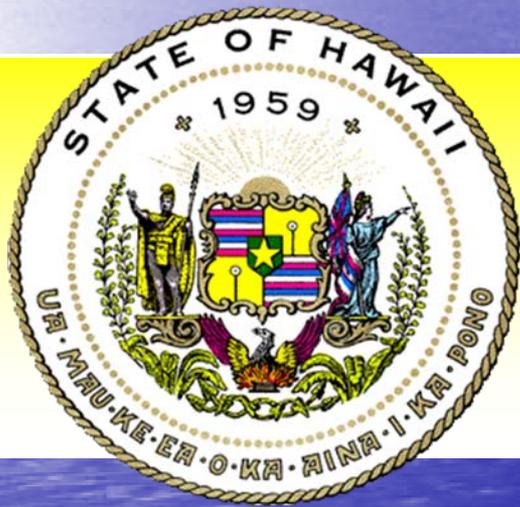


***State of Hawaii***  
***Department of Transportation***

---

***Asia Pacific Clean Energy  
Summit & Expo  
August 14 2012***



## *Harbors Division Clean Energy Initiative*



# Hawaii Department of Transportation: Harbors Division

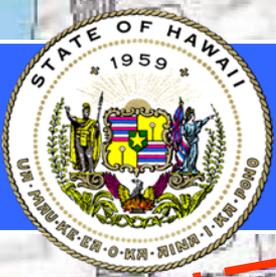
## KAPALAMA TERMINAL DEVELOPMENT

**CONCEPTUAL DESIGN**  
Subject to Change

Sand Island Access Road

**DESCRIPTION:** Development of 1,800' Pier, 90-Acre Cargo Yard, and Roadway and Gate Improvements.  
**EST. CONSTRUCTION COST:** \$221 million.



