

Pacific Air Forces

Integrity - Service - Excellence



PACAF Energy Initiatives

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PACAF Energy Strategic Plan Components



"If you measure it, it will improve" - Maj Gen Fox

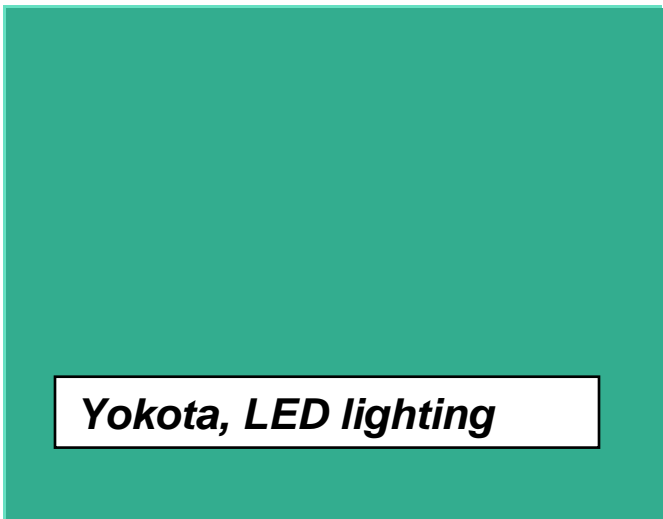
1. *Manning*
2. *Metering*
3. *Projects*
4. *Design Standards*
5. *Maintenance*
6. *Renewable Energy and Distributed Generation*
7. *Reporting*
8. *Awareness*
9. *Training*



