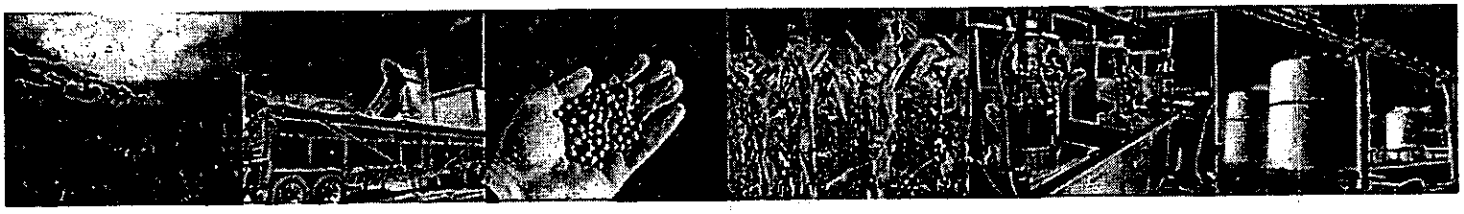

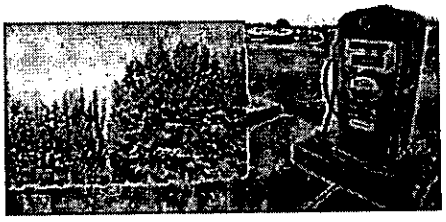

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Life of the Land is a Hawaii-based Environmental and Community Action Group.

Founded in February 1970. The mission of Life of the Land is to preserve and protect the life of the land through sustainable land use and energy policies and to promote open government through research, education, advocacy and, when necessary, litigation.

Life of the Land: A Brief History

Please support our work

Make A Donation

... Puna Geothermal Ventures - HELCO Power Purchase Contract (Docket 2011-0040)

Recent Victories

Public Utilities Commission rejection of HECO 3-year palm oil biofuel contract.

HECO pronuncement that global warming is real (PUC Evidentiary Hearing)

Feed-In Tariffs (the rates needs adjusting)

.....

... **Major Campaigns**

Energy: Party in numerous Public Utilities Commission regulatory proceedings on biofuels, generation, feed-in tariffs, planning, reliability

Ocean Thermal Energy Conversion (OTEC)

Sustainable Agriculture: Video: Timothy LaSalle, Ph. D. was the Keynote Speaker at the Hawai`i State Agricultural Conference held at the Ihilani Resort and Spa, Ko 'Olina, Oahu (September 23-24, 2010).

Video: Sustainable Agriculture & Biofuels with Senator Russ Kokubun

.....

HECO Docket 2009-0162 Big Wind

... **Hawai`i State Legislature (2011)**

Overhauling Environmental Impact Statements (HRS Chapter 343)

Big Wind (Islands should be self-sufficient; O`ahu should not require industrialization of Lana`i and Moloka`i)

Protection of Agricultural Lands

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Life of the Land is a 501(c)3 Charitable Organization.

Make a Tax Deductible Donation to Keep Our Island Clean, LLC
The donation goes to Life of the Land, fiscal sponsor for Keep Our Island Clean, LLC

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Henry Curtis (Secretary, Ka Lei Maile Ali`i Hawaiian Civic Club; `Olelo Director; Ililani Media Blogger)

Assistant Executive Director

Kat Brady (Ka Lei Maile Ali`i Hawaiian Civic Club; `Olelo Director; Citizens for Equal Rights; Chair Honolulu County Committee on the Status of Women; UH Institutional Review Board Committee on Human Subjects.

... **Publications**

Life of the Land's Motion to Intervene in PUC Docket 2011-0112. The regulatory proceeding focuses on HECO's attempt to get ratepayers to pay for Big Wind Studies that refused to examine alternatives

Life of the Land's Energy Independence for Hawai`i (2030): An Integrated Approach to Economic Revitalization in a Culturally and Environmentally Sensitive Way.

Life of the Land Letter dated May 13, 2011 to the PUC re Docket 2009-0162

Member

Pa`a Pono Aquaculture Alliance

Save Our Seals

Working in coalition with Friends of Lana`i in opposition to "Big Wind"

Justice: Civil Unions, Inclusion of Cultural Impact Statements (CIS) and Environmental Justice (EJ) in regulatory and legislative proceedings

Toxics: Chromium 6 in Drinking Water. Henry Curtis appeared on Hawai`i Public Radio's Town Square (January 6, 2011) MP3 Recording (59 minutes)

Land Use: Mauna Kea: Oppose Telescope expansion. Rail: If built, it should be at ground level wherever possible. Agricultural Land: food self-reliance before biofuels.

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Life of the Land's

Energy Independence for Hawai`i (2030)

An Integrated Approach to Economic Revitalization in a Culturally and Environmentally Sensitive Way

Written by Henry Curtis

(February 25, 2011)

EXECUTIVE SUMMARY

With this document, Life of the Land lays out a plan whereby each island would be 100% energy self-reliant by 2030. The chief baseload energy would be Ocean Thermal Energy Conversion (OTEC). Pacific Biodiesel would focus on the production of Jet Bio-Fuel.

Chapter 1 focuses on the key energy issues that need to be understood in discussing energy projects. There is often confusion in public discourse between load and peak load, between megawatts and megawatt-hours, between costs and financial costs and between intermittent and continuous power. Key mechanisms for delivering non-utility power to the grid are also discussed.

Chapter 2 focuses on energy efficiency. It is often, but erroneously, described as the low hanging fruit. Energy efficiency is primarily an economic tool, not an energy tool.