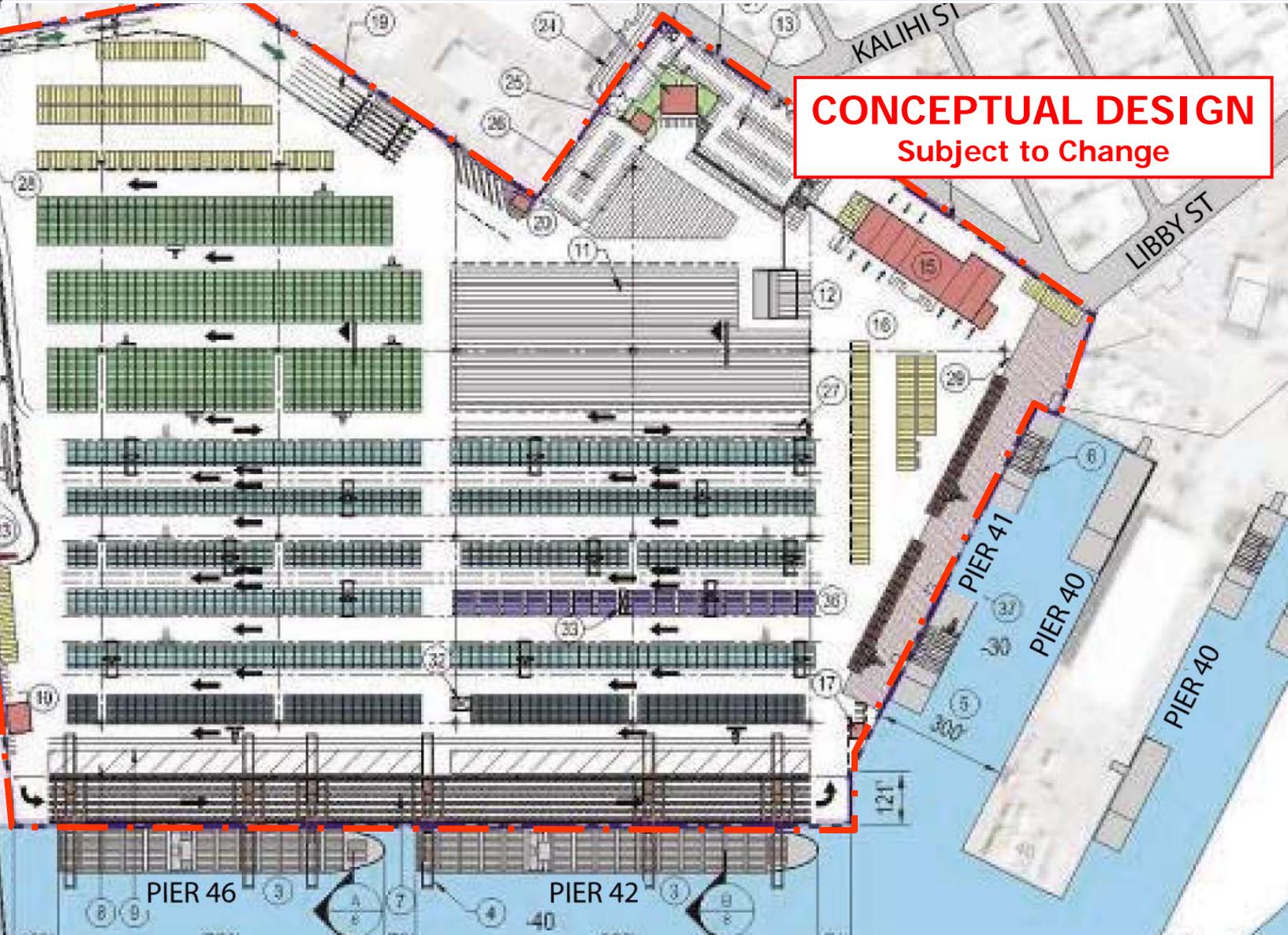


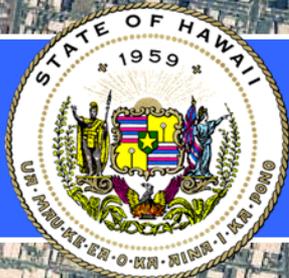
# Hawaii Department of Transportation: Harbors Division

## KAPALAMA TERMINAL DEVELOPMENT

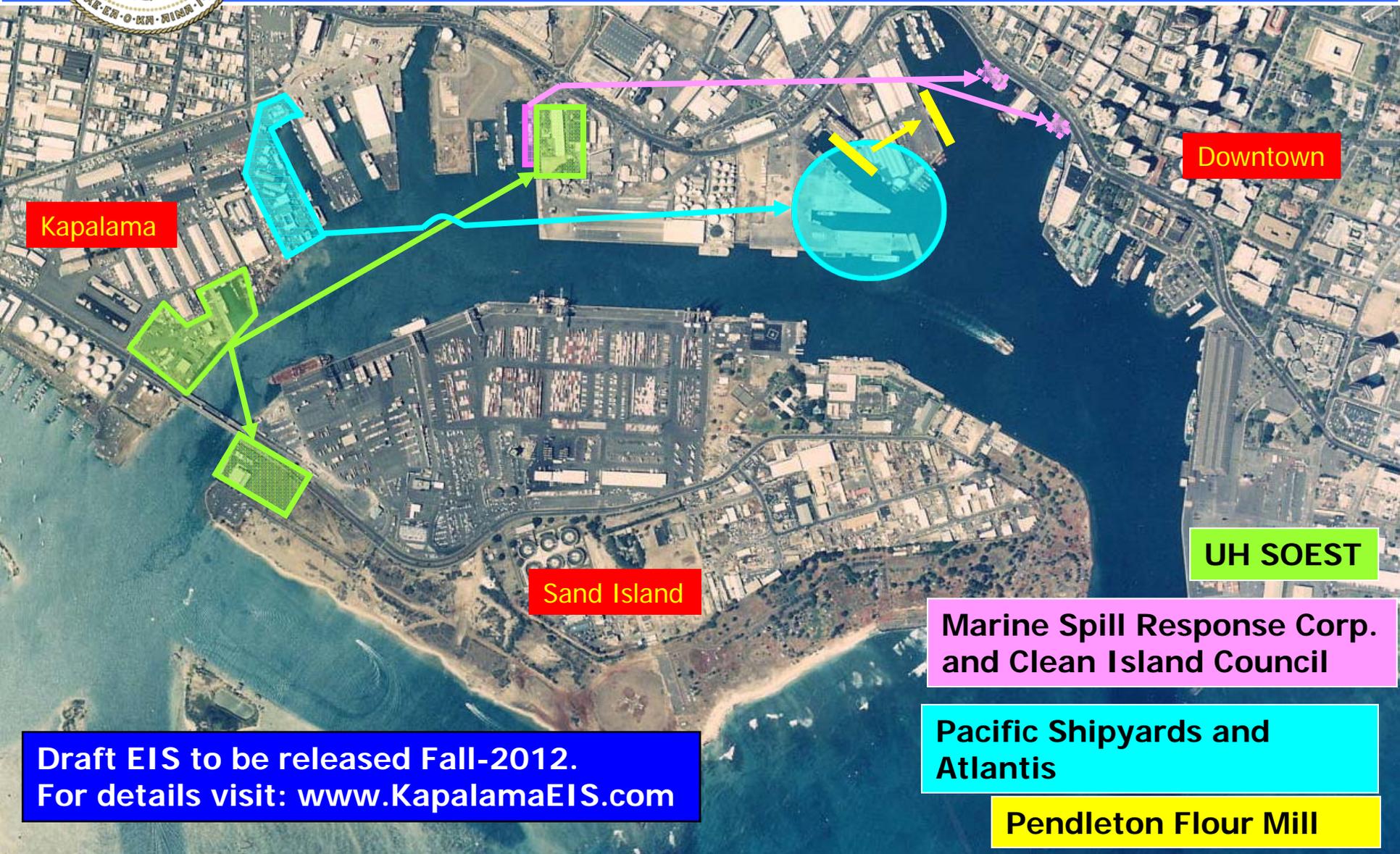
**CONCEPTUAL DESIGN**  
Subject to Change

