

## TKC Leaflet: June 2007 Newsletter

### FRONT

#### Reshaping Our Energy Future



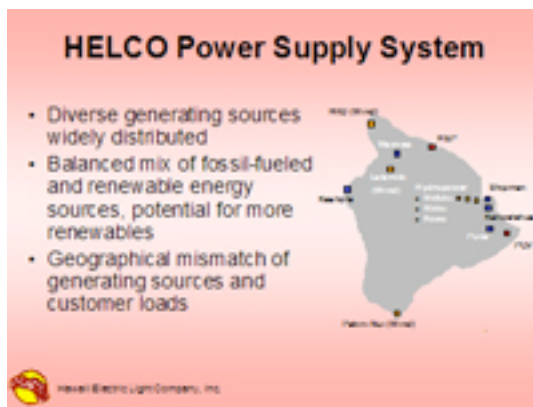
**Image:** Puna Steam Plant. Many of the island's major power plants are located at the sites of former sugar mills, which up until the completion of the island-wide grid in the 1960's provided power to the isolated communities of the island. Currently, much of the generation capacity is on the east side. Many of the power plants are old, built in the middle of the last century, and require extensive maintenance to keep them operating at their design output. Photo and caption courtesy of Curtis Beck, Manager of HELCO's Energy Service Department, from "Planning for a Sustainable Future" PowerPoint presentation, May 22, 2007.

*"Islands foretell the future for other systems. Islands have a limited natural carrying capacity, a limited resource base, and tenuous resource security. The immediacy of the problem is more dramatic here – when you run out of fuel, there are no quick fixes."* – [Marian Chertow, Ph.D.](#), Director of the [Industrial Environmental Management Program](#) at Yale's School of Forestry and Environmental Studies

If one draws a line down the center of Hawai`i Island to divide the west side from the east side, the energy picture that emerges is asymmetrical. Recent population growth has surged in West Hawai`i, an area which requires more than half of the 272 megawatts (MW) of the capacity that HELCO can distribute. Yet power production has been historically concentrated in East Hawai`i, where roughly 75% of the utility's power is produced. So the west side of the island imports power from the east - across miles of transmission lines. High fossil fuel costs, a relatively small population distributed across a relatively large geographic area, line losses, and aging infrastructure contribute to making HELCO's rates among the highest, if not the highest, in the nation. Current rates are 32.7 cents per kilowatt-hour.

The generation of renewable energy can help reduce costs. However, we

need to think through creative ways to change the current regulatory climate, so that incentives can be provided to the utility to construct renewable power generation facilities or purchase more power from independent renewable energy producers. HELCO already plans to beef up its distribution network through roughly \$75 million in transmission line upgrades over the next several years. Volatile oil prices and supplies threaten the Island's energy security, and the utility has no short-term plans to retire its least efficient fossil fuel plants. The challenges are compelling. As Council Chairman Pete Hoffmann phrases it, "we really have to push a noodle uphill."



**Image:** The existing HELCO power supply system. Slide courtesy of HELCO.

In collaboration with The Kohala Center, global leaders in industrial ecology at Yale University were engaged to help our County government rethink the Island's energy future. With \$90,000 in grant funding from three County Council members, a team of four Yale graduate students led by Professor Marian Chertow and Yale doctoral graduate Jeremiah Johnson were contracted to study the Island's energy system and prepare a draft Hawai'i County Sustainable Energy Plan. The team worked with Hawai'i Island and State of Hawai'i experts and community leaders. "The County Department of Research and Development and Bob Arrigoni, the County's Energy Specialist, provided intelligent leadership and support for this project," says Kohala Center Executive Director, Matt Hamabata.

After nine months of work, Dr. Chertow and Dr. Johnson presented their preliminary findings in two public meetings and at a stakeholder forum on May 22-23. Their preliminary report maps out over 60 strategies to achieve a more sustainable energy future in Hawai'i County, through energy efficiency measures, increased production of energy from renewable resources, and the transformation of Island electrical and transport systems. The preliminary report suggests that our Island environment is the perfect

place to implement solutions, through a combination of private and public initiatives. Indeed, we have tremendous opportunities to maximize energy efficiency and renewable energy production by implementing comprehensive and thoughtful measures now. [Learn more.](#)

## Encore!



**Photo:** Yale students visited with Edith Kanaka`ole Foundation (EKF) representatives as part of their cultural orientation to Hawai`i Island, in preparation for their work on the Hawai`i Energy Sustainability Plan. **From left to right,** Jeremiah Johnson (Yale Project Manager), Noe Noe Wong-Wilson (Hawai`i Community College), Dawn Lippert (Yale graduate student), Ulu Garmon (EKF), Zeke Hausfather (Yale graduate student), Claire Gagne (Yale graduate student), and Michael Davies (Yale graduate student).

If you'd like to hear more about the preliminary recommendations for a Hawai`i Island Energy Sustainability Plan, tune into "Island Issues" with Sherry Bracken airing soon on three local radio stations. Bracken taped interviews with Jeremiah Johnson, The Kohala Center's Project Manager for the preliminary recommendations, and with Bob Arrigoni, Energy Specialist at the Hawai`i County Department of Research and Development.

The first "Island Issues" interview will air Sunday, June 17, and the second interview will air on Sunday, July 15, on the following stations:

- 6:30 a.m. on KKOA, the country station (107.7 FM)
- 8 a.m. on LAVA 105, the oldies station (105.3 FM)
- 11 a.m. on KIPA, oldies (620 AM)

Read the [Executive Summary](#) and the full [Preliminary Recommendations](#) for a Hawai`i Island Energy Sustainability Plan.

