



Hawaiian Electric
Company, Inc.

Interisland Wind

House Legislative Briefing
January 27, 2011

Robbie Alm

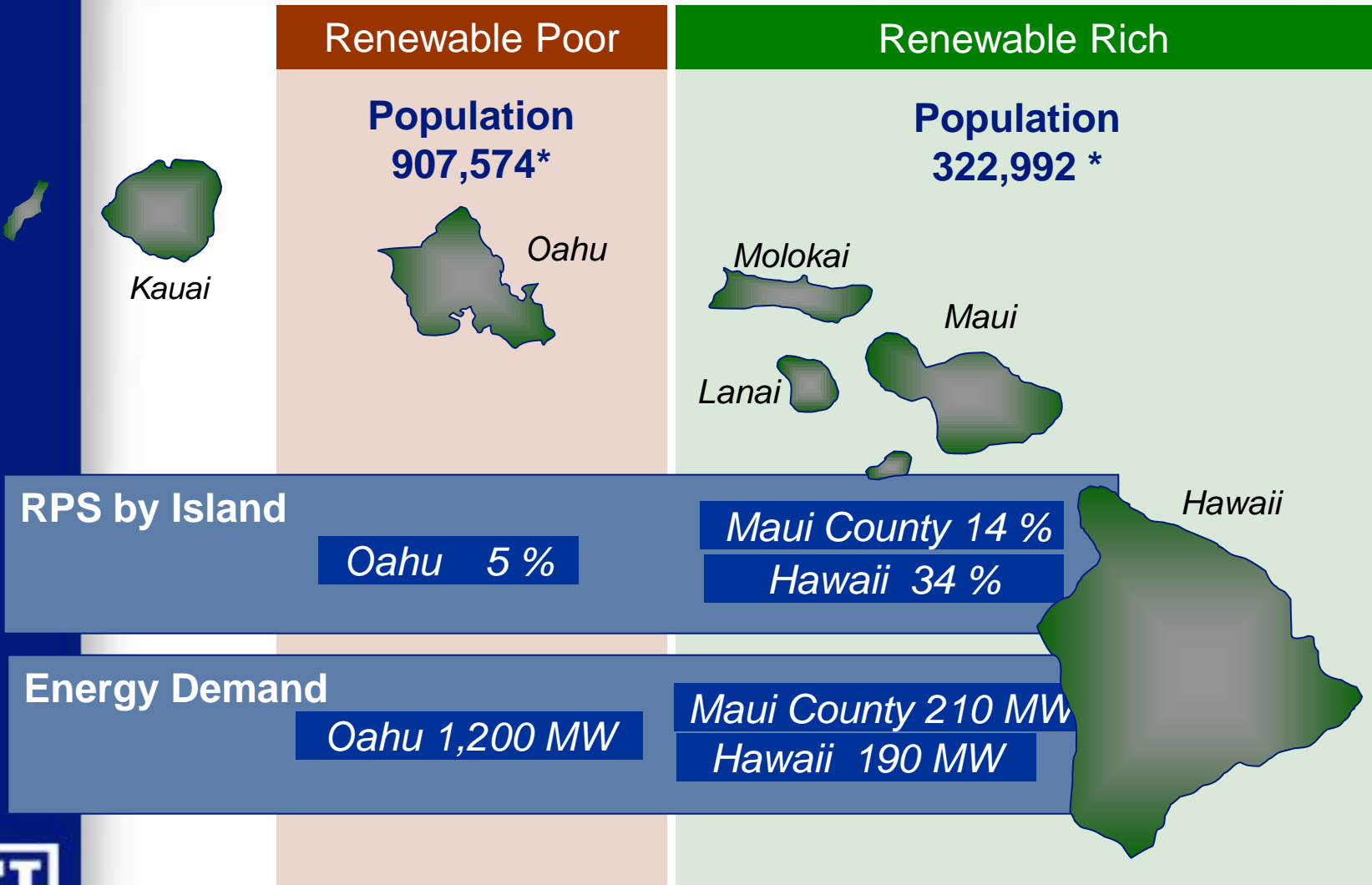
Hawaiian Electric Company





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Oahu's Challenge



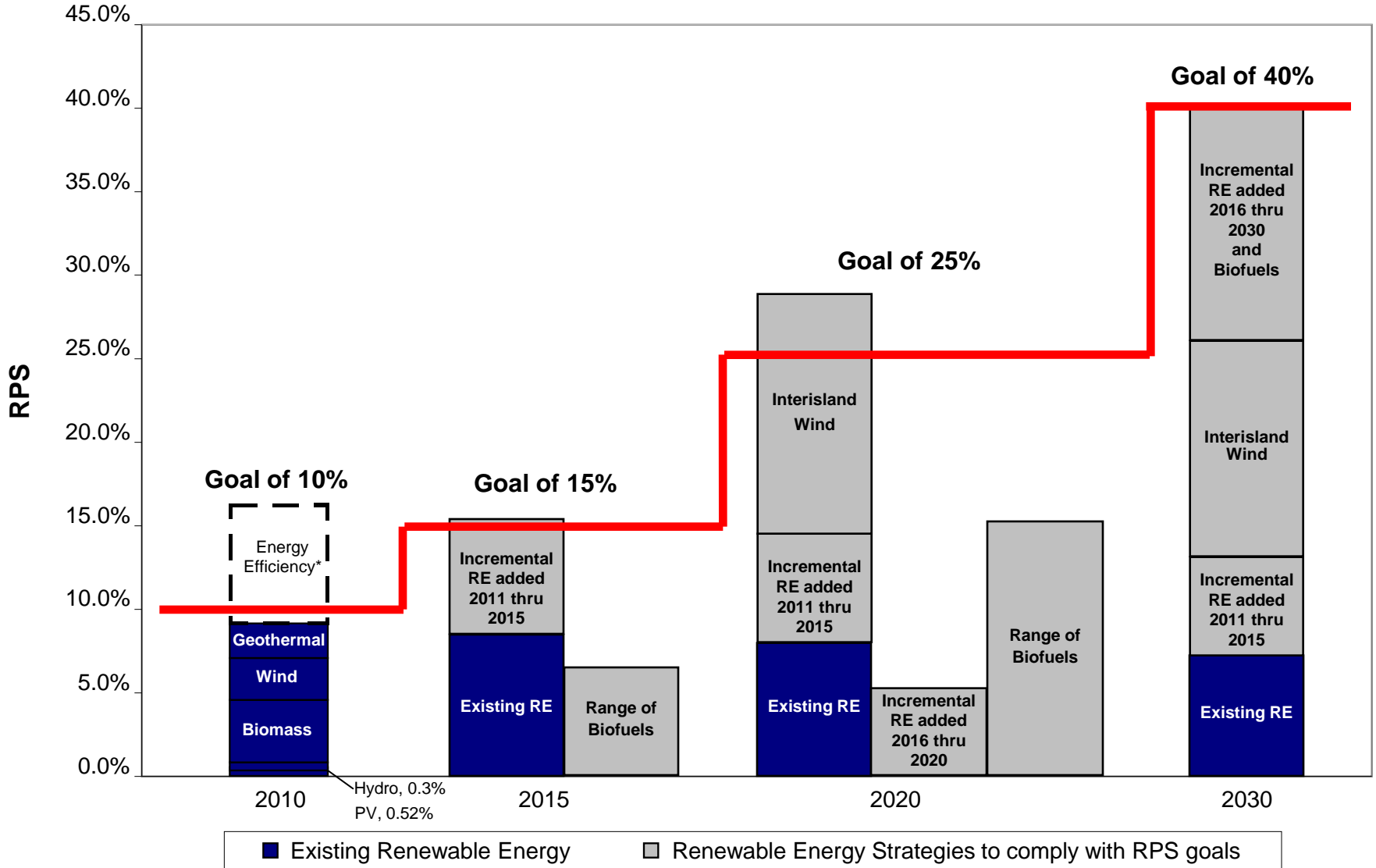
* U.S. Census estimate for 2009





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HECO Consolidated RPS Scenarios



* Counts towards RPS through 2014



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Interisland Wind Status

- Oahu Wind Integration Study work by Technical Review Committee (TRC) complete
 - ➔ Integration of 400 MW Interisland Wind is feasible without energy storage
- Nov. 18, 2010 PUC Decision re Bifurcation Agreement
 - ➔ Term sheets required by March 18, 2011
- January 3, 2011 Letter Agreement between Hawaiian Electric and Castle & Cooke
 - ➔ Target PPA pricing and community benefits