Sand Island Access Road  
AD





# Hawaii Department of Transportation: Harbors Division MOVES FOR KAPALAMA DEVELOPMENT



**Kapalama**

**Downtown**

**UH SOEST**

**Sand Island**

**Marine Spill Response Corp.  
and Clean Island Council**

**Pacific Shipyards and  
Atlantis**

**Pendleton Flour Mill**

**Draft EIS to be released Fall-2012.  
For details visit: [www.KapalamaEIS.com](http://www.KapalamaEIS.com)**



# Kalaehoa Barbers Point Harbor, Oahu

## LAND ACQUISITION



West  
Beach  
Marina

Pier P-6

Pier P-5

LOT A

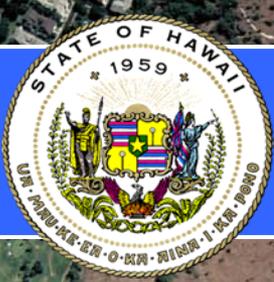
Malakole Street

Kenai  
Industrial  
Park

**DESCRIPTION:** Property Acquisition for Future Harbor Development.

**EST. ACQUISITION COST:** Subject to Appraisal.

**SCHEDULE:** TBD.



# Kalaehoa Barbers Point Harbor, Oahu

## FUEL SYSTEM PROJECTS



West Beach Marina

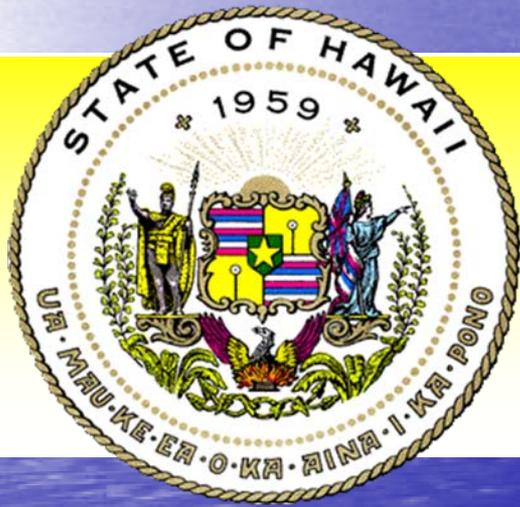
Possible Pier Improvement

Kenai Industrial Park

Possible Storage Location

Pier P-6  
Pier P-5

**DESCRIPTION:** Fuel Pier Development Plan and Environmental Documentation and Kalaehoa Master Plan  
**SCHEDULE:** Late-2012.



***Highways Division  
Clean Energy Initiative***

# Photovoltaic Power System at DOT Baseyard

*Kauai District*



## **DESCRIPTION**

DOT's Photovoltaic Energy Systems Project with Hoku Solar.

Installation of 15.4 KW PV system.

Generating 103.4 kwh/day.