Chapter 3 focuses on the major types of renewable energy. We include Sea Water Air Conditioning in this section, although it is a displacement technology and not a renewable energy. That is, it diminishes the need for renewable energy rather than providing renewable energy.

In Chapters 4 we lay out the vision of what we want to accomplish. The key is recognizing that energy facilities are part of, and not separate from, the community. They need to be integrated into the educational system and there must be transparency at every level; data must be collected and shared.

OTEC systems utilize a number of specific technological components including very lengthy underwater pipes, and special heat exchangers, and they move around substantial amounts of water. The facility must be in waters 4000 feet deep. Underwater transmission lines are needed to bring the power to shore. To avoid the coastal reefs, the transmission line should be buried using Horizontal Directional Drilling (HDD).

While the oil industry brought us global warming, it also brought an understanding of oil rigs and other offshore platforms. Unlike oil operations, which tap into huge underground oil and gas fields that can leak or explode, the oil platform technology can serve as relatively benign platforms for renewable energy systems such as OTEC and wave energy facilities.

In Chapter 5 we discuss solutions for transportation.

Chapters 6-11 examine the impacts from various perspectives: environmental, cultural, social justice and economics.

The amount of electricity that could be generated is measured in megawatts (MW). The actual amount of electricity that is generated is measured in megawatt-hours (MWhr). The combined total of all electricity generating power plants operating in Hawai`i is about 2300 MW. Table I lists the amount of Renewable Energy that could be brought on line now, at today's prices and using current technology

Table 1: Potential Renewable Energy Systems (MW)

Type	Technology	Kaua`i	O`ahu	Maui	Moloka`i	Lana`i	Hawai`i	State
Baseload Power (MW)	Ocean Thermal Energy Conversion (OTEC)		1550				100	1650
	Geothermal			30			30	60
	Biomass	30		40	2	2		74
Semi-intermittent Power (MW)	Concentrated Solar Power	100	200	100	5	5	100	510
	Blowhole Wave Energy Conversion (BWEC)	30	200	10				240
Variable Power (MW)	Wind Farms		500	100	2		100	702
	Rooftop Wind		1					1
	Photovoltaic	20	200	20	2	2	100	344
	Hydroelectric	5					5	10
TOTAL (MW)		185	2651	300	11	9	435	3591

TIME LINE (2011-2025)

The large systems proposed within this document should be built over a 20-year period. Table 2 lays out a reasonable timeline for installing these future systems.

Table 2: Installation of Future Baseload Renewable Energy Facilities

Year	Kahe	Pearl Harbor	Kaneohe	Kailua-Kona
2015	Kahe Marine Research Park I (OTEC: 150 MW)			
2020	Kahe Marine Research Park II (OTEC: 200 MW)		Kaneohe Marine Facility (Wave Hub 200 MW)	NELHA Marine Research Park (OTEC 100 MW)
2025			Kaneohe Marine Facility (OTEC 400 MW)	
2030		Pearl Harbor I & II (OTEC 800 MW)*		

* Photovoltaic systems, algal biodiesel, micro-geothermal and/or batteries may displace need for OTEC.

APPENDIX 8: OTEC: ASSESSING POTENTIAL PHYSICAL, CHEMICAL, AND BIOLOGICAL IMPACTS AND RISKS (NOAA 2010)

OTEC BACKGROUND

OTEC is unique in that very large flows of water are required to efficiently operate. It is estimated that 3-5 m3/sec of warm surface water and a roughly equivalent amount of cold water from the deep ocean are required for each MWe of power generated (Myers et al., 1986). Therefore, for a small commercial sized facility (i.e., 40 MWe), this requires flows of 120 – 500 m3/sec (i.e., between 2 and 11 billion gallons per day).
In July 1981, NOAA issued the Final Environmental Impact Statement (EIS) for commercial OTEC licensing. Based on information available at the time, potential impacts were divided into three categories: major effects, minor effects and potential effects from accidents. ...

In 1986, NOAA's National Marine Fisheries Service (NMFS) built upon the 1981EIS and developed a report entitled "The Potential Impact of Ocean Thermal Energy Conversion (OTEC) on Fisheries" (Myers et al., 1986). This report attempted to quantify the impact of an OTEC facility to marine biota, and estimated losses due to entrainment (i.e., entering the system through an intake) and impingement (i.e., held against a surface by water flow). The report concluded that:

"The potential risk to fisheries of OTEC operations is not judged to be so great as to not proceed with the early development of OTEC. Due to the lack of a suitable precedent, there will remain some level of uncertainty regarding these initial conclusions until a pilot plant operation can be monitored for some period of time. In the meantime, further research on fisheries should be undertaken to assure an acceptable level of risk regarding the larger commercial OTEC deployments" (Myers et al, 1986).

While the NOAA NMFS report provides an overview of the types of impacts that could be expected, it did little to quantify the magnitude of the impact, as the estimates generated were speculative and relied on now outdated techniques and methods.
An example of this is the entrainment and impingement estimates, which were generated using an average composite of biomass in the Hawaii region. This technique ignored the ability of the facility to act as a fish attractant, thus increasing the concentration of organisms subject to entrainment and impingement. Some impacts may be minimized or mitigated through changes in operational or design parameters. However, the feasibility of design modifications due to environmental concerns needs to be weighed against the efficiency of energy production.

Mitigation measures that result in substantial reductions in the efficiency of an OTEC facility could cause a project to be economically unviable, and thus cancelled. While the easiest to identify impacts may be direct (i.e., biota directly killed through entrainment or impingement), cumulative and secondary ecosystem impacts may be much more of a concern and are much more difficult to assess. Cumulative and secondary ecosystem impacts will likely require careful long-term monitoring to distinguish effects, and may be impossible to fully evaluate due to ecosystem complexity.