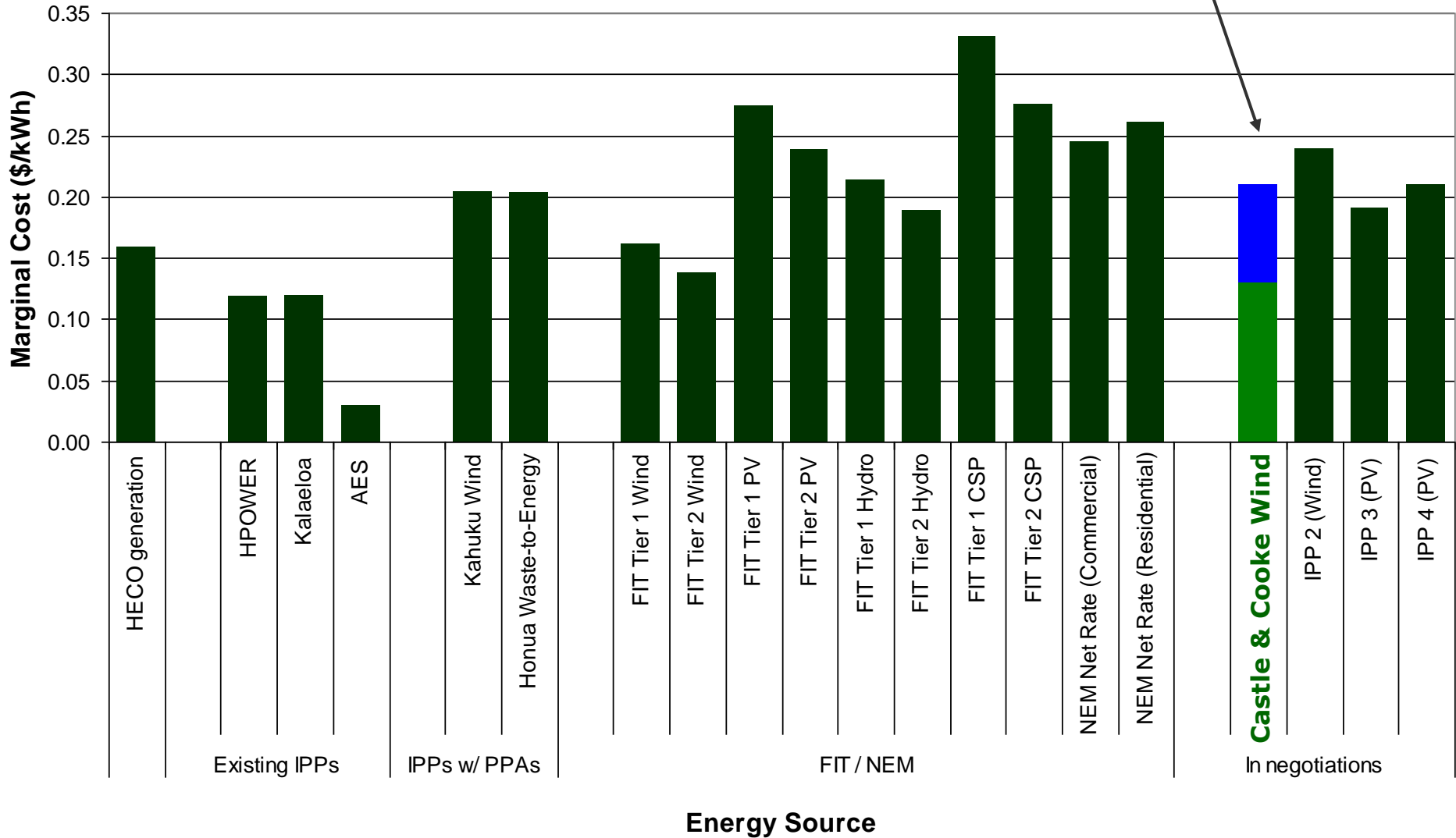
Lanai Energy Pricing

- Target cost of wind energy based on January 3, 2011 letter agreement between Hawaiian Electric and Castle & Cooke
 - 11 ¢/kWh for 400 MW Wind Farm
 - 13 ¢/kWh for 200 MW Wind Farm
- Total estimated cost of project
 - Approx. 20.98 ¢/kWh (levelized)
 - Wind Energy – 11 to 13 ¢/kWh
 - Oahu Infrastructure – 1.11 ¢/kWh
 - Cable – 6.87 ¢/kWh



Oahu Energy Price Comparison

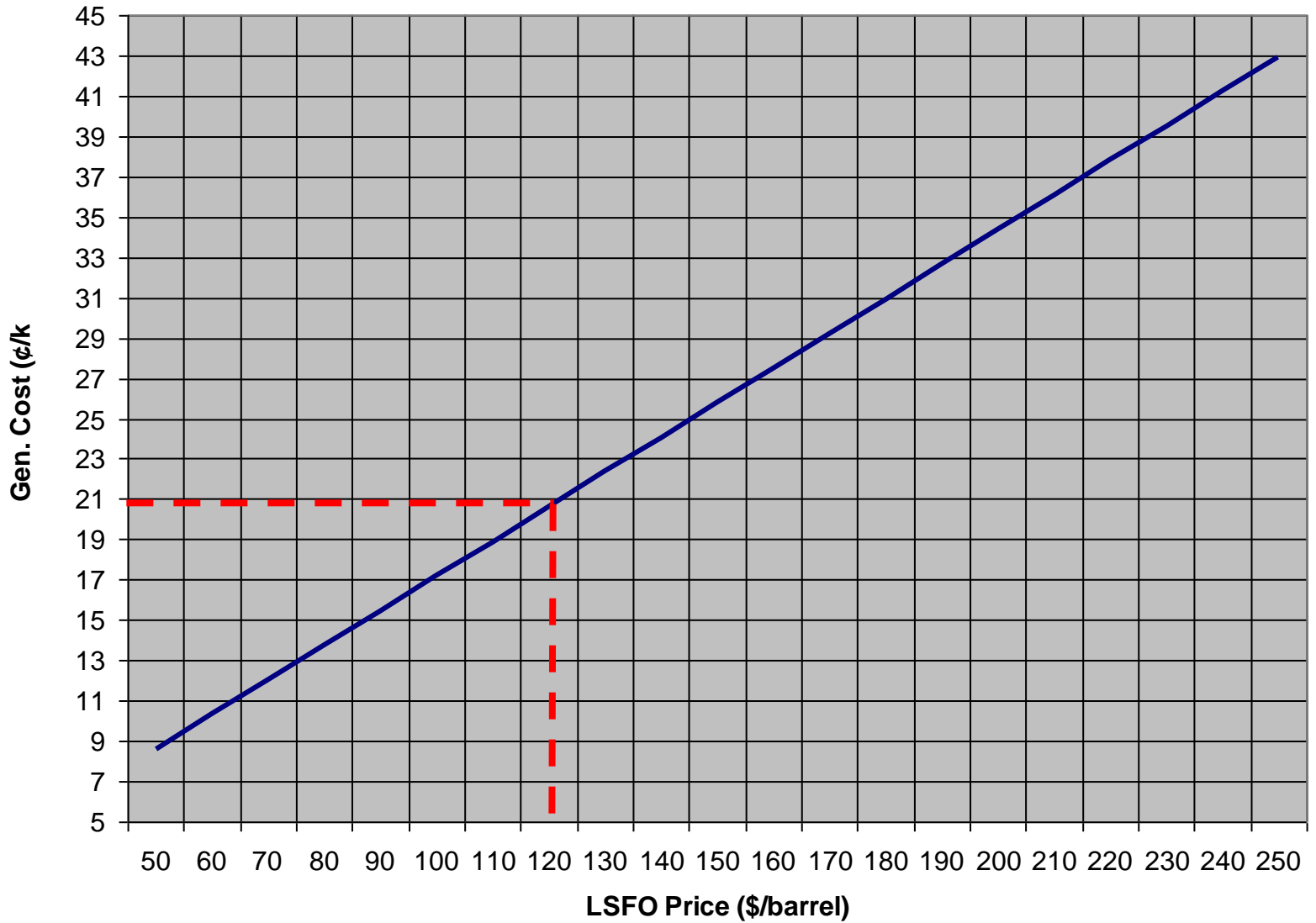
Oahu T&D Infrastructure & Undersea Cable





