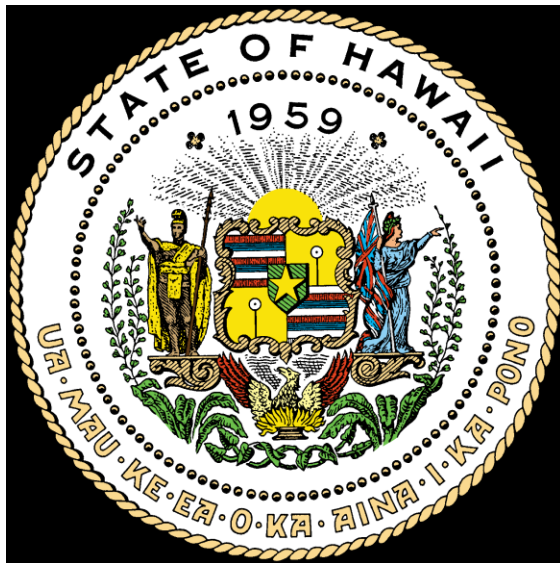


DBEDT Energy Plan



HCEI Plenary Session
December 6, 2011

Presented by Richard Lim
State Energy Resource Coordinator

Hawaii State Department of Business, Economic Development & Tourism

<http://energy.hawaii.gov>

Overview

- ▶ Hawaii's Progress Towards Clean Energy
- ▶ HCEI: The Partnership
- ▶ DBEDT Clean Energy Plan

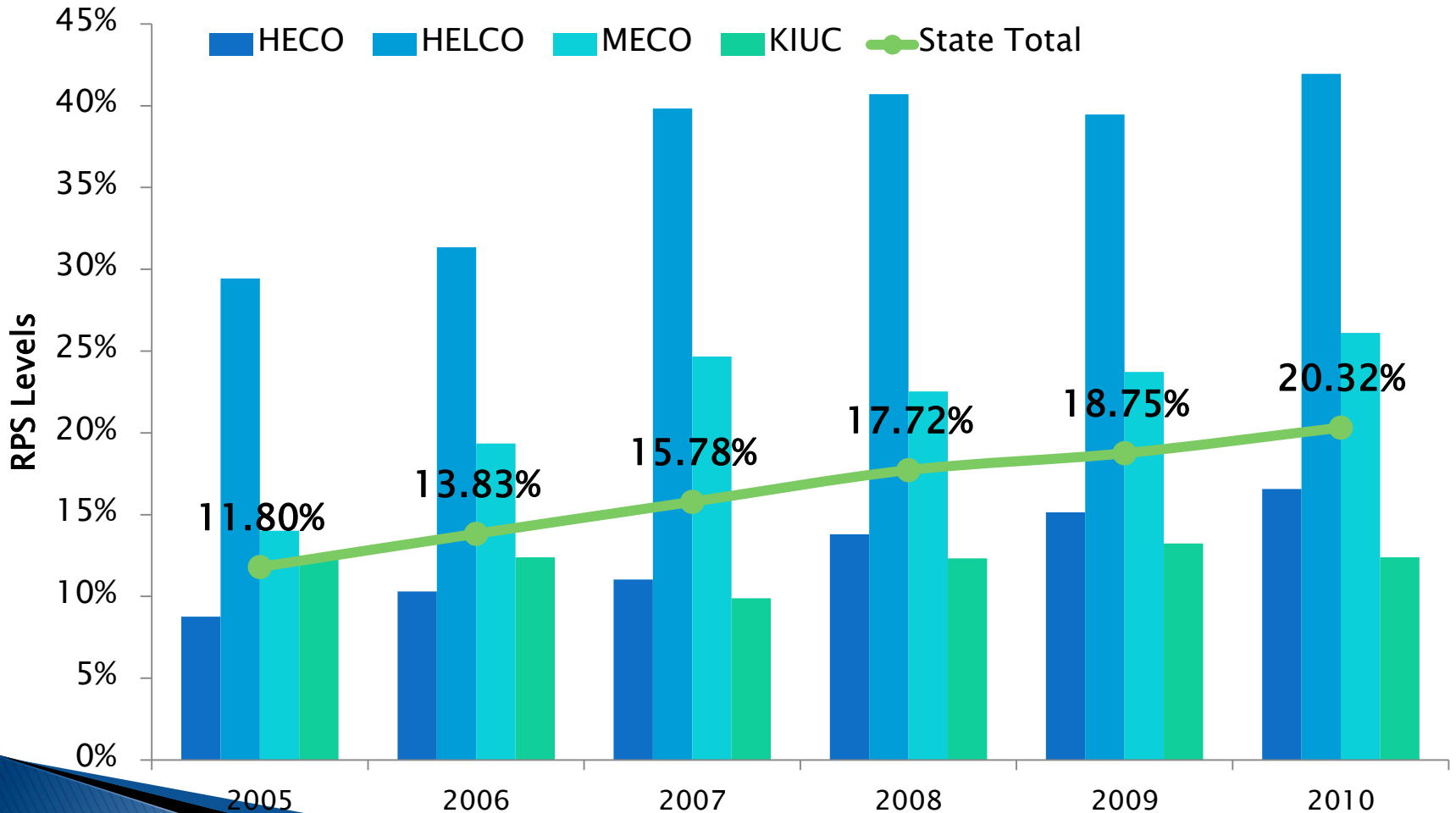


Progress Towards Clean Energy

- »» *Deploying clean energy infrastructure as a catalyst for economic growth, innovation sector development, and energy security advancement*

Hawaii Renewable Portfolio Standard Levels

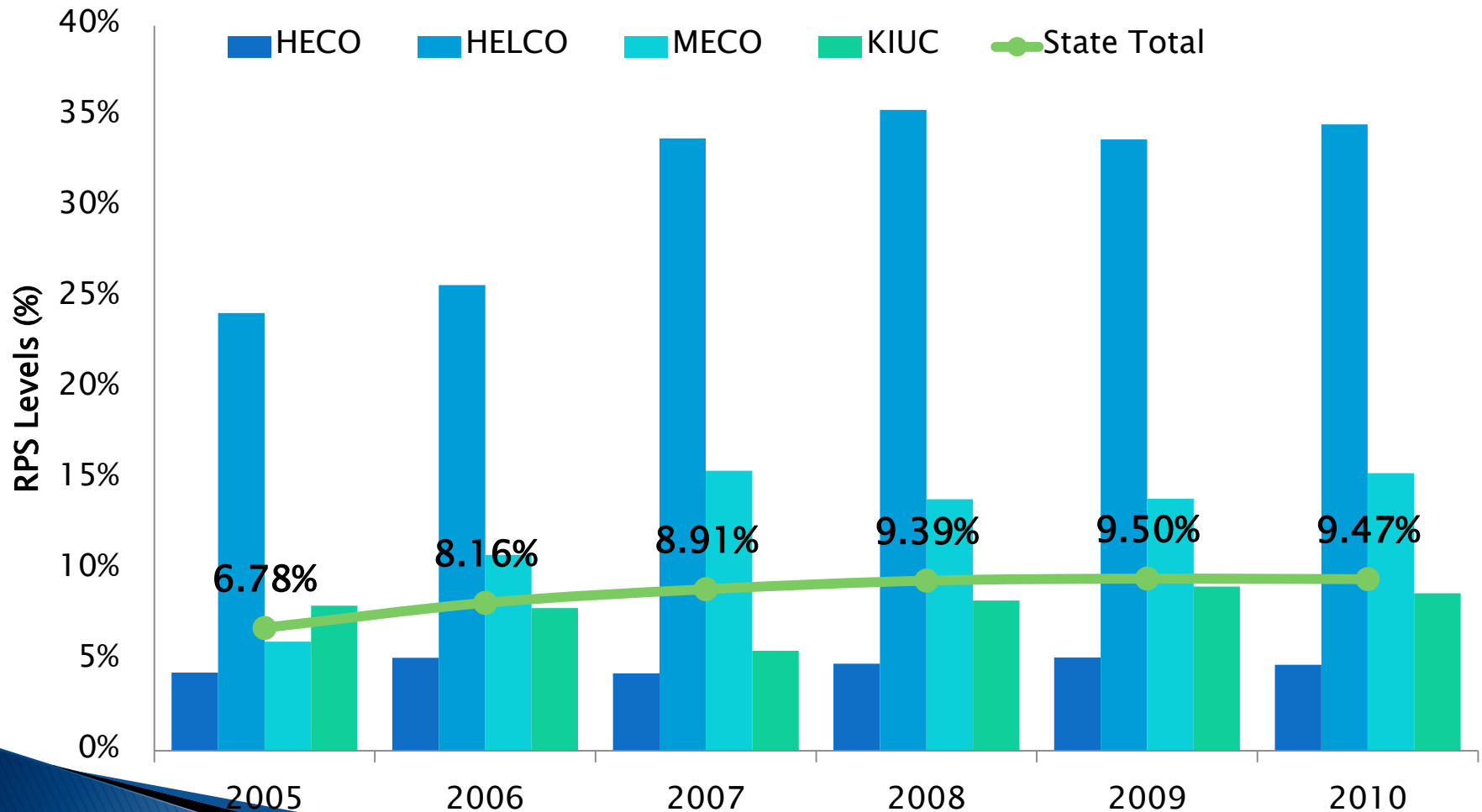
In 2010 Hawaii met its 10% RPS goal for renewable energy and energy efficiency, which when combined totals over 20% of energy use



