



Hawaiian Electric
Company, Inc.

Biofuels for Power Generation: A Success Story

Hawaiian Electric Company, Inc.





Hawaiian Electric Company, Inc.

HEI Profile



Market cap (based on closing price of \$22.79 on 12/31/10)	\$2.2B
Common Equity	\$1.5B
2010 revenues	\$2.7B
Assets	\$9.1B
Debt	\$1.4B
Indicated annual yield (based on closing price of \$22.79 on 12/31/10)	5.4%
NYSE	HE

HE is included in the following indices:

- S&P Mid-Cap 400
- Russell 1000

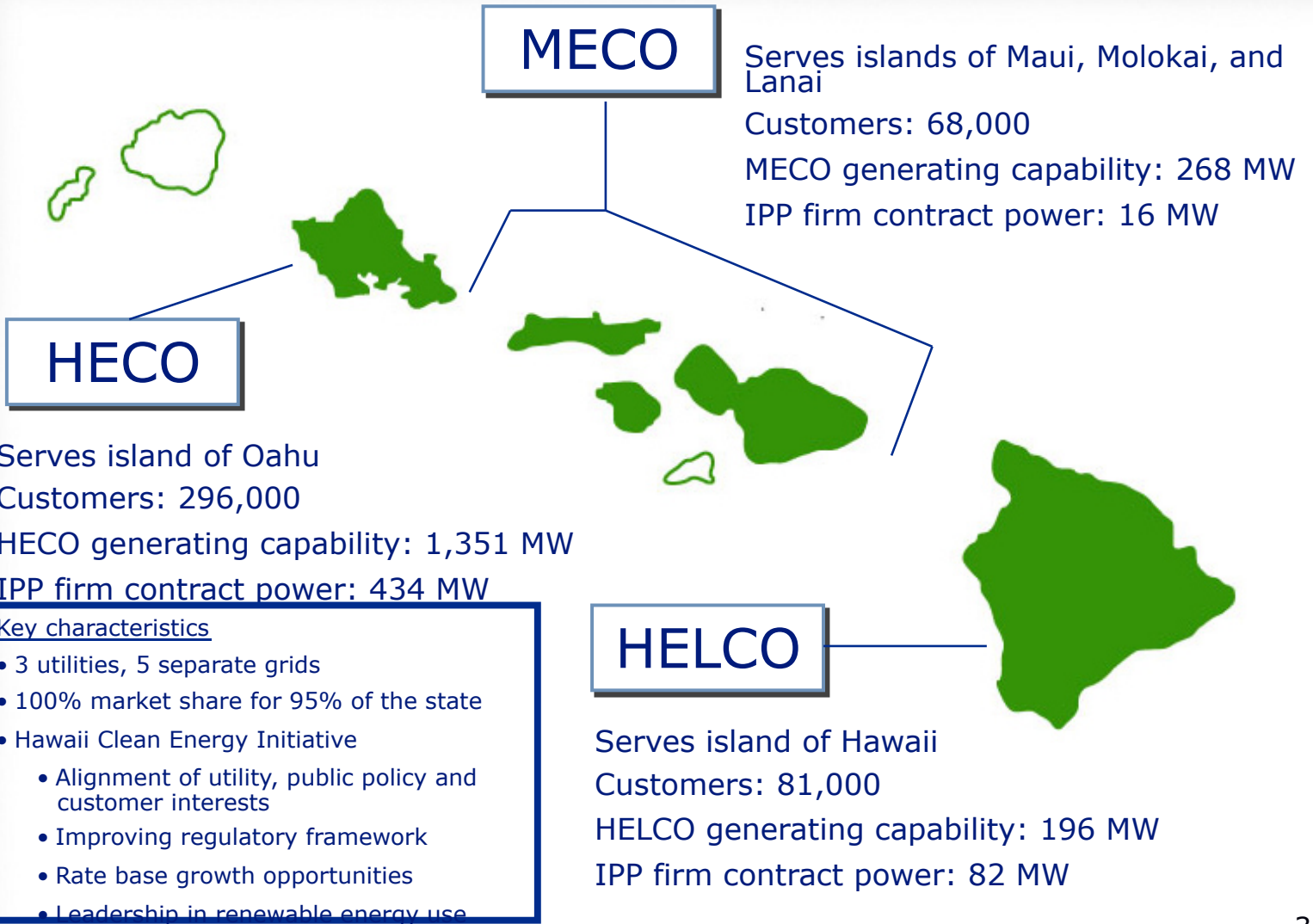


As of 12/31/10 unless otherwise indicated



Hawaiian Electric Company, Inc.

