Increasing Resilience: US Army Garrison Hawaii and Hawaiian Electric Company

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Our Universe
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
US Dept of State Geographer
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Our Worlds

USAG-HI

- Second Largest City in Hawaii
- 19 Installations on Oahu, 3 on Hawaii Island
- Population 97,943
- 5,391 Buildings/8,056 Homes
- Second largest DoD consumer of electricity

HECO

- O'ahu, Maui, Hawai'i Island
  - 95% of the state's 1.4 million residents
- Regulated
- 462,225 customers
  - O'ahu-304,948
  - Maui-71,352
  - Hawai'i Island-85,825
- Renewable goals
  - State: 100% by 2045

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B.L.U.F.

- ✓**US Army Garrison Hawaii and Hawaiian Electric Company partnered to solve mutual resilience and renewable needs**
  - USAG-HI shifted from being a consumer to prosumer
- ✓**Results:**
  - 640 solar hot water systems and chiller retrofit (2001)
  - 17 MW of PV on Army Installations (2006 to present)
  - 18 MW of demand response (2013 to present)
  - 50 MW Schofield Generating Station & Microgrid (2018)
  - Utility Privatization (presently pending)

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Solar Hot water

- ✓**640 systems were installed on homes and recreation cabins through a utility energy Service contract (UESC)**
  - Army had no funding, HECO provided financing
  - Rebates lowered costs
- ✓**Lowered generation requirement**
- ✓**Decreases costs**
  - Army
  - Ratepayers

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17 MW PV

- ✓**Over 6,000 rooftop inter-connected systems were facilitated through carve out process**
  - Reduced application requirement, batch vs. each system Army
  - Reduced inter-connection study costs
- ✓**Decreased housing operating costs for housing developer**
  - More and higher quality homes
  - Local economy benefit from construction
- ✓**State and Army Renewable goals benefitted**
  - Army has the most roof top PV of all HECO customers
  - *HECO named "Utility of the Year" (2019) by Utility Drive*

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2 MW Demand Response

- ✓**1.0 MW of residential heaters, 1.1 MW of water and wastewater pumps are on demand response**
  - $287K credited to electric bill annually
  - No impact to Mission (water systems have storage ride through)
  - Tenant participation encouraged – privatized housing and utilities
  - USAG-HI participated in the Hawaii Solar Integration Study
- ✓**Mitigate Variability**
- ✓**Army is largest provider of demand response**

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50 MW Schofield Generating Station and Microgrid

✓**Executed through a 35 year + 10 year option lease**

- First right to power in lieu of lease rent for 8 acres of land

✓**Station is :**

- Utility-owned and operated
- Resilient – Six 8.3 MW multi-fuel marine diesels (4 plus 2)
- Renewable - utilizes 3 MGALS of biofuel annually
- Secure – located within a military installation, not on coastline
- Operates daily to serve all utility customers
- Provides microgrid services to Schofield Barracks, Wheeler Army Airfield and Field Station Kunia (80% of Mission)

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50 MW Schofield Generating Station and Microgrid