Source: Renewable Portfolio Standard Status Reports, 2005-2010 (Hawaii Public Utilities Commission)

Renewable Generation

At the end of 2010, the State generated about 9.5% of its electricity from renewable sources



Source: Renewable Portfolio Standards Status Reports, 2005-2010 (Hawaii Public Utilities Commission)

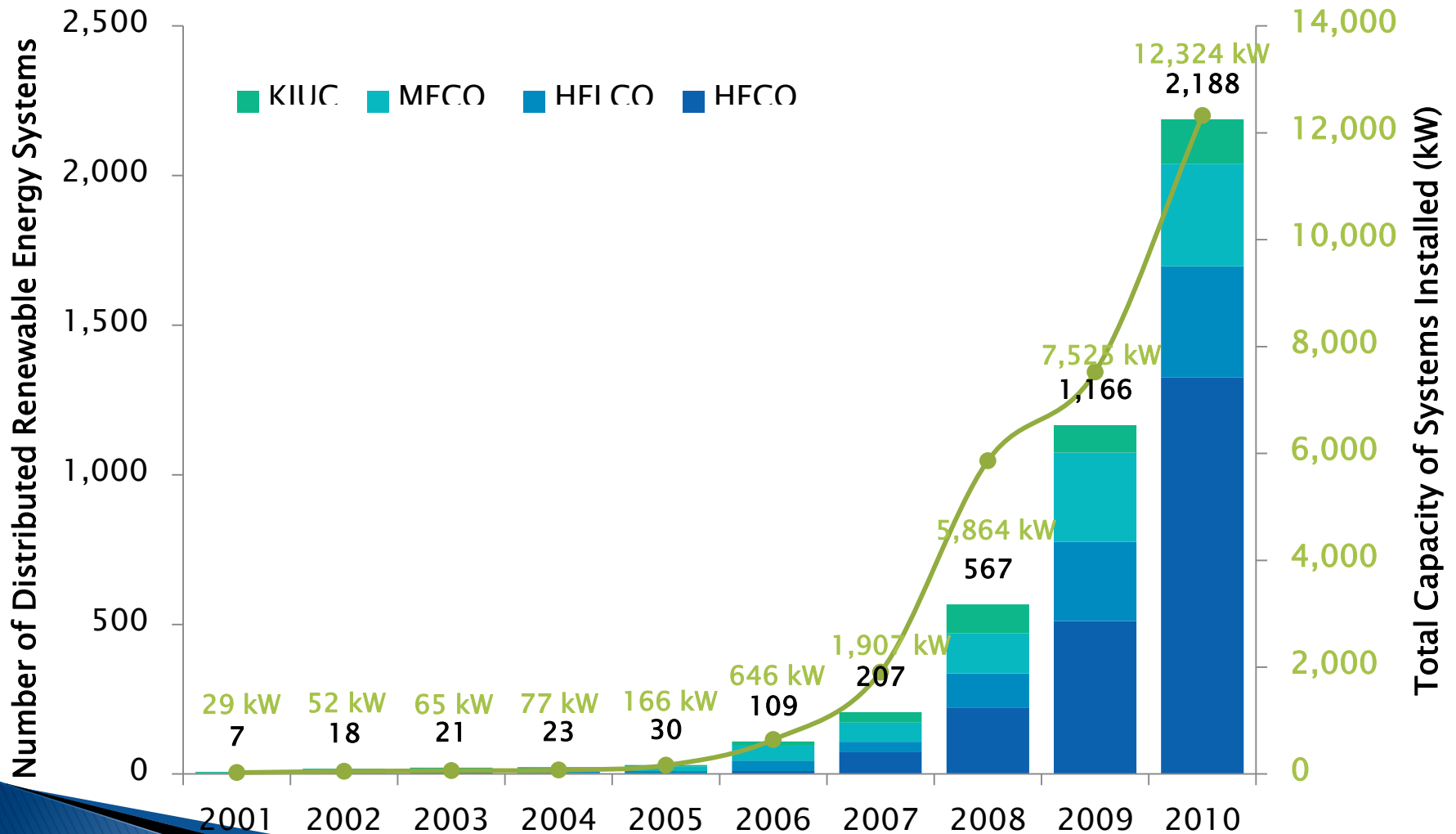
Existing Commercial Renewable Projects

Existing commercial renewable projects statewide has a total capacity of 275.5 MW

Commerical Projects	Location	Technology	MW Capacity
Puna Geothermal Venture	Hawaii	Geothermal	30.0
Tawhiri	Hawaii	Wind	20.5
Hawi Renewable Development	Hawaii	Wind	10.6
Pueo and Waiau Hydro	Hawaii	Hydro	4.4
Kapaa Solar	Kauai	PV	1.2
KIUC Waiahi	Kauai	Hydro	1.3
Kauai Hydro IPPs	Kauai	Hydro	7.2
Lanai Sustainability Research	Lanai	PV	1.2
Wailuku River Hydro	Maui	Hydro	12.1
Makila Hydro	Maui	Hydro	0.5
H-Power	Oahu	WTE	46.0
Keahole Solar Power	Oahu	CSP	0.5
Campbell Industrial Park Generation Station	Oahu	Biodiesel	110.0
Kahuku Wind Farm	Oahu	Wind	30.0
Total			275.5

Distributed Systems Installed Annually

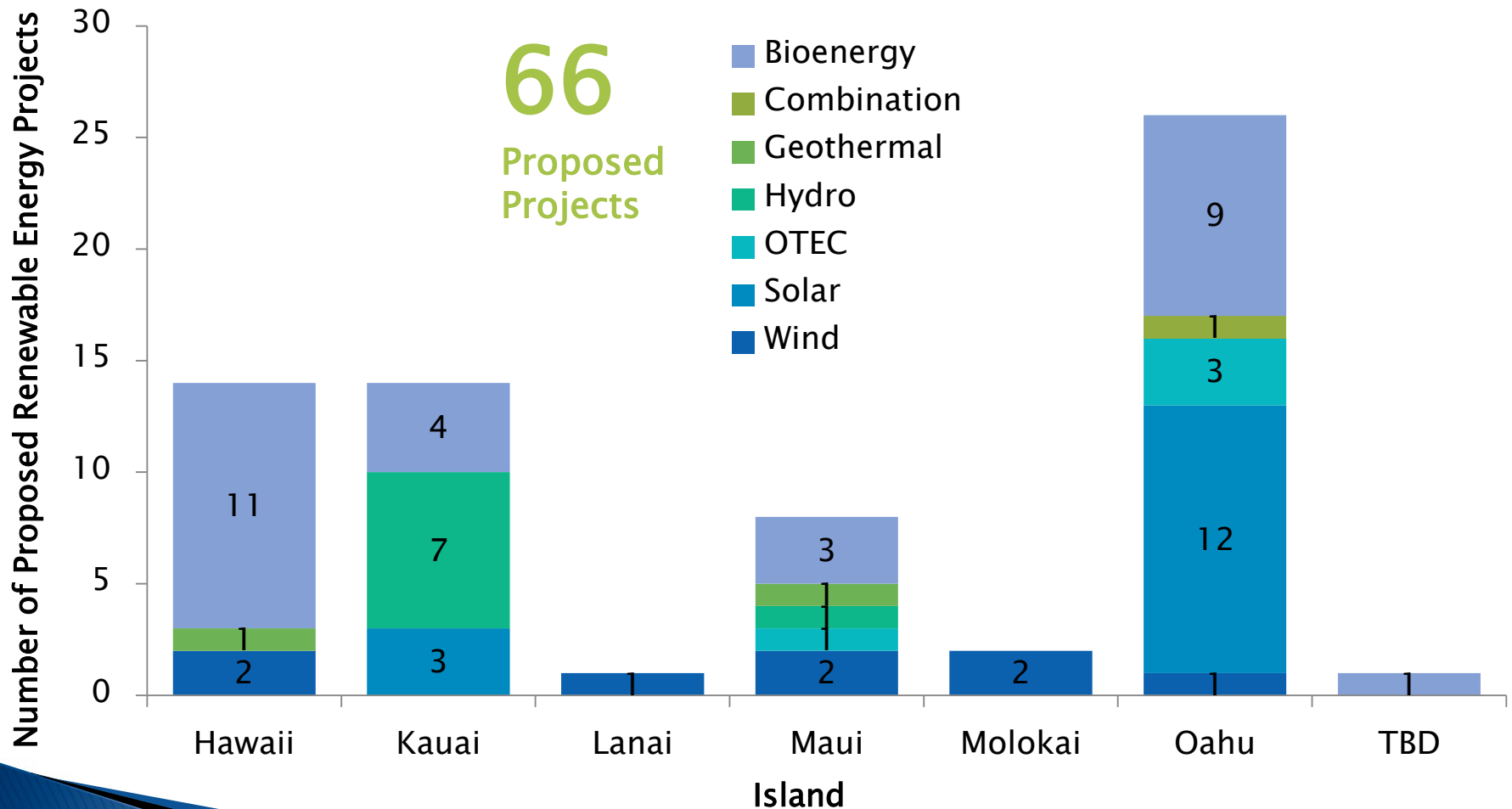
4,336 distributed renewable energy systems installed, total capacity of 28.7 MW



