

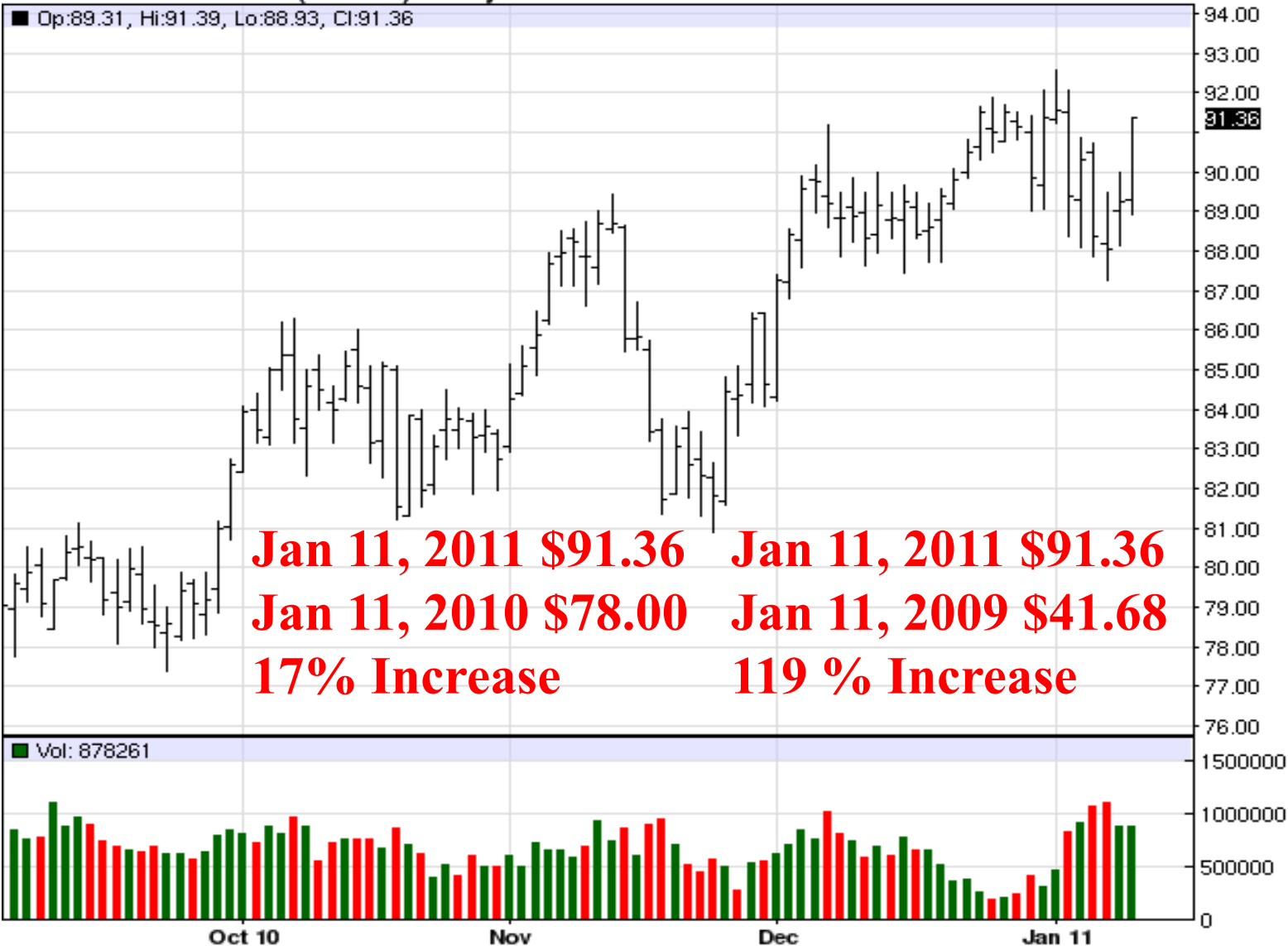


Update on Interisland Wind

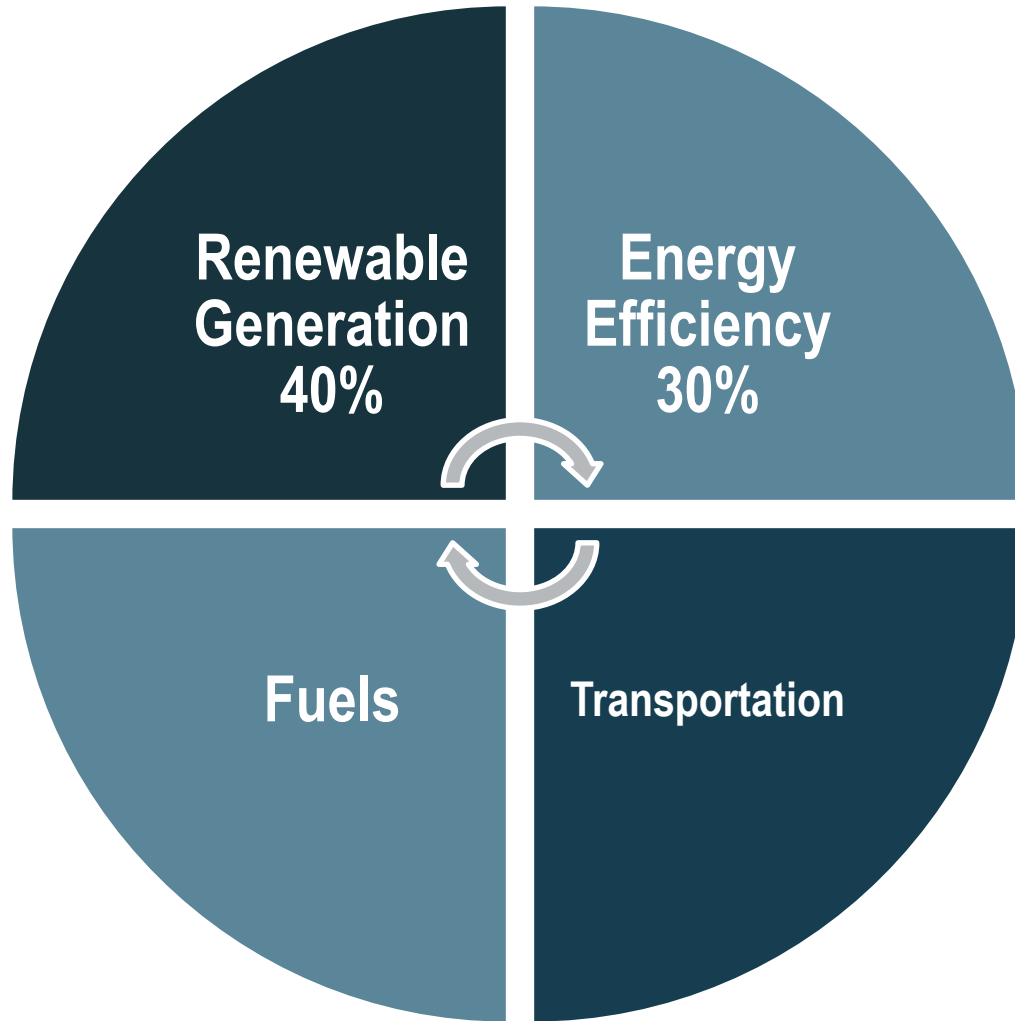


Price of Oil – \$91.36

CLG11 - Crude Oil WTI (NYMEX) - Daily OHLC Chart



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**



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.**