## `Opihi Talk



**Photo:** Courtesy of Christopher Bird, Ph.D.

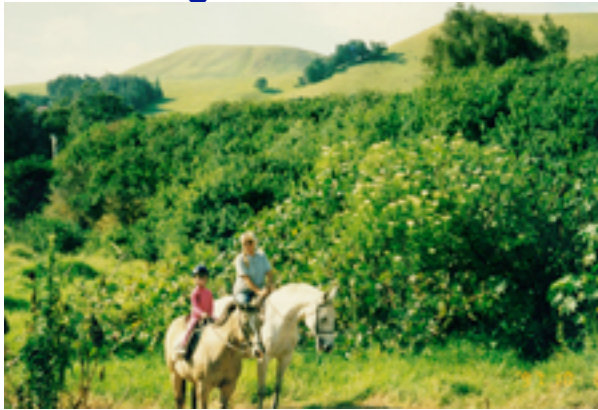
*"`Opihi graze on the intertidal rocks, keeping space open for new `opihi and other plants and animals to settle. `Opihi help maintain a natural rich diversity in the inter-tidal ecosystem. When `opihi are eliminated, the ecosystem changes and rocks get overgrown with macro-algae. This algae eliminates clear spaces and reduces natural diversity."* – Dale Sarver, Ph.D., `Opihi Restoration Project Coordinator

`Opihi (limpets) are a vital part of the Island's natural heritage. Unfortunately, `opihi populations around the island and across the State have declined dramatically over the past several years, due to over harvesting. The problem is compounded by the fact that people are taking immature `opihi before they can reproduce and replenish the population. The minimum legal harvest size is 1.25 inches, but the law is not enforced and largely ignored. Bills have been introduced at the State legislature to halt commercial fishing of `opihi, but these bills were defeated.

Dale Sarver is spearheading an effort to help repopulate the Island's `opihi. The **`Opihi Restoration Project** will enhance the wild stock with a hatchery-based stocking program. Christopher Bird recently finished his Ph.D. on `opihi at the University of Hawai`i at Mano`a, and he is also advocating for the revitalization of `opihi populations in the State. Another ally in the **`Opihi Restoration Project** is Bill Walsh, Ph.D., the State DLNR-Department of Aquatic Resources representative for Hawai`i Island. Walsh is involved in monitoring and protecting marine resources in Hawai`i, and he is familiar with the legal process necessary to change rules and laws governing the management of `opihi populations in the State. These three experts will present a talk, sponsored by The Kohala Center, on their efforts to

repopulate and better manage Hawai`i's `opihi. Join us on Friday, June 22, 2007, from 5:00 to 6:30 pm at the Sheraton Keauhou Bay Resort & Spa in the Keauhou Ballroom II for a free public talk, moderated by Glennon Gingo of the West Hawai`i Fisheries Council. And remember, if you do harvest `opihi, "take only those well over 1.25 inches in diameter and take only what you need," says Dr. Sarver.

## Embracing the Future



**Photo:** Riding through Waimea Homesteads is Judy Ellis on Ray and Malia Kissner on Dandy. Ellis is a member of the Waimea Equestrian Trails Association and the [Equestrian Land Conservation Resource](#). Ellis is advocating for keeping the horse in the Waimea Trails & Greenways use plan.

All around Hawai`i Island, in Kona, Puna, and now in Kohala, residents are participating in a monumental planning effort to direct the future development of their communities. The community development planning process has now begun in earnest in the districts of North and South Kohala. Steering committee members have been selected, planning consultants have been retained, and critical planning issues are being determined. Neighbors are working with neighbors to ensure that long-cherished places are preserved, long-awaited projects get implemented, and the voice of the people is heard as decisions which affect our landscape for generations to come are being made.

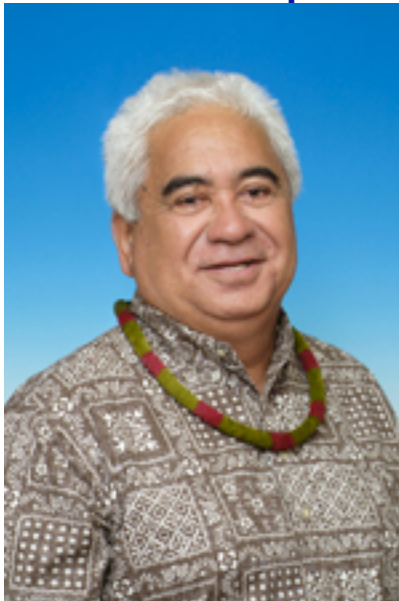
The process is off to a valiant start. Two pilot projects initiated by members of the Waimea Community Development Plan (WCDP) Committee are working their way through the County government with near universal support from local residents **and** from within the government administration. One project was to establish a district park for the town of Waimea on land promised to the community over a decade ago as part of Parker Ranch's 2020 rezoning. The other project was to down zone the 400+-acre State parcel behind Waimea town, which encompasses several sacred *pu`u* (hills). Preservation of this significant resource has been a broadly supported goal of

the community for decades. On May 24, The Hawai`i County Planning Commission voted unanimously to grant a favorable recommendation to the [rezoning application](#).