Source: *Net Energy Metering Status Reports, 2010* (Public Utilities Commission)

Proposed Renewable Energy Projects

There are currently 66 proposed renewable energy projects in various stages of development in Hawaii



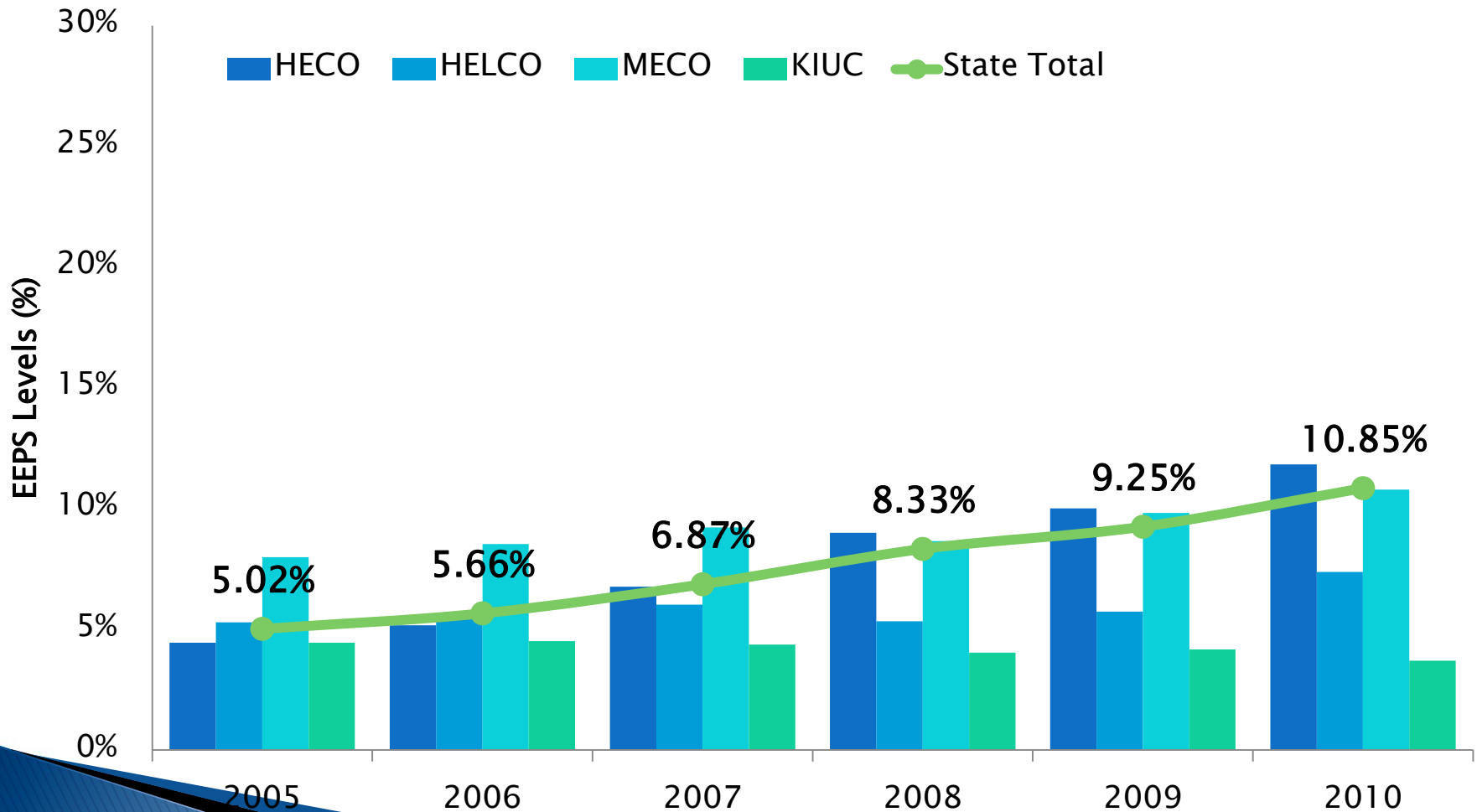
Source: Department of Business, Economic Development and Tourism, August 2011

Top 40 Renewable Projects

Project			Project			Project			Project		
1	First Wind	Oahu	11	Phycal Pilot Facility	Oahu	21	The Gas Company	Oahu	31	Kalaeloa Solar One	Oahu
2	HPower Expansion	Oahu	12	Pacific Biodiesel	Hawaii	22	West Wind Works	Oahu	32	IC Sunshine	Oahu
3	Sempra Energy	Maui	13	Kalaeloa Solar Two	Oahu	23	BioEnergy Hawaii	Hawaii	33	Kikialoa Solar	Kauai
4	First Wind	Maui	14	Castle & Cooke	Lanai	24	AES	Oahu	34	Poipu Solar	Kauai
5	Puna Geothermal Venture	Hawaii	15	Honeywell UOP	Oahu	25	Clean River Power 16	Kauai	35	Big Island Carbon	Hawaii
6	Honua Technologies	Oahu	16	Honolulu Sea Water Air Conditioning	Oahu	26	Clean River Power 15	Kauai	36	Molokai Renewables	Molokai
7	Aina Koa Pono	Hawaii	17	Scatec Hunt Development	Oahu	27	Kahawai Power 2	Kauai	37	Pacific West Energy	Kauai
8	Hu Honua Bioenergy	Hawaii	18	Forest City	Oahu	28	Konohiki Hydro Power	Kauai	38	Kahawai Power 5	Kauai
9	Green Energy Hawaii	Kauai	19	NexGen Energy	Hawaii	29	Kahawai Power 1	Kauai	39	Ocean Thermal Energy Conversion	Oahu
10	Castle & Cooke	Oahu	20	NexGen	Hawaii	30	Cellana ClearFuels	Maui	40	Oceanlinx	Maui

Energy Efficiency Improvements

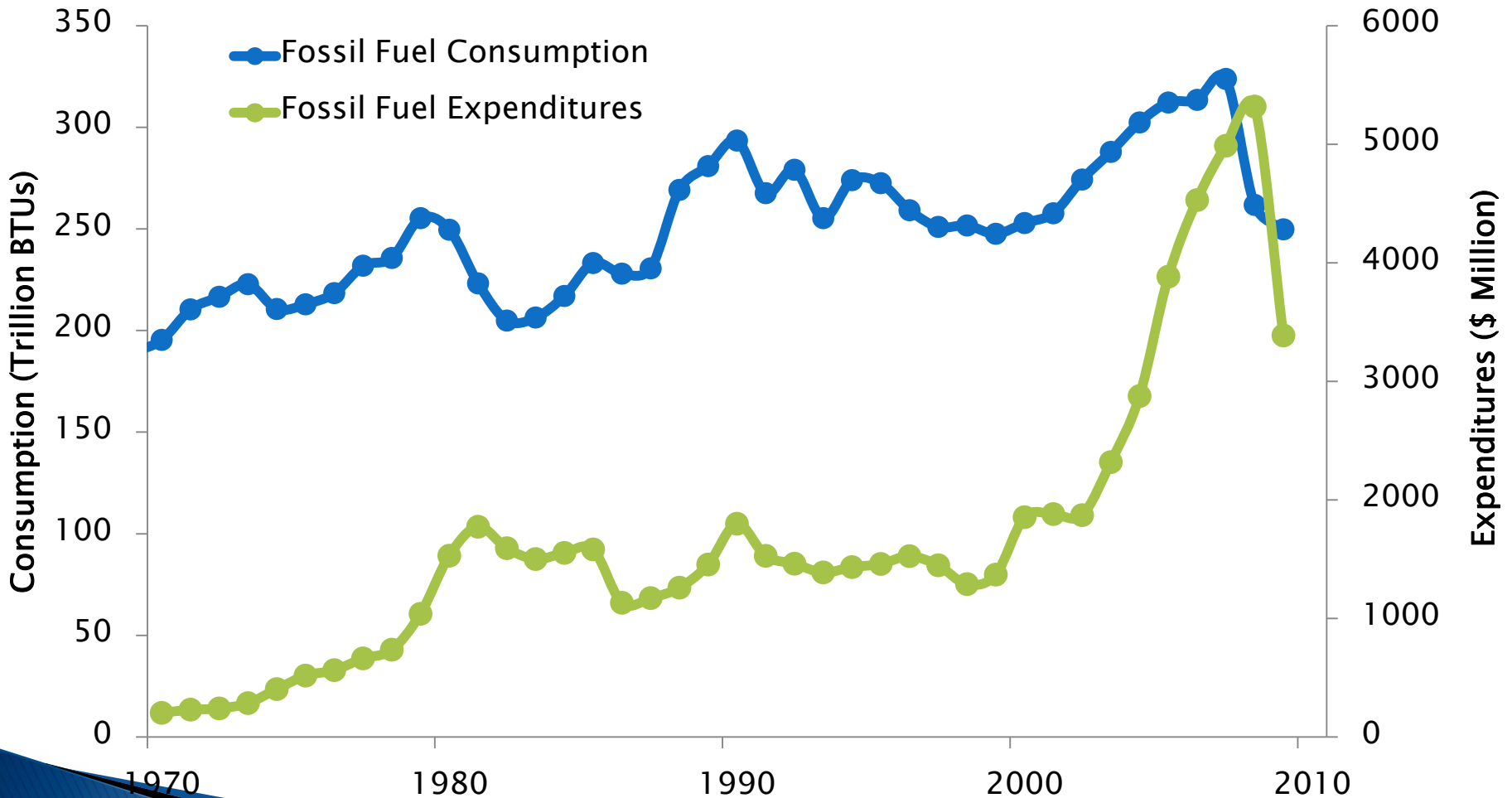
At the end of 2010, the State achieved almost 11% electricity savings



