



# Southwestern Energy – Data Center

## 630 kW CHP System

### Site Description

Southwestern Energy (SWN) is the third largest natural gas producer in the continental United States. It focuses largely on oil and gas exploration and production, natural gas gathering and marketing. In 2014, SWN opened its new 10-story, 570,000 square foot headquarters in Spring, TX. The new campus allows Southwestern Energy to consolidate its staff of over 1,000 professionals from five buildings scattered across the Houston region, to one facility.

### Reasons for CHP

SWN decided to install CHP for two purposes. First, SWN's Spring, TX campus houses the data center for the company. Ensuring the data center remains online during natural or man-made disaster was key for the decision to invest in CHP. Second, SWN wanted to demonstrate the feasibility and opportunity of deploying natural gas powered CHP with chilling for commercial properties. The system has been designed with the intent of demonstrating its capability to site visitors through site tours and presentations.

### Quick Facts

**LOCATION:** Spring, TX  
**MARKET SECTOR:** Commercial Office/Data Center  
**FACILITY SIZE:** 570,000 square feet  
**FACILITY AVERAGE LOAD:** 982 kW  
**EQUIPMENT:** GE Jenbacher J312 Reciprocating Engine; York 120 ton absorption chiller  
**FUEL:** Natural Gas  
**USE OF THERMAL ENERGY:** Building Cooling  
**CHP EFFICIENCY:** 87%  
**CHP IN OPERATION SINCE:** 2014



Southwestern Energy Building, Spring, TX



Jenbacher Reciprocating Engine

## CHP Equipment Configuration

The CHP system was designed and installed by Smith Power. The CHP is composed of a GE Jenbacher J312 480V reciprocating engine. The engine has a 60,000– hour engine service life. The system powers the data center, as well as the parking garage lights. The heat from the engine is captured by an exhaust heat recovery system with a heat output of 200°F at current load and 220° F at full load. The captured heat is used to run a 120 ton York absorption chiller which provides space cooling to the building. There are also two 1,500 kW diesel back-up generators on site, one for the data center and one for the base building.

## CHP Operation

The CHP system is owned and operated by Southwestern Energy. The system is maintained by Smith Power through a Master Services Agreement (MSA). Through this MSA, Smith Power provides maintenance at every 2,000 hours and 10,000 hours.

The system has been operating at 390 – 400 kW, which is approximately two-thirds of full load. This is largely due to the data center using less power than anticipated. The data center installed servers that used less power than when the CHP system was initially designed. This has allowed SWN to add additional circuits to the CHP system, including all of the lighting for the seven story parking garage. The chiller runs at 70 tons due to reduced engine load.

The CHP system was installed with the GE Diane control system, which is capable of running in island mode. However, the interconnect agreement with CenterPoint Energy, the transmission and distribution utility, only allows for the diesel backup generators to run when the power is out.



York Absorption Chiller

## Lessons to Share

- End user should get involved from the beginning with the design of the project to ensure the system is designed to meet expected operating conditions.
- Involve the O&M staff early in the design process so they can learn how to operate the system optimally.
- Be conservative in your energy saving estimates and develop a variety of energy pricing scenarios to see when system may or may not be economical to operate the CHP system. With currently natural gas prices, grid electricity prices are very low and the system saves \$12,000 per year.

**“Southwestern Energy is dedicated to the safe and environmentally responsible development of energy, and the CHP program has helped us to meet this goal at our Spring, TX campus by an impressive margin. We are obtaining electricity and cooling through the CHP for our 9,000 square-foot data center off-the-grid, while reducing our carbon footprint and overall environmental impact.”**

**-- Jayme Negvesky, Senior Operations Manager**

## For More Information

### U.S. DOE SOUTHWEST CHP TECHNICAL ASSISTANCE PARTNERSHIP

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### MORE CHP PROJECT PROFILES

[www.southwestCHPTAP.org](http://www.southwestCHPTAP.org)