*"I almost choked up delivering an emotional plea in support of the rezoning and how important this was to the community. The basic idea is to use a power that the State has delegated to the County (the power to set minimum lot sizes) to prevent any residential development of a parcel that no one wants to see development on."* - Robert M. (Bob) Hunter, President of WCDP Committee and South Kohala CDP Steering Committee member

The next step is passage of the rezoning application by the Hawai`i County Council. Council Chair Pete Hoffmann authored the original request to rezone the parcel, and he will be supporting the measure before the Council later this summer. Hoffmann has pledged his ongoing support to the community development planning efforts in Kohala through a grant administered by The Kohala Center. [Learn more](#) about this important effort to educate, inform, and engage as many citizens as possible in planning for the future of our community.

## **New Leadership at OHA**



**Photo:** Trustee Bob Lindsey. Photo courtesy of Sterling Wong at OHA.

*"Bob was among the Native Hawaiian leaders who inspired our work from the very beginning. He has always believed that the Island of Hawai`i with its unique set of natural and cultural assets could become a world center of knowledge. We are honored to have him serve as a member of our Board of Directors. Bob thinks clearly and creatively, gives generously, and leads with*

*such great respect for Island communities. He is, simply put, a spectacular person.*" - Matt Hamabata, Executive Director of The Kohala Center

One of The Kohala Center's founding Board members, Bob Lindsey, has been named an [Office of Hawaiian Affairs \(OHA\) trustee](#). We asked Bob to share some thoughts about his appointment and about The Kohala Center:

"The interesting points are 1) my appointment was unanimous and 2) unprecedented in the time it took the Board to make a decision. There were six others being considered. In my mind, I was the lightweight in the group," Bob replied.

[Read more](#) by Bob Lindsey.

## **EES Alumna Awarded Fulbright Scholarship**



**Photo:** Dana Shapiro at Honopua Farm in Waimea, where she lived with renowned lei-maker, Marie MacDonald, in summer 2005.

Congratulations to Dana Shapiro, a brand new Fulbright Scholar! Dana will spend her Fulbright year working on sustainable agriculture in Israel. Dana participated in the [Cornell University Field Program in Earth and Environmental Systems \(EES\)](#) on Hawai`i Island in spring 2005. Dana feels that her semester in Hawai`i was a keystone experience that opened her eyes to new opportunities:

*"While the experience in Hawai`i did not directly motivate me to apply for a Fulbright in Israel, it helped shaped my academic interests and, in fact, the person who I've become. In this sense, the semester spent in Hawai`i played an indispensable - but indirect - role in the events leading up to my decision to study sustainable rural development in the Arava desert. After returning to Ithaca 2 years ago, I became much more involved on campus and in the greater community. I felt empowered to create the sort of change I wanted to see in the world, and had a better sense of what skills I could*

offer.” – Dana Shapiro, EES Alumna and Fulbright Scholar

Read more [from Dana](#) about the value of the EES Program.

## NEWS FLASH!



**Photo:** Kealakehe Intermediate ROV Team students accept their awards at BIRR.  
**From left to right:** Ari Matthews, Gunner Nagata, Cameron Fischer, Koloa Kalavi, Ileana Argyris (Team Leader), Jonathan Kutsunai (Team Leader). Additional team members not pictured are Kela Hauck, Alayna Machacek, and Lisa Diaz (Teacher).  
Photo courtesy of Lisa Diaz.

Kealakehe Intermediate 7th grade students won first place at the Big Island Regional ROV (Remotely Operated Vehicle) (BIRR) Competition and qualified to participate in the [MATE International Underwater ROV Competition](#) in St. John's, Newfoundland, Canada. Six Kealakehe Underwater ROV Team students are now busy fundraising to go to the International Competition on June 22-24. Teams from middle and high schools, and colleges and universities from around the world will be competing, including teams from Japan, Hong Kong, Iran, Pakistan, Spain, Canada, and the U.S. Kealakehe Intermediate's team is the youngest team and the ONLY middle school competing against high schools and colleges. Any assistance to send our Kealakehe ROV Team to the competition is encouraged and welcomed! Please contact Lisa Diaz at [lisadiaz@hawaii.rr.com](mailto:lisadiaz@hawaii.rr.com) for more information on the Kealakehe ROV Team and the MATE International Competition in Canada.

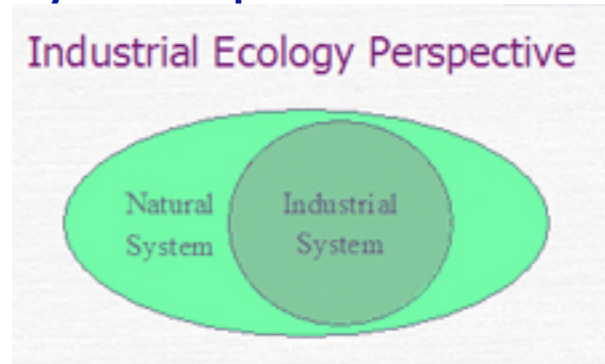


## TKC Leaflet: June 2007 Newsletter

### **BACK**

#### **Learning to Solve Our Own Problems**

**By Linda Copman**



**Image:** Model of industrial systems embedded in the natural system, courtesy of Marian Chertow.

*"We must put aside the things that are not good and focus on what is good. The well being of all of us rests in our unity."* – Cindi Punihaole, The Kohala Center's Outreach and Volunteer Coordinator

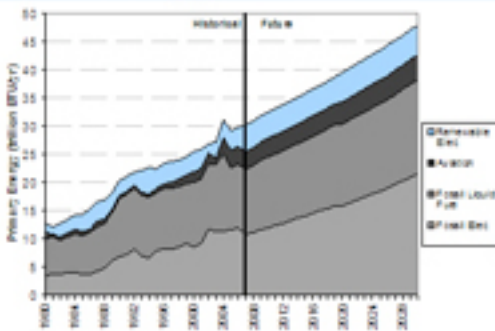
The field of industrial ecology looks at the intersection between industry and the environment and business and the environment. Industrial ecologists think of industrial systems as part of, or embedded within, the natural systems that encompass them.