Source: Renewable Portfolio Standards Status Reports, 2005-2010 (Hawaii Public Utilities Commission)

Fossil Fuel Consumption and Expenditure

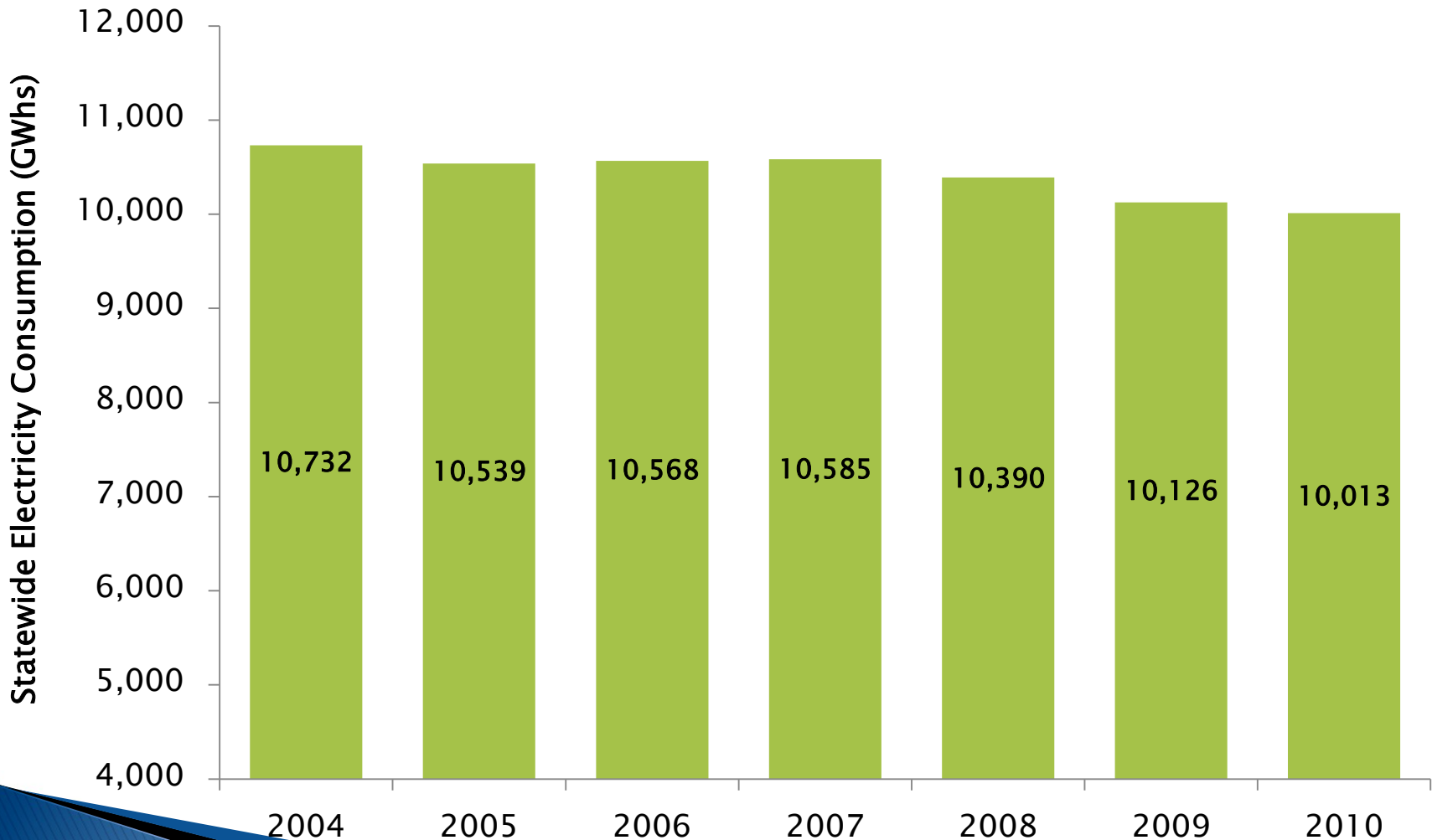
Both fossil fuel consumption and expenditures are on the decline



Source: State Energy Data System, Hawaii Primary Energy Use, June 2011 (Energy Information Administration)

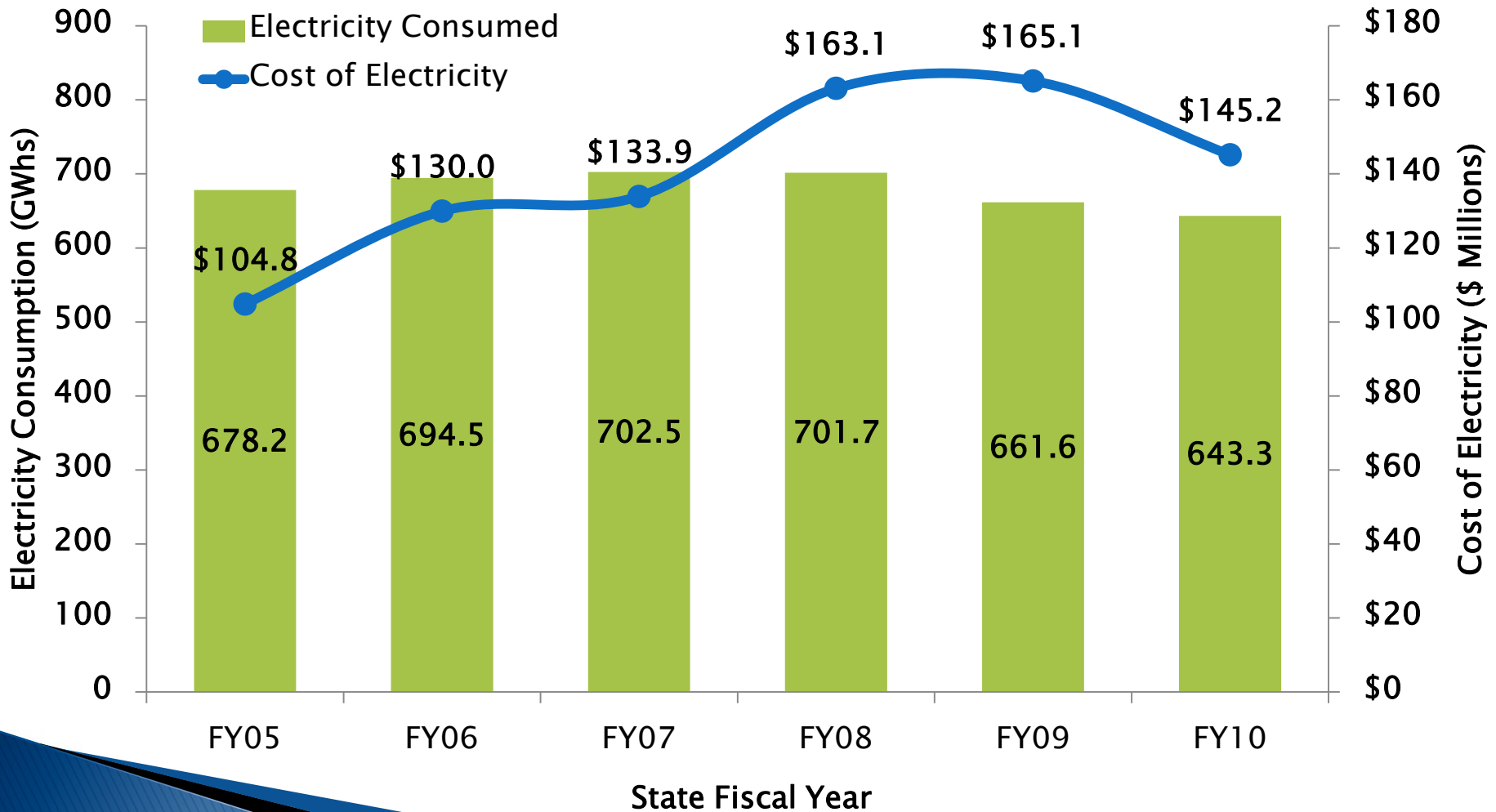
Electricity Consumption Decreased

Electricity consumption has decreased 6.6% statewide since 2004



Lead By Example

State agency electricity consumption and cost have decreased in recent years as a result of energy efficiency and performance contracting

