JGPO
JOINT GUAM PROGRAM OFFICE

NAVFAC
Naval Facilities Engineering Command
NAVFAC PACIFIC

# Smart Growth and Sustainable Design including LEED

## 29 April 09

# Introduction



- **Smart growth and sustainable design work to meet the needs of the present without compromising the ability of future generations to meet their own needs.**

- **In our case, it is an approach that encourages local economic growth, preserves the environment, and improves the quality of life for all island residents while enabling DoD to develop full mission capability as it expands its presence on Guam and CNMI.**

JGPO
JOINT GUAM PROGRAM OFFICE

# Limited Resources and Environmental Challenges

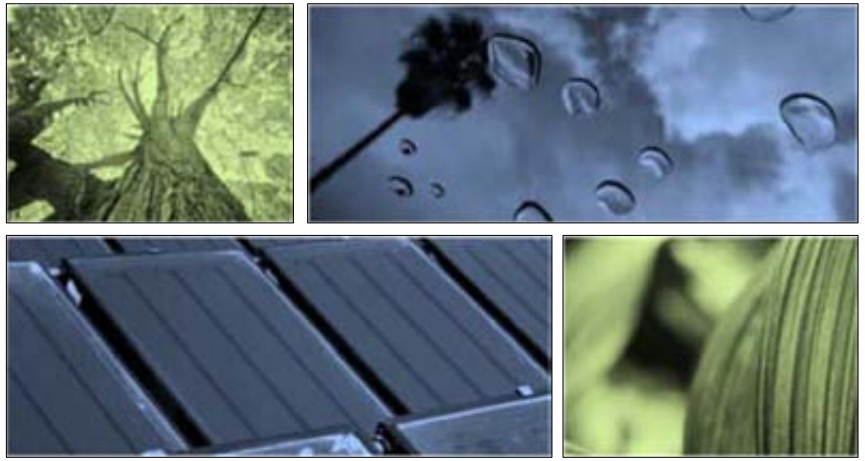
NAVFAC

- Energy
- Raw Materials
- Fresh Water
- Natural Habitat
- Open Space
- Air and Sea Transport

- Typhoons
- Earthquakes
- Radon
- Heat and Humidity
- Mildew and Mold
- Termites

# Sustainable and Smart Growth Policies and Guidance

- **Federal Policies**
  - Energy Policy Act of 2005
  - MOU for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles)
  - Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management
  - Energy Independence and Security Act of 2007
  - National Defense Authorization Act 2007



# Sustainable and Smart Growth Policies and Guidance

- **Navy, Marine Corps and Joint Region Marianas**
  - **Engineering & Construction Bulletin 2008-01 Energy Policy Act of 2005 Implementation and USGBC LEED Certification**
  - **NAVBASEGUAMINST 4100.1 Energy Management Program**
  - **NAVBASEGUAMINST 11330.1 Water Conservation Program**
  - **UFC 3-210-10 Low Impact Development (Stormwater)**
  - **UFC 4-030-01 Sustainable Development**