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LSFO Price vs. Electricity Generation Cost





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Community Benefits in PPA

- Very unusual case
- Process
- Other venues
- Hawaiian Electric/Maui Electric Commitments
 - Levelized rates to Oahu*
 - 100% RPS by 2020*
 - PV-related grid enhancements*
 - PAYS-like program*
 - Contribution to Lanai Community Fund
 - Youth program sponsorship
- Castle and Cooke Commitments





Castle & Cooke Commitments

- Establish Lanai Community Benefits Fund with proceeds of 1% of wind farm's gross revenues.
- Employment on Lanai maintained at no lower than Castle & Cooke employment today.
- Continued access to hunting areas and to coastal fishing in the Ka'a area.
- Residential, agricultural and commercial lessees to be able to buy their properties at fair market prices.
- Priority for qualified Lanai residents in construction jobs and contractors required to respect Lanai community standards in their behavior.
- Wind farm structures to be removed when no longer in service.
- Contractors required to protect Lanai archeological and cultural sites, monitored by Lanai residents when possible.
- 5,000 acres reserved for creating a viable biofuel crop on Lanai.
- \$250,000 a year for the term of PPA for preservation of Lanai Hale watershed.
- At least \$500,000 a year for the term of the PPA for capital improvements to Lanai water system and 250,000 gallons of water a day above current allocation to encourage diversified agriculture.



Summary

- Interisland wind would contribute significantly to meeting RPS targets, and is part of a broader renewable portfolio including solar, biomass, geothermal, biofuel, ocean energy, and other sources
- Interisland wind is cost effective
- Community benefits will be an integral part of the project scope