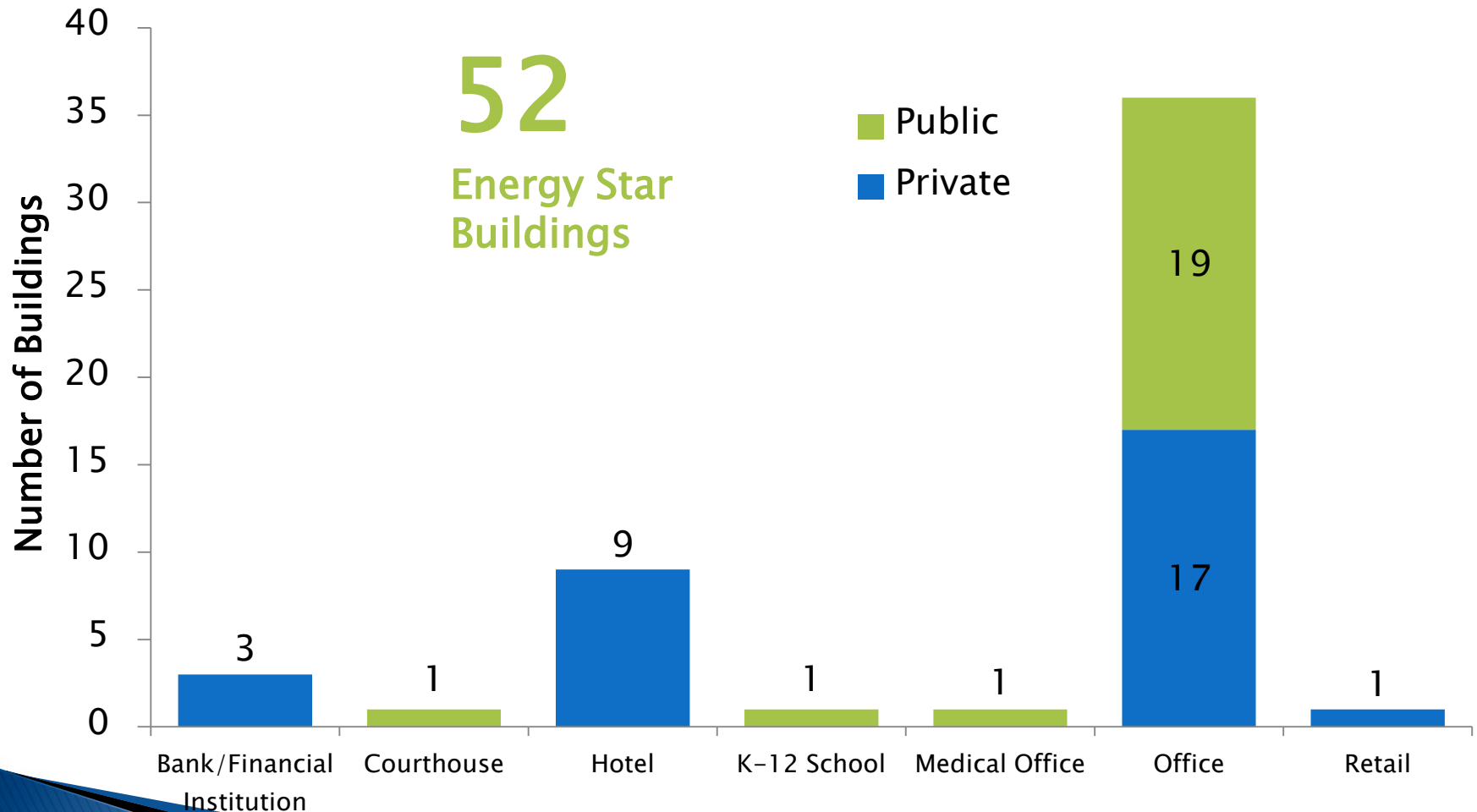


Energy Savings Performance Contracting

- ▶ **4 State Agencies (DAGS/UHCC/PSD/HPHA)**
 - \$125M (investment value)
 - 3,325 (jobs created during construction/installation)
 - 50 office buildings (2 million sq. ft.)
 - 6 community college campuses
 - Workforce Development Summit
 - Student Fellowship/Intern Program
 - Energy Kiosk
 - 3 prisons/jail
 - 67 public housing sites / 5,269 dwelling units

Hawaii Energy Star Buildings

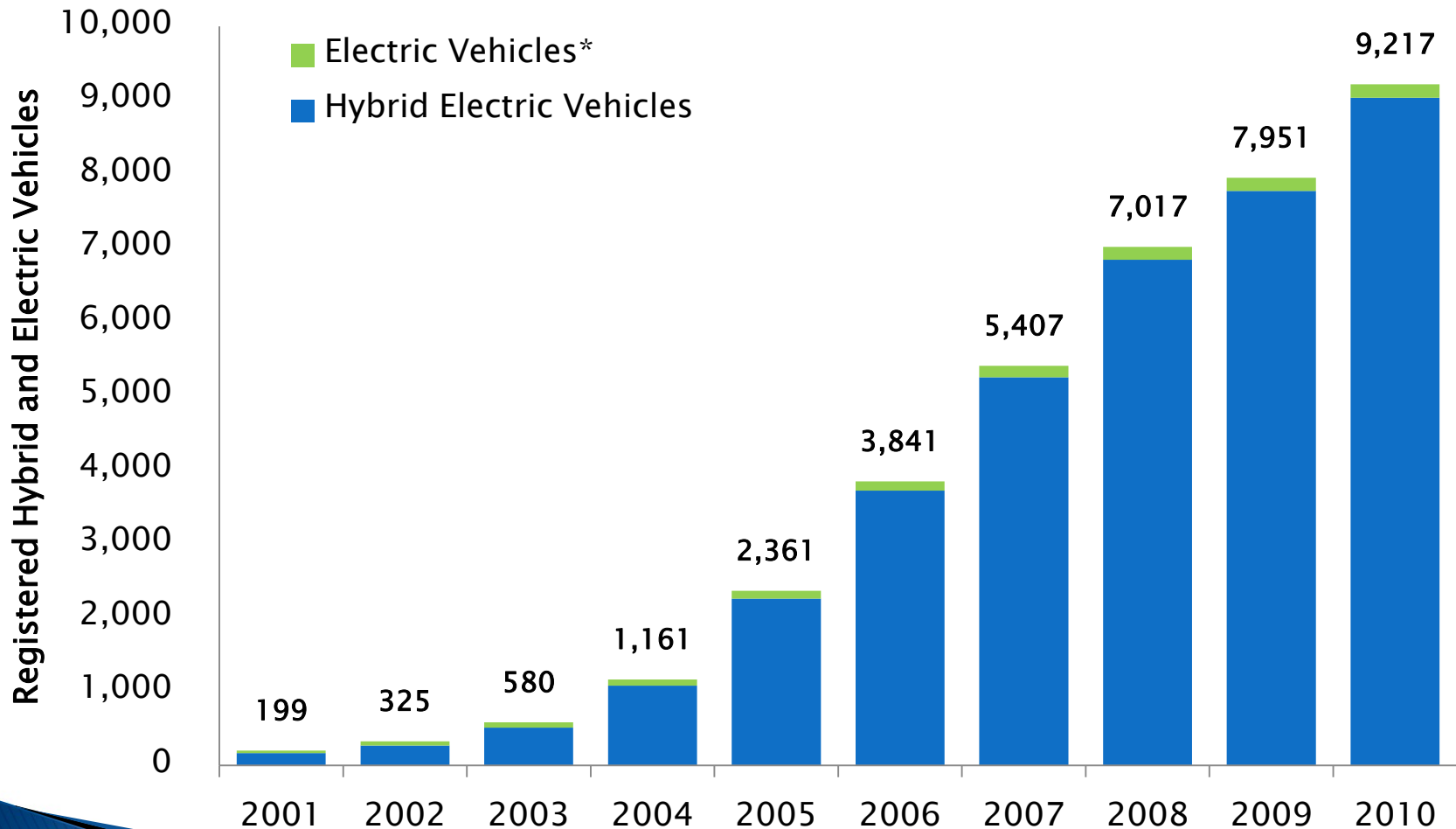
Since 2003, 52 buildings totaling 4.7 million sq. ft. in floor space have received Energy Star certification



Source: *Energy Star.gov*, November 2011 (US Environmental Protection Agency & US Department of Energy)

