

TST INC. FONTANA, CALIFORNIA

# Capstone Microturbine Cogeneration Installation



## **DATES**

Construction Initiated:  
*April 2006*

Startup Completed:  
*August 2006*

Facility Dedicated:  
*October 2006*

## **LOCAL AUTHORITY**

TST Inc.

## **PROJECT COMPONENT**

Four Capstone C60 Microturbines producing a total of 240kW in parallel with the electric Utility to reduce energy imported from the grid.

High temperature ducting to transfer the 600F microturbine exhaust into the foundry process to offset natural gas used in traditional burners.

## **Project Goals**

The TST Inc. foundry in Fontana, California, produces aluminum ingot, billet and other bulk aluminum forms from recycled aluminum scrap. In an effort to control power costs and improve overall plant energy efficiency, TST contracted with Alliance TST Energy, LLC to install a 500 kilowatt (kW) fuel cell cogeneration system to deliver electricity and thermal energy to the TST facility. In a separate, concurrent project, TST installed four 60-kW Capstone C-60 microturbines in a similar cogeneration installation at the TST site.

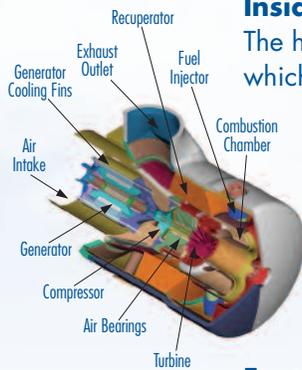
## Environmental Benefits

The Capstone microturbines provide clean combustion of natural gas to generate onsite heat and electrical power. The result is a net reduction in the emissions of both NO<sub>x</sub> and CO<sub>2</sub> compared to the traditional use of fossil fueled power plants for the electricity and natural gas burners for the process heat. Using actual EPA test results for the Capstone C60 microturbine and EPA data for emissions of fossil power plants in the US, the installed system at TST is capable of reducing annual emissions of NO<sub>x</sub> by 6,800 lbs and the greenhouse gas CO<sub>2</sub> by 820 tons. According to EPA data for the NO<sub>x</sub> emissions of the average passenger vehicle, this is the equivalent of removing 175 cars from the road.

## Project Process

The South Coast Air Quality Management District (SCAQMD) provided the four Capstone C60 microturbines to the project as part of their program to deploy clean distributed generation to offset emissions from local Utility power plants. Installation and project management was provided by Alliance Power.

## Inside the Capstone MicroTurbine



The heart of the Capstone microturbine is the turbogenerator (see figure on left), which includes a compressor, recuperator, combustor, turbine, and permanent magnet generator. The rotating components are mounted on a single shaft supported by Capstone's patented air bearings. This is the only moving part in the engine/generator assembly, and rotates at up to 96,000 rpm. The output from the generator is high frequency AC power, which is transformed by power electronics into 60Hz power output to match the utility grid. Combustion is so clean that it does not need any after-treatment to meet California's strict emission standards.

## Features & Benefits

The Capstone microturbines are designed to provide clean and reliable continuous power. The air bearings eliminate the need for liquid lubricants – no oil changes needed. Air-cooled electronics eliminate the need for liquid coolants and pumps – no external radiators either. The integrated control system takes care of fault protection, synchronization with the grid, and load sharing between the microturbines. Clean combustion means that these generators can be sited easily, and are often exempt from local air permitting. Capstone microturbines are listed to UL 2200 and UL 1741, so you have the added assurance that they meet strict safety and performance standards. The microturbines are compact, light weight, quiet, and essentially vibration free – so they can be installed just about anywhere. And Capstone's remote monitoring system allows customers to view operation of their generators from any web-enabled PC.



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