## **SCHEDULE**

Began receiving electricity on April 30, 2009

# Photovoltaic Power System at DOT Baseyard

*Maui District – Molokai Baseyard*



## **DESCRIPTION**

29 KW PV system

Generating  
144 kwh/day

## **SCHEDULE**

Began receiving  
electricity on

September 2011

# ***LED Street Lights***



## ***DESCRIPTION***

LED Street Lights – Pilot Project

## ***BENEFITS***

Reduced maintenance cost

Consumes less than ½ energy of traditional street lighting

# High-Performance Retro-Reflective Signs

*Moanalua Freeway Corridor (between Halawa Interchange & Middle Street)*



## **DESCRIPTION**

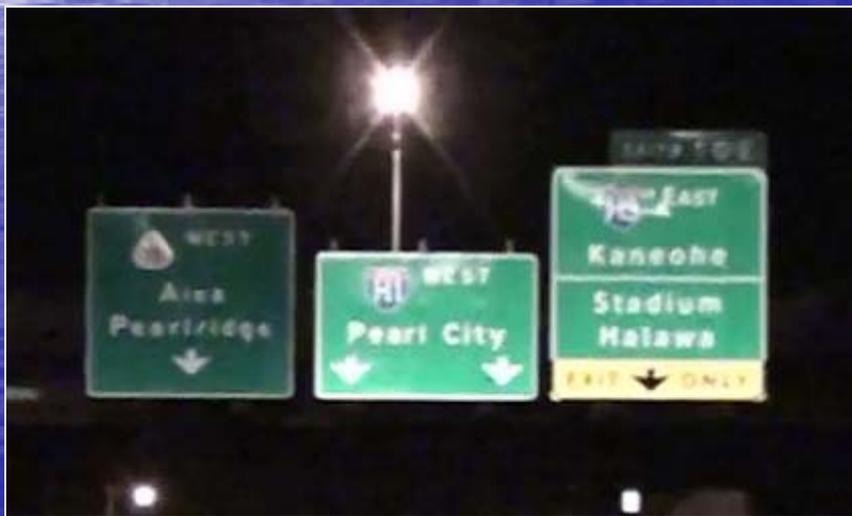
Installation of high performance retroreflective sign sheeting reduces energy costs and eliminates maintenance work on existing overhead light bulbs.

## **SCHEDULE**

Initial completion: Aug. 2008

## **BENEFITS**

New signs save \$14,000 a year in electrical costs and \$30,000 in maintenance work to replace overhead bulbs annually and save thousands of tax dollars.



# Traffic Signal Modernization (LED Signal Retrofit)

*Oahu: Major Intersections*



## **DESCRIPTION**

Replace incandescent lamp signal heads with LED signal heads (6,550)

Increase visibility at major intersections, reduced electrical costs and reduced maintenance costs.

## **SCHEDULE**

Completed Jan. 2009

# Solar-Powered Emergency Telephones

Interstate Routes H-1 & H-2



## DESCRIPTION

Install solar powered emergency call boxes on:

- H-2 Freeway (Waiawa Interchange to Wilikina Drive)
- H-1 Freeway (Airport Interchange to 17<sup>th</sup> Avenue)
- H-1 Freeway (Farrington Highway to Airport Interchange)

## BENEFITS

Reduced installation costs, operational and energy costs.

# Solar-Powered Speed Signs

*Pali Highway*



## **DESCRIPTION**

Use of solar powered driver feedback speed signs reduces operational & energy costs as well as installation costs.

**COST:** \$26,000

**COMPLETION:** Dec. 2003

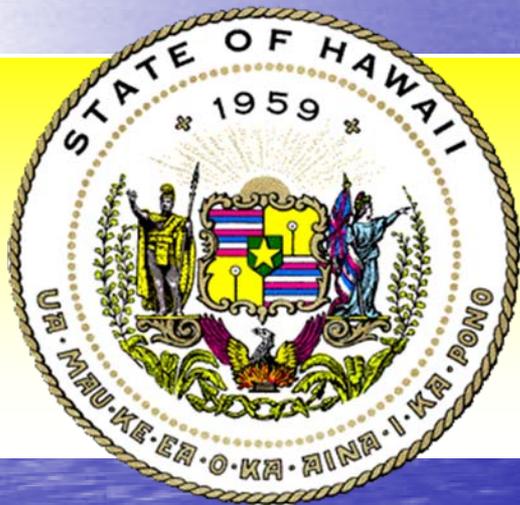
# Alternative Powered Vehicles & Equipment



