



COLLEGE OF SOCIAL SCIENCES

**HAWAII ENERGY POLICY FORUM**

UNIVERSITY OF HAWAI'I AT MĀNOA

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# **Hawaii's Evolving Energy Strategy: Grappling with Energy Security and Costs**

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# Energy Policy Formulation and Implementation in Hawaii

- **Legislative action**
  - ❑ Mandates for public sector: energy coordination and very recently public sector energy use: LEED buildings, energy efficient vehicles
  - ❑ Mandates for private sector: Regulation of energy utilities; Taxes and fees; RPS, 10 % ethanol requirement, GHG emission RPS, 10 % ethanol requirement, GHG emission reduction; x.
- **DBEDT: development and implementation of energy strategies**
- **Public Utilities Commission and CA**
  - ❑ Electricity rates and terms of service
  - ❑ Review /Approval of Integrated Resource Plans
- **Hawaii Clean Energy Initiative**

# Energy Policy in Hawaii

- **First articulated in 1974, HRS 196**
  - ❑ **Legislature responded to OPEC oil embargo**
    - **State Program for Energy Planning and Conservation**
    - **Hawaii Natural Energy Institute**
    - **Natural Energy Lab of Hawaii**
  - ❑ **Energy objectives in HRS 226-18 first promulgated in 1978 and updated to 2007**

# Legislative Response to Oil Embargo 1974

## §196-1 Findings and declaration of necessity.

The State of Hawaii, with its total dependence on imported fossil fuel, is particularly vulnerable to dislocations in the global energy market. This is an anomalous situation, as there are few places in the world so generously endowed with natural energy: geothermal, solar radiation, ocean temperature differential, wind, waves, and currents--all potential non-polluting power sources;

There is a real need for strategic comprehensive planning in the effort towards achieving full utilization of Hawaii's energy resource programs and the most effective allocation of energy resources throughout the State.

# Legislative Articulation of Energy Objectives and Policies

## HRS §226-18 Objectives and policies for facility systems—energy

- (a) Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:
- (1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;
  - (2) Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;
  - (3) Greater energy security in the face of threats to Hawaii's energy supplies and systems; and
  - (4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.

# Hawaii Energy Strategies

- **Hawaii state energy policies & plans**
  - Hawaii Integrated Energy Assessment (1981)**
  - Hawaii Integrated Energy Policy Development Program (1991)**
  - Hawaii Energy Strategy (1995)**
  - Hawaii Climate Change Action Program (1998)**
  - Hawaii Energy Strategy (2000)**
  - Draft Hawaii Energy Strategy (2007)**
  - Hawaii Clean Energy Initiative (2008)**

# Integrated Resource Planning

- **Public Utilities Commission (1993)**
  - ❑ Issued order for HECO examine Integrated Resource Plan at HECO
  - ❑ Mandated HECO to submit first plan
- **Regulated Electric Utilities**
- (Plans submitted but no plan has ever been approved)

HECO	MECO	HELCO	KIUC
IRP-1 1995	IRP-1 1996	IRP-1 1996	IRP-1 2008
IRP-2 1998	IRP-2 2004	IRP-2 2004	
IRP-3 2005		IRP-3 2008	
IRP-4 2008			

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# HECO IRP 4: Proposed Objectives and Goals

- Generating system reliability
- Renewable Portfolio Standards—  
increase use of renewables and  
efficiency
- Global warming—reduce GHG  
emissions
- Potable water—reduce consumption

# Energy Strategy 2000

- **Recommendations to energy stakeholders. Examples include**
  - ❑ **Leg: Add focus on climate change and GHG emissions to policy**
  - ❑ **DBEDT: Encourage 10% ethanol blend**
  - ❑ **PUC: Implement recommendations of renewable energy docket**
  - ❑ **Counties: Adopt residential model energy code**

# Draft Energy Strategy 2007

## ➤ **DBEDT: Build on Governor's Energy for Tomorrow Initiative:**

- Reduce the state's dependence on oil;
- Protect the environment;
- Reduce negative economic impacts related to use of imported fuels;
- Enhance renewable energy use and energy efficiency; and
- Improve the security and reliability of Hawaii's energy system.

# Energy Policy Forum

- **Convened by UH in May 2002 with initial financial support from HECO and subsequent state funding**
  - Made up of energy stakeholders**
  - Convened to develop new energy and energy strategy**
  - Commissioned five major studies**
  - Energy Policy Summit—December 2003**
  - Hawaii at the Crossroads: A Long-Term Energy Strategy**
  - 10 Point Plan**
  - Spearheaded support for legislation consistent with plan**
  - Raised level of civility in dialogue on energy and significantly more cooperation among stakeholders**

# Ten Point Plan Goals and Objectives

1. Expand Renewable Energy Opportunities
2. Promote Conservation and Energy Efficiency
3. Reduce Green House Gas Emissions in Hawaii
4. Foster Civic Action and Participation
5. Enhance Regulatory Goals and Protections
6. Encourage Culturally Appropriate and Sustainable Energy Planning
7. Improve Energy Efficiencies and Options in Transportation
8. Support research and development of alternative energy sources (hydrogen, wave energy, etc.)
9. Support sustainable development and use of biofuels
10. Ensure the security and reliability of energy supply and distribution.