Hybrid and Electric Vehicles Registered

Hybrid and electric vehicle ownership in Hawaii grew 45 times in the past decade

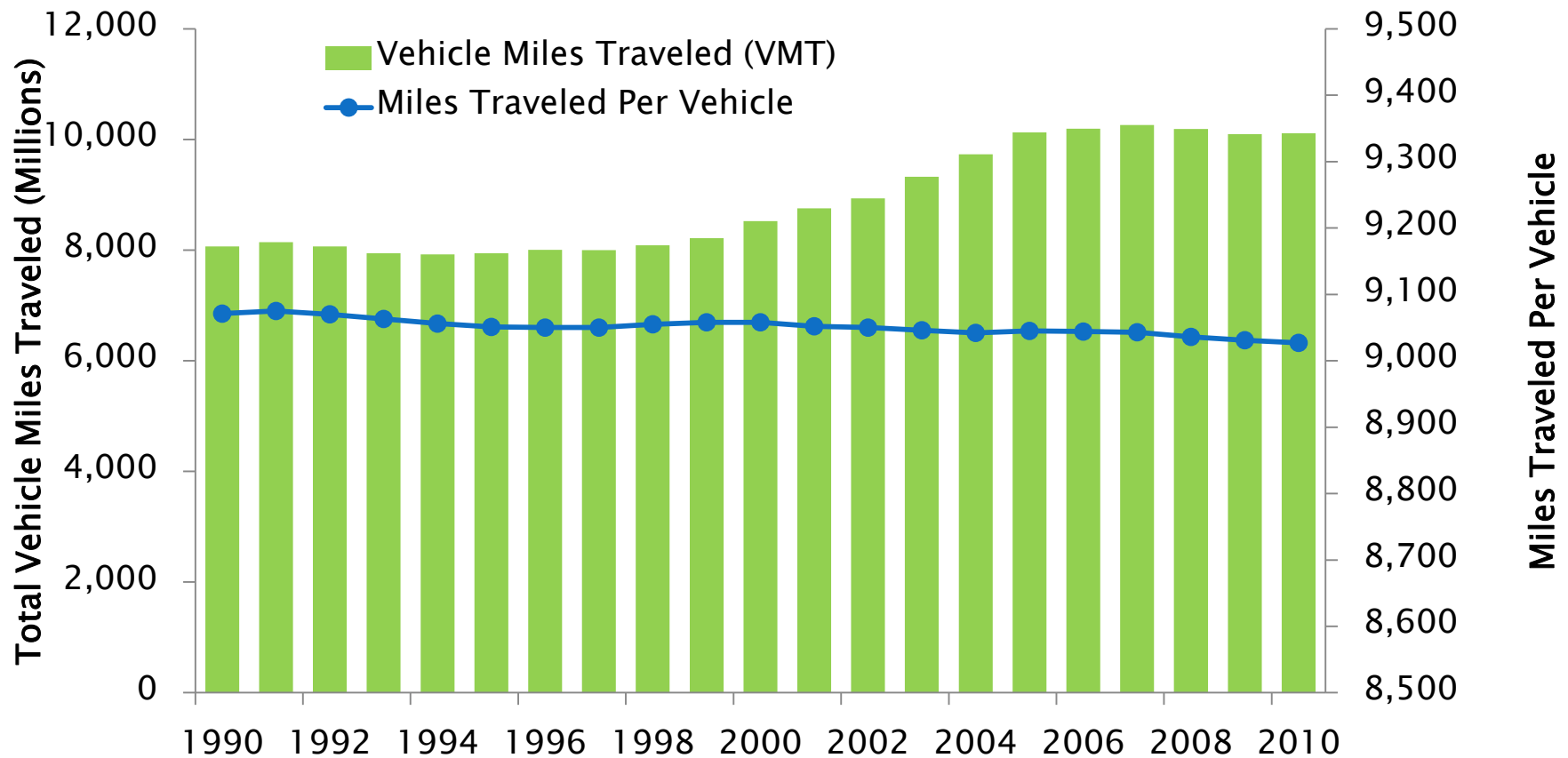


*Includes Neighborhood Electric Vehicles

Source: National Renewable Energy Laboratory, August 2011

Hawaii Vehicle Miles Traveled

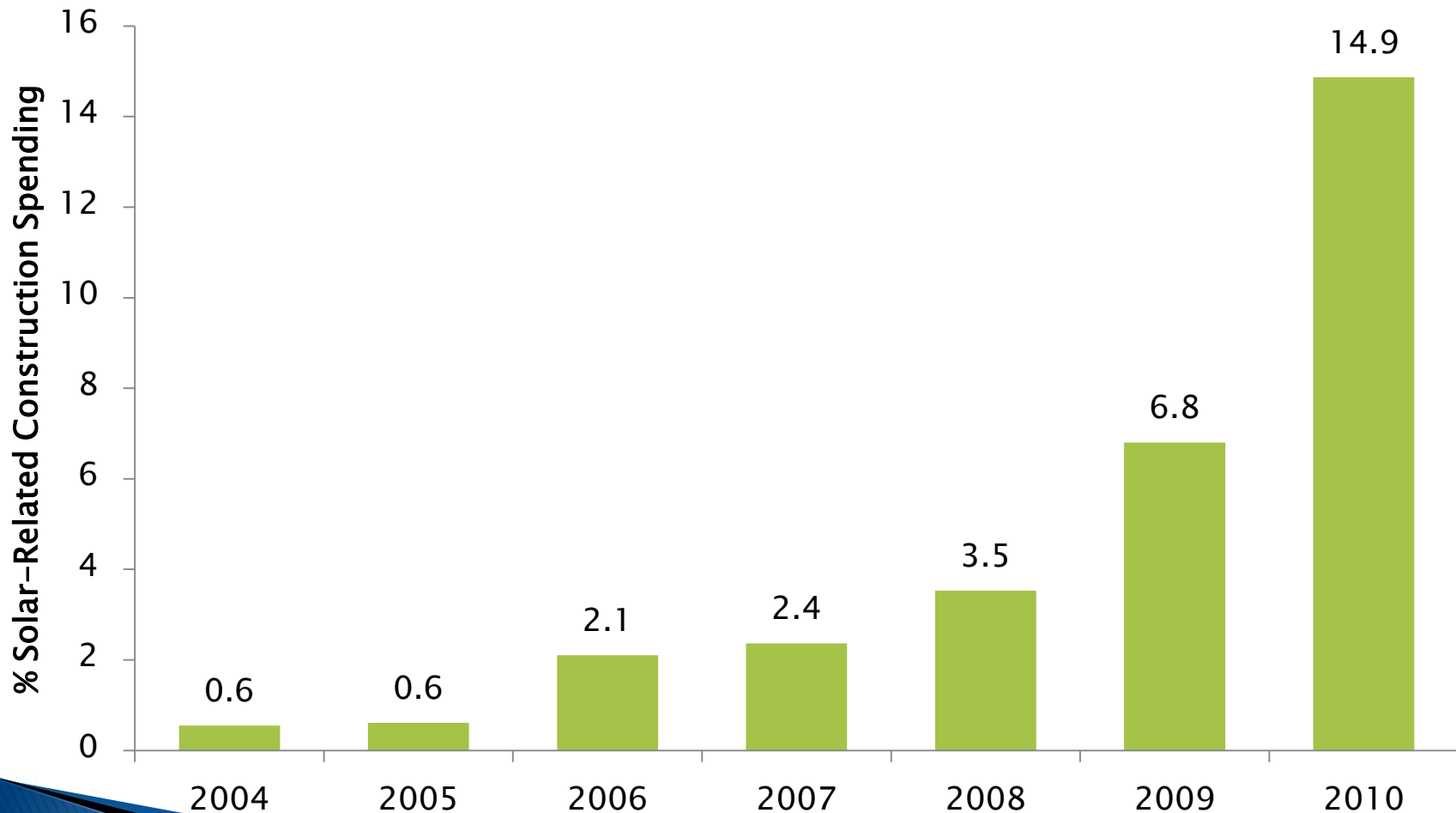
Both vehicle miles traveled and miles traveled per vehicle have slowly declined in the past few years



Source: *Motor Vehicle Fuel Consumption and Vehicle Miles*, 1990–2010, State of Hawaii Data Book (DBEDT)