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**



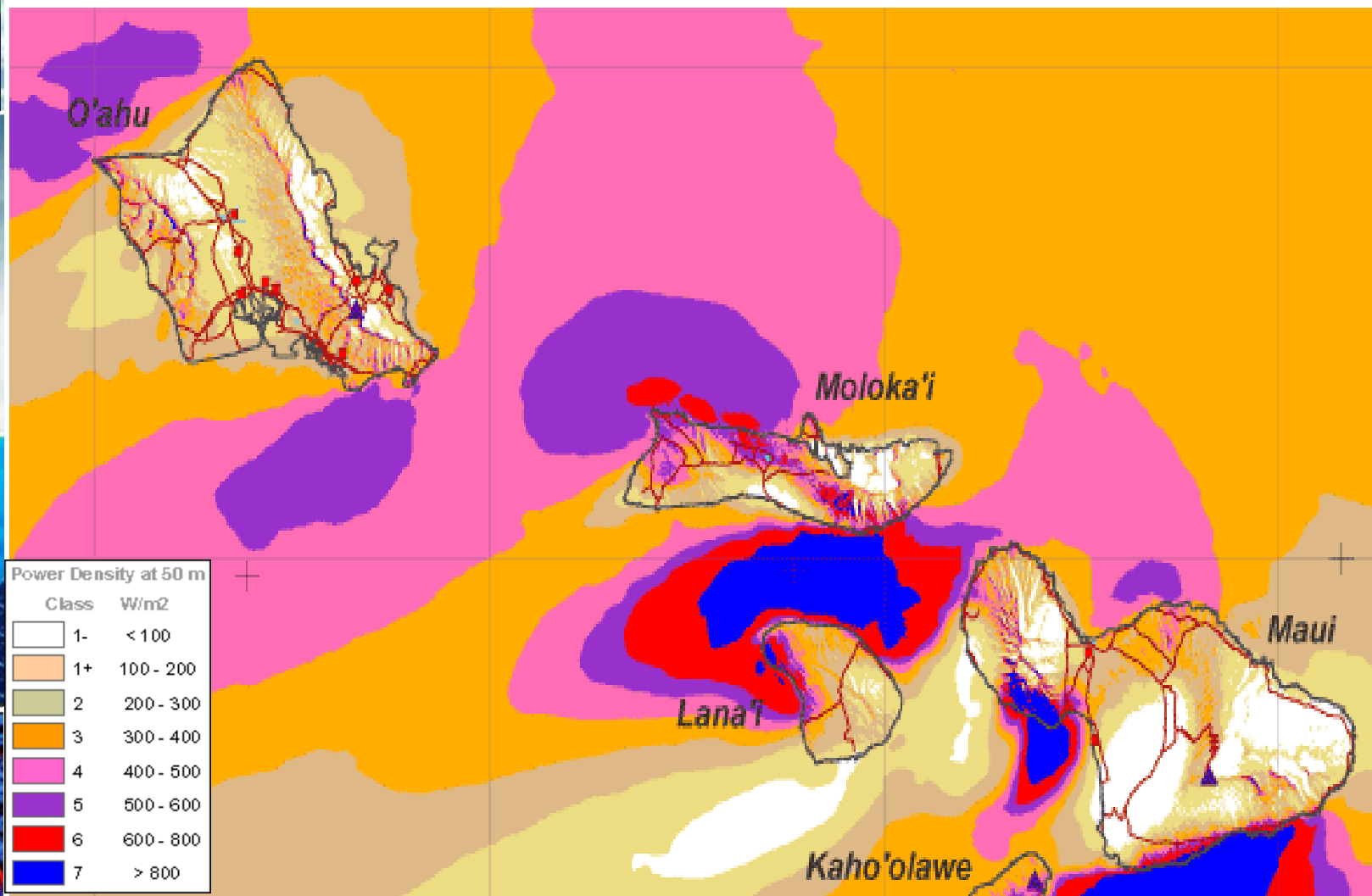
Existing

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

Proposed

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

Wind on Moloka'i and Lāna'i

