

## Case Study - Elmendorf Air Force Base CHPP Decentralization

### Heating System Decentralization

Elmendorf AFB is home to the 3rd Wing, providing the U.S. Pacific Command with highly trained and equipped tactical air superiority forces, all-weather strike assets, command and control platforms, and tactical airlift resources for contingency operations. The Wing flies the F-22, F-15, C-17, C-12 and E-3 aircraft, and maintains a regional medical facility to provide care for all forces in Alaska. Elmendorf is also Headquarters of the 11th Air Force, the Alaskan Command, the Alaska NORAD Region, and 94 associate organizations. Elmendorf AFB has 797 facilities totaling 9.3 million square feet of residential, commercial, industrial, and administrative space.

Ameresco decommissioned the combined heat and power plant (CHPP) and installed decentralized boiler plants (boilers, water treatment, required auxiliaries, and building structure as necessary) to serve each of the 130 facilities (encompassing approximately 1.5 million square feet) that were provided steam from the CHPP.



Each boiler plant is sized to serve the building in which it is located. In order to provide freeze protection against boiler failure, each building has at least two steam boilers, each sized for 60% of the peak building load.

Ameresco also coordinated with ENSTAR Natural Gas to construct 8 miles of new natural gas lines to supply the distributed boiler systems throughout the base. We modified substations to accept new capacities for electric service and integrated the base SCADA system into the local utility's SCADA system for monitoring and control. Additionally, Ameresco upgraded two substations so Elmendorf could receive full electrical service from the local electric utility.



This challenging project scope was completed in two short Alaska construction seasons. The decentralized boilers were commissioned and running and the CHPP was shut-down on schedule for the start of the critical heating season.

The project also included the demolition of the old decommissioned plant and associated steam pits. The old plant consisted of the following major equipment:

- Six (6) 150,000 lb/hr natural gas/jet fuel boilers
- Two (2) 9.3 MW steam extraction turbines
- One (1) 7.5 MW steam extraction turbine

The decommissioned steam distribution system was previously only providing approximately 15% condensate return back to the plant.

Ameresco owns, operates, and maintains all the installed equipment (300+ boilers) for the 22 year performance period. Working with the Elmendorf AFB, Pacific Air Forces, and the Air Force Civil Engineer Support Agency, we executed a comprehensive M&V Plan. This project alone made Elmendorf's energy reduction goals and a major impact on the Air Force's goals with annual energy savings of over 1 million mmBtu's. To date, this project has exceeded all project performance criteria.

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*"This past year, PACAF surpassed the goal with an FY06 reduction of 17%; tops among the MAJCOMs. On the surface, we look healthy; however, our command energy savings was "carried" by superb efforts from a few bases; and particularly one high impact project – Elmendorf's shutdown of their Combined Heat and Power Plant."*

Paul V. Hester, General, USAF  
Commander Pacific Air Forces (PACAF)  
Memorandum to PACAF Wing Commanders dated 8 Jan 07