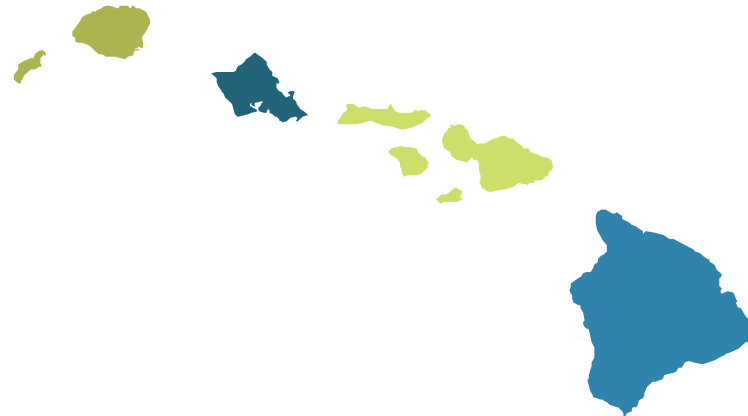
Solar-Related Construction Expenditures

Solar-related construction expenditures reached 15% in 2010



Green Jobs Count

Estimated 2012 green jobs count for Hawaii is 14,048 jobs across all industries

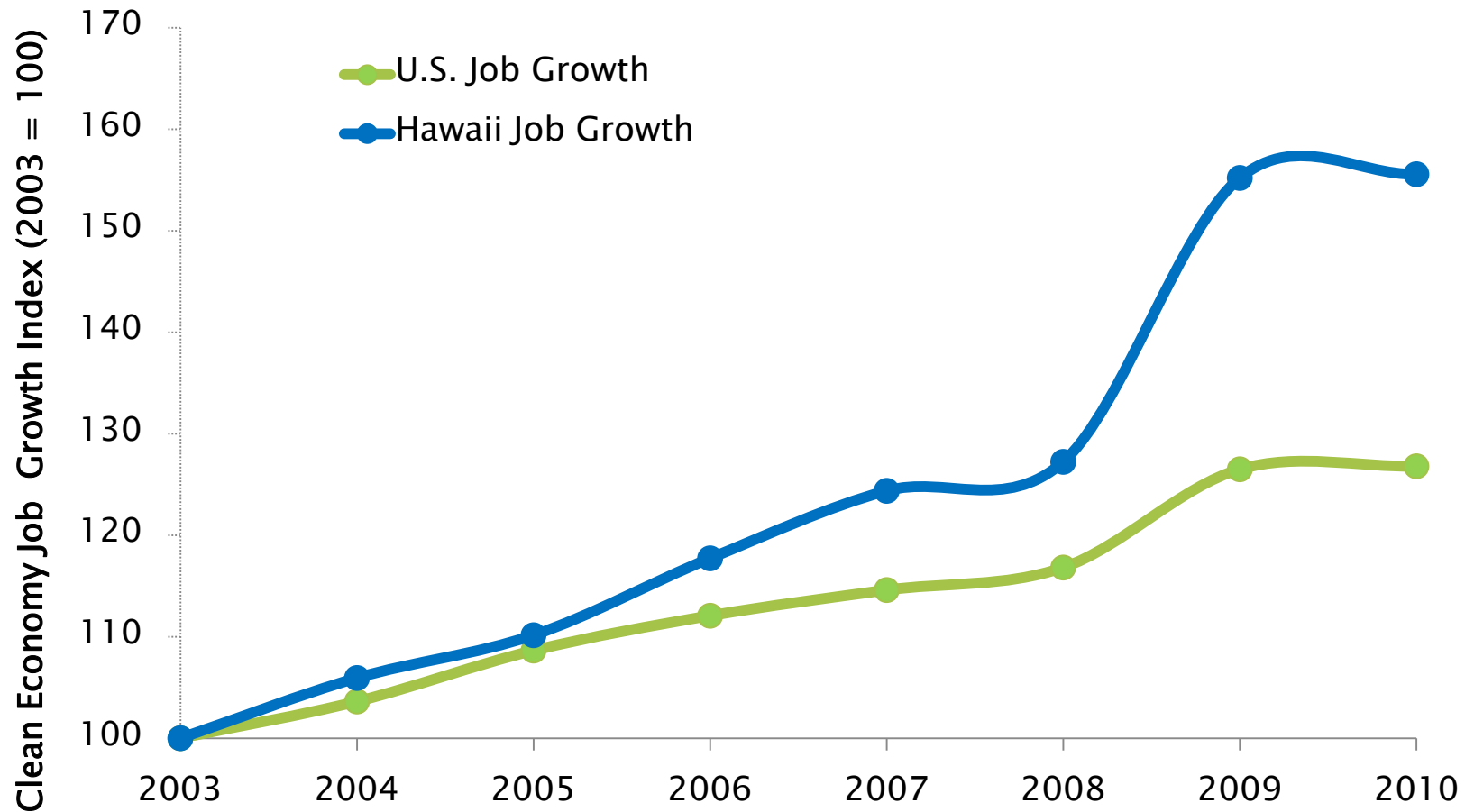


COUNTY	PRIVATE SECTOR GREEN JOBS	% OF COUNTY JOBS	ADDITIONAL GREEN JOBS BY 2012
Hawaii	1,222	2.5	510
Honolulu	6,866	2.0	1,885
Kauai	460	1.9	71
Maui	2,597	4.6	437
State Total	11,145	2.4	2,903

Source: Hawaii's Green Workforce: A Baseline Assessment, December 2010
(Department of Labor and Industrial Relations)

Hawaii Clean Economy Job Growth

Clean economy job growth exceeded national average to become third fastest in growth in the nation



Source: *Sizing the Clean Economy*, August 2011 (Brookings Institute)

Rankings Compared to Other US States

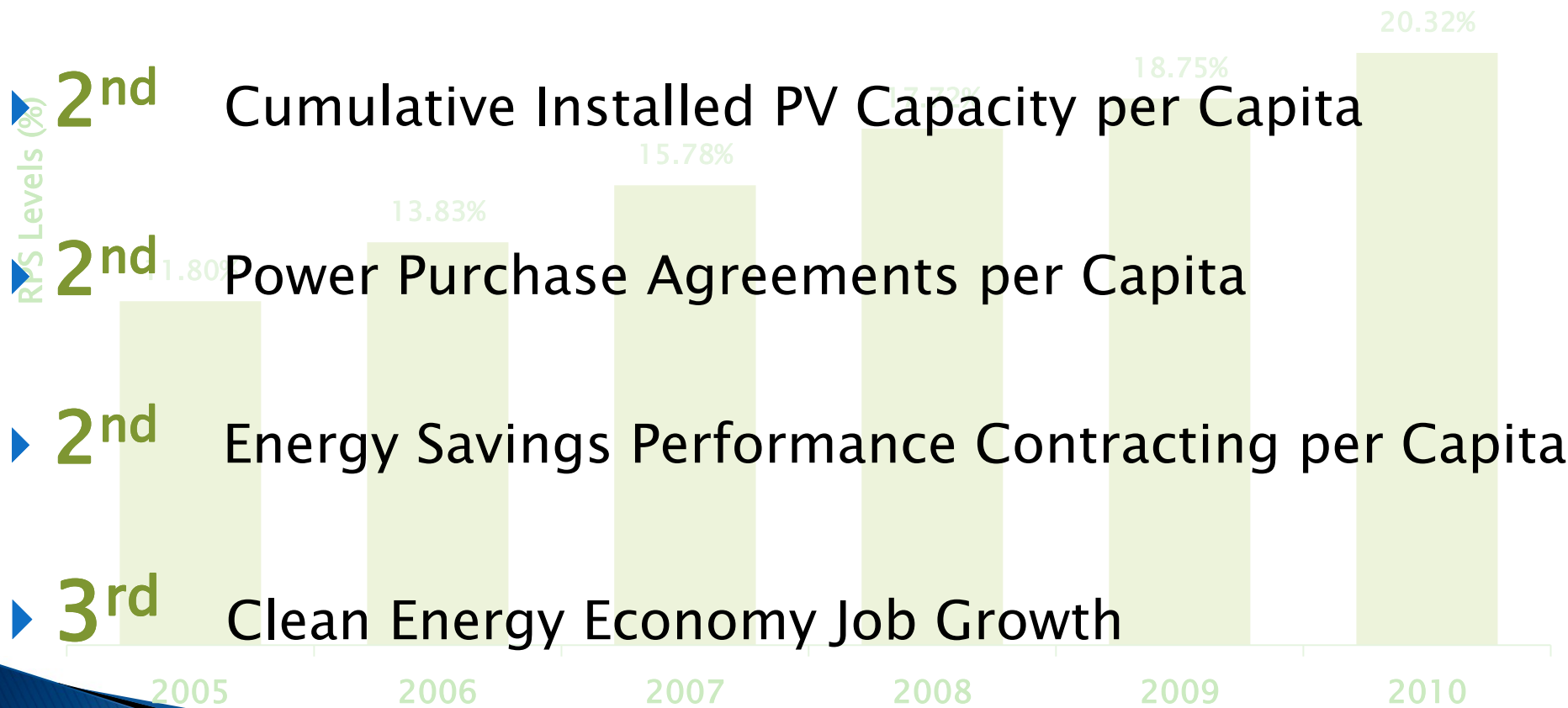
▶ **1st** Solar Water Heaters per Capita

▶ **2nd** Cumulative Installed PV Capacity per Capita

▶ **2nd** Power Purchase Agreements per Capita

▶ **2nd** Energy Savings Performance Contracting per Capita

▶ **3rd** Clean Energy Economy Job Growth



HCEI: The Partnership

- »» Building the foundation for a clean energy future

HCEI Roadmap 2011

Fuels Sector

Meet In-State Demand for Renewable Fuels

Electricity Sector

40% RPS by 2030

Transportation Sector

Displace 70% Petroleum by 2030

Efficiency Sector

30% EEPS by 2030

Federal Partners

▶ Congressional Delegation

- Directed over \$125 million in clean energy funding to Hawaii in the past 5 years

▶ US DOE

- Hawaii–Japan NEDO Smart Grid Community Project
- KIUC NRECA Cooperative Research Network Smart Grid Demonstration Project
- Oahu Wind Integration and Transmission Study
- Kaupuni Net Zero Energy Community
- Hawaii Hydrogen Initiative

▶ US DOD

- Hydrogen Refueling Infrastructure
- GIFTPAC
- OTEC Demonstration Project
- Smart Power Infrastructure Demonstration for Energy Reliability and Security

Policy Stakeholders

▶ **Legislature**

- Act 109 PUC Consideration of Clean Energy Capital Investment
- Act 198 PV Adoption Working Group
- Act 204 On Bill Financing

▶ **PUC**

- Rule 14H Interconnection
- FIT Tier III
- PPAs: Poipu Solar, Kalaeloa Solar II, Auwahi Wind, Kaheawa Wind II

▶ **Hawaii Energy Policy Forum**

- Clean Energy Data Metrics Working Group
- Hawaii: The State of Clean Energy (Six-Show Series)

State Partners

▶ DBEDT

- Expended over \$23 million on clean energy projects statewide
- Smart grid MOU with New Energy and Industrial Technology Development Organization (Japan)
- LOI with China Council for the Promotion of International Trade, LOI with Ministry of Knowledge Economy (South Korea) for clean energy projects
- Revamped HCEI and State Energy websites

▶ HNEI

- Received over \$31 million in outside funding for 2011

▶ PICHTR/HREDV

- Awarded over \$4.3 million to fund private sector clean energy innovations

Utility Partners

- ▶ **HEI Utilities: HECO, MECO and HELCO**
 - 3rd in Annual Solar Watts per Customer
 - 4th and 5th in Cumulative Solar Watts per Customer
- ▶ **KIUC**
 - 2nd in Cumulative Solar Watts per Customer
- ▶ **Gas Company**
 - Hawaii Hydrogen Initiative
 - Tests for thermal cracking of bio-oil feedstocks

