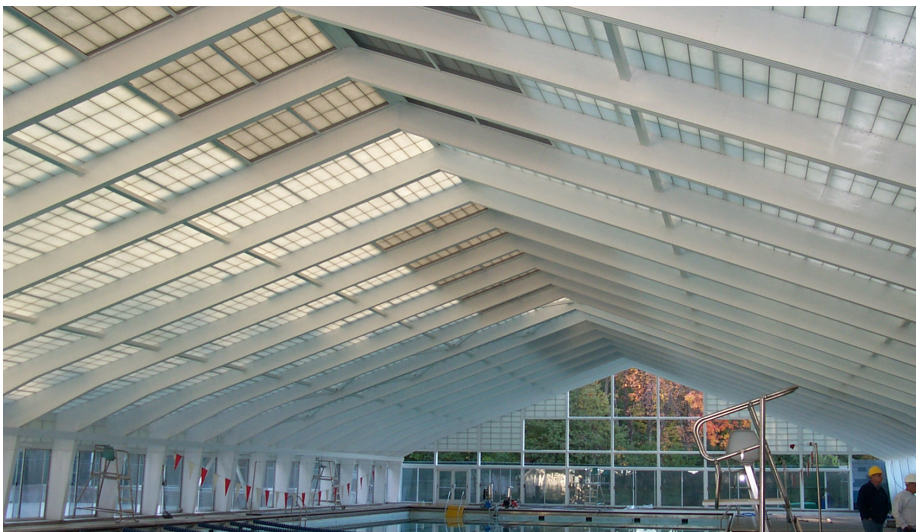


Hanscom Air Force Base

Energy Savings Performance Contract (ESPC, 2005)



Hanscom Air Force Base (HAFB) encompasses more than 109 buildings totaling over 2.5 million square feet in the Boston suburbs. HAFB is responsible for providing research and development services to numerous air force organizations throughout the world. HAFB also houses one of the premier research facilities of the Massachusetts Institute of Technology (MIT).

RWE Clean Energy was tasked with identifying and implementing energy conservation measures throughout the entire HAFB campus. Energy audits were conducted during the Investment Grade Audit phase at each facility and included detailed equipment inventories and power usage measurements.



PROJECT DATA

LOCATION

Bedford, MA

CONSTRUCTION DATES

Completed on time

CAPITAL COSTS

\$8,323,855

ANNUAL SAVINGS

1,056,832

ENVIRONMENTAL BENEFITS

3,169 tons of harmful greenhouse gas emissions reduced annually

Equivalent to:

- Preserving 21 acres of forest from deforestation* or
- Conserving 6,072 barrels of oil*

*Sources:

- Leonardo Academy's Cleaner & GreenerSM Emissions Reduction Calculator: <http://www.cleanerandgreener.org/resources/pollutioncalculator.html>
- U.S. Environmental Protection Agency, Greenhouse Gas Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

Comprehensive engineering and economic analyses were performed including studies to determine what measures would produce the most significant benefit. Analysis included lifecycle cost analysis, savings calculations, and metering and verification of equipment operation.

The results of the Investment Grade Audit phase, prompted HAFB to issue three consecutive Delivery Order Awards (DOA) to RWE Clean Energy for firm fixed-price contracts. RWE Clean Energy managed turn-key installation of all measures, hired subcontractors, coordinated schedules with facility staff, and trained facility personnel to operate equipment.

RWE Clean Energy also managed disposal of debris and recycling of material, where appropriate. Additionally, RWE Clean Energy arranged project financing and secured a significant utility incentive for the energy efficiency upgrades.

PROJECT HIGHLIGHTS	ACTUAL AVERAGE ANNUAL ENERGY SAVINGS:
Electricity Use (kWh)	3,332,425
Electricity Demand (kW)	521
Natural Gas (therms)	106,084
Other Fuel (therms)	622,237
Other Fuel Type	Steam oil, CHW
Water Use (gallons)	3,071,189



PROJECT DATA

ENERGY CONSERVATION MEASURES

Heating Ventilation Air Conditioning

- Installed an all new variable volume HVAC system with state-of-the-art systems and controls
- Redesigned the exhaust system
- Achieved 75% energy savings

Passive Solar Natatorium

- Installed an innovative heat recovery dehumidification/heating system
- Reduced pool water heating and dehumidification costs by over 80% using a pool cover
- Open air design limits need for mechanical HVAC equipment

Steam System Upgrades

- Installed high-efficiency, low maintenance steam traps

Residential Upgrades

- Installed energy-efficient HVAC and lighting controls
- Insulated the roofs

Lighting System Upgrades

- Installed high-output lighting systems with electronic ballasts
- Installed lighting controls
- Lighting electricity load/demand declined by over 40%

Water Conservation

- Saves 3,071,109 gallons of water annually*

Energy Management System Upgrades

- Added optimum start-stop, demand controlled ventilation, pump and air handling unit control, zone thermostats with override controls, occupancy based HVAC controls