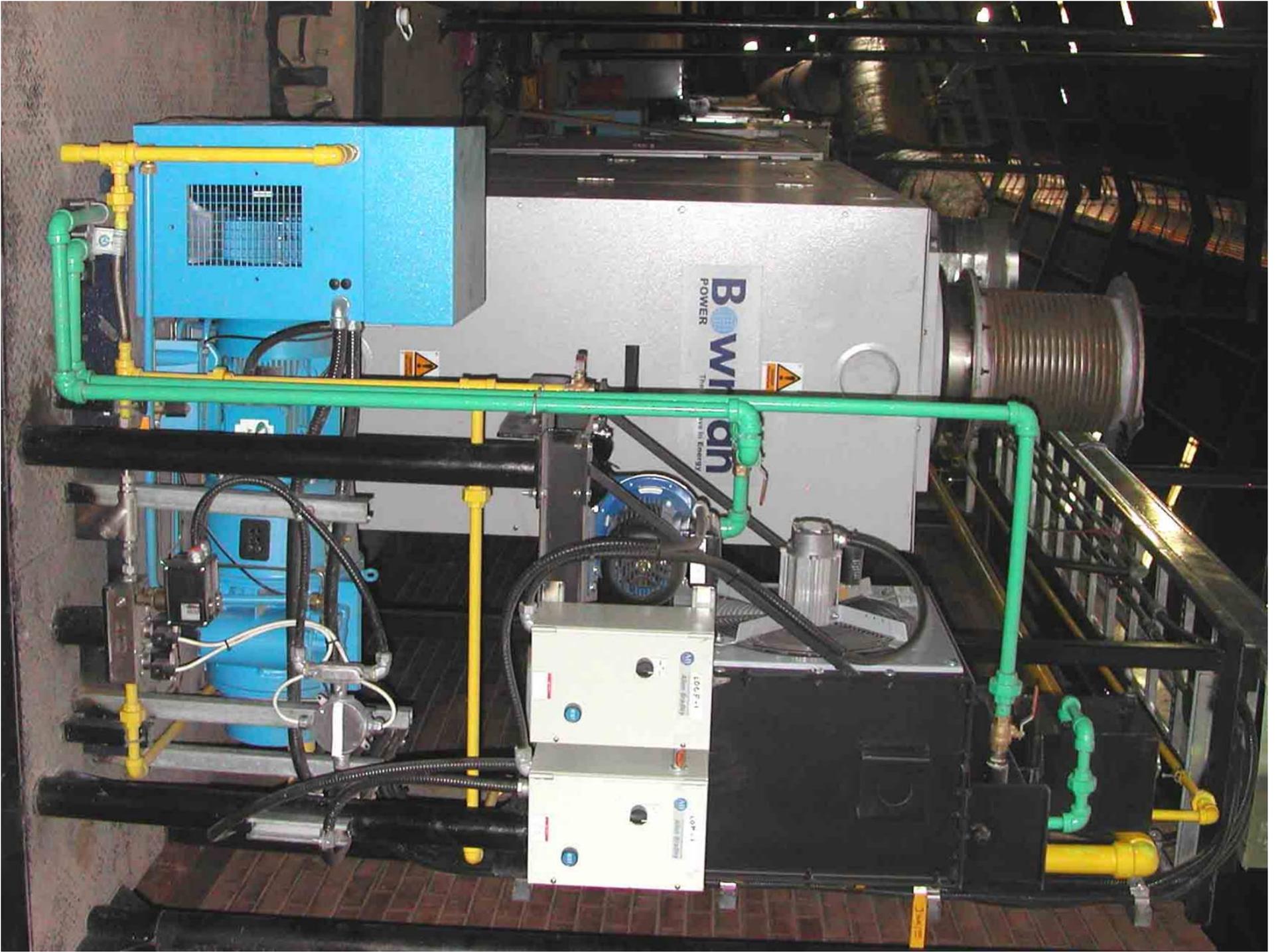
Higgins CHP Schematic



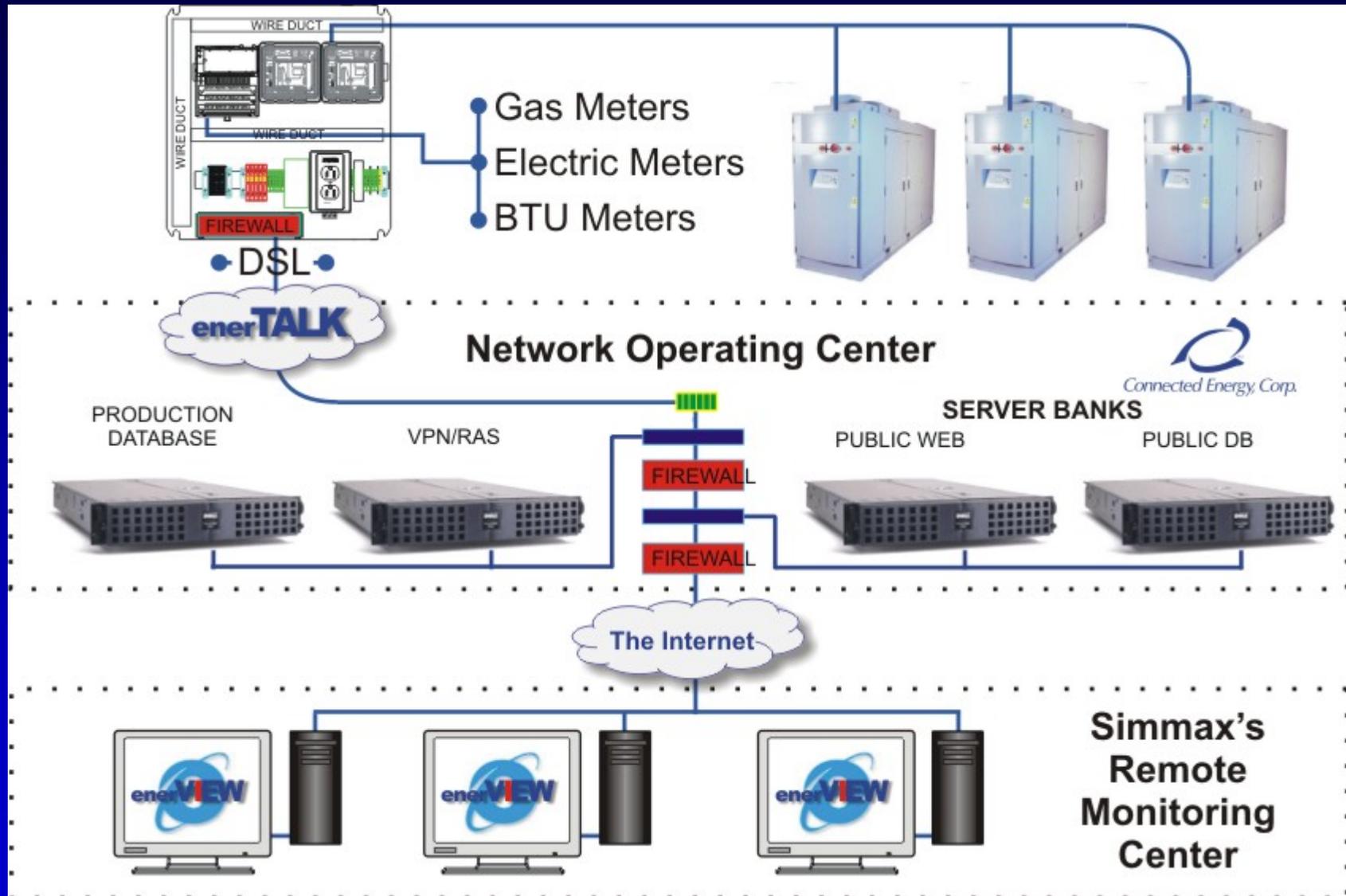
CHP System: Three 80 kW Bowman Microturbines

Higgins Brick Kiln Installation





Connected Energy Remote Monitoring



Higgins Brick Preliminary Data

Date	9/9	8/31	8/26	
MTs	3	3	3	MTs shut down 9/9/05 for winter period
Power (kW) –half load	134	123	126	
Ambient Temp. (°F)	69	78	92	
CHP Efficiency (%)	86	70	58	

Onsite generation cost: 6 - 8 c/kWh plus marginal fuel cost.

Based on kiln performance, preliminary data indicates the marginal fuel cost is about 1.5 c/kwh for \$7 MMBtu gas

SoCal summer grid charge is 9.32 c/kWh as of 6/05

Project Economics

- Installed cost \$642,000
- California's Self Generation Incentive Program covered about 30% of the construction cost
- Simmax expects a payback in 4-5 years.



For Additional Information Contact:

Richard Biljetina
Director, Energy Technologies
Energy Solutions Center
Washington, DC
202-251-8902
biljet@att.net

www.escenter.org