Update on Interisland Wind



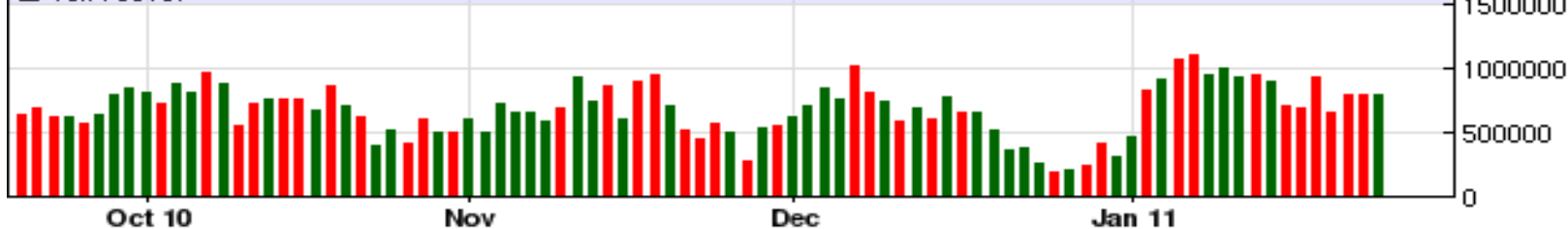
Price of Oil – \$86.56

CLH11 - Crude Oil WTI (NYMEX) - Daily OHLC Chart

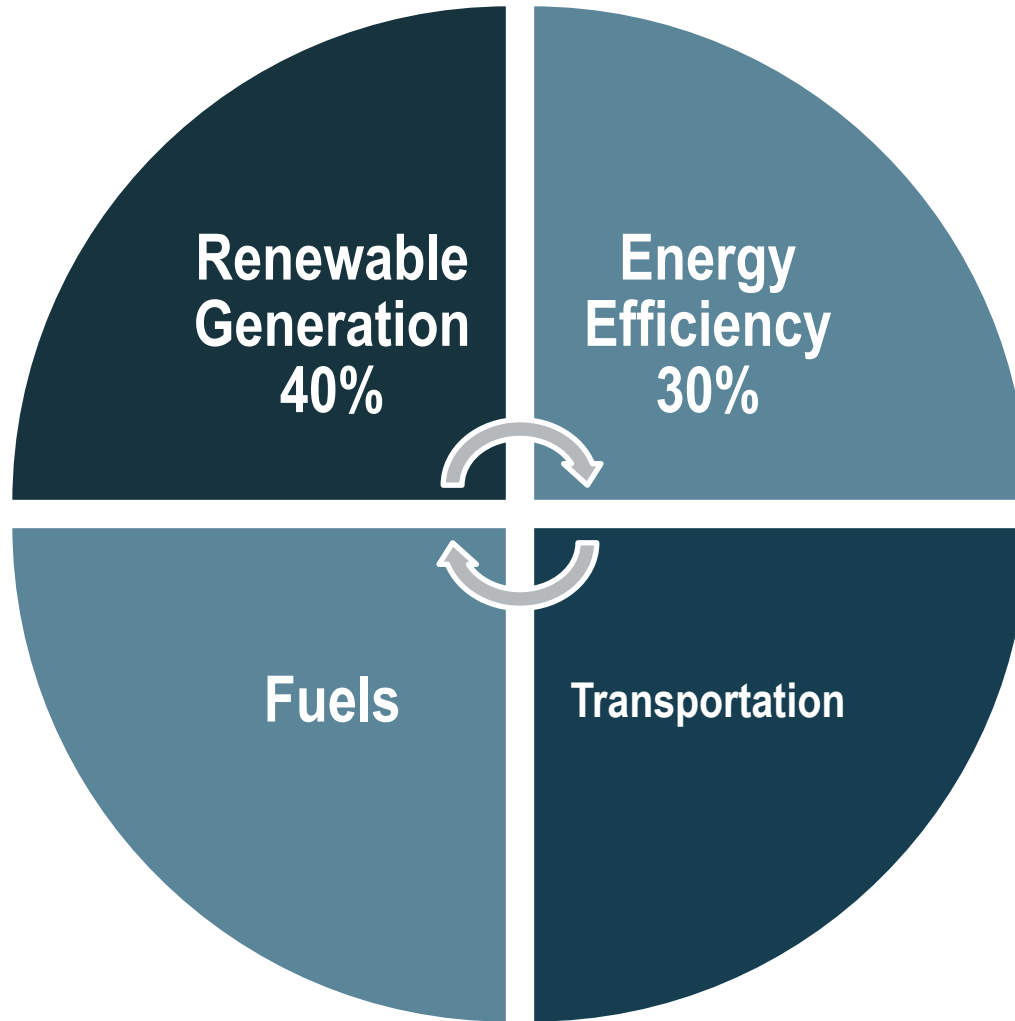
■ Op:86.23, Hi:86.60, Lo:86.19, Cl:86.56



■ Vol: 795107



Key Pieces of HCEI





Energy Efficiency

- Energy Efficiency Portfolio Standard goal of 4,300 gigawatt-hours (GWh) by 2030
- Public Benefit Funds for energy efficiency
- New, efficient building codes adopted by all counties
- The American Council for an Energy-Efficient Economy named Hawaii as one of the top four energy-saving states in the nation
- State agencies' energy consumption in fiscal year 2010 dropped 2.8% and the State paid 12.1% less than in fiscal year 2009; the Energy Services Coalition ranked Hawaii second in the nation for energy savings projects for State facilities



Energy Efficiency

- **Loan Loss Reserve**

- **\$3 million of Loan Reserve Fund can leverage from \$30-60 million in loans**
- **The LRF is a debt service reserve that covers part of the risk of lenders that make energy efficiency loans**
- **This results in the creation of an energy loan program with lower interest rates for consumers.**
- **Launch of Hawaii's Loan Reserve Fund program anticipated during Spring of 2011**



Distributed Generation

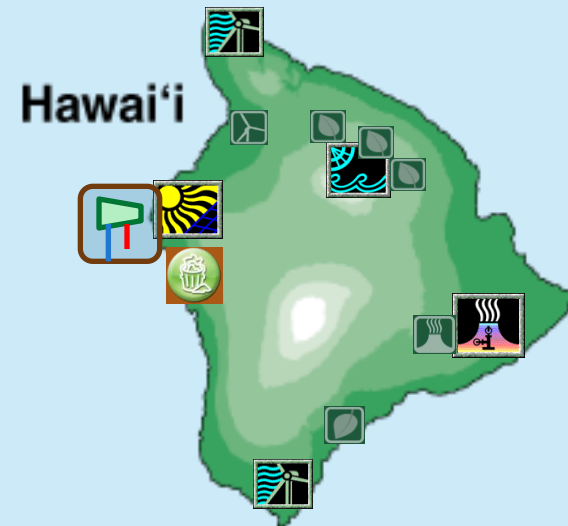
- Feed in Tariff
 - **Allows for Photovoltaic Solar, Concentrated Solar, Wind, and Hydroelectric to come on to the grid at fixed rates**
 - **Currently 3.5 MW of new projects in the HECO queue**
 - **Tier 1 includes all islands and technologies where the project is less than or equal to 20 kilowatts-AC (kW-AC) in capacity.**
 - **Tier 2 includes systems sized greater than 20 kW-AC and less than or equal to:**
 - 100 kW-AC for on-shore wind and in-line hydropower on all islands;
 - 100 kW-AC for PV and CSP on Lanai and Molokai;
 - 250 kW-AC for PV on Maui and Hawaii;
 - 500 kW-AC for CSP on Maui and Hawaii;
 - 500 kW-AC for PV and CSP on Oahu Tier One – up to 20 kW on all islands
- Renewable Integration Support Project
 - **\$2.1M for projects on Moloka`i, Maui, and the Big Island**



