

ECMs Installed

Mechanical

- » AHU replacement
- » Demand control ventilation
- » Magnetic bearing chillers
- » Consolidated central chiller plants
- » Decommissioning of central heat plant

Water Conservation

- » Water conservation with low flow fixtures

Electrical

- » Variable frequency drives
- » Energy management control system
- » Advanced metering
- » Programmable thermostats
- » Lighting retrofit and controls, including LEDs
- » Central back-up generator plant

Renewables

- » Ground Source Heat Pumps

Experience and Expertise

FPLS has been working collaboratively with the federal government to help our customers meet federal mandates for energy efficiency and water conservation. We provide follow-on support intended to identify and implement projects aimed at enhancing energy security, upgrading equipment, and introducing advanced technologies such as smart metering.

Our projects have helped customers become better stewards of the environment, conserve energy, and reduce costs by implementing turn-key energy efficiency, water conservation, and other solutions over the course of long-term, multi-phase partnerships.

Selected by PAFB as their energy partner, FPLS has applied years of industry-leading experience and expertise to help the base achieve their ambitious efficiency goals.

Future of the CEP

By following the CEP, PAFB is moving closer to meeting federal mandates for energy and water reduction and smart metering installation, as well as automating and monitoring major energy systems and buildings. Additional benefits include improved and reduced maintenance, failure/ repair notification, tenant comfort, and reduced ongoing replacement costs. FPLS will continue our partnership with PAFB to help the base achieve federally-mandated energy reduction goals.

Visit [FPLES.com/ESCO](https://www.fples.com/ESCO) or call 1-888-706-5685



Patrick Air Force Base

Meeting federal mandates for energy consumption reduction

For more than 18 years, FPL Services, LLC (FPLS) has partnered with Patrick Air Force Base (PAFB) to design and implement a comprehensive phased approach to energy management. This Comprehensive Energy Program (CEP) identifies, develops, and implements projects to reduce energy and water demand, and ultimately cost, ensuring PAFB will fulfill federal energy, water, and renewable goals set by federal mandates and executive order.

By following the strategy outlined in the CEP, the base will achieve:

- » Total energy savings of up to 20,000 MWh/year
- » Savings of almost \$1,500,000 per year
- » Reduction of 72,000 MBTU/year
- » Annual reduction in greenhouse gasses: 77,000 lbs/year of NO_x, 175,000 lbs/year of SO_x, and 15,030 tons/year of CO₂

These amounts exceed the overall goals and objectives of White House executive orders, the Office of the Secretary of Defense, and PAFB.

By working cooperatively with PAFB, using an energy master plan phased approach, FPLS has implemented a variety of energy conservation measures (ECMs) across a large geographic area without disrupting day-to-day operations.



Project History

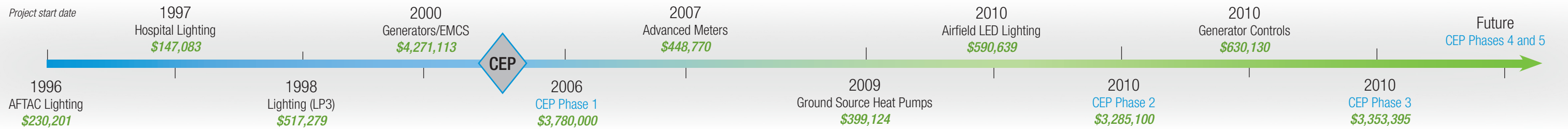
Situated on Florida's eastern coastline, PAFB houses approximately 1,900 personnel in 200 buildings and structures within a secure military facility. With 35 major mission partners and tenants responsible for launching unmanned rockets, the base's annual energy bill totals \$6 million with peak demand of 19MW.

Our partnership with PAFB began when the base sought to implement a limited scope lighting project. Due to the success of the initial lighting project, FPLS was awarded two additional small-scale lighting projects, which later led to the award of a \$4.3 million Generators/Energy Management Control System (EMCS) project in 2000. This project included a 6.6MW back-up generator plant and the inception of a new, consolidated base-wide energy management system that combined seven individual stand-alone systems onto a single platform.

Since 1996, we have partnered with PAFB to implement contracts with a total value of more than \$17 million.

When federal mandates were implemented requiring a decrease in year-over-year in energy consumption for government installations, PAFB understood that a large-scale effort would be required to meet them. For example, the Energy Independence and Security Act (EISA) of 2007 required an aggressive 30 percent decrease over 2003 levels in energy consumed by 2015 – a very ambitious goal.

In order to achieve the large-scale energy savings needed to meet federal mandates, FPLS and PAFB joined in partnership to develop a comprehensive program to reduce and manage utility costs at the base.



Dollar amounts represent project contract values

Comprehensive Energy Program (CEP)

The cornerstone of our energy partnership was the development and implementation of a base-wide CEP, which outlines a systematic approach to implement a series of energy, demand, and water savings projects over the entire base using a holistic view versus a building by building or system by system approach.

The CEP was designed to ensure the base is in compliance with energy, water, and renewable goals as required by Executive Order and legislation. FPLS periodically reviews, updates, and revises the CEP to verify its continued accuracy and assure its capacity for compliance with all new mandated goals.

Completed in 2001, the CEP was developed by:

- » Auditing approximately 200 buildings on the base
- » Determining applicability of a set of potential ECMs
- » Investigating the potential of consolidating and centralizing large HVAC systems
- » Estimating costs and savings

Because integral sites within the PAFB campus are spread out over a large geographic area, the project was segmented into five phases to optimize project efficiency.

Highlights

The table below summarizes the savings achieved by implementing the first three phases of the CEP.

Comprehensive Energy Program Savings				
Savings	Phase 1	Phase 2	Phase 3	Total
\$ per year	\$259,509	\$386,841	\$377,006	\$1,023,356
kW per month	107	473	290	870
kWh per year	2,048,526	4,505,448	4,165,893	10,719,867
Therms per year	65,273	N/A	986	66,259
Gallons of water per year	N/A	N/A	1,693,079	1,693,079
NOx (lbs) per year	7,887	17,346	16,039	41,272
SOx (lbs) per year	17,925	39,424	36,452	93,801
CO ₂ (lbs) per year	3,078,934	6,771,687	6,261,337	16,111,958

CEP Phases and Additional Projects

Phase 1

Consisting of three ECMs based on their function at the base, this phase included consolidating chillers into a central chilled water plant with Variable Frequency Drives (VFDs), the updating and expansion of the EMCS, and the decommissioning of an outdated steam plant installing point of use high heating.

Phase 2

Consisting of six ECMs, this phase included construction of a second central chiller plant, air side improvements including Demand Control Ventilation (DCV), high efficiency lighting and controls, occupancy controls, upgrade and expansion of EMCS, and installation of advanced meters.

Phase 3

Phase 3 consisted of three ECMs focused on further mechanical controls enhancements to reduce heating and cooling costs, lighting upgrades (with controls), and water conservation.

Phases 4, 5, and Additional Projects

Phases 4 and 5 are being planned for design. Also, due to our past performance and successful partnership, additional ECM-focused projects were implemented. These projects included a ground source heat pump evaluation project, LED taxi-way lighting, and installation of advanced metering.