Islands provide valuable case studies for looking at food, energy, water, buildings, and the natural environment, and examining how these systems interact and influence one another. Professor [Marian Chertow](#), Director of the [Industrial Environmental Management Program](#) at Yale's School of Forestry and Environmental Studies, has spent years studying island systems.

*"We've never really understood a system as well as we do here. Thanks to The Kohala Center, we have had unprecedented access to so many people that we would never have had otherwise. We asked these people questions and because they answered, we moved forward."* – Marian Chertow

Industrial ecologists carefully analyze the components of each system so that they can better understand whole system interactions. The tools that industrial ecologists use have the potential to help us, here on Hawai'i Island, strategize how to reduce our environmental impacts while maintaining our quality of life and strengthening our local economy.

## Future Energy Use: Status Quo



**Image:** Energy use projections through the year 2030, with no new renewable generation or efficiency measures. Image courtesy of Jeremiah Johnson.

Left to our own devices, the demand for fossil fuels and energy on Hawai`i Island is rising dramatically. In order to meet the island's energy needs in a sustainable way, we need to increase renewables, decrease the demand for energy, and decrease the importation of fossil fuels.

*"We are at the tipping point with Mother Earth crisping the way she is. I think we're ready for a paradigm shift. More than a third of Americans think that global warming is the No. 1 environmental issue, and most Americans want the government to do something. Most of us think that the effects of global warming will become irreversible within ten years. E.O. Wilson said that 'the human mind is incapable of seeing into the future and acting in the present.' We are the mutants!"* – Howard Wiig, Institutional Energy Analyst, Department of Business, Economic Development and Tourism, State of Hawai`i

The energy sustainability team analyzed our Island's current energy system and asked themselves if there are other ways to rearrange the "pie." They studied historical trends and various renewable options for the future, such as wind, solar, biomass, and geothermal energy. They analyzed imported fuels to see where they were going on the island.

The aim of all this analysis is to restructure the industrial system in a manner which is inspired by an understanding of biological ecosystems. Biological systems are cyclical, with virtually no waste products which are not utilized as the feedstock for a complementary system. Industrial ecologists look at separate industries to see what they might have in common and what resources they might share in an industrial symbiosis.



**Image:** Until 1991 Parker Ranch raised its beef on the island from birth to slaughter, but rising costs of feed made it more profitable to send the cattle off-island. Four barges leave the island each year, two in spring and two in fall, and Parker Ranch beef eventually makes it back to the shelves of Safeway as premium beef. Image courtesy of Marian Chertow and Jeremiah Johnson.

*"Talking to your neighbors is the prudent thing to do, especially in an island setting. In many cases, working together turns out to be both profitable and beneficial to environment."* – Marian Chertow

The stakeholders in Hawai`i County's energy system are certainly not all motivated by the same things. Yet all of them are key players in what the island's energy future will look like.

HELCO is a clearly a big piece of the mosaic. HELCO President Warren Lee made a pledge in 2005 that its Keahole plant would be the last fossil fuel power plant on the island. Curtis Beck, Manager of HELCO's Energy Service Department, says that HELCO does wish to build on the vision of a more sustainable energy future for the island. "The paradigm is changing now, and we're being asked to change too. We can't turn on a dime, however. We need to do this in a cost effective way," says Beck.

HELCO's major challenges include ensuring system stability and getting the system back to work following line faults and generation loss, as occurred after the October 15, 2006 earthquake. The utility is also working on optimizing unit scheduling based on more accurate hour- and day-ahead forecasts of intermittent resources, like wind and solar energy. HELCO currently has 56 MW of "as available" generation capacity, in addition to its 272 MW of "firm" power generation capacity.



**Image:** Hawi Renewable Development wind energy facility in North Kohala, Hawai`i. Image courtesy of HELCO.

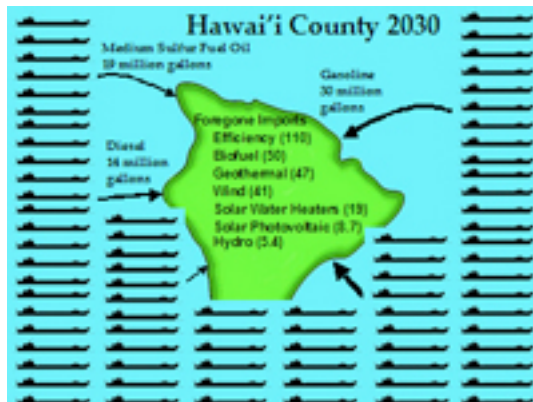
Wind energy, in particular, has been problematic for the utility. As the wind fluctuates, the output from the wind generation facility goes up and down, causing deviations in the frequency of the power output from that facility.

“Our other units must compensate for these deviations,” says Beck. “If we deviate too much, we could lose the entire grid. If there is an imbalance in our system caused by a drop in wind production, there are no neighboring utilities to carry us through this drop. We need to deal with this issue here on this island. To minimize frequency deviations, we need to have reserve capacity. We have to change our centralized controls and basic operating practices to manage this. We are a world leader in integrating wind into our system, as are the islands of Crete and Maui.”