Renewable Portfolio Standard

HRS 269-92 Renewable portfolio standards. (a) Each electric utility company that sells electricity for consumption in the State shall establish a renewable portfolio standard of:

- **Ten per cent of its net electricity sales by December 31, 2010;**
- **Fifteen per cent of its net electricity sales by December 31, 2015;**
- **Twenty-five per cent of its net electricity sales by December 31, 2020; and**
- **Forty per cent of its net electricity sales by December 31, 2030.**



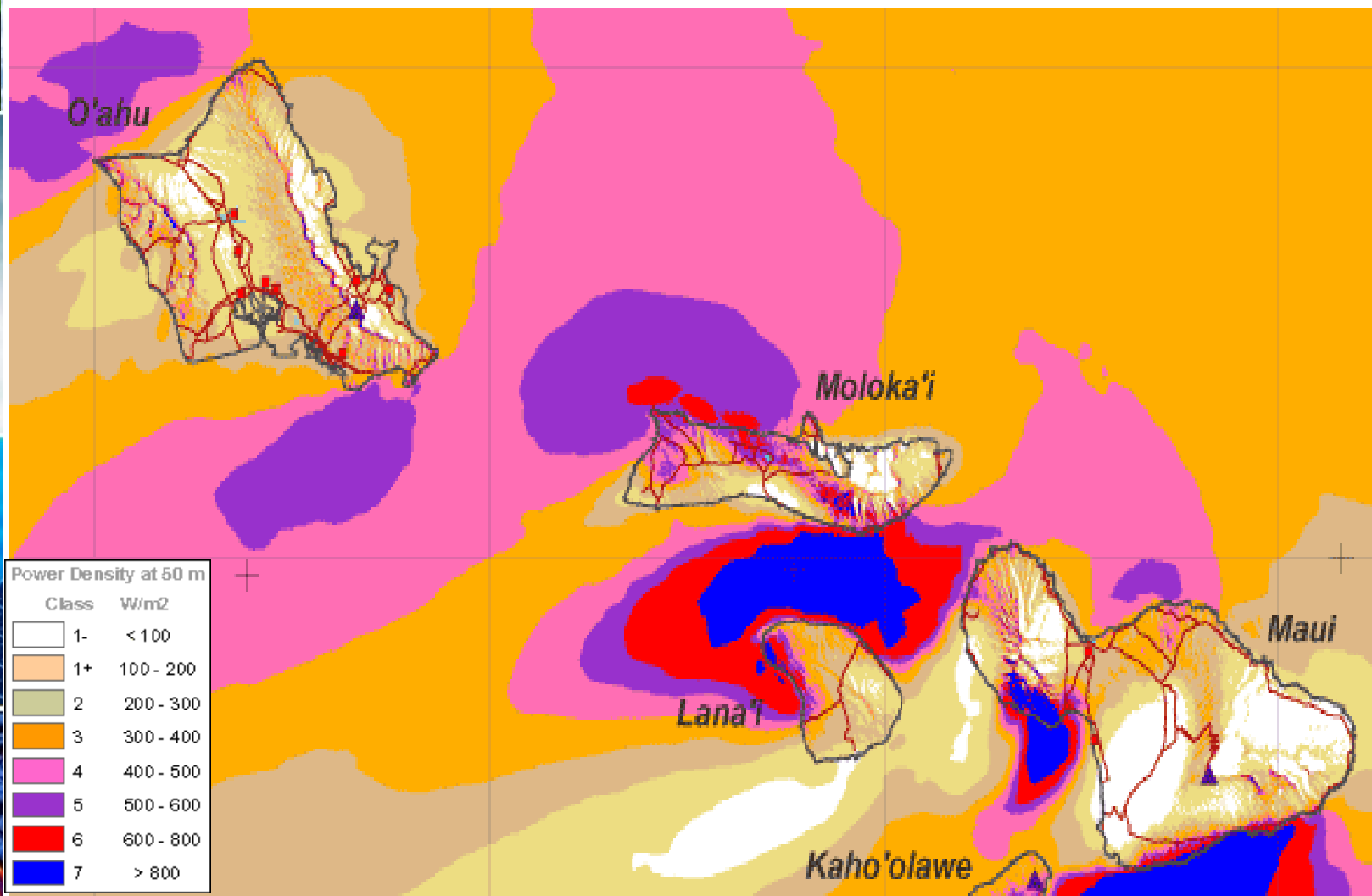
Existing

- Geothermal 
- Solar 
- Hydro 
- Biomass 
- Wind 
- Waste 

Proposed

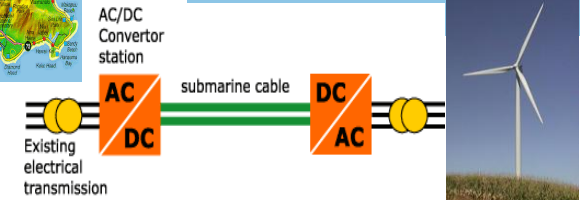