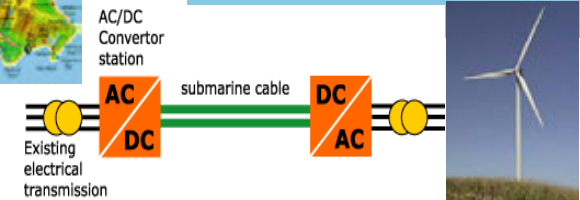


Interisland Cable Structure

- 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**

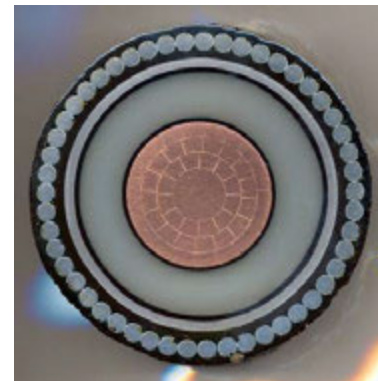
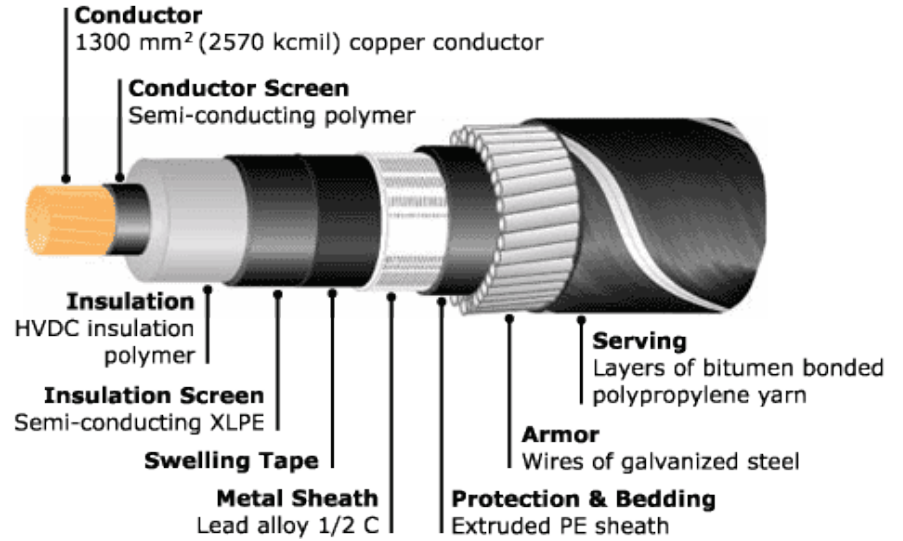


400 MW



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.