HELCO is exploring better storage options for “as available” resources and how to integrate these options into the existing system. HELCO is also considering how Island grown biodiesel fuels might offset its current demand for petroleum-based diesel. HELCO currently utilizes its diesel plants to meet peak evening demand, starting about 40 to 50 minutes after sunset each day.

Jeremiah Johnson, Ph.D., is the Project Manager for The Kohala Center’s portion of the Hawai`i County Energy Sustainability planning process. According to Johnson, Hawai`i Island imports 74 million gallons of gasoline each year. Our per capita aviation fuel use is among the highest in the country. Hawai`i Island’s costs for imported fuel in 2006 were roughly \$580,000,000, while estimated energy costs for 2007 are as high as \$750,000,000. Projections for the year 2030 at rising consumption rates are clearly unsustainable.

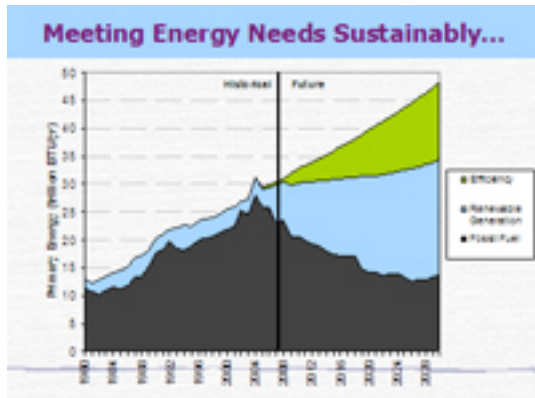
"There are too many barges to count." – Jeremiah Johnson



**Image:** Each barge represents 5 million gallons of petroleum-based fuel/year. The preliminary report recommendations will displace 71% of the demand for imported petroleum by 2030, or 280 million gallons worth. Image courtesy of Jeremiah Johnson.

The energy sustainability team took a look at a large sweep of possible actions to help level future energy growth and to aggressively pursue renewable generation. Hawai`i County is blessed with a wide variety of opportunities in this latter area. The team provided options for efficiency and renewable generation that could potentially reduce imports to about 29% of the total energy resources by the year 2030 and direct the island toward a much more sustainable future.

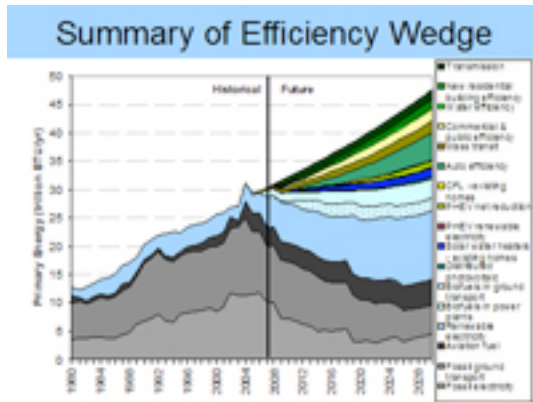
The energy sustainability team's energy plan has redistributed the pie to save the energy equivalent of 110 gallons of diesel per year through increased efficiency measures, and to increase renewable energy generation through biofuels (50 gallons of diesel equivalent/year), geothermal (47 gallons of diesel equivalent/year), wind (41 gallons of diesel equivalent/year), solar water heaters (19 gallons of diesel equivalent/year), solar photovoltaic systems (8.7 gallons of diesel equivalent/year), and hydropower (5.4 gallons of diesel equivalent/year) by the year 2030. "Renewable resources, like the existing wind generation facilities in North Kohala and at South Point, are already saving us 29 million gallons of fuel annually that we would otherwise be importing," says Johnson.



**Image:** The sum of the potential benefits of enacting 68 of the recommendations in the preliminary energy report. This scenario meets the County’s goals for greater self-sufficiency, conservation, and increasing the use of renewables – as a means of addressing the very high costs of energy and making the island less susceptible to fluctuations in imported oil. Image courtesy of Jeremiah Johnson.

Energy efficiency measures include adopting a model energy code to set baseline regulatory guidelines for new construction, the type of code that is already in effect on all the other Hawaiian Islands. The preliminary plan also recommends treating very large homes similar to commercial users and applying higher commercial energy efficiency standards. The recommendations also include incentive-based approaches like environmental labeling, streamlining the permitting process for “green” buildings, and offering tax credits to builders who design energy-efficient buildings. The report calls for public outreach to educate consumers about the immediate cost benefits they can realize by replacing incandescent light bulbs with compact fluorescent bulbs (which use about 75% less energy and pay for themselves in less than two months), by installing solar water heaters (which typically pay for themselves in two to three years), and by choosing Energy Star appliances.

*"As far as I'm concerned, the future for this issue begins today. We have to convince the developers and the taxpayers that their investment in energy self sufficiency will be returned manifold in the future. We have to show the people living and working on the island that this plan makes sense, and that we can serve as a model for the rest of the country."* - Pete Hoffmann, Chairman, Hawai`i County Council



**Image:** This diagram summarizes where all of the energy savings proposed in the preliminary recommendations will come from. Slide courtesy of Jeremiah Johnson.

The report states that the County should require higher efficiency standards for their own operations, and thereby set an example for others. For example, the County Department of Water Supply (DWS) uses 5% of all electrical energy consumed on the island. Currently, 44% of all the water pumped through the DWS system in Hilo is lost due to leaks in the system. Leak detection systems are in place, but the DWS needs financial support to repair the leaks and stop this hemorrhaging – providing the County with excellent opportunities to save water, energy, and money.