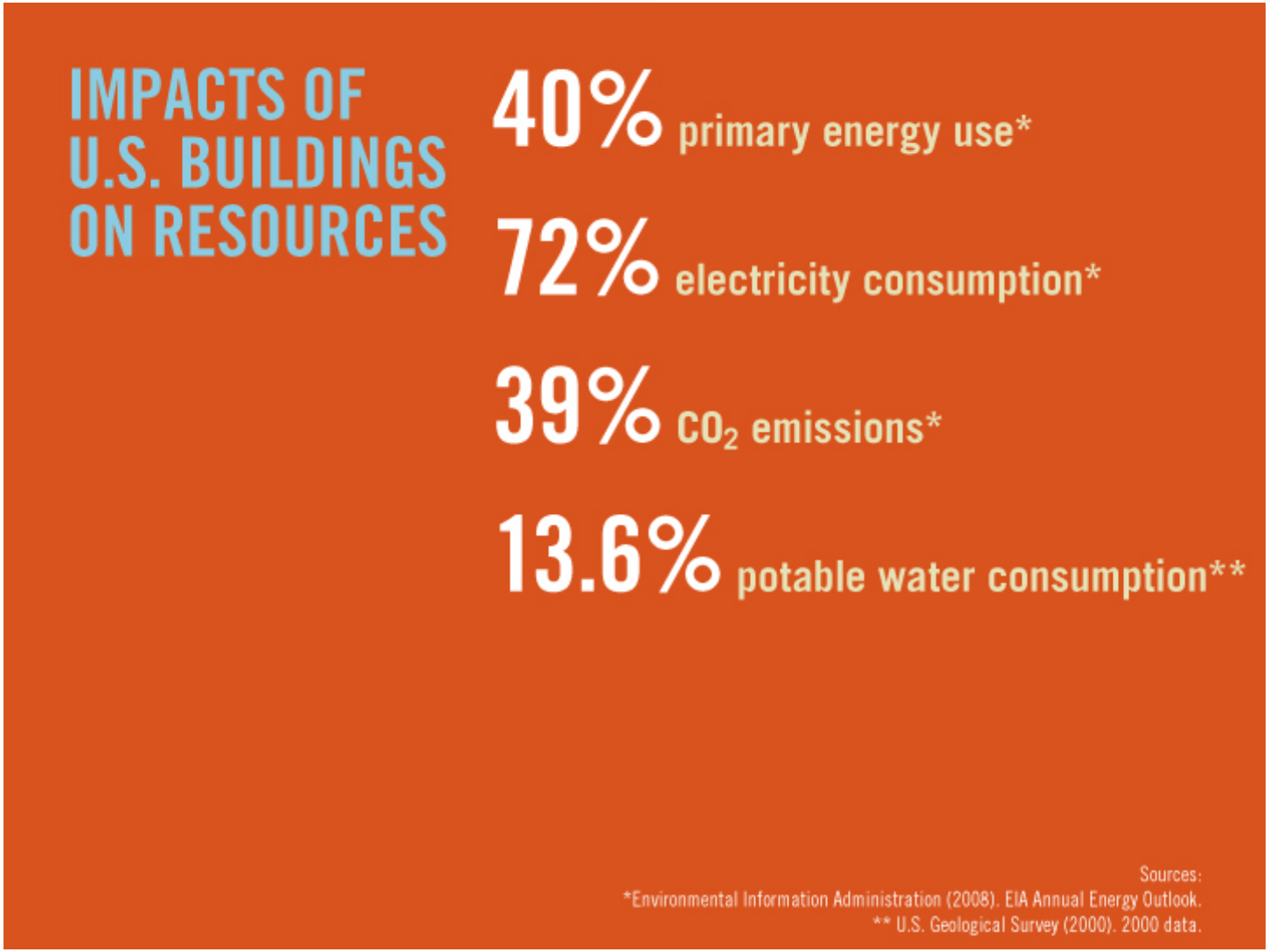
*"**Reducing the Cost of Ownership** through sustainable development of Navy and Marine Corps shore facilities, including planning, programming, design, construction, operations and maintenance, sustainment, restoration and modernization of all shore facilities projects."*

# Sustainable and Smart Growth Policies and Guidance Summary

- **Buildings**
  - LEED Silver for all New Construction and Major Renovation
- **Energy**
  - 30% reduction
  - 30% renewable energy component by 2015
  - 100% reduction in fossil fuels & “Carbon-Neutral” by 2030
- **Water**
  - 20% reduction indoors, 50% reduction outdoors
  - Pre = post-development hydrology outdoors