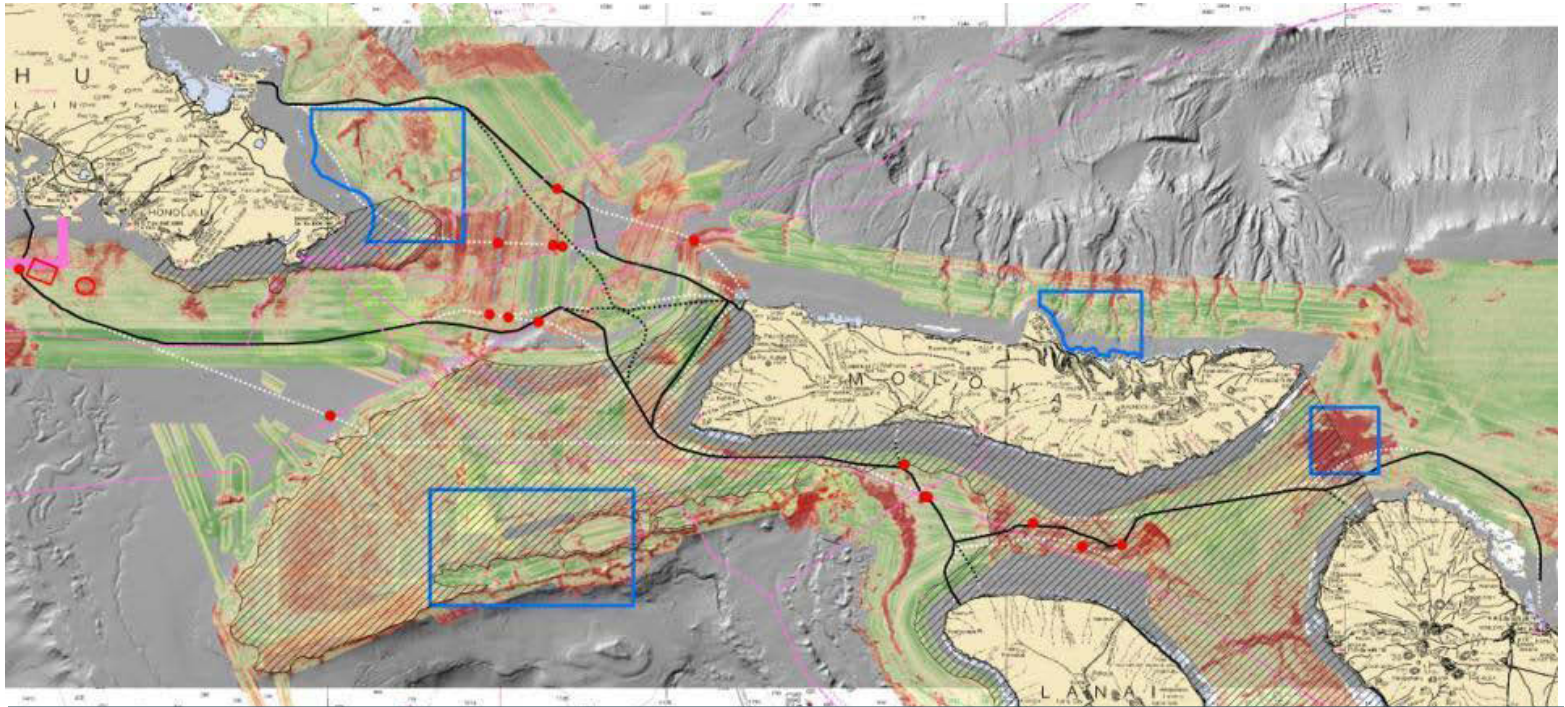




Energy Agreement

- 7. Understanding the complexity of large scale infrastructure siting and investment in an Inter-Island Electric Cable, the State shall accept primary responsibility and shall serve as lead, while coordinating with developers, contractors, and/or Hawaiian Electric as the circumstances merit, on all matters related to the siting and permitting of the undersea cable systems consistent with the Implementation Studies. **These responsibilities include but are not limited to conducting or having contractors and advisors conduct the appropriate engineering and design of the undersea cable systems, acquisition of all necessary off-shore and on-shore land rights, permits and approvals (including the Environmental Impact Statement)**, and construction, operation and maintenance of the undersea cable systems. The undersea cable systems shall be considered