Hawaiian Electric Company, Inc. and Subsidiaries Service Area



As of 05/2010



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Hawaii Clean Energy Initiative

- Hawaii spends \$6-\$7 billion/year on oil.
- Hawaii Clean Energy Initiative (HCEI)
 - 70% clean energy by 2030
- Hawaii's renewable portfolio standard (RPS)
 - HB 1464 legislation passed in 2009.

% of net electricity sales	By December 31:
10%	2010
15%	2015
25%	2020
40%	2030





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Biofuel Initiatives in Hawaii

State of Hawaii Bioenergy Master Plan, Dec. 2009:

- Aims to develop a bioenergy industry in Hawaii.
- Seeking transition to energy self-sufficiency based in part on biofuels for power generation & transportation.
 - R&D and deployment of biofuels technologies and biomass crops
 - Evaluation of Hawaii's potential to rely on biofuels as a significant renewable energy resource
 - A roadmap to implement commercially viable biofuels development

Department of the Navy – USDA

- MOU signed January 2010, pilot launched in Hawaii April 2010
- To encourage development of advanced biofuels





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Why biofuel for power generation?

- Generation primarily from liquid fuel:
 - Consume over 9 million barrels per year.
- Replace imported oil and diesel.
- Provide renewable firm power generation
- Environmental compliance
- Energy security





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Campbell Industrial Park, Oahu

- SIEMENS Single Cycle Combustion Turbine (CT)
- Nominal 110 MW
- Peaking Unit
- PUC mandated biodiesel
- Fully operational on biodiesel Nov. 2010



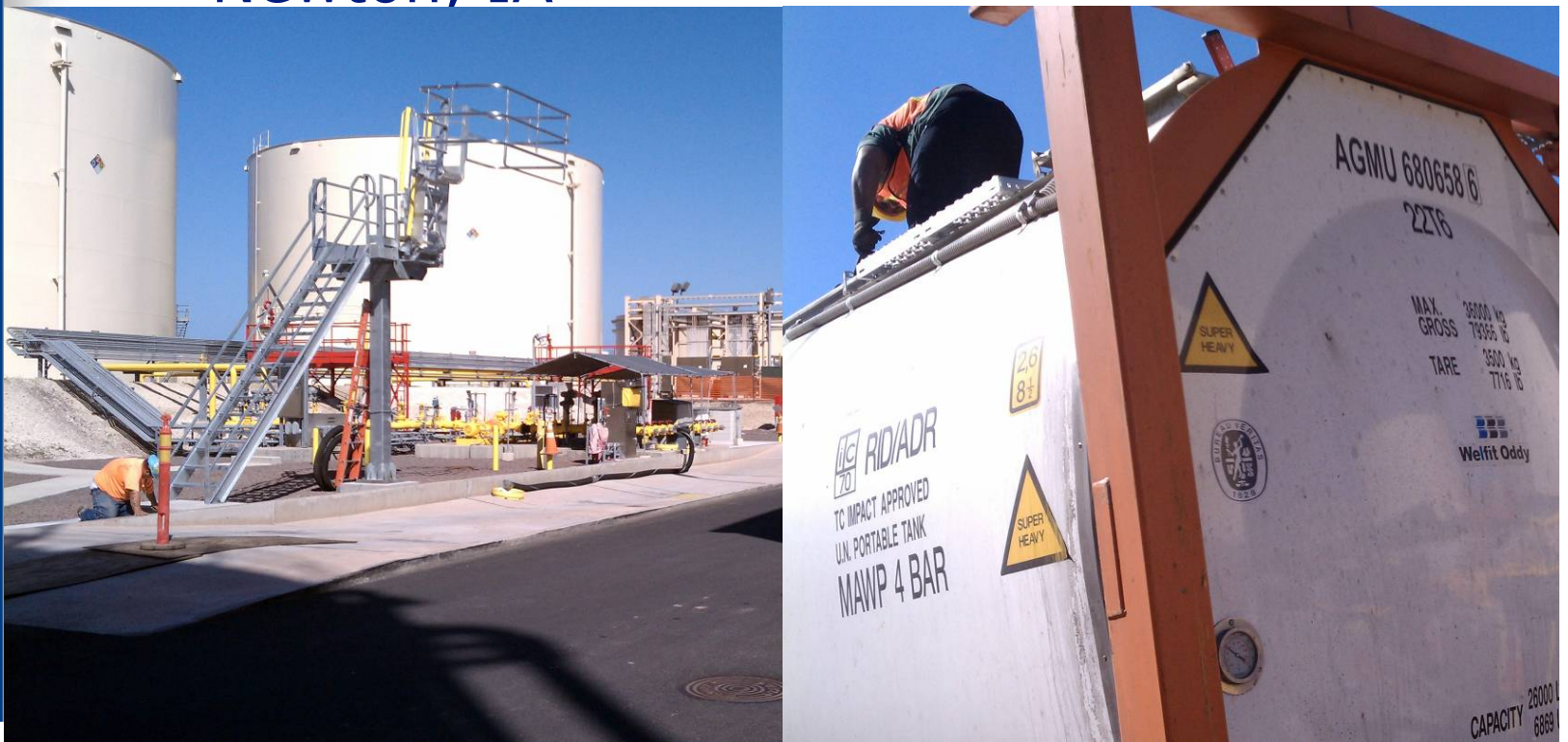
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Campbell Industrial Park, CT-1