Mass transit is another phenomenal success story on the island. After it adopted a free ridership model 2 years ago, ridership within the County increased dramatically. The County has augmented the initial success of the free buses by improving the number and availability of buses. Riding the bus just once or twice per month saves energy, reduces congestion, enhances traffic safety, and saves commuting costs for residents.



**Image:** General Motors has announced its intention to release the Chevy Volt in 2010, which will run on plug-in electricity, then on gasoline/diesel. This plug-in hybrid will allow owners to run their car on solar, wind, or geothermal power, as available. Photo courtesy of the Associated Press.

Other key recommendations advanced in the preliminary report include:

- For HELCO, retire the Puna Steam and Shipman power plants and replace them with another source of firm renewable power. The existing geothermal plant has up to 60 MW of existing capacity (roughly double its current output). To meet future demand, it is recommended that 40 MW of wind be added to the system, coupled with “pumped storage hydro”, which is a technology used to eliminate the intermittency of wind.
- Adopt a “fee-bate” for personal autos, whereby owners of inefficient autos pay fees and owners of efficient models receive rebates, to encourage the purchase of more efficient vehicles.
- Encourage the use of plug-in hybrids, which, when available, can travel the first 40 miles on an electric charge. Combined with the use of “smart” meters, which charge customers based on the time of day they plug in, these vehicles would utilize HELCO’s excess night-time capacity and save their owners money.
- Create energy zones within the County to incentivize the production of bio-crops. There is potential to produce 100 million gallons of biofuels on the Island per year, if we can clearly establish crop viability and yield rates for investors. The report notes that biofuel production should be carefully examined for its interaction with food production, to assure that sustainability and security is maintained for both types of crops.
- Incorporate the costs of greenhouse gases into future planning projections, as these will undoubtedly become part of the economics of energy production in the near future.

*“We need to work together. We have to learn to solve our own problems. Earth is our island – that’s the island that we have to work together to save.”* - Kyle Datta, formerly Managing Director of RMI, now with US BioDiesel Group





**Image:** *"We truly are on an island."* Image and caption courtesy of Kyle Datta, U.S. BioDiesel Group.

The full preliminary report is available online at [www.kohalacenter.org](http://www.kohalacenter.org). Professor Chertow invites the public to provide input on the preliminary report. "It's hard to get it right when you're far away and not here every day. We welcome your comments and your feedback on the plan," she says. Please email your feedback to [jeremiah.johnson@yale.edu](mailto:jeremiah.johnson@yale.edu) by June 18, 2007, to be included in the first round of comments. Additional public meetings will be held throughout the summer, providing further opportunities to comment.

The Kohala Center would like to thank the County of Hawai'i's Department of Research and Development, especially Jane Testa, Director, and Bob Arrigoni, Energy Specialist, Professor Marian Chertow, Jeremiah Johnson, and Yale students Michael Davies, Claire Gagne, Zeke Hausfather, and Dawn Lippert for their outstanding work on this report. Michael and Claire will be on island all this summer to make sure that community input is solicited and incorporated into the plan. The final report will be submitted to the Hawai'i County Council in October 2007.

Learn more about the Yale team members below. These brief autobiographical statements were written by the individual team members themselves.

### **Marian Chertow**



**Photo:** Courtesy of Yale School of Forestry & Environmental Studies.

Professor Marian Chertow, Ph.D. has been a Director of the Industrial Environmental Management Program at the Yale School of Forestry and Environmental Studies since 1991. Her teaching and research focus is on industrial ecology, business/environmental issues, waste management, and environmental technology innovation. Her most recent research involves the study of industrial symbiosis - including geographically based exchanges of energy, water, and material byproducts within networks of businesses. The central focus of this work is a long-term study of business clusters on islands. Chertow is also on the founding faculty of the Masters of Science in Environmental Management Program at the National University of Singapore. In 2006 she was named a Visiting Professor at Nankai University's National Center for Innovation Research on Circular Economy in China.

Prior to Yale, Chertow spent ten years in environmental business and state and local government, including service as President of the Connecticut Resources Recovery Authority, charged with developing a billion dollar waste infrastructure system for the state. She is an original member of the Advisory Board of the Connecticut Clean Energy Fund, which is developing renewable energy and fuel cell projects to increase the availability of green energy in the state. She is a frequent international lecturer and has testified on waste, recycling, and other environmental issues before committees of the U.S. Senate and House of Representatives. She holds a BA from Barnard College, Columbia University, as well as an MPPM and a Ph.D. in environmental studies from Yale University.

**Jeremiah Johnson**



Jeremiah grew up in a small town in upstate New York in the foothills of the Adirondack Park, spending his free time hiking and camping. After graduating with a Chemical Engineering degree from Clarkson University, he worked in the Environmental Health and Safety Department of a corn mill in Iowa for a short period, before starting his graduate studies in Yale's Environmental Engineering Program.

In January 2007 he finished his Ph.D. and has since been dedicating his time to managing the Hawai`i County Energy Sustainability Plan research project. Jeremiah has found this project amazing for several reasons, including the unprecedented level of excitement and dedication that the residents of Hawai`i Island have for their home. Residents recognize the need for change and are eager to make it happen – this was evident from the tremendous turnout at the public meetings for the preliminary report. Jeremiah also believes that the County Council and Administration are acutely aware of the need to improve the Island's energy security and environmental performance.