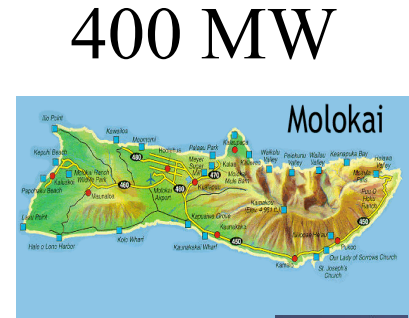
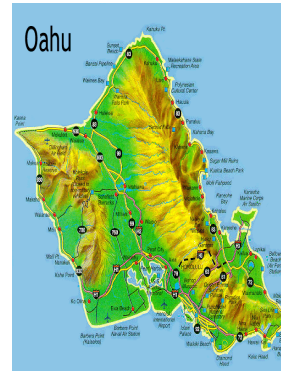
- Geothermal 
- Solar 
- Hydro 
- Biomass 
- Wind 
- Waste 
- Wave 
- OTEC 
- Seawater AC 

Wind on Moloka'i and Lāna'i



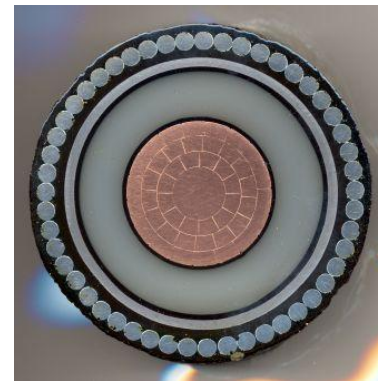
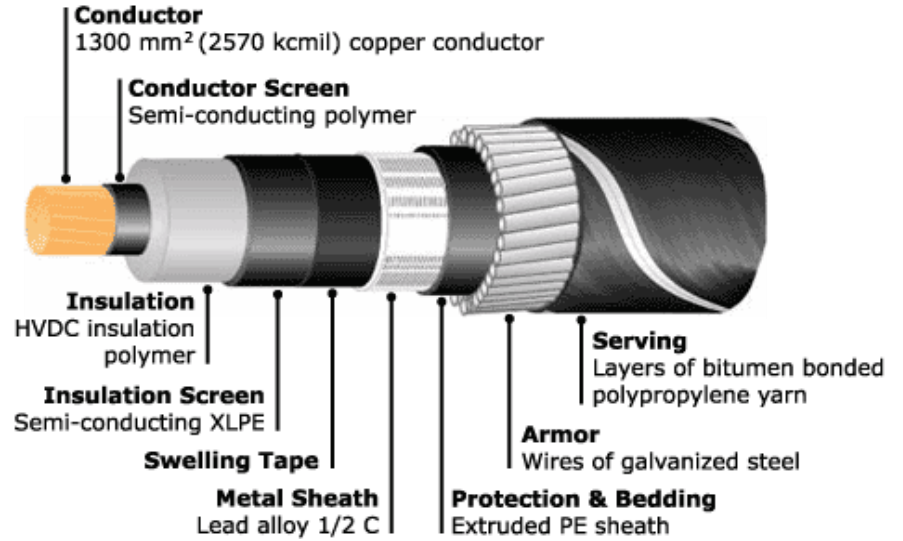
Interisland Cable Structure

- This project consists of three main components:
 - **Wind farms on Moloka`i and Lāna`i**
 - **An undersea cable system connecting the wind farms to O`ahu**
 - **Grid upgrades on O`ahu**



Undersea Cable

- The cables are approximately 4 inches in diameter depending on carrying capacity, about the size of a can of tuna.