# Why Green Building?

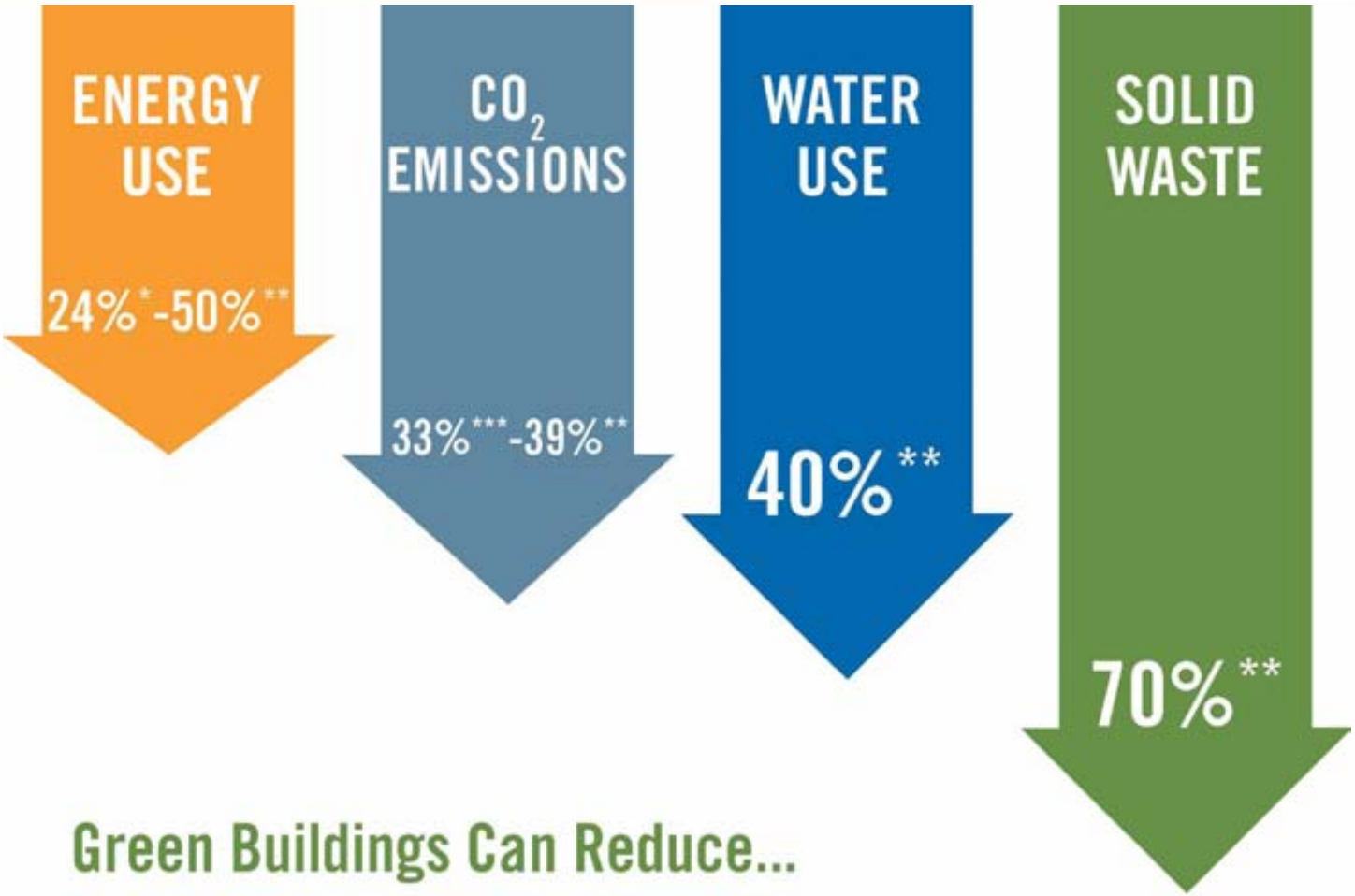




JGPO
JOINT GUAM PROGRAM OFFICE

# Why Green Building?

NAVFAC




## Green Buildings Can Reduce...

* Turner, C. & Frankel, M. (2008). Energy performance of LEED for New Construction buildings: Final report.
** Kats, G. (2003). The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force.
*** GSA Public Buildings Service (2008). Assessing green building performance: A post occupancy evaluation of 12 GSA buildings.

# Why Green Building?



## Green Building Occupants Are Healthier & More Productive

- In the U.S., people spend, on average, 90% or more of their time indoors*
- Green buildings typically have better indoor air quality and lighting
- LEED certified project case studies illustrate 2-16% increased worker and student productivity**

* Source: The Total Exposure Assessment Methodology (TEAM) Study. EPA 600/S6-87/002. U.S. Environmental Protection Agency. 1987.
** Source: LEED project data, USGBC