Generation Technology

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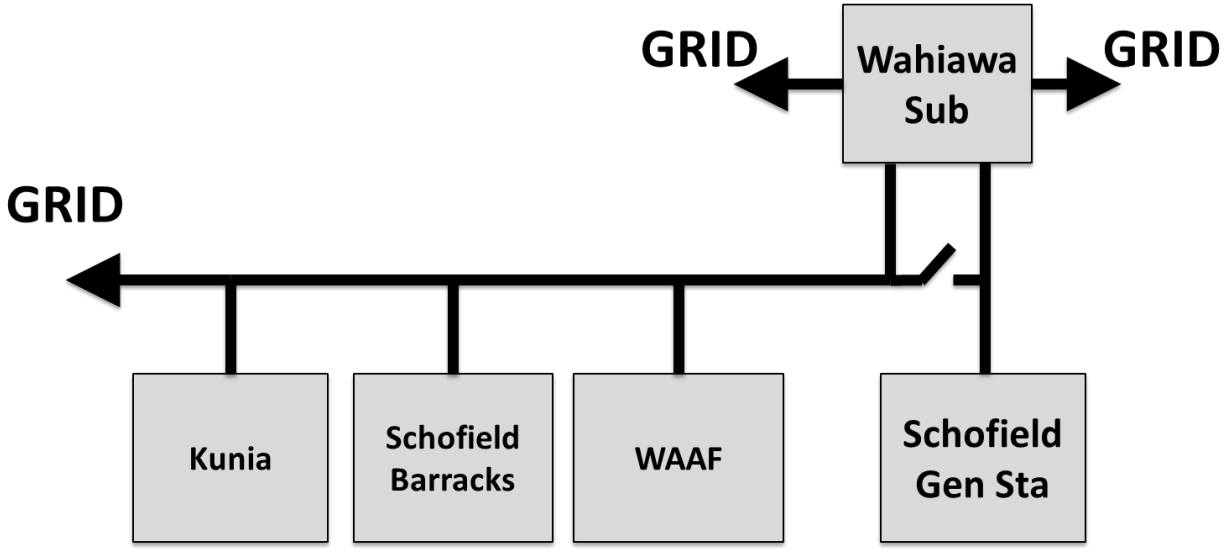
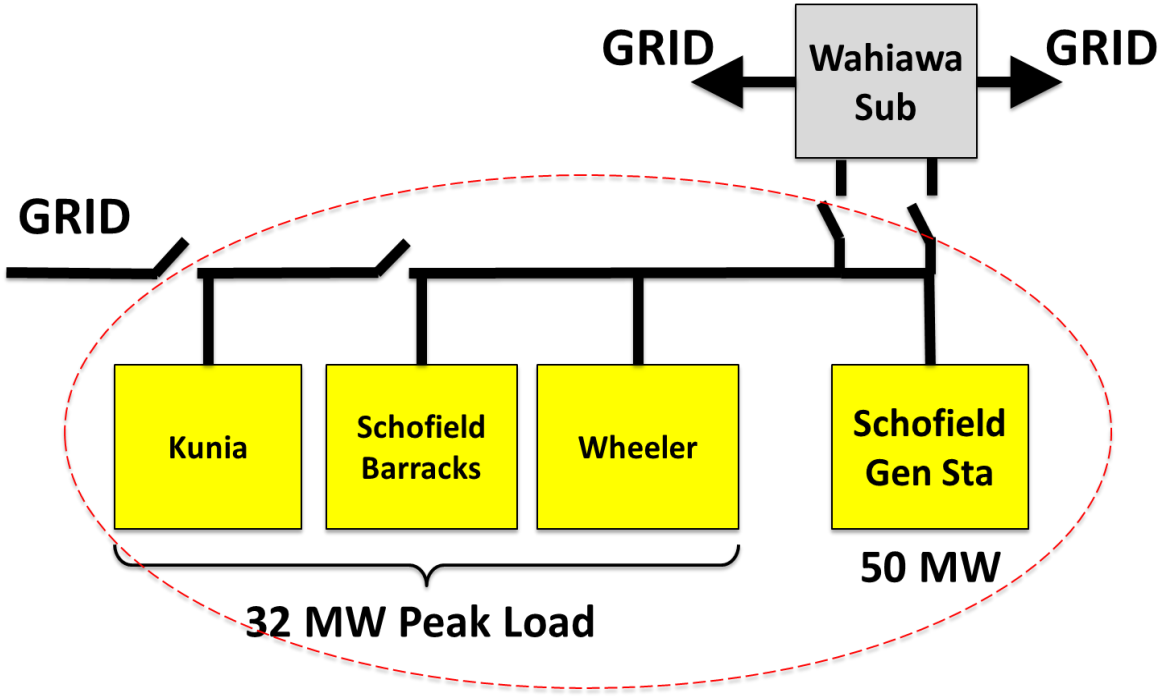
50 MW Schofield Generating Station and Microgrid

Interconnection/Microgrid

Normal Operation: Grid-tied



Contingency Operation: Microgrid



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50 MW Schofield Generating Station and Microgrid

Step 1: What do we need?