State owned infrastructure unless alternatives are discovered as part of the Implementation Studies and agreed to by relevant affected Parties. The State can also consider the option of bringing in a third-party independent transmission company to fund and build the inter-island cables.

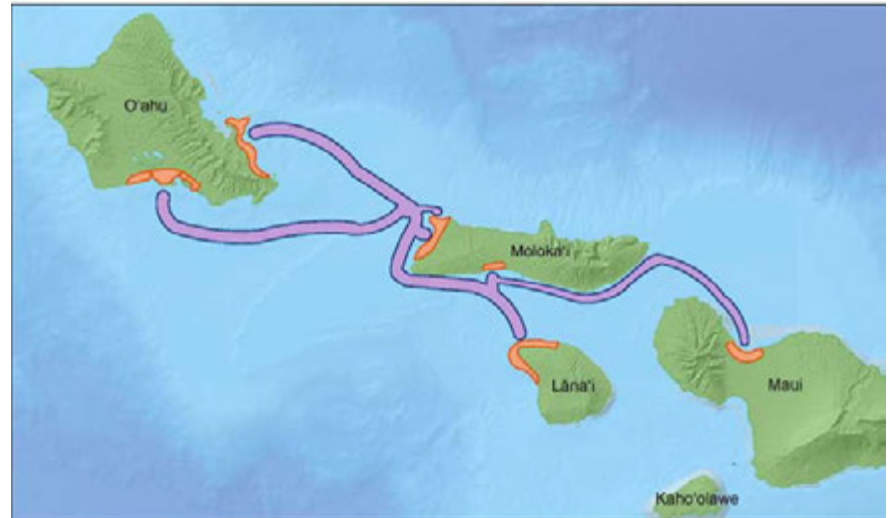
UH SOEST Undersea Cable Surveys



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

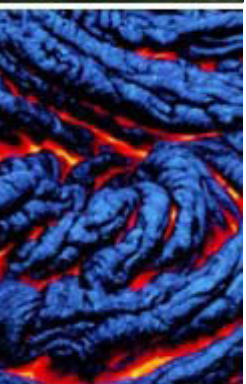
Environmental Review

- 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



Alternatives Analysis – Wind and Solar

Wind from Maui County


- 40% capacity factor
- 8760 hrs a year
- 400 MW project
- MWh = 1400000

Equivalent Solar Farm

- 1400000 MWh
- 20% capacity factor
- 8760 hrs a year
- 800 MW Solar Farm
- Solar efficiency = 5 acres/ MW
 - **4000 acres**
- Acres/Square mile = 640
 - **Approximately 6 square miles for a 800 MW solar farm**



