

# Innovative Clean Tech Policies in the Asia Pacific Region

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# Clean Energy Future for the Asia Pacific Region

- Major transition is underway
- From fossil fuels to “clean energy”
- “Clean energy” = renewable energy + energy efficiency
- Renewable generation for electricity production
- Transportation
- Environmental and economic drivers

# Environmental Drivers

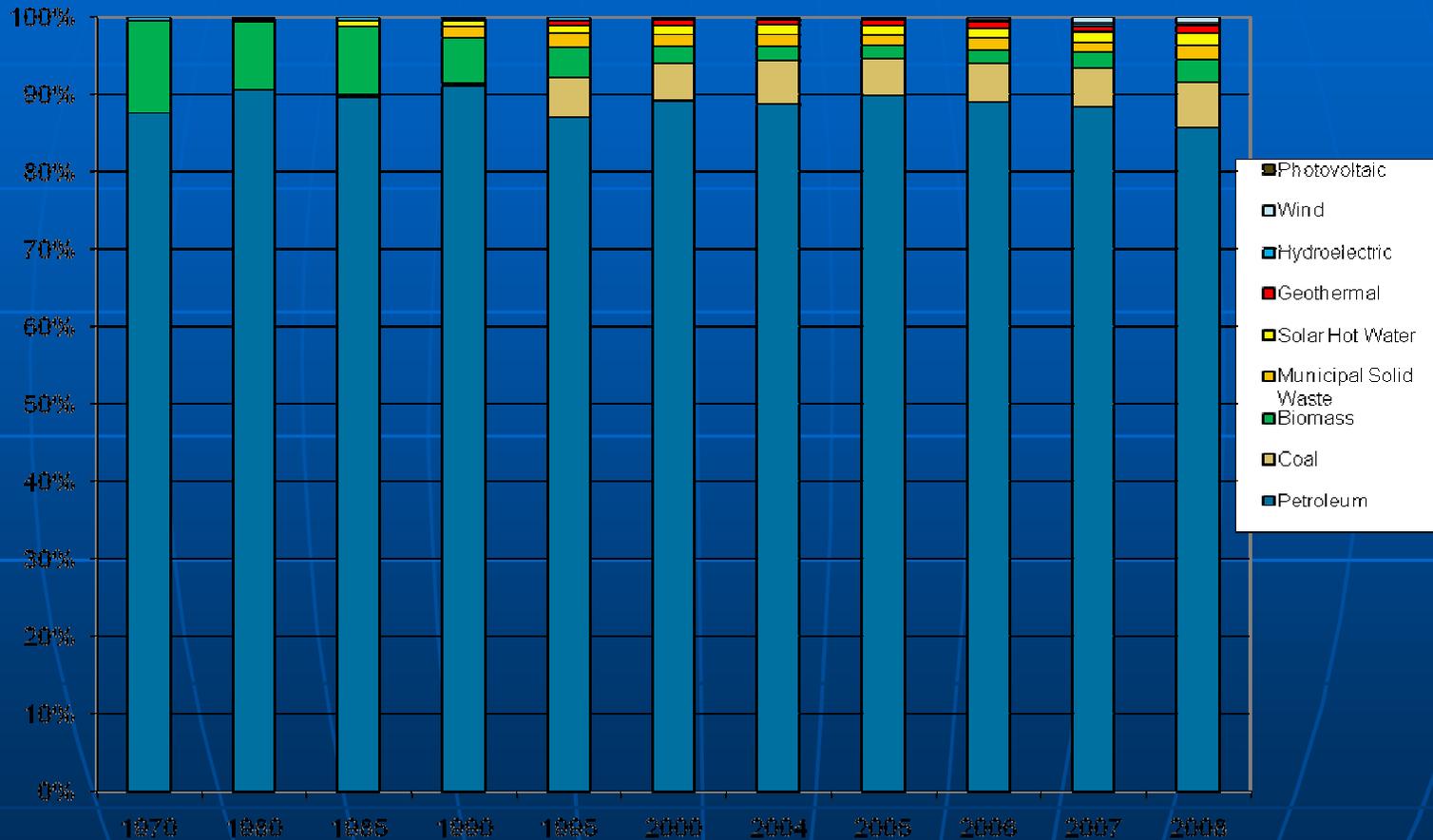
- GHG emissions result in climate change impacts
- International law – UN Framework Convention on Climate Change and protocols
- U.S. federal law – EPA regulation of CO<sub>2</sub> as pollutant based on U.S. Supreme Court decision *Mass. v. EPA*
- U.S. federal legislation – “American Clean Energy and Security Act” (HR 2454), “Clean Energy Jobs and American Power Act” (S 1733), “Clean Energy Jobs and American Power Act” (Kerry-Boxer), “Carbon Limits and Energy for America’s Renewal Act” (Cantwell-Collins)
- Regional and State laws and policies – California’s Global Warming Solutions Act (AB 32) and Hawaii’s Act 234 (HRS § 342B-71) requiring 1990 levels of GHG emissions by 2020
- Climate change calls for renewable generation
- Solar PV, concentrated solar power (CSP), onshore and offshore wind, biomass, geothermal, and ocean energy

