



# Targa Resources

## 15.0 MW CHP Application

### Project Profile

combined heat & power in fractionation plant

#### Quick Facts

**Site location:**

Mont Belvieu, TX

**Industry Type:**

Natural Gas Liquid Fractionation

**CHP equipment:**

One Titan 130 Solar Turbine with Heat Recovery Steam Generator and supplementary duct burners

**Fuel:** Natural Gas

**Generating Capacity:**

15.0 MW

**Steam Production (fired):**

260,000 lbs/hr

**Efficiency**

Roughly 90%

#### Site Overview

The Targa plant at Mont Belvieu has been in operation since 1967. It receives natural gas liquids from various sources including plants in Louisiana and New Mexico through pipelines, barges or rail cars. The composition of the natural gas liquid is a mixture of ethane, propane, butane, and natural gasoline. Each of the components is stored in a liquid state in wells formed by salt domes; the gas is pumped out on demand and sent to the fractionators for processing. The natural gas liquids (NGL) undergo fractionation in a series of towers where the products are separated into various components through a distillation process. The fractionation process requires heat to sequentially boil the different hydrocarbons in the NGL stream. A majority of the process steam needs, which was being served by aging and unreliable boilers, is now handled by the CHP plant.

#### Plant Description

The CHP plant at Targa consists of a Solar Turbines Titan 130 gas turbine with Selective Catalytic Reduction (SCR) technology and a duct fired Heat Recovery Steam Generator (HRSG). The Titan 130, which has a nominal rated capacity of 15.0 MW, provides 70 – 90% of the site's electricity needs. Exhaust gas from the turbine pass through the HRSG to produce steam at a pressure of 420 psi. Duct burners integrated into the HRSG boost steam production from a nominal unfired capacity of 50,000 lbs/hr to 260,000 lbs/hr. The resulting steam meets roughly 65 % of the site's peak steam demand, which allowed Targa to decommission an aging boiler and reduce overall NOx emissions. In addition to the CHP Plant, the project also entailed the burner replacement of a 100 MMBtu/hr heater with low-NOx burners. The NOx emissions rate associated with the project is 17 tons/year or 0.021 lb/MWh. Despite the plant being in Chambers County, which is part of the eight county Houston-Galveston non attainment zones, the NOx permit for the plant was granted within **two months from the date of application**. The plant operates 24/7 throughout the year with four scheduled quarterly outages for preventive turbine maintenance, each lasting between one to three days.

## CHP Drivers

The steam requirement at the plant was around 400,000 lbs/hr. Four boilers, with a combined nameplate capacity of 420,000 lbs/hr catered to this steam need. Two 30 years old boilers were energy hogs and had frequent maintenance issues. The boiler situation resulted in high energy costs and led to reliability issues that threatened critical processes. The inefficiencies and poor reliability of the existing heating plant, coupled with the potential of plant expansion, led Targa to examine the potential for on-site cogeneration. The match between electric and thermal loads at the plant created strong economic advantages for the CHP option. Different plant configurations were considered, although the Titan 130 was eventually selected for technical and economic reasons. The CHP plant resulted in an Internal Rate of Return of 15% on invested capital.



## Lessons Learned

- Installation of the CHP Plant was completed in approximately 15 months with relatively few minor hurdles.
- The site is located close to a 500 psi natural gas pipeline, thus not requiring any gas compression. However, low pressure fuel was required for the duct burner. As a result, a gas pipe with regulators was required to deliver 15 psi gas to the burner.
- Poor quality ammonia in the selective catalytic reduction processer caused some scaling once the plant became operational. Targa quickly changed Ammonia suppliers alleviating the problem.
- The aging on-site substation caused a unique interconnection to the grid. Electricity exported to the grid is separately metered, but is credited back to Targa on a monthly basis. Since the plant was greater than 10.0 MW, the plant is registered at ERCOT. However, Targa chose to be classified as a 'self provider,' as they did not anticipate significant exports.

**For more information –**

**Krishnan Umamaheswar, LEED AP, CEM, CDSM**  
U.S. DOE Gulf Coast Clean Energy Application Center  
O: (281) 363-7906  
Email: [ukrishnan@harc.edu](mailto:ukrishnan@harc.edu)  
[www.gulfcoastcleanenergy.org](http://www.gulfcoastcleanenergy.org)

**Unique inter-connection with the utility. Due to age and limitations of the existing substation, the generator was connected via step-up transformer to the grid. Electric utility bills Targa based on the difference between the electricity it provides to the plant and the amount it receives from the CHP**