Army

- Resilience
- Renewable Energy
- Reliable Power
- *Money*
- *Expertise*

Utility

- Resilience
- Renewable Energy
- Reliable Power
- Flexible Generation
- Permittable Land

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50 MW Schofield Generating Station and Microgrid

Step 2: What do we have?

Army

Utility

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50 MW Schofield Generating Station and Microgrid

Step 3: Who/What do we know?

Army

- US Army Garrison Hawaii
  - 25th Infantry Division
  - National Guard
  - Tenants and neighbors
- ASA Installations Environment and Energy
  - Office of Energy Initiatives
- Authority to Lease Land
  - US Corp of Engineers

Utility

- **Local Community**
  - Businesses
  - National Guard
  - Political entities
  - City, County, State offices
- **Congressional Delegation**
- **Hawaii Regulatory Process**
  - Public Utilities Commission

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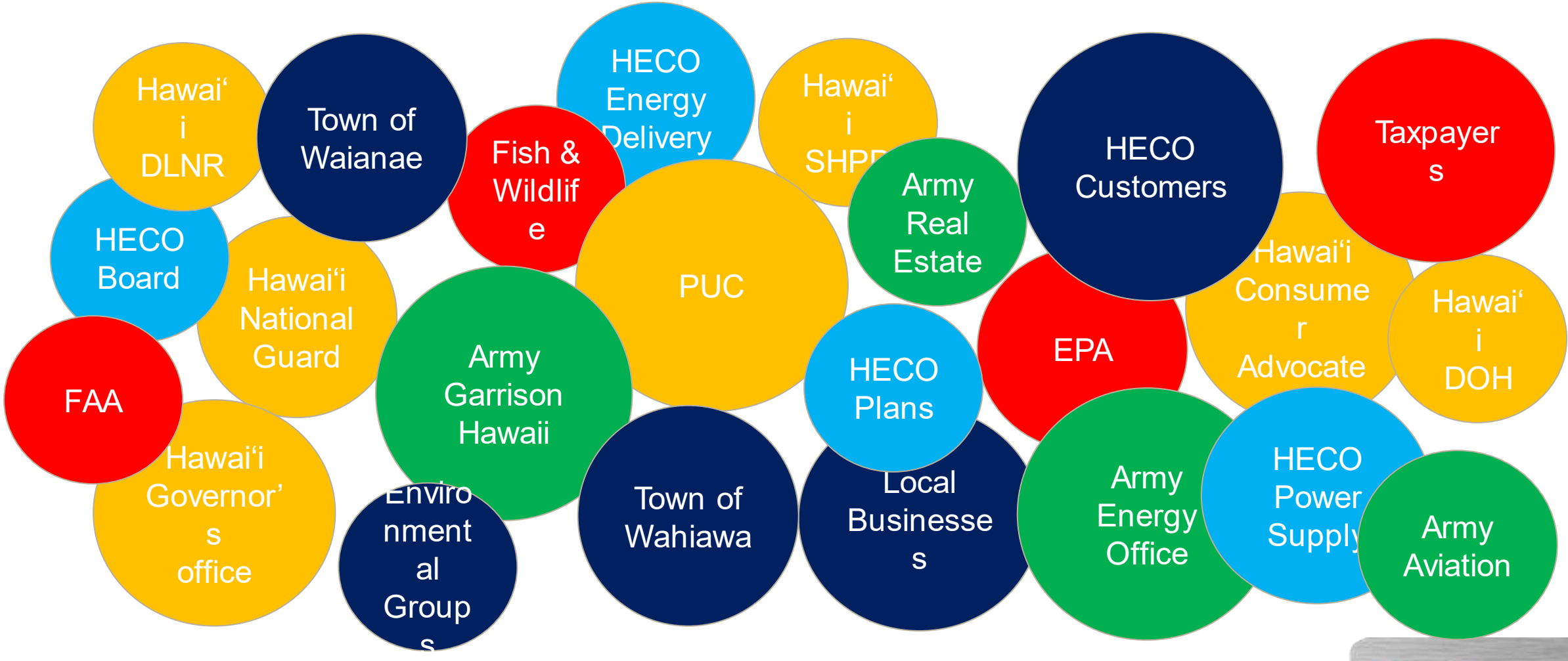
50 MW Schofield Generating Station and Microgrid