One of the most surprising findings of the study, according to Jeremiah, is the great potential to reduce energy demand through efficiency measures. Without sacrificing consumer choice or access to the services that the residents need or want, energy efficient technologies can be employed to greatly reduce demand.

Following this project, Jeremiah will begin work at PA Consulting in Cambridge, Massachusetts as a member of their energy team. He would like to thank The Kohala Center for making this project possible and for providing his team with access to many of the key stakeholders in Hawai`i Island's energy system.

## Michael Davies



*(Editor's Note: Michael's work focused on increasing demand-side efficiencies in the residential and commercial sectors, including improving building codes on the Island and incentivizing businesses and resorts to improve their energy efficiency.)*

Michael Davies is an Australian who grew up in London, Denmark, the Middle East, South East Asia, the Far East, India, and the U.S. His father's career in the oil services industry meant he and his family moved regularly. Being exposed to large-scale energy projects in different parts of the world sparked Michael's interest in energy at a young age.

Michael graduated from the University of Rochester in upstate New York in 1997 with a degree in Environmental Sciences. He worked for almost 9 years as an environmental consultant on remediation, water, and wastewater projects in numerous states in the South and the Northeast, as well as in Saudi Arabia. In 2006 he fulfilled a long-term goal to get his masters degree. His focus is on energy and sustainability in the urban and built environment.

For the *Hawai'i County Energy Sustainability Plan* research project, Michael focused on energy efficiency and demand-side management in the built environment. One conclusion that has been evident to Michael and the rest of the group is the need for a multi-faceted approach to energy sustainability in Hawai'i County. More effective energy demand management is a first step that must be done in conjunction with the development of supply alternatives. While working on this project, Michael was greatly encouraged by two facts: (1) there are many effective and innovative demand-side management programs being implemented all over the world, and (2)

Hawai'i is in a unique position with its climate, excellent resources, and population size to be able to implement effective change. Propelled by the interest in environmental issues that the County population has, Hawai'i can be a national leader in energy sustainability.

### Claire Gagne



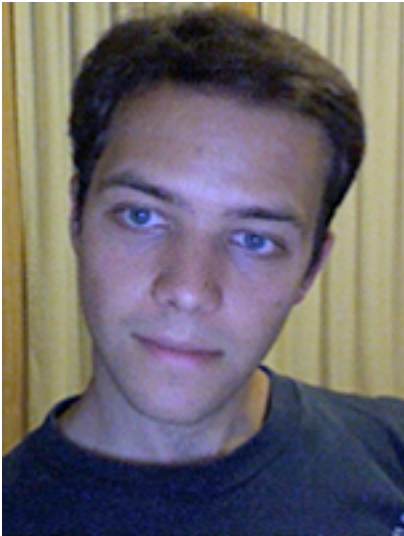
*(Editor's Note: Claire's work focused on integrating plug-in hybrids into the Island's transport system, including consideration of incentives for rental car companies and consumers to switch to plug-in hybrids, incentives for establishment of recharging stations at resorts, and incentives to plug-in at night during off-peak hours.)*

Born and raised in East Maui, the concept of *malama 'aina* (kinship with the land) played an influential role in my childhood. When I left the island for college, it was with the expectation that my education would allow me to help protect Hawai'i's unique and spectacular natural environment.

Though my original plan to become a marine biologist morphed into a passion for politics and economics, the environment has remained my primary academic, professional, and personal interest. It was through my undergraduate study of environmental policy that I discovered the energy field, which became the focus of my master's coursework at the School of Forestry and Environmental Studies. I am particularly interested in pollution credit trading and greening the transportation sector.

There will be opportunities to engage in discussion, ask questions, and provide feedback on the Hawai'i County Sustainable Energy project throughout the summer months. It is through collaboration that we will achieve the best solutions to our energy needs, and I look forward to working with you to create a truly sustainable energy strategy for the Island.

## Zeke Hausfather



*(Editor's Note: Zeke concentrated on supply-side issues, with the premise that renewable power generation can reduce the cost of energy for the people of the Island. Zeke looked at storage options for wind energy, including pumped hydro, to stabilize the output from wind energy facilities and make them "firm" - as opposed to "as available" - sources of power.)*

From hiking around rural Northern California as a child, I've always had an abiding love for the outdoors. During my undergraduate experience at Grinnell College in Iowa, I became increasingly aware of the importance of environmental policy and preservation and helped lead the student environmental group. While in college, I worked with a number of different non-governmental organizations including Greenpeace, Rainforest Action Network, USPIRG, MASSPIRG, and Forest Ethics. Working on market-based campaigns helped provide insight into the importance of private sector decisions and incentives on natural resource use. I then turned away from environmental organizing and toward research, working on joint forestry management and micro-finance programs in India, and analyzing the international market for shark fins and shark landings in India with the Centre for Maritime Research at the University of Amsterdam. I also spent a year in the Netherlands on a Fulbright fellowship working for Cesar Environmental Economics Consulting on coral reef valuation projects.

Since coming to graduate school at Yale, I've become increasingly interested in the intersection of energy and climate issues. I want to work on the long-term transition away from fossil fuel resources in a manner that is least disruptive to both the economy and environment. The task of transforming the global economy into a form that is sustainable within the global environment will be the great challenge of our generation, and I hope to play

whatever role I can.