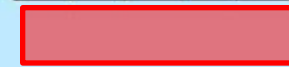
Oahu

 Solar Radiation
(cal./sq.cm./day)

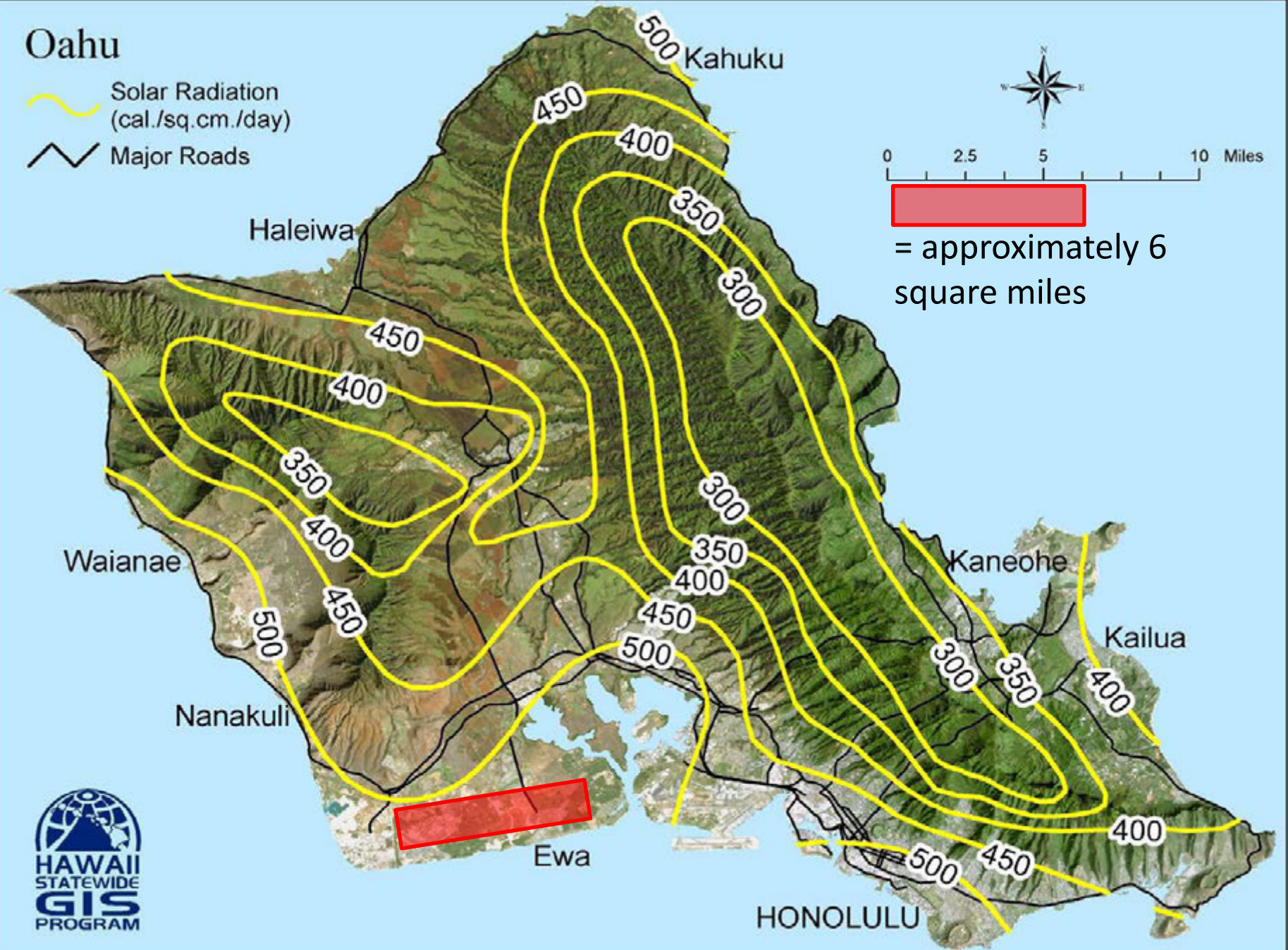
 Major Roads



0 2.5 5 10 Miles



= approximately 6 square miles





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