## ***DESCRIPTION***

Passenger vehicles:  
Hybrids, propane flex  
fuel, CNG flex fuel, E85  
flex fuel, and propane  
fueled

Equipment: small & heavy  
(1/2 Ton and larger)  
construction equipment



## ***Airports Division Clean Energy Initiative***

# Energy Projects

## Phase I PV PPA Portfolio



Lihue Airport, Kauai  
1 system, 338 kW

Kahului Airport, Maui  
2 systems, 369 kW



- ✓ Aggregate size: ~1MW+
- ✓ Total # of systems: 7
- ✓ Estimated annual power output: 1.5+ million kWh
- ✓ Total cost: \$8+ million



Kona Airport, Hawaii  
1 system, 61 kW

Hilo Airport, Hawaii  
1 system, 111 kW



# Energy Projects

## Phase II Renewable Energy Initiative

- Phase II Advertised March 8, 2010
- 18 Site Statewide for DOT, DBEDT, and UH
- Small and Large Sites
- PV, Concentrated Solar and Wind
- In Negotiations for 3.3 MW of PPAs

# Energy Projects

## Energy Savings Performance Contract

- Energy Savings Performance Contract was Advertised June 2011
- Full Range of Energy Services and Capital Improvements for Energy Conservation Measures for Airports, Highways and Harbors Facilities
- Investment Grade Audit to be Performed for Energy Conservation Measures on Systems including HVAC, Lighting, Building Envelope, Hot Water, Water Consumption and Sewage, Electrical Distribution and Metering
- Energy Conservation Measures to Fund Capital and Implementation Costs Amortized over the Contract Term
- Currently working through a protest on the project

# Tracking DOT Airports TIA Consumption and Cost Savings



# Total Annual Consumption and Cost of Meter #20210019-349 at Lihue Airport

<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	4,046,100	\$1,195,573
<b>2007</b>	4,164,000	\$1,263,272
<b>2008</b>	4,468,500	\$1,630,965
<b>2009</b>	3,955,200	\$1,326,944
<b>2010</b>	3,317,700	\$1,058,533
<b>2011</b>	3,329,700	\$1,177,834
<b>2012</b>	2,208,600	\$869,054

# Total Annual Consumption and Cost of Meter #20210019-349 at Lihue Airport

Fiscal Year	kWh	Cost
2006	4,046,100	\$1,195,573
2007	4,164,000	\$1,263,272
2008	4,468,500	\$1,630,965
2009	3,955,200	\$1,326,944
2010	3,317,700	\$1,058,533
2011	3,329,700	\$1,177,834
2012	2,208,600	\$869,054

50.6%  
decrease  
from 2008.

46.7%  
decrease from  
2008.

# Total Annual Consumption and Cost of Meter #98529/127031 at Hilo Airport

<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	3,484,800	\$855,909
<b>2007</b>	3,625,200	\$930,517
<b>2008</b>	3,630,100	\$1,100,291
<b>2009</b>	3,110,400	\$980,567
<b>2010</b>	3,078,000	\$870,619
<b>2011</b>	3,016,800	\$962,227
<b>2012</b>	2,068,800	\$763,009

# Total Annual Consumption and Cost of Meter #98529/127031 at Hilo Airport

Fiscal Year	kWh	Cost
2006	3,484,800	\$855,909
2007	3,625,200	\$930,517
2008	3,630,100	\$1,100,291
2009	3,110,400	\$980,567
2010	3,078,000	\$870,619
2011	3,016,800	\$962,227
2012	2,068,800	\$763,009

43%  
decrease  
from 2008

30.7%  
decrease  
from 2008

# Total Annual Consumption and Cost of Meter #85081 at Kahului Airport (T-Hangar)

<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	84,880	22,580
<b>2007</b>	91,200	25,610
<b>2008</b>	100,160	31,150
<b>2009</b>	78,120	27,111
<b>2010</b>	9,280	4,857
<b>2011</b>	11,360	\$6,159
<b>2012</b>	4,800	\$3,691