Stakeholders



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50 MW Schofield Generating Station and Microgrid

Partnering to overcome challenges

Regulatory Constraints

- Competitive framework for new generation
- HECO Army MOA enabled PUC waiver

Mission Impact

- Exhaust Stack intruded into aircraft protection zone
- HECO Army coordination to reconfigure plant foot print and utilize 3 into one stack to meet clean air permitting requirement

Renewable Requirement

- Aggressive Army renewable goal
- Shift biofuel from less efficient CT plant to the more efficient diesels at SGS. Adjust renewable requirement to address CA concerns.

In Kind Benefit

- Land value fixed
- Valuation of energy security developed by Army and restoration time adjusted to lower infrastructure costs.

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Success with UP at USAG-HI

✓**Success with existing UP Partner at USAG-HI**

- Partnership with waste water Utilities Privatization contractor or System Owner
- Improved the quality of our effluent.
- Enabled waste water reuse – local farmers
- Options on reuse rather than disposal
- Biosolids from the waste water plant

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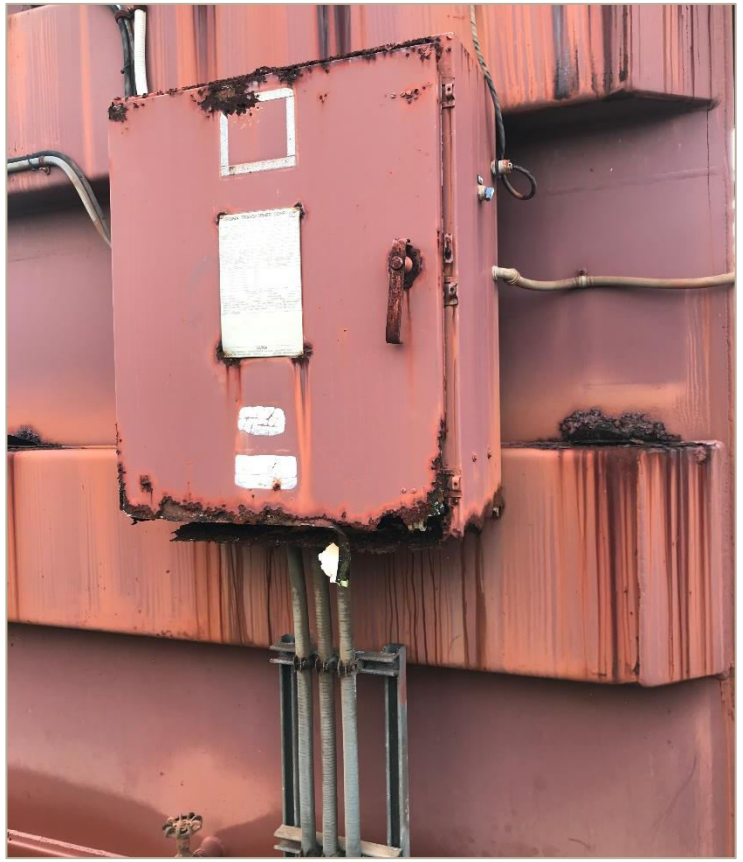
UP at USAG-HI

Typical HECO substation

US Army Garrison Hawaii (USAG-HI)



Utilities Privatization

Government Owned

- Different colors of money
- Turnover of SMEs
- Manpower is capped
- Utilities have to compete with high visibility facilities.

Utility

- Flexibility
- Expertise
- Manpower and Resources
- Money is committed

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UP at USAG-HI

✓**Future with UP and HECO**

- Redundant feeds
- Industry standard
- Initial System Deficiency Corrections (ISDCs)
- Continuity on and off the installation

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End of Slides
HOOAH!

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