



# Sustainability Master Plan Pilot Study Joint Base Pearl Harbor-Hickam, Hawaii

NAVFAC Pacific and NAVFAC Hawaii  
Asset Management

25 Apr 2012

# Agenda



- **Objectives/Goals**
- **Status Update**
  - **Project Methodology**
  - **Project Area**
  - **Sustainability Vision**
  - **Sustainability Goals**
  - **Findings**
  - **Implementation Plan**
  - **Action Plans**
  - **What's Next?**

# Objective/Goals



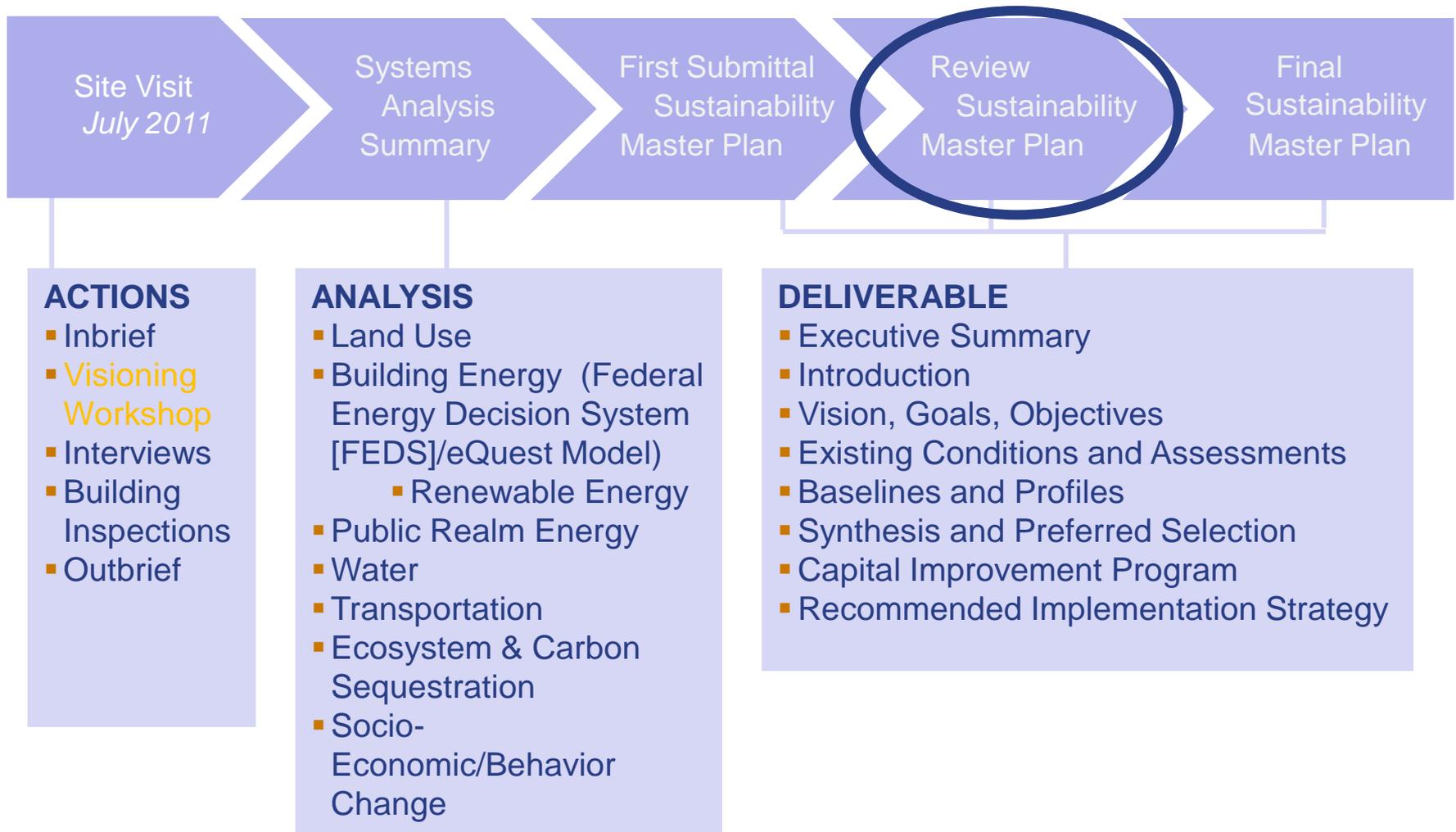
- **Objective:**

- To find the sustainability program that delivers the highest level of environmental and energy improvement at lowest cost while maintaining or enhancing Region energy security

- **Goals:**

- Provide criteria for future infrastructure and public realm facilities
- Evaluate where the installation is at in meeting the federal mandates
- Recommend measures, projects and policies that need to be in place to assist in meeting the mandates
- Show how the Navy can apply, or integrate the sustainable practices into the Navy planning and programming process