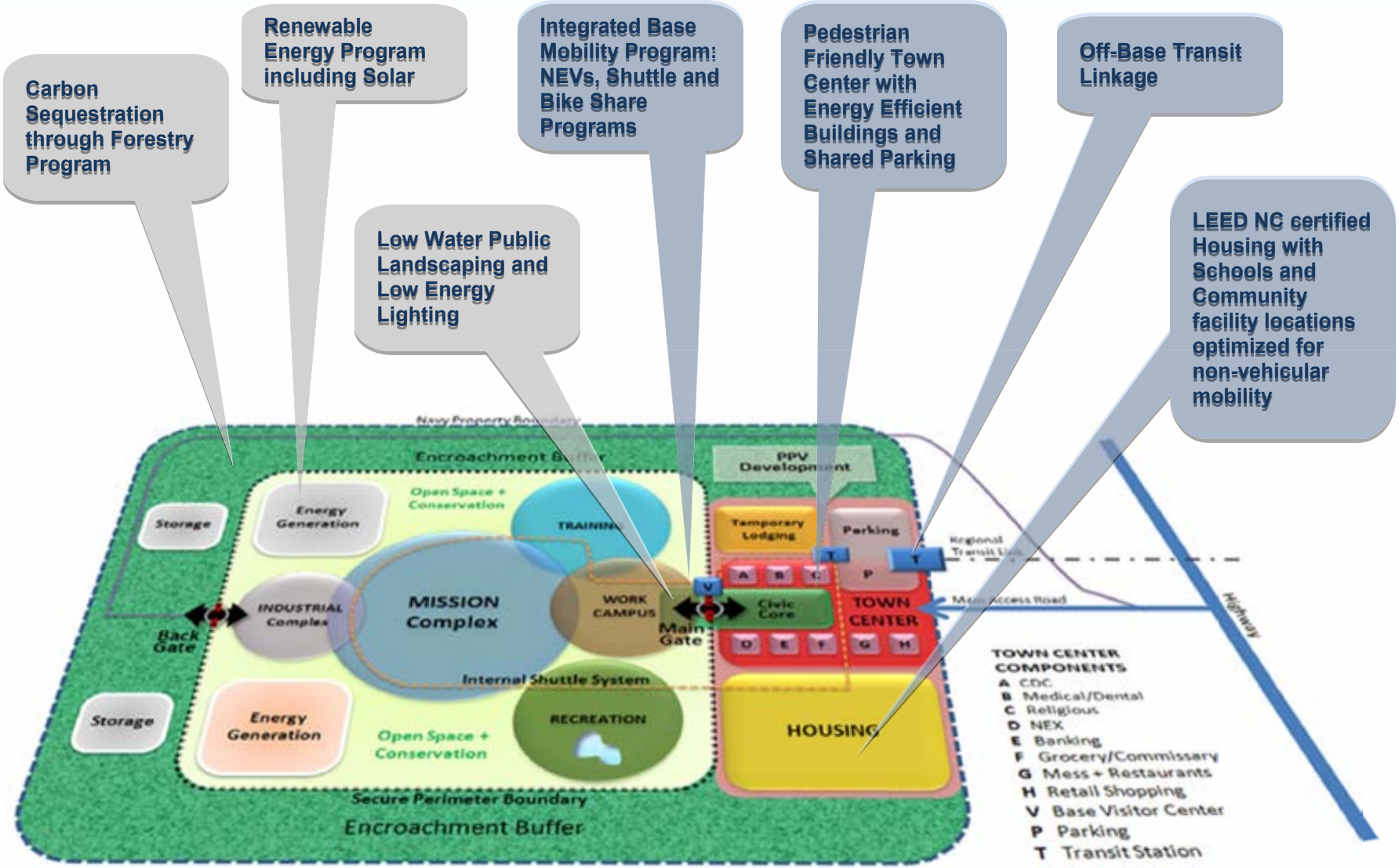
# Planning for a Smart and Enduring Base


**TOWN CENTER COMPONENTS**

- **A** CDC
- **B** Medical/Dental
- **C** Religious
- **D** NEX
- **E** Banking
- **F** Grocery/Commissary
- **G** Mess + Restaurants
- **H** Retail Shopping
- **V** Base Visitor Center
- **P** Parking
- **T** Transit Station