Business Community



Honolulu Seawater Air Conditioning, LLC

referentia

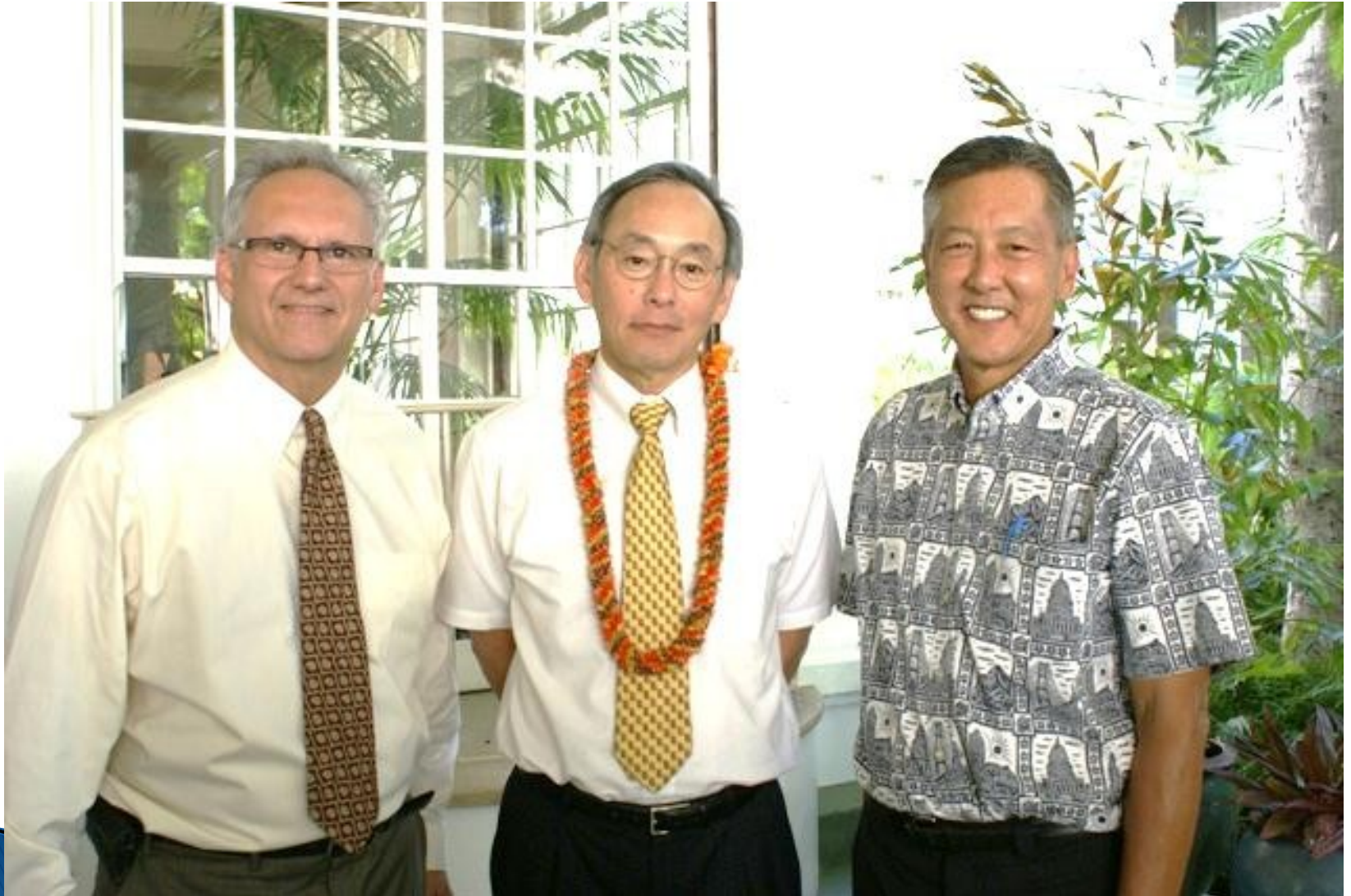




better place



Good Job



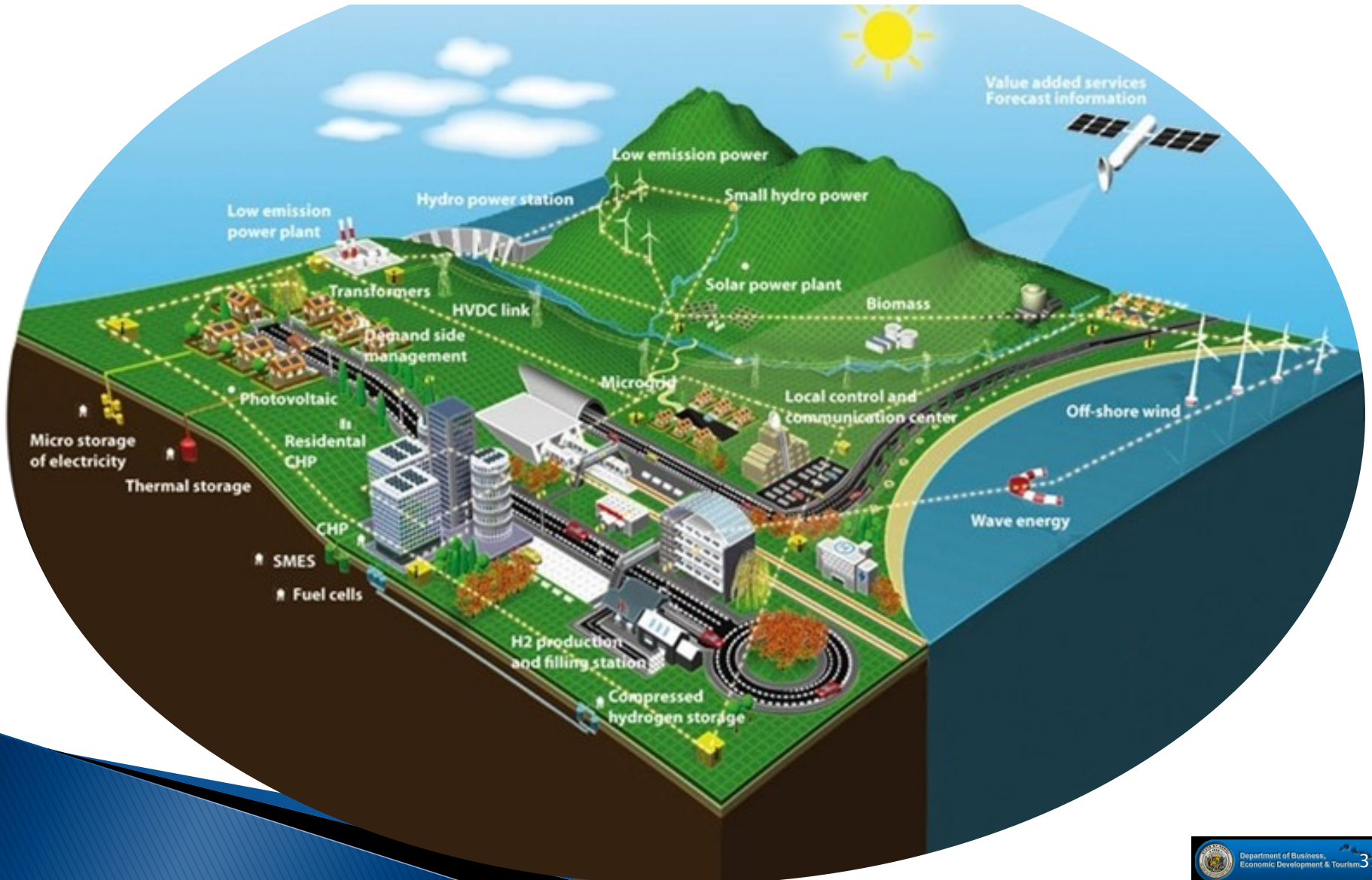
DBEDT Clean Energy Plan

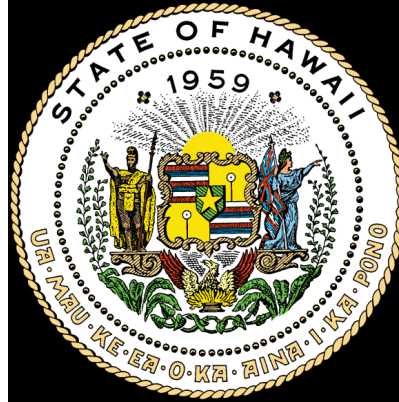
- »» Plan for reaching the next milestones

ENERGY OFFICE PLAN

- ▶ REBRAND CLEAN ENERGY
 - ECONOMIC DEVELOPMENT/JOBS
 - TEST BED FOR ASIA PACIFIC REGION
- ▶ STRATEGY
 - FOCUS
 - LEVERAGE
 - REACH
- ▶ KEY LONG TERM AREAS
 - SMART GRID
 - BIO-JET FUELS
 - GEOTHERMAL

Clean Energy Transformation





Mahalo

Hawaii State Department of Business
Economic Development & Tourism
<http://energy.hawaii.gov>