# Project Methodology



# Project Area



- **Land Area** **255 acres**
- **No. of Buildings** **270 buildings**
- **Building area** **3.2m SF**
- **Est. Population\*** **5,200 persons**  
(Live and work)
- **Est. Density** **20 persons/acre**  
(Est. Population/Acres)



\* *Methodology for estimating population*

- *Applied space criteria to building square footage, according to Category Codes and square footage as identified in property record.*
- *Space criteria came from Facility Planning for Navy and Marine Corps Shore Installations (UFC 2-000-05N), accepted industry standard, professional knowledge.*

# Sustainability Vision



***Joint Base Pearl Harbor–Hickam will continue supporting mission requirements, while maintaining a superior Quality of Life in a sustainable, efficient, and conservation-minded community.***

*(Source - Final version of the sustainability vision at the end of visioning exercise June 2011)*

# Sustainability Goals



1. Adopt sustainable **building** standards
2. Maximize **energy** efficiency in existing buildings, facilities and new construction
3. Conserve **water** resources
4. Reduce dependence on **fossil fuels**
5. Improve **mobility** to reduce vehicle miles traveled (VMT)
6. Maximize tree planting and open space in order to reduce heat island effect, buffer against noise pollution, **enhance natural habitat**
7. Improve community **health** (indoors / outside)
8. Enhance personal **awareness** and encourage best practices
9. Reduce **solid waste**
10. Increase use of **energy efficient** appliances and green products
11. Reduce Green House Gas (**GHG**) emissions
12. Be a **net-zero energy installation (NZEI)**; implies SECNAV RE goal (50% by 2020)
13. Continue to preserve **historic** aspects of JBPHH
14. Enhance **utility resilience and security**

# Putting it All Together



# Organization of the Report



## ■ Main Report

- Executive Summary
- Introduction
- Summary of Federal Mandates
- Sustainability Components
- Support Activities
- Requirement Analysis and Capital Investment Strategy
- Implementation Plan
- Measurement and Verification (Scorecard)
- Summary and Recommendations

## ■ Appendices

# Component and Support Activities



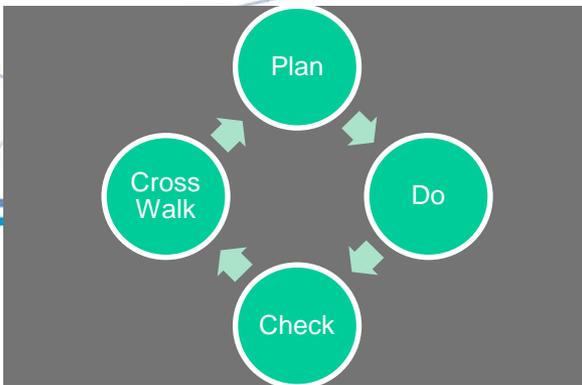
## Components

- Energy
- Renewable Energy
- Water
- Waste
- Fossil/Alt Fuel and Transportation
- High Performance Building
- Health
- GHG
- Other (Environmental Management System (EMS), Electronic Stewardship , Procurement, Community Planning)
- Utility Resilience and Security

## Support Activities

- Organization
- Policies and Procedures
- Process/Protocol
- Tools
- Training
- Metrics and Baselines
- Awareness
- Budget / Funding Status
- Occupant Behavior Change Program
- Current SRM / O&M / FYDP
- Historic Preservation
- Measurement and Verification

# Behind the Curtain



	Plan	Do	Check	Cross Walk
<b>Energy Component</b>	Conduct a Level I assessment (FEDS) or other building energy model	Implement output of FEDS or other building energy model	Measure/verify performance and energy savings	Convert energy savings to ton of CO2
	Collect data on exterior lighting	Install most appropriate higher efficiency lighting	Measure/verify performance and energy savings	Convert energy savings to ton of CO2 and use solar power to power exterior lighting
<u>Support Activity</u>	<u>Details</u>			
Organization	Energy Manager/BEM/Designer/Const Manager / Energy O&M/Public Works			
Policies and Procedures	Energy Management Plan			
Process/Protocol: NZ	NZ Energy			
Training	NZ Energy Tool			
	Energy Manager/BEM/Designer/Const Manager / Energy O&M/Public Works			
Metrics and Baselines	2003 Energy Consumption Baselines			
Awareness	Energy Conservation Program			
Budget/Funding Status	UELs, ESPCs, USPCs and PPAs			
Occupant Behavior Change Program	Phantom load (example)			
Current SRM/O&M FYDP Plan	Energy portion of current SRM/O&M/FYDP Plan			
Historic Preservation	Energy applicability in Historic Buildings/District			
Measurement and Verification	Meter electric -2012 gas and steam-2016;10% audits; reduce energy 30% by 2015, reduce energy 50% by 2020, Consolidate data centers, Annual Reporting			

# Findings



- **Based on initial results of this study, considering both base and regional information, JBPHH is in a strong position to meet currently directed goals and mandates in the energy, renewable energy and water fields.**
- **The GHG goals and mandates could not be assessed due to lack of available information.**