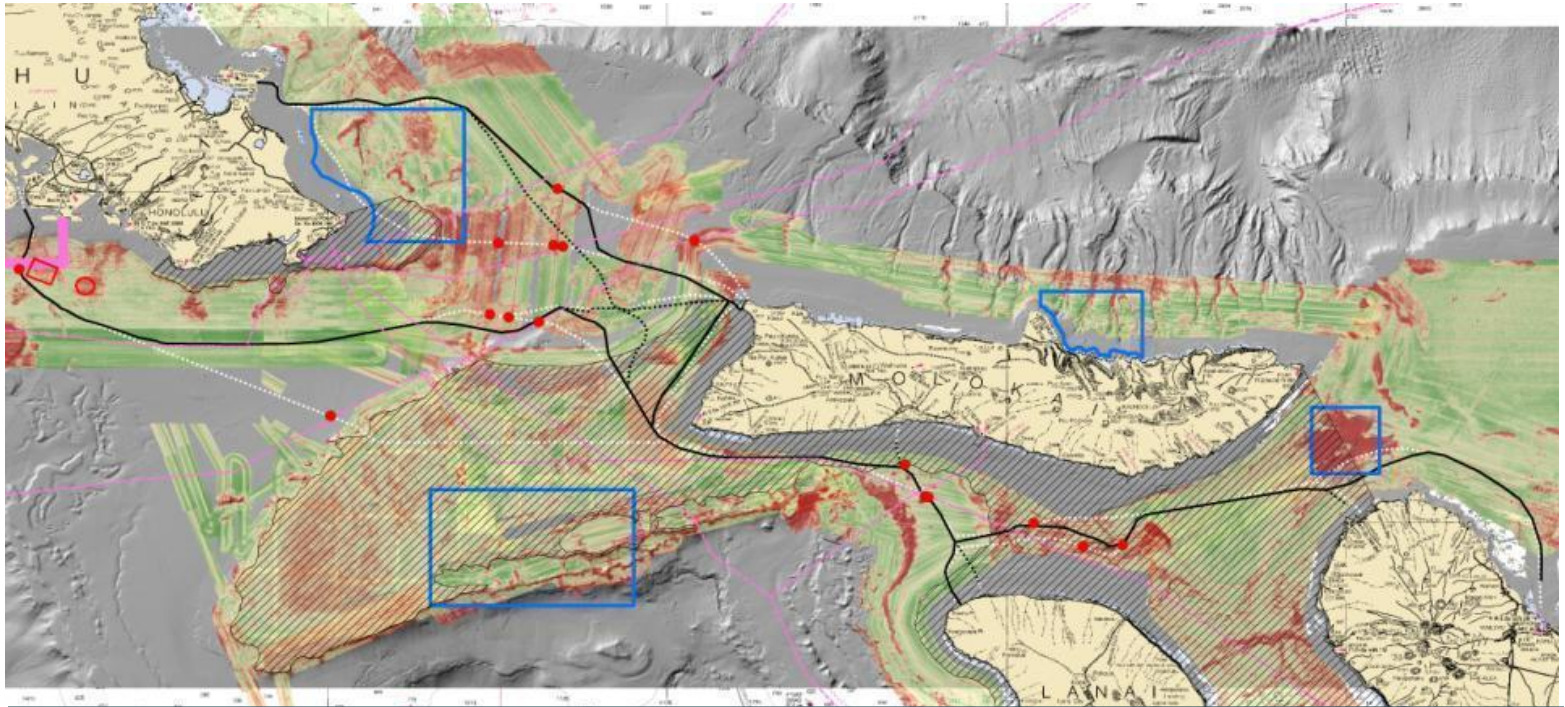


Converter Stations

- On each end of the cable is a converter station.
- The stations are typically 3-4 acres in size.
- The stations are approximately 2 stories tall.



UH SOEST Undersea Cable Surveys

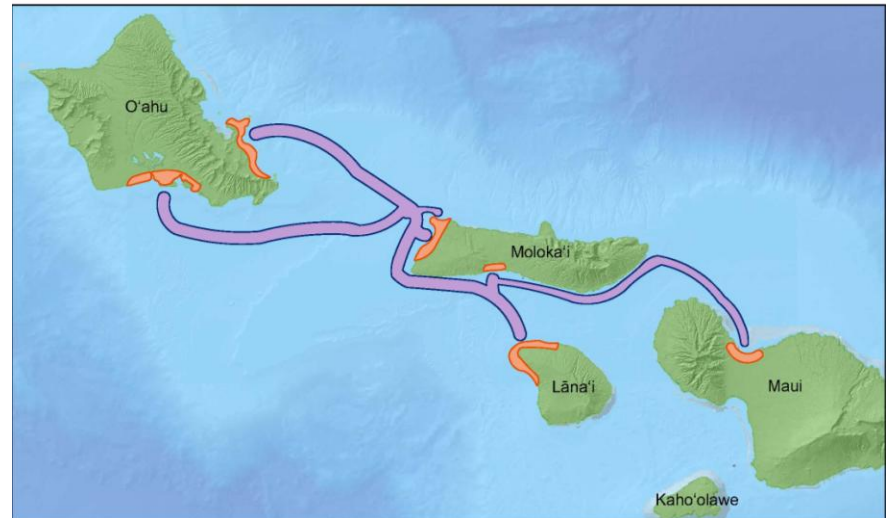


- Sea floor imagery – red = strong, green = weak
- Red dot – cable crossing; Blue box = Bottom Fish area; Hatch = whale sanctuary; Pink = Existing cable



Environmental Review

- Hawaii Interisland Renewable Program: Wind Phase
- Department of Energy is the federal lead agency
- Comment period for scoping the Programmatic EISPN ends in March 2011



ENVIRONMENTS & POTENTIAL IMPACTS

- Geologic and Geographic Resources
- Water Resources
- Terrestrial and Coastal Biological Resources, Species, and Habitat
- Marine/Benthic Biological Resources, Species, and Habitat
- Air Quality
- Noise
- Land Transportation
- Airspace Utilization
- Land Use
- Visual Resources
- Marine Transportation, Recreation, and Commerce
- Public Services, Infrastructure, and Utilities
- Cultural and Historical Resources and Compliance with Act 50
- Socioeconomics
- Public Safety and Health
- Natural Hazards, Hazardous Materials, and Unexploded Ordnance
- Climate and Climate Change





EISPN Comments

- www.hirep-wind.com
- Scoping Meetings
 - O`ahu Feb 1, Mckinley HS 5:30 pm –9:00 pm
 - Maui Feb 2, Pomaika`i Elementary 5:30 pm – 9:00 pm
 - Moloka`i Feb 3, Mitchell Pau`ole Community Center 5:30 pm –9:00 pm
 - Lāna`i Feb 5, Lāna`i HS 9:00 am – 3:00 pm