# Planning for a Smart and Enduring Base



# LEED Silver and EPAct of 2005 on Guam

USGBC
LEED Silver

Energy Star
Efficiency

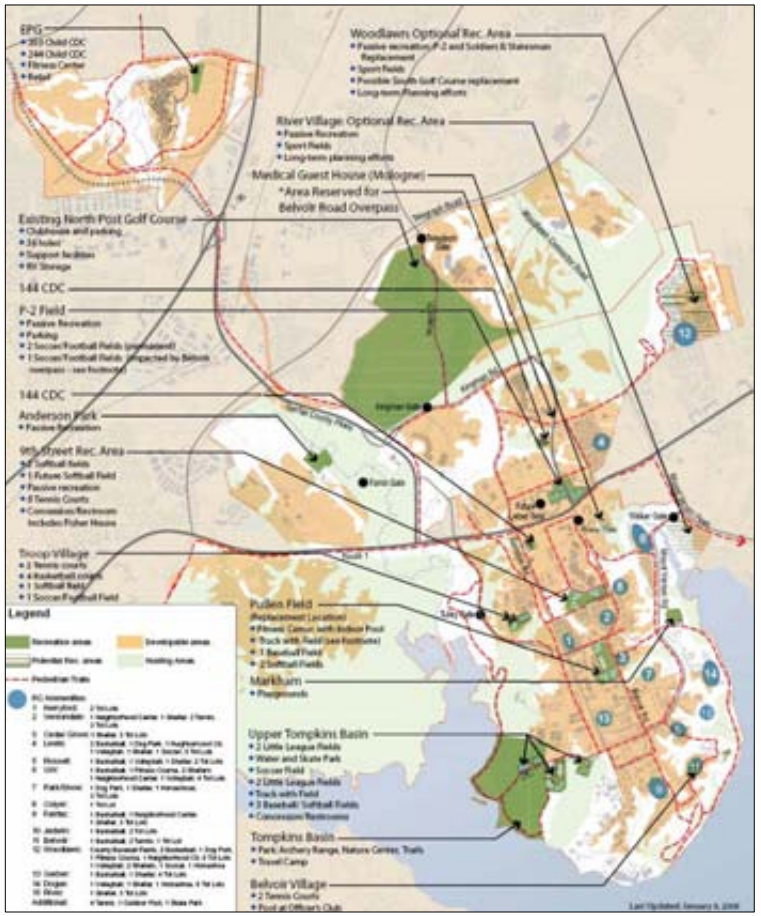
***This is a green building under redevelopment now on Guam!***

# Smart Growth at Marine Corps Base Hawaii at Kaneohe Bay

- **Renewable energy and water conservation projects**
  - Adapting aircraft hangars with skylights and sensors that control lighting based on available sunlight
  - Placing solar hot water systems in its lodging facilities
  - Using photovoltaic roofing on buildings
  - Using an "ice bear" hybrid air-conditioning thermal ice system where ice made at night cools buildings in the day
  - Using a central air conditioning and lighting control system that manages energy use in 56 buildings on base
  - Developing multi fuel-capable generation plant and solar array field
- **Hawaii Regional Housing PPV Increment II**
  - LEED for Neighborhood Development Registered Pilot Project

# Smart Growth at Fort Belvoir

- **Similar in project scope and magnitude of development**
  - LEED ND Prototype
  - Bio-retention
  - Rain gardens
  - Reduce impervious cover
  - Limit use of potable water
  - Core urban planning strategies

# U.S. EPA Smart Growth Award Example

- **The Village at Naval Training Center San Diego**
  - Well designed public spaces
  - Pedestrian friendly streetscapes
  - Regional architectural styles
  - Integration with surrounding community
  - Used as a model for military housing
  - Contains 500 housing units, a seven-acre site for an elementary school, a community center, recreational space, and community spaces such as the Navy Exchange.

# U.S. EPA Region IX Resources

- LEED Accredited Professional advice
- Technical expertise
- Green building training ideas
- Funding suggestions
- Competitive funding available for:
  - Green homes
  - Energy-efficiency
  - Reusing or reducing construction and demolition debris
  - Other innovative pilots