- 3-7 million gallons/year
- 2 year Biodiesel Supply Contract with REG, July 2010 – July 2012
- Currently delivered by iso-container from Newton, IA





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HECO & MECO Sustainable Biofuels

9

- 1.5 million gallons sustainable crude palm oil
- 1 million gallons sustainable biodiesel
- Roundtable on Sustainable Palm Oil Certified



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Kahe Biofuel Co-firing Demonstration

10

- 90 MW Oil fired steam turbine generator
- Fuel delivery system retrofitted for co-firing
- In cooperation with the Electric Power Research Institute
- Results
 - Achieved 100% biofueling at 100% capacity
 - Lower Opacity
 - Lower NOx
 - Lower SO2



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Maui Electric Company: Biodiesel Demonstration Project, 2011

- 12.5 MW Mitsubishi reciprocating diesel engine generators
- Units currently start on biodiesel to achieve cleaner emissions
- Testing full operation on 100% biodiesel





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Operational Challenges

- Engine manufacturers' warranty
 - Performance guarantee not extended to biodiesel
 - Initial testing was performed using petroleum diesel
- Lower heat content
- Adjusting / tuning required
- Compatibility of "soft" parts (gaskets, etc...)
- Combustion Turbine Specifications
 - Lower limits on Sodium / Potassium
 - Lower Acid Number
 - Lower limits on Particulates





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Quest for Biofuel Originating in Hawaii

- Promote local agriculture
- Stimulate local economy
- Achieve self-sufficiency & energy security
- Request for Proposal issued March 2010
 - Restricted to biofuel processed in Hawaii from feedstock grown or originating in Hawaii
 - Most proposed advanced biofuel technologies:
Algae, cellulosic biomass, sweet sorghum
 - 20-yr contract awarded 1/6/2011: Aina Koa Pono
 - Negotiations continue with others





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Aina Koa Pono

- 20 year contract for 14 M Gallons/year in 2014 increasing to 16 M Gallons/year
- Targeted for Keahole from Ka'u on Big Island
- Biodiesel from cellulosic biomass
 - Initial plans for feedstock are sweet sorghum and eucalyptus





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<http://biodieselsupply.heco.com>

- Biodiesel for Campbell Industrial Park
"CT-1"
 - Issued January 31, 2011
 - 3M to 7M gallons/year; 3 year term expected
 - Supply to begin after July 2012
- Crude Biofuel for Kahe Power Plant
 - Expect to issue 2Q 2011
 - Potential to supply from 1M to 3M barrels
 - Supply to begin by 2015

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