

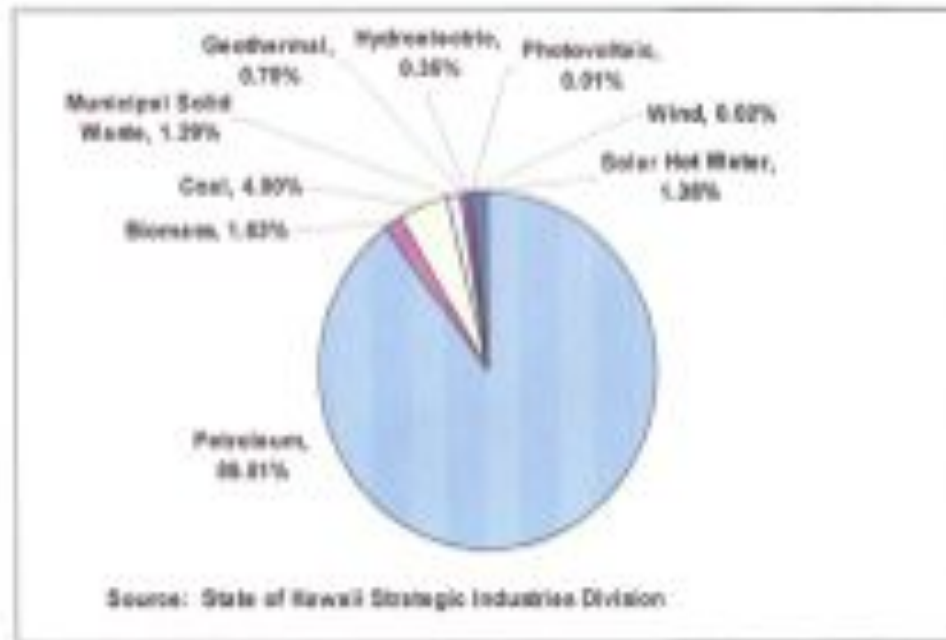
# Session 7: Energy and Environment

## ALTERNATIVE ENERGY HAWAII'S EXPERIENCE

Northeast Asia Economic Forum  
Kenji Sumida

# Why Hawaii Needs Alternative Source

## Hawaii Is Heavily Dependent on Petroleum for Energy Use



# ALTERNATIVE SOURCES USED IN HAWAII

1. Solar
2. Wind
3. Geothermal
4. Ocean
5. Hydro

# Solar Energy in Hawaii

1. Hawaii law requires new homes to install solar heaters
2. Tax credits for solar heaters and photo voltaic installations:  
Federal – 30%, State – 35%
3. More than 80,000 solar water heaters installed
4. Power purchase agreement provide for the sale of power to electric utility company, and Hawaii has the highest per capita amount of solar energy linked to the utility power grid
5. Hawaii among leaders in photo voltaic installations.  
Installed mega watts increased by 353% from 2009 to 2010, and will double in 2011.

# Wind Energy in Hawaii

1. Locations on all major islands offer wind conditions ideal for wind generators
2. Several projects in the 80's and 90's failed primarily because of maintenance problems
3. With improved wind generators, current installations provide 114 mw spread among three islands
4. 70 mw project scheduled for 2012 on Oahu
5. On a longer term 200 mw each are envisioned for Lanai and Molokai, but this would require an expensive undersea cable to transmit power to Oahu

# Geothermal Energy in Hawaii

1. Geothermal plants use volcanic steam and hot water extracted from deep well to generate electricity
2. Geothermal energy sources found on Maui and Hawaii
3. 3 mw demonstration power plant on line in 1981 on Hawaii and operated for 8 years
4. 1993 Puna Geothermal Venture 30 mw plant on east rift zone operating continuously since then
5. Potential for 500 mw of geothermal energy on Hawaii, but undersea cable needed to transmit to Oahu's grid

# Ocean Energy in Hawaii

1. Ocean Thermal Energy Conversion (OTEC) uses temperature differential in sea water to produce electricity
2. 1981 Japanese build 120kw plant feeding Nauru grid
3. 1993 225 kw gross plant built on Hawaii Island
4. Lockheed Martin, with U.S. and Taiwan support plans 10 mw plant, designed to expand to 100 mw offshore in Hawaii

# Cold Seawater A/C Network





# INFORMATION SOURCES

Hawaii Natural Energy Institute

Hawaii DBEDT Energy Division

Simple Solutions for Planet Earth, Dr. Patrick  
Takahashi

**THE END**

**THANK YOU**