# U.S. EPA Region IX Resources

## LEED Accredited Professionals


**Timonie Hood**
Hood.Timonie@epa.gov
**415-972-3282**

**Saskia van Gendt**
VanGendt.Saskia@epa.gov
**415-947-4103**

**Pankaj Arora**
Arora.pankaj@epa.gov
**415-972-3040**


---

## Others


**Leif Magnuson**
**Green Homes**
Magnuson.leif@epa.gov
**415-972-3286**

**Wendi Shafir**
**Green Schools and Hospitals**
Shafir.wendi@epa.gov
**415-972-3422**

JGPO
JOINT GUAM PROGRAM OFFICE

# Energy Initiatives and Projects on Guam

NAVFAC

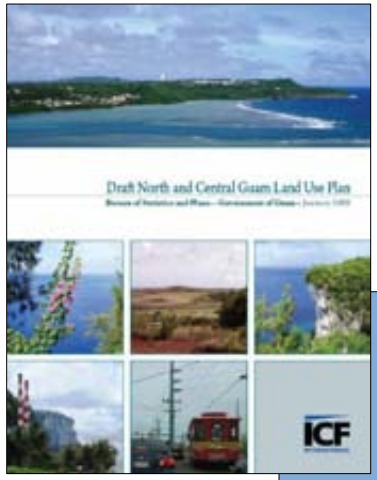
- **Current**
  - Energy star certification for housing projects
  - Solar lighting on playgrounds and sidewalks
  - Solar water heating on bachelor housing
  - Wind data collection to determine feasibility
  - Energy saving performance contract and detailed energy survey
  - Photo-voltaic feasibility study
  - Ocean thermal energy conversion feasibility study
- **Planned**
  - Motion sensor retrofits
  - Additional solar power, lighting, water applications
  - Micro-turbine feasibility study
- **See https://navyenergy.navfac.navy.mil/**

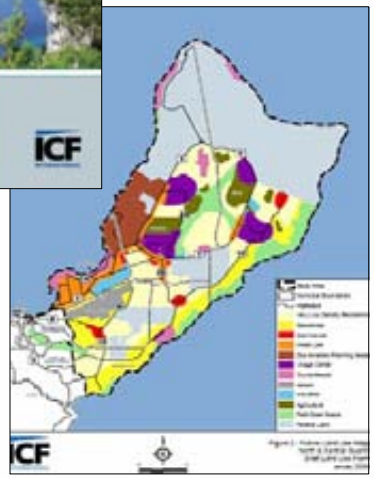
# Integration with Guam Land Use Plan

- **Guam Land Use Plan Vision Statement**

  **"Guam is a sustainable paradise that is safe, walkable, family- and community-oriented, and protective of natural resources"**

- **Land Use**
- **Housing**
- **Economic Development**
- **Natural Systems**
- **Transportation**
- **Infrastructure**

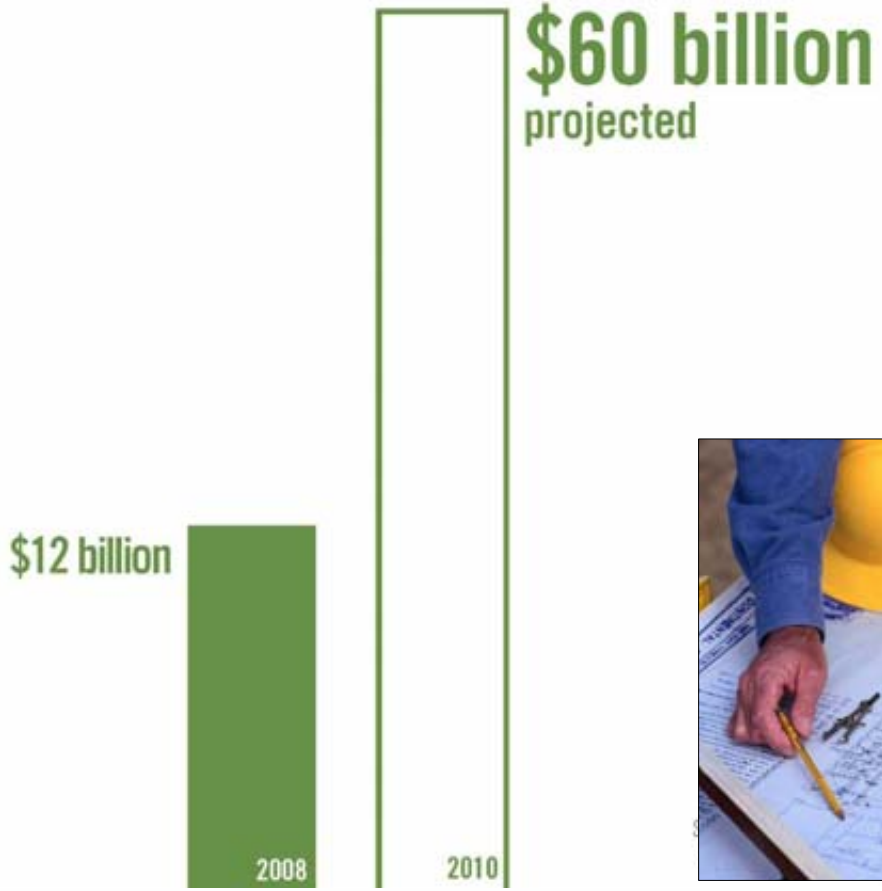


# Opportunity for Industry



## Green Building is in Demand




JGPO
JOINT GUAM PROGRAM OFFICE

# Panel Discussion

NAVFAC