Osan, adjusted hot water temperature settings



Kadena, education booth



Yokota, LED lighting

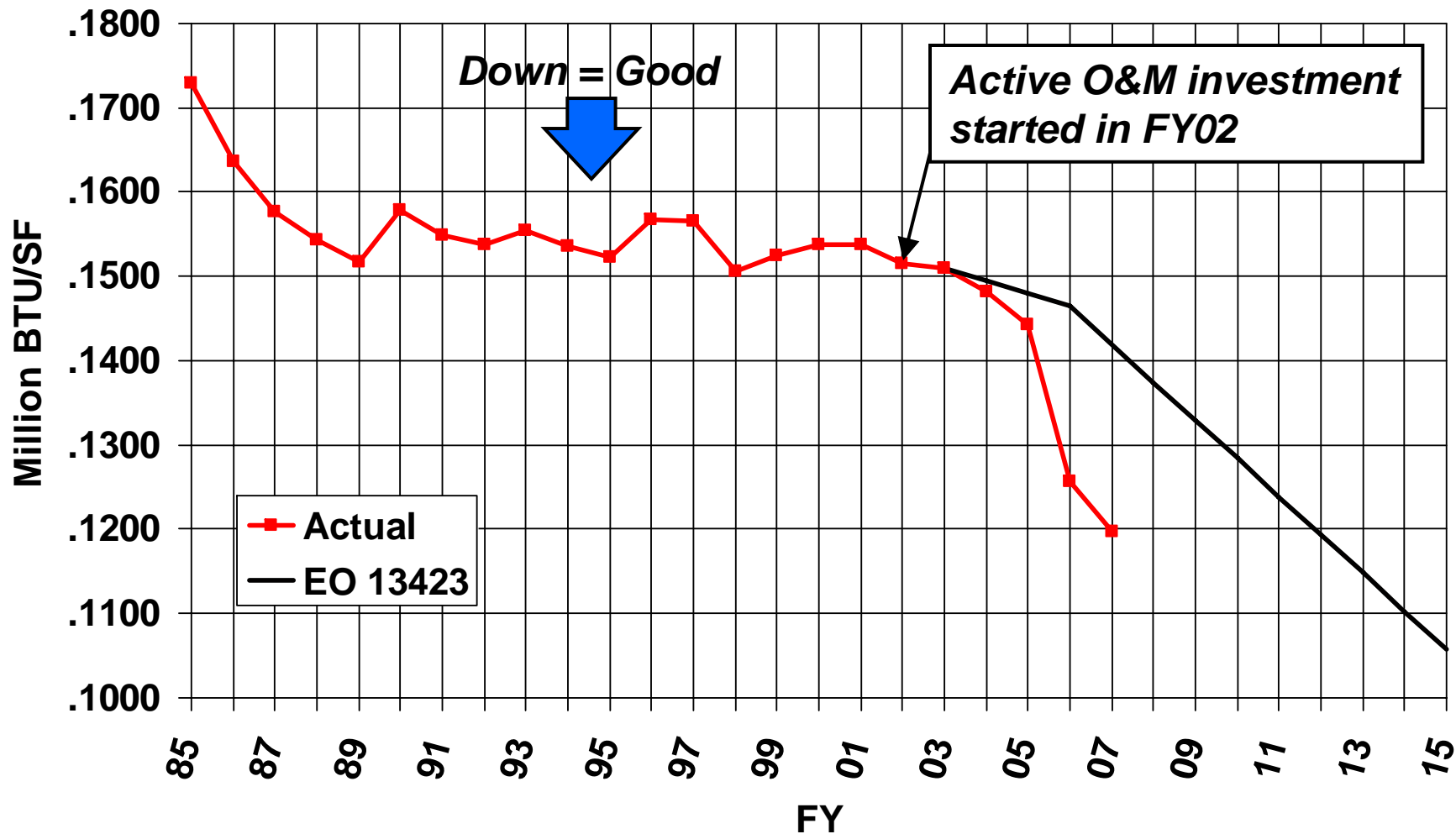


Energy Conservation Program

- **High priority at OSD & SECAF**
 - **CINC Installation Excellence & AFSSO 21 use energy conservation in score**
- **Key Metric: Reduce energy intensity 3% each year from FY06 - FY15 using FY03 baseline (Energy Independence and Security Act of 2007)**
 - **PACAF reduced 20% in FY07 -- exceeded 6% FY07 target**
 - **FY08 goal is 9%--currently evaluating data**
- **Key initiatives worth our investment:**
 - **Resource Efficiency Manager -- 1 contract FTE per base to assist Government Energy Manager (\$1.8M annually)**
 - **PACAF/A7 self-funded robust PACAF O&M Energy Program**
 - **\$5M in FY07--\$4.9M obligated**
 - **\$10M in FY08--\$12.8M obligated**
 - **Target more AFSSO21 funds in FY09**



PACAF Reduction Performance





Metering

- **Allocated \$4.7M in FY08 for installing 720 meters; captured 42% of AF meter funding**
 - **Advanced electric meter systems for Andersen, Eielson, Hickam, Kadena, Kunsan, Osan and Yokota**
 - **Elmendorf, 611 CES, and Misawa investigating metering system options**
 - **PACAF funded (\$180K) Elmendorf water/wastewater meters**
 - **FY09 meter projects for Eielson and Yokota only – anticipate Air Staff providing meter matching funds again**
- **PACAF will set aside \$1.0M for water conservation/metering in FY09**
 - **EO 13423 mandates 2% annual water consumption reduction starting in FY08**



Initiatives & Funding Examples...



Elmendorf B8326 Air Ground Equipment Maintenance -- T5 High Output Lighting, PACAF SRM



Tin City, 611 Air Support Group, AK -- 250 Kilowatt Wind Generator, Energy Conservation Program



Kunsan Contract Resource Efficiency Manager -- ID'd & fixed excessive temperature in gym's hot water system, saved \$7K per year. No-cost-low-cost.



Misawa -- Hardened Aircraft Shelters Thermal Improvements, Ground Source Heat Pumps, Base & PACAF SRM, possibly AFSO 21



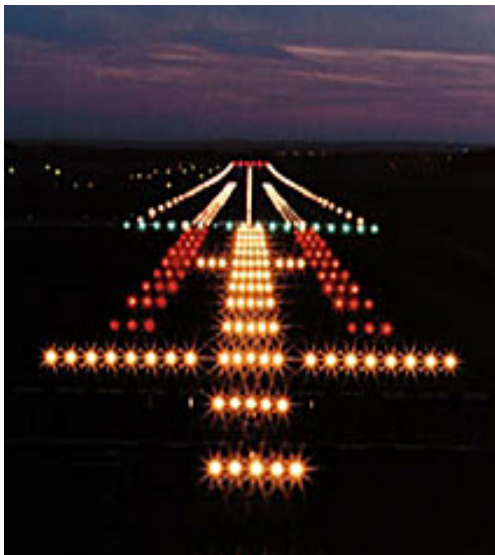
Andersen -- Advance Meter Reading System, Base SRM & PACAF SRM Energy Program



**Hickam -- Solar Thermal Hot Water, Housing Privatization
Hydrogen Vehicle Fuel Initiative**



LED Lighting



- All PACAF bases (except 611th) have or plan on installing LED taxiway lights
 - LED traffic and pedestrian walk signals installed at Misawa; planned at Kadena and Yokota
 - LED obstruction lights installed (Hickam, Kunsan and Misawa); planned at Kadena
-
- Elmendorf is planning to install 32 LED street light fixtures
 - In-house CE installation in most cases
 - Lower maintenance, lower energy usage
 - Uses 11 watts vs. 45 watts
 - Cuts replacement from every 6 months, to ~15-20 years





LED Lighting - Kunsan AB



Traditional Type Lights



LED Type Lights





LED Lighting - Kunsan AB

- All In-house CE installation – approx 30 min/change out





Bellows AFS, HI

- **Approximately 1,500 acre installation on east coast of Oahu**
- **Air Force MWR and Marine Corps training**
- **Commercial power, water, and septic system**
- **Limited energy improvements due to low mission priority and energy costs--no ESPCs or prior audits**
- **Utility costs: \$200K-\$400K annually**





Bellows AFS, HI

- **GOAL:** Achieve a “net-zero” installation--one that produces as much energy as it consumes
 - Support State of Hawaii/DoE partnership to reduce Hawaii fossil fuel usage by 75% by 2030; also EISA 2007, EPACT 05, EO 14323
- **APPROACH:** Study underway to evaluate feasibility
 - Efficiencies and retrofits to existing cabins/facilities
 - Potential for solar, wind, tidal and biodiesel
 - Prepare project packages based on recommendations, ready for USAF bid process by Mar 09
- **STATUS:** Data gathering-early Aug; Initial first draft due Dec 08





Design Standards

- Base Energy Team review designs from energy use perspective early in process
- Using local standards/environment, focus on HVAC systems, bldg orientation, PV potential, etc.
- Achieve one actual LEED certification annually





Renewable Energy and Distributed Generation (DG)

- Renewable energy sources not equally available at all AF locations; consider location specific facility renewable energy goals
- 611 CES, Tin City – construct wind generators, ECIP \$1.95M
- Hickam -- investigating uniform initiative for DoD in Hawaii; team with Army, Navy, and Marine Corps to take advantage of cost effective renewable energy generation options
- Hickam -- designing solar hot water systems for fitness center and temporary lodging facilities



Awareness

- **Top Down Attention**
 - **PACAF Energy Management Steering Group (EMSG)**
- **Wing EMSGs promote energy awareness program**
 - **Must be an active wing program to be effective**
 - **Local facility manager training a must**
 - **Energy must be treated like safety...second nature in all we do**
 - **Energy can be saved today...must change our mind set**
 - **Turn off lights especially at night/weekends**
 - **Adhere to thermostat settings**
 - **Shut down HVAC at night/weekends**
 - **Seek inputs from base populace**



Training

- **Gov Energy & annual AF Energy Manager's meeting**
 - Encourage Gov energy managers to attend at least once every two years
 - REM funded via contract
- **AF design/project mgrs obtain LEED accreditation**
 - Gathering data to confirm LEED accreditation status
 - All other AF engineers obtain working knowledge of LEED principles
 - Push AAFES toward LEED in all designs/renovations
 - PACAF and 15 CES engineers attended 8 hour LEED class in May 08
 - AFCEE sponsoring LEED training at Hickam (2-4 Dec 08)



Summary

- **Manning** - Integrated, Seek best value in REM contracts - \$1.8M PACAF investment in FY08/FY09
- **Metering** - Focus on metering FY08 and FY09
- **Projects** - Continue program, \$10M O&M in FY08, \$15M O&M in FY09; seek other available funding sources
- **LED Lighting** - cuts energy use/extends bulb life
- **Design Standards**- Get designers/PMs LEED approved
- **Bellows Net Zero** – Produce transferable knowledge
- **Renewable Energy and Distributed Generation**- Location specific goals
- **Awareness** - All groups on base brief during EMSG's
- **Training** - Base's invest in personnel energy training

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**PACAF #1 in AF
“Actual” 06/07
Energy Reductions**

Questions?