# Total Annual Consumption and Cost of Meter #85081 at Kahului Airport (T-Hangar)

Fiscal Year	kWh	Cost
2006	84,880	22,580
2007	91,200	25,610
2008	100,160	31,150
2009	78,120	27,111
2010	9,280	4,857
2011	11,360	\$6,159
2012	4,800	\$3,691

95.2%  
decrease  
from 2008

88.2%  
decrease  
from 2008

# Total Annual Consumption and Cost of Meter #95696 at Kahului Airport (ASAP)

<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	11,205,600	\$2,503,091
<b>2007</b>	11,109,600	\$2,693,135
<b>2008</b>	11,150,400	\$3,079,986
<b>2009</b>	11,061,600	\$3,217,023
<b>2010</b>	11,384,400	\$2,662,371
<b>2011</b>	11,439,600	\$3,239,860
<b>2012</b>	7,837,200	\$2,651,557

# Total Annual Consumption and Cost of Meter #95696 at Kahului Airport (Alien Species Action Plan (ASAP) Cargo Building)

Fiscal Year	kWh	Cost
2006	11,205,600	\$2,503,091
2007	11,109,600	\$2,693,135
2008	11,150,400	\$3,079,986
2009	11,061,600	\$3,217,023
2010	11,384,400	\$2,662,371
2011	11,439,600	\$3,239,860
2012	7,837,200	\$2,651,557

29.7%  
decrease  
from 2008

13.9%  
decrease  
from 2008

# Total Annual Consumption and Cost of Meter #81734/115335 at Kona Airport

<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	5,744,400	\$1,354,149
<b>2007</b>	6,012,000	\$1,505,236
<b>2008</b>	6,213,600	\$1,809,034
<b>2009</b>	5,826,000	\$1,837,714
<b>2010</b>	5,962,800	\$1,598,994
<b>2011</b>	5,804,400	\$1,774,817
<b>2012</b>	3,655,200	\$1,332,863

# Total Annual Consumption and Cost of Meter #81734/115335 at Kona Airport

Fiscal Year	kWh	Cost
2006	5,744,400	\$1,354,149
2007	6,012,000	\$1,505,236
2008	6,213,600	\$1,809,034
2009	5,826,000	\$1,837,714
2010	5,962,800	\$1,598,994
2011	5,804,400	\$1,774,817
2012	3,655,200	\$1,332,863

41.2%  
decrease  
from 2008

26.3%  
decrease  
from 2008

# Total Annual Consumption and Cost of All DOT Facilities Included in PPA

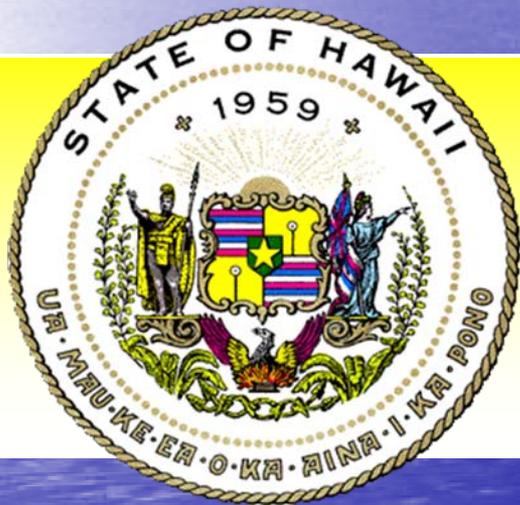
<b>Fiscal Year</b>	<b>kWh</b>	<b>Cost</b>
<b>2006</b>	24,565,780	\$5,931,301
<b>2007</b>	25,002,000	\$6,417,769
<b>2008</b>	25,562,760	\$7,651,426
<b>2009</b>	24,031,320	\$7,389,359
<b>2010</b>	23,752,180	\$6,195,374
<b>2011</b>	23,601,860	\$7,160,899
<b>2012</b>	15,774,600	\$5,620,175

# Total Annual Consumption and Cost of All DOT Facilities Included in PPA

Fiscal Year	kWh	Cost
2006	24,565,780	\$5,931,301
2007	25,002,000	\$6,417,769
2008	25,562,760	\$7,651,426
2009	24,031,320	\$7,389,359
2010	23,752,180	\$6,195,374
2011	23,601,860	\$7,160,899
2012	15,774,600	\$5,620,175

38.3%  
decrease  
from 2008

26.6%  
decrease  
from 2008



***MAHALO!***