



SOUTHEAST  
**CHP**  
APPLICATION  
CENTER

**CLEAN HEAT & POWER**

# LAFARGE GYPSUM

## 5.2 MW COMBUSTION TURBINE

### CHP FACTS

**Location:**

Silver Grove, KY

**Generation Equipment:**

Combustion Turbine

**Output:**

5.2 MW

**Installation Date:**

2002

**Estimated Installation Cost:**

Approximately \$4.5 Million

**Fuel:**

Natural Gas



### PROJECT OVERVIEW

The Lafarge Gypsum plant is a wallboard manufacturer in Silver Grove, KY. They produce 900 million square feet of wallboard annually.

The Silver Grove facility uses a CHP system which provides 5.2 MW of electricity and up to 85,300,000 BTU/h of thermal generation.

The system uses a combustion turbine as the prime mover to produce electricity. The exhaust from the turbine is used in place of a gas-fired dryer in the wallboard facility. By using exhaust in the drying process, fuel consumption is reduced by 35% over using a separate gas fired dryer. The combined thermal efficiency can range from 87 to 95 percent.

### PROJECT AWARD

In 2003, Lafarge Gypsum received the CHP Energy Star Award with over 87% efficiency.

### ADDITIONAL FACTS

This CHP system reduces carbon dioxide by 18,000 tons per year, equal to taking 3,100 cars off the road.



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## INSTALLATION

A natural gas turbine was selected to provide 5 MW of electrical power needed by the new plant and to provide a proper thermal source for the gypsum cage mill dryer.

In order to overcome ambient conditions affecting the output air quality, a 200-ton air cooled chiller was installed to produce chilled water to feed a cooling coil in the inlet duct work. The chiller is capable of lowering the inlet air from 95° F to 55° F. The chiller uses 200 kW of electricity, but boosts the generator output by 600 kW.

A 12 in. gas pipe was installed to directly connect to the KO Gas Transmission Line. A 138 kV substation was designed for Lafarges electrical needs which imports and exports power from two new 138 kV lines.

Sound walls, inlet and exhaust silencers, and acoustic blanketing on the air intake had to be added due to the plant's proximity to residential neighborhoods.

## CHP EQUIPMENT

- 5 MW Combustion Turbine (44 MMBtu/h Thermal Energy (1,100° F))
- 200 ton Inlet air chiller
- 138kV Substation
- Inlet and Exhaust silencers



## SOURCES

<http://www.de-gs.com/pdfs/Lafarge.pdf>

<http://www.netl.doe.gov/publications/proceedings/99/99ats/1-5.pdf>

<http://files.harc.edu/Sites/GulfCoastCHP/News/RoadmapWorkshop2005/AdopterPerspective.pdf>

[http://www.thermaltech.com/downloads/Articles/ASHRAE\\_Journal\\_Article\\_Lafarge.pdf](http://www.thermaltech.com/downloads/Articles/ASHRAE_Journal_Article_Lafarge.pdf)