

## **Engine Plant Cuts Costs With Cogeneration**

*Greenhouse gas emissions have been reduced by 10%*

Pratt & Whitney's Middletown, Conn., jet engine manufacturing, assembly and test facility faced a number of operational challenges in its plant powerhouse. Aging steam generation infrastructure of a facility built in the 1950's required significant upgrades in its powerhouse operations. Old boilers needed to be replaced.

The new Middletown co-generation project, which was designed and constructed by Carrier Corporation, will save Pratt & Whitney approximately \$3.1 million per year in energy costs, while producing enough power to provide approximately two-thirds of all steam and electricity needs of the Middletown site. This was a turnkey installation that allowed the project to be completed quickly. The facility was completed in 12 months once ground was broken at the site. In addition, use of the co-generation equipment will reduce the site's CO2 emissions by 12,000 metric tons in the first year of operation -- representing a 12% overall reduction.

The compressed timeline required significant effort on all parts to look for innovative ways to install equipment. Continuous review of any and all opportunities was consistently evaluated. Specific examples and successes: selective use of overtime to keep critical path elements either on schedule or ahead of schedule; the fabrication of the enclosure building after the turbine was set in place eliminating nearly three weeks in rigging time; early delivery of the turbine and associated hardware to a nearby storage location to speed site installation.



Working together, Carrier and Pratt & Whitney have created a powerful cogeneration model that benefits the company, the environment and the community at large. Waste heat generated by the cogeneration facility is piped directly into the existing steam distribution system and is utilized for heating, process and air conditioning loads. The unit also reduces the need for operating labor, as well as eliminates the costs associated with maintenance and repair of the existing inefficient boilers. Other savings were realized from no longer having to continually heat fuels in the storage tank, the lack of acid creation in the stack, the installation of new highly efficient pumps and motors and reduced emissions fees paid to the CT DEP. The savings generated by the cogeneration unit yield an overall internal rate of return greater than 20%, and a simple payback in the range of 5 years. In addition, the demand for electricity from Connecticut Light and Power will be reduced over 60%.

The cogeneration unit is also able to benefit from production subsidies for producing electricity from renewable sources. The Renewable Energy Credits that it obtains for producing electricity can later be sold on the market. This practice generates close to one million dollars in additional revenue for the company.

Besides the cost savings generated and the green house gas reductions for the Corporation, a tremendous community benefit is also provided by operating these units when the electrical grid is being strained in high electricity consumption periods. As Pratt & Whitney is able to generate most of their own power, the power they would have taken from the grid can be directed to other higher priority areas in the state such as local hospitals, educational institutions and community centers. This distributed generation model can minimize or even eliminate the risk of a "brown out" or "black out" in the community. Our employees also actively participate in these events by reducing power consumption in their work areas during these periods of high consumption.