# Economic Drivers – Hawaii

- Hawaii highly dependent on imported fossil fuels
- 77% electricity from petroleum
- 95% transportation fuels
- Highest electricity prices in the U.S.
- US\$6.21 billion for energy in 2007 or approximately 10% of GSP
- HRS § 196-1(1) – Oil dependence is threat to public health and safety

# Hawaii's Historic Dependence on Fossil Fuels

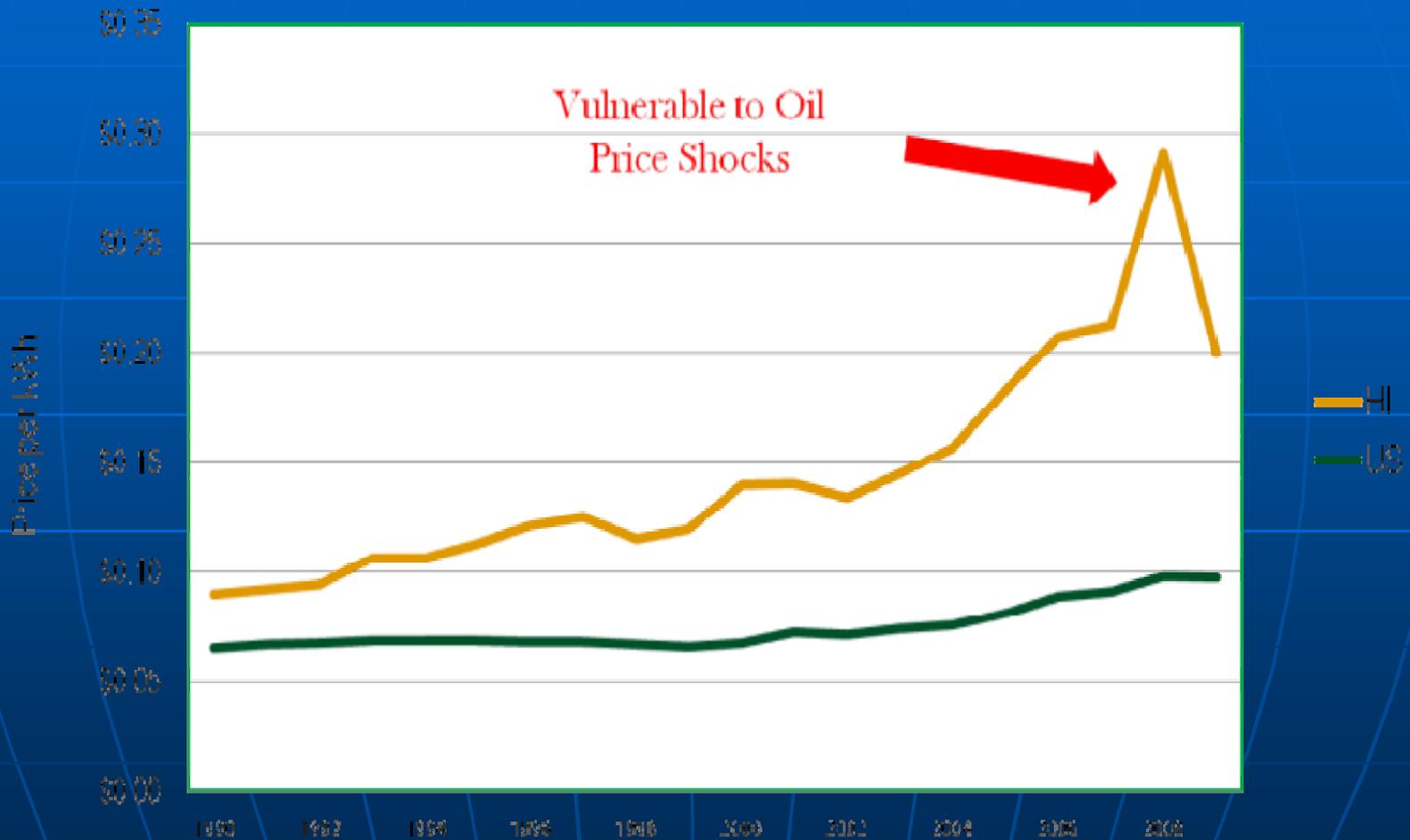
## Primary Energy Sources in Hawaii, 1970-2008, Selected Years