The Hawai`i project provided a unique, hands-on research experience for us all in an environment where our work can actually make a difference. I worked on the supply side recommendations for the report, developing a model to measure the price savings of renewable sources vis-a-vis oil-based generation under different assumptions about avoided cost linking, carbon pricing, etc. I also examined potential storage options that could be developed in Hawai`i County to “firm up” intermittent renewables and allow the expansion of renewable energy generation without destabilizing the grid. Working on energy supply issues on an isolated, small island micro-grid really opened my eyes to the numerous challenges facing the effective development of renewable energy and the difficulty of replacing locked-in infrastructure.

### **Dawn Lippert**



**Photo:** Dawn Lippert in New Delhi during my internship at The Energy and Resources Institute in summer 2006.

*(**Editor’s Note:** Dawn’s research focused on distributed generation options for the Island and on solar water heating for the residential and commercial sectors.)*

Growing up in Mercer Island, Washington, I developed a love of exploring, for wilderness, and a special passion for efficiency. As an undergraduate at Yale I majored in environmental studies and took every opportunity to explore the world by traveling abroad. I lived in Peru, Puerto Rico, and India during my summers in college and loved learning about environmental and social challenges by working for the U.S. government and non-governmental organizations in these places.

Now that I am at the Yale School of Forestry and Environmental Studies

(FES), I have focused on energy and the efficient use of resources. This is an exciting field because things can always be made more efficient. When I graduate from FES in May, I will be pursuing these interests by doing renewable energy and energy efficiency consulting in Washington, DC.

For the Hawai`i County Sustainable Energy Plan, I looked at distributed generation (exploring how homeowners and businesses can save money and contribute to Hawaii's energy sustainability at the same time) and public transportation (looking at opportunities for residents to use more efficient means of transportation).

Of all the things I learned in the course of this project, the most surprising for me was discovering how far Hawai`i has already come in its thinking about energy. The County has replaced all its traffic lights with LEDs, eliminated the fees for public buses, and explored other creative and innovative ideas with respect to energy generation and use. I hope that the Sustainable Energy Plan can build on this impressive list of accomplishments to help create an even more unified, comprehensive, and effective plan for the County.

## Grassroots Planning

By Andrea Dean



**Photo:** Andrea Dean of Andrea Dean Project Management, working on the final edit of the Waimea CDP Newsletter.

*"In contemporary Hawai`i -- and particularly in Waimea -- the settlement rate of new residents has been set on fast forward. The South Kohala District is growing in population so rapidly that the physical and social infrastructure strains to accommodate the change. With a population growth averaging between 4 and 5% a year for the past 15 years, an open, informed, and inclusive community planning process will be necessary to adequately*



*address infrastructure and quality of life concerns.”* – Betsy Cole, Deputy Director of The Kohala Center and administrator overseeing this project

In 2005, the County of Hawai'i launched its Community Readiness Program, to introduce the Community Development Plan process, provide education about planning concepts, solicit community input in identifying problems and future opportunities for the community, and to plan and implement some small projects. In response, the Waimea Community Development Plan (CDP) Committee was formed to help meet the goals of the Community Readiness Program in Waimea.

Since January of this year the Waimea CDP committee has held and helped promote through email, flyers, website announcements, and the local media the following educational community events:

**February 1, 2007** - Waimea Community Association Town Meeting with Chris Kanazawa, President & CEO of Parker Ranch on land planning

**February 21, 2007** - Waimea CDP Committee presentation with Pat Engelhard, Director, County of Hawai'i Department of Parks & Recreation on planning for parks in Waimea

**March 1, 2007** - Waimea Community Association Town Meeting with Carolyn Stewart on the Wai'ula'ula Watershed Management Project

**March 19, 2007** - Hawai'i State Department of Health & Hawai'i County Planning Department "Healthy, Livable Communities Workshop" with Mark Fenton, public health consultant & national pedestrian advocate

**March 21, 2007** - Waimea CDP Committee presentation with Bob Hunter & Margaret Wille on "Finding Nature in Waimea"

**April 4, 2007** - County of Hawai'i Public Access, Open Space, & Natural Resources Preservation Commission Community Meeting

**April 5, 2007** - Waimea Community Association Town Meeting with Clam Lam & Kaz Shigezawa on the Waimea Trails & Greenways Project

**April 18, 2007** – Waimea CDP Committee presentation on "Eating Locally Grown Foods & Food Security for Hawai'i Island" with Nancy Redfeather & Jan Dean

**May 16, 2007** – Waimea CDP Committee presentation with Judy Ellis on

"Sharing the Trail," with information on how other communities have accommodated horses, bikes and hikers on the same trail

The community is welcome to attend the next presentation:

**June 20, 2007** - Waimea CDP Committee presentation with Bob Hunter called "SHOW ME THE MONEY! Transportation Concurrency: What Is It? How Does It Work?" at 6:00 pm at the Waimea Community Center

Over the course of the past two years, the Waimea CDP Committee has developed a very comprehensive resource website at [www.waimeaplan.org](http://www.waimeaplan.org). The CDP Committee also produces a quarterly newsletter, which is mailed to every postal address in Waimea and emailed to interested residents. The [March newsletter](#) highlighted progress on pilot projects, including rezoning the State parcel above Waimea and the Waimea Park Project. To sign up for the next Waimea CDP electronic newsletter and to receive notices upcoming meetings, visit [www.waimeaplan.org](http://www.waimeaplan.org) and fill out the "Sign Up for Our Newsletter" box.

## Island for Learning

By Bob Lindsey



**Photo:** Mauna Kea, the Earth's tallest mountain, