



Recycled Energy at a Gas Processing Plant

Site Description

The Williams Ignacio Gas Plant, located southeast of Durango, Colorado, provides compression, dehydration and natural gas liquids recovery and produces liquefied natural gas (LNG) as part of the company's San Juan Gathering System. A recycled energy system captures waste heat from the compression process and uses it to generate electricity.



Facts at a Glance

- **Project:** Williams Ignacio Gas Plant steam turbine waste heat recovery cogeneration facility
- **Collaborators:** Williams, La Plata Electric Association (LPEA), Tri-State Generation and Transmission Association (Tri-State)
- **Location:** Southern Ute Indian Reservation, La Plata County, Colorado
- **Waste Heat Source:** Waste heat from turbine that drives centrifugal compressors
- **Capacity:** 6.2 MW
- **Annual Electric Output:** 43,800 MWh per year
- **Commercial Operation:** 1984, upgraded 2014
- **Financial Benefit:** Increased reliability, lower risk to operations if grid goes down
- **Additional Value:** Power generated helps Tri-State meet renewable energy standard (RES) obligation
- **Awards:** Southern Gas Association 2014 Environmental Excellence Award; 2014 San Juan Citizens Alliance Green Business Roundtable Finalist Company
- **Other Applications:** Compressors, steam intensive process



Key Benefits

- Improves on-site energy reliability, allowing the plant to island and continue to run when the grid is down
- Minimizes risks and associated costs of a power outage and a resulting facility shutdown
- All power generated on site qualifies as eligible energy resource under Colorado's RES
- The power as well as the renewable energy credits (RECs) are sold to LPEA, which in turn transfers the RECs to Tri-State
- Plant emissions were reduced by an estimated 2,480 tons per year:
 - Nitrogen oxides (NO_x) reduced 88%
 - Carbon oxides (CO) reduced 48%
 - Volatile organic compounds (VOC) reduced 82%
 - Particular matter (PM) reduced 59%



Project Details

Williams began generating electricity from waste heat in 1984 when it installed a recycled energy system in conjunction with a facility upgrade that increased efficiency of hydrocarbon separation. The recycled energy system included waste heat recovery boilers and a GE steam turbine driving a 4,160 volt GE generator to utilize waste heat from the turbine exhaust to produce backup power for the facility.

In 2014, five Solar turbines replaced the seven 1950's vintage reciprocating engine compressors and four 1970's vintage turbine engine compressors. The new configuration consists of gas-fired turbine compressors that provide inlet compression to the cryogenic turboexpander for gas separation and outlet compression for recompression duty. The replacement increased reliability of compression and overall efficiency of the gas processing plant while significantly reducing air emissions and increasing waste heat, thereby increasing the power generation capability.

Waste heat from the turbines and pollution control equipment (thermal oxidizer) is routed to waste heat boilers. The boilers produce 600-psi steam which is directed to a steam turbine that generates an average of about 5 MW daily. Low pressure steam exiting the turbine at 60 psi is used for process heat. Once the steam is used it is condensed back to water and fed back to the boilers in a closed loop system.

All power generated on site is eligible under Colorado's RES. The plant sells all the power it generates, as well as the associated RECs which represent the value of the environmental attributes, to LPEA, the local electric cooperative. LPEA sells the power to its members and sells the RECs to Tri-State, which uses the RECs to meet its RES obligation. The power from recycled energy that the Williams Ignacio Gas Plant generates makes up about 4% of LPEA's local power requirement and 75% of La Plata County's renewable energy. The electricity the plant needs to run its operations is purchased back from LPEA.

Reason for Installing Recycled Energy

The key driver for the recycled energy system was reliability. For safety and operational reasons, the plant must have a constant supply of electricity. If an outage should occur that prevents the plant from obtaining power from the electric grid, it can island from the grid and use the power it is self-generating until grid power is restored.



About Recycled Energy in Colorado

Recycled energy systems use waste heat from industrial processes to generate electricity with no additional fuel, combustion or emissions. Recycled energy does not include energy produced by any system that uses waste heat from a process whose primary purpose is the generation of electricity. Power generated from recycled energy systems in Colorado can be used to help utilities meet their renewable energy standard obligations.



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