**Over 36 years, petroleum consumption remains above 85%**

# US and Hawaii Average Retail Price All Sectors per kWh

1990 through August 2008



# Innovative Commercial Strategies and Policies

- Rapid adoption of clean tech is necessary to combat climate change and mitigate climate change impacts
- Commercial strategies and public policies needed
- Focus on two primary objectives
  - Protect investment to stimulate renewable energy development projects (jobs and economic activity)
  - Link commercial projects to climate change, energy security and economic development to ensure broad-based NGO and public support
- Two examples – Public-private partnerships and feed-in tariffs
  - Public-private partnership – Hawaii Clean Energy Initiative
  - Feed-in Tariff – relatively new and growing in Asia Pacific region

# Hawaii Clean Energy Initiative (HCEI)

- HCEI – example of public-private partnership to promote clean energy
- Jan. 2008 Hawaii and US Dept. of Energy MOU
- Oct. 2008 “Energy Agreement” signed by Governor, State agencies, and Hawaiian Electric Company
- Energy Agreement has 38 major sections, including feed-in tariff and decoupling
- Goal of Energy Agreement is to move “decisively and irreversibly” to clean energy
- 70% clean energy by 2030
  - 40% renewable energy generation
  - 30% energy efficiency
- In 2009, 70% clean energy by 2030 became statutory Renewable Portfolio Standards requirement (HRS § 269-92)
- Hawaii as global model for swift transition to clean energy economy

# Feed-in Tariff – Overview

- U.S. National Renewable Energy Laboratory (NREL) defines FIT to guarantee three key elements
  - Payment for total kWh of renewable electricity produced
  - Access to the grid
  - Stable, long-term contracts
- Rates set at “cost plus reasonable profit”
- 20 year “take or pay” contract with standard terms and conditions
- Predictable revenue stream and government involvement
- Stimulate and protect investment in commercial projects
- Promote public and NGO support
- Experts consider FIT a highly successful renewable energy policy mechanism
  - German FIT led to 15% renewable supply, 280,000 employed in renewables and ~\$50 billion economic activity
  - FIT may affect one third of world population (EU, China and India)

# FITs in Asia Pacific Region

- FITs adopted in Australia, China, India, Japan, Malaysia, New Zealand, Philippines, South Korea and Taiwan
- Hawaii FIT
  - One of HCEI's first key initiatives
  - Hawaii FIT among first in the United States
  - Regulatory proceeding before State Public Utilities Commission (Docket No. 2008-0273)
  - Four technologies: Solar PV, concentrating solar, onshore wind, and in-line hydro
  - Baseline FIT for all other technologies
  - Project sizes in three tiers – Tier 1 (<20 kW); Tier 2 (20 kW < 500 kW) and Tier 3 (500 kW < 5 MW)
  - Rates differentiated by technology and based on "cost plus reasonable profit"
  - 20-year contract with standard terms and conditions
  - Isolated island grids require queuing and interconnection procedures

# FITs in China and India

## ■ China FIT

- US\$148 billion from Nov. 2008 stimulus to renewable energy sector
- Jan. 2006 Renewable Energy Law authorized FIT with differentiated rates
- For solar PV, rates set by State Council at cost plus reasonable profit
- Rate set after project approval in case supplemental funding needed
- FIT generation may be registered as Kyoto Protocol Clean Development Mechanisms (CDM)
- Fixed-price FIT viewed positively by foreign wind manufacturing investors
  - Domestic wind manufacturers purchase foreign technology permits for electronic control equipment
  - National Development and Reform Commission recently repealed "70 percent homemade rule"

## ■ India FIT

- India declares FIT's "special importance" in light of India's National Action Plan on Climate Change calling for 5% renewable power purchases by 2010
- Central Electricity Regulatory Commission (CERC) announced FIT Sept. 2009
- CERC to open regulatory docket
- FIT includes all renewables
- Tariffs based on cost of generation plus reasonable profit
- Solar PV contract 25 years
- Rate of return 19% pre-tax during first 10 years and 24% after ten years

# Conclusions

- Climate change calls for innovative public policy measures and private commercial strategies to promote the rapid adoption of clean technologies
- To succeed, policies must balance protection of private commercial interests and public goals
  - Hawaii Clean Energy Initiative as example of public-private partnership
  - Feed-in Tariff as example of policy mechanism
- Innovation and cooperation are essential for swift transition to clean energy economies in the Asia Pacific region