# Findings - JBPHH Best Practices Summary



- **Energy and RE:** Energy Conservation Board, knowledgeable staff, diversified strategy, plans, awareness, combine condition assessments and audits
- **Water:** Use of non-potable source for irrigation, modernization of tracking non-potable water, use of native vegetation and landscaping (ADPs)
- **Waste:** Joint approach to determining waste strategies
- **Fossil Fuel Reduction:** Installation of alternative fuel pumps at fleet fueling centers
- **High Performance Buildings:** Strong BEM program
- **Health Component:** Strong IAP and ADPs focusing on walkability and bike paths
- **GHG:** Energy manager taking independent action to determine source and size of GHG emissions
- **EMS:** Energy manager standardizing EMS
- **Energy Resilience and Security:** Hawaii's role in SPIDERs program

## Analysis (Components and Support System) Output:

- **Target / Status:**
- **Estimated Cost:**
- **Estimated Simple Payback:**
- **Goal / Objective:**
- **Estimated Contribution in**
  - Reduction of energy
  - Reduction of water
  - Increase in renewable energy (RE)
  - Reduction of fossil fuel
  - Increase in alternative fuel
  - Reduction in GHG emissions

## Priority of Action Plans:

1. Health, regulatory, safety, mission or support, quality of life
2. Component
3. Support system
4. Function
5. Payback
6. Implementation period
7. Timing of other action plans

# Six Recommended Action Plans (by Component)



- Implement energy conservation and efficiency measures from FEDS level 2 investigations – (**Energy**)
- Implement recommended renewable energy portfolio – (**Renewable Energy**)
- Implement leak detection measures – (**Water**)
- Prepare for Light Rail Station – (**Fossil Fuel / Transportation**)
- Integrate sustainability into final versions of the North Side Area Development Plan – (**Community Planning**)
- Develop and install smart grid– (**Utility Resilience and Security**)

# Major Recommended Action Plans (Support Activities)



- Have a Sustainability Council with all components represented and a Sustainability Manager - (**Organization**)
- Provide for comprehensive training across all segments of sustainability - (**Training**)
- Invest in a parametric net-zero energy tool – (**Tool**)
- Adapt net-zero energy process – (**Process**)
- Investigate feasibility for ESPCs / PPAs /EULs– (**Budget**)
- Investigate Phantom Loads – (**Occupant Behavioral Change**)

# Implementation Plan



- **Prioritization of Action Plans**
  - There are 124 action plans with 64 “money” action plans arranged in six phases
  - Phases start in 2013 and run through 2022
  - Phases are sequenced to achieve net zero
- **Cost is at \$803M, with the recommendation that majority of financing must be through Energy Savings Performance Contracts (ESPC) / Power Purchase Agreements (PPAs) / Enhanced Use Leases (EULs)**

- Technique by which base has an opportunity to tell higher headquarters what it needs, through a subjective rating scheme, relative to sustainability.
- The base can rate any and all components, as well as support system activities. The rating on the score card is a cumulative rating, that may be the analysis of one or more criteria for the component due to multiple mandates/directives.
- The base can declare “red” to highlight assistance required versus the failure to attain.
- There is one “red” identified for JBPHH: green house gas emissions.

# Scorecard



Sustainability Component	Description	Baselines	Mandate and Current Status	Rating
Green House Gas (GHG): Socio-Economic Behavior / Carbon Sequestration / Low Impact Development (LID)	Concentrate on reduction of base generated GHG emissions	FY08 Base GHG Emission	3 percent reduction annually targeted in Scope 1,2, and 3 greenhouse gas emissions by the end of FY15. <b>Current/Projected Status: Awaiting guidance to track GHG</b>	<b>RED</b> <b>(Projected Base)</b>

# Summary of Sustainability Plan Highlights



- Contractor-facilitated “Plan-Do-Check-Crosswalk” approach can be applied to all naval bases and stations that have varying degrees of sustainability maturity
- Highlights best practices that JBPHH currently does for Navy-wide dissemination
- Scorecard is a subjective approach to identify those issues requiring higher headquarters/ regional assistance’
- Proposal for Regional consideration is to consider joint service solutions to many of the same sustainability challenges
- Proposals for DON consideration: recommended process to integrate sustainability at the IDP and ADP levels; and adaptation of JBPHH’s HAMP process / use of DOI historical guidelines.
- Proposal for DOD consideration: adaptation of SROI process; shared joint service sustainability assets and grouping; integrate sustainability into BRAC decisions; and have a DOD rack-and-stack list of projects from a centralized perspective.

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**Questions?**

# Backup Slides

# Assumptions



- **Data collected, actual or assumed, is a true representation of the study area or joint base.**
- **Data and results collected from the study area being applied to the joint base is a fair representation of the study area.**
- **Funding streams are accurate and available for the times suggested.**
- **Action plans and sustainability projects are feasible and able to be implemented in the sequence presented.**