# 2007 Legislative Action

**§36-41 Energy retrofit and performance contracting for public facilities**

**§196-11 Energy efficiency in state facilities**

**§235-12 Energy conservation; income tax credit**

**§103D-412 Energy-efficient vehicles**

**§235-12.5 Renewable energy technologies; income tax credit**

**§269-92 Renewable portfolio standards**

**§342B-71 Statewide greenhouse gas emissions limit, adoption (Act 234)**

# Hawaii Clean Energy Initiative

- Initiated in 2008 as joint venture between State of Hawaii and US DOE
  - *The Hawai'i Clean Energy Initiative aims to transform Hawai'i into a world model for energy independence and sustainability. Our goal is to meet 70% of Hawai'i's energy needs with clean energy by 2030.*

# Hawaii Clean Energy Initiative

- Initial effort: energy agreement signed by Governor, HECO, DBEDT, Division of the Consumer Advocate:
  - ❑ Undersea cable connecting Maui, Moloka'i and Lāna'i for additional 400 MW of renewable wind power to O'ahu
  - ❑ Commitment to integrate 1100 megawatts (MW) of new renewable energy HECO grids
  - ❑ Retirement of old fossil fuel generators and move to renewable sources, including biofuels and prohibition of new coal plants
  - ❑ Feed-in tariffs, advanced metering and time of use rates, decoupling of profits from electricity sales

# Hawaii Clean Energy Initiative

## Objectives:

- Define new infrastructure to move Hawai'i to clean energy economy
- Foster and demonstrate innovation of clean energy technologies, creative financing, and public policy to accelerate transition to clean energy
- Create economic opportunity by developing and diversifying our economy so all benefits from sustainable energy policy
- Establish "open source" learning model that supports other island communities seeking similar goals and makes Hawai'i a world model for clean energy-based economies.
- Build our workforce with new skills that will form the foundation of an energy-independent Hawai'i.

# Hawaii Clean Energy Initiative

## Legislation: Electricity

- ACT 155 (09), HB 1464, signed June 25, 2009—The 2009 Clean Energy Omnibus Bill sets precedent for electrical utility clean energy portfolio standards including a separate goal for energy efficiency. The law calls for 30% reduction in energy use via efficiency by 2030 and directs the Hawai'i Public Utilities Commission to establish incentives and penalties that foster compliance. It also increases the renewable portfolio standard to 40% by 2030.
- ACT 154 (09), SB 464, signed June 25, 2009—The Renewable Energy Technology Income Tax Credit amends existing law, in effect since 1990, which provided personal and corporate tax credits of up to 35% of the cost of installing solar electric and solar thermal equipment and up to 20% of the cost of installing wind turbines. Law now enables individuals and corporations to receive a tax refund when their earned tax credits under this program exceed their state income tax for the year
- ACT 050 (09), HB 1270, signed May 6, 2009—Public Utilities Commission Renewable Energy Act allows utilities to invest in renewable energy technologies even if a project costs more than the fossil fuel costs it aims to avoid.
- HRS § 196-6.5, HB 1464, signed June 25, 2009—Solar Water Heater System Requirement amends the 2008 Solar Roofs Act to require single-family homes built in Hawai'i to include solar water heating as of 2010. The new law aims to substantially reduce electrical use for domestic water heating over time.
- HRS § 269-101 et seq., signed June 25, 2001; amended in 2004 and 2005—Hawaii's Net Metering policy, originally established in 2001 and subsequently expanded, requires electric utilities to accept power generated by small residential and commercial renewable energy installations and to reduce customers' bills accordingly, at the retail rate.

# Hawaii Clean Energy Initiative: Transportation

Hawai'i Clean Energy Initiative goal is to use clean energy to supply 70% of Hawai'i's ground transportation needs

- **ACT 156 (09), SB 1202, signed June 25, 2009**—The Transportation Energy Initiatives Act seeks to make Hawai'i residents more comfortable investing in electric and plug-in hybrid electric vehicles (PHEVs) by fostering development of electric-vehicle infrastructure. The new law requires parking lots to include spaces dedicated to electrically charged vehicles and sets up a grant program for building electric-vehicle infrastructure

# Evolution of Energy Strategies for Hawaii

- Energy objectives have changed little
  - ❑ Increase energy security
  - ❑ Increase use of renewable energy resources
  - ❑ Increase energy efficiency
- Environmental sensitivity increased
  - ❑ Global climate change and GHG emissions are major concerns
  - ❑ Concern about impacts of biofuel
  - ❑ Conservation of potable water added
- Despite all our efforts we are getting further from fulfilling objectives

# Geographical Imperatives Remain

- Hawaii's isolation
  - ❑ Distance to tourism market and suppliers of everything imported
  - ❑ Stand-alone grids
- Population on Oahu and renewable resources on neighbor islands
- The most Abundant local resources (solar and wind) are intermittent and require storage or liquid fuel backup
- Economic dependence on tourism and tourism's dependence on jet fuel

# Context is Changing

- Price of petroleum increasing
  - Has been >\$100 per barrel and will probably increase
- Global warming and GHG emissions must be addressed
- Impact of high fuels costs will eventually hitting airline industry hard in the future (significant factor in Aloha and ATA bankruptcy)

# Near Term Options Limited

- Wind and solar intermittent
  - ❑ Development of large scale storage technology costly
  - ❑ Seabed cable may help address Oahu demand vs neighbor islands renewables
- Biofuels
  - ❑ Many proposals being floated
  - ❑ Need much further evaluation
- Other energy technologies not being developed fast enough

# Future Options

- Increasing cost of fossil fuel-based electricity and transportation fuels probably best short-term option
  - ❑ Will stimulate conservation
  - ❑ Will make alternatives more economic and attractive
  - ❑ This is what will come with GHG emission reduction strategies
  - ❑ Realistically, will require lifestyle changes and could impose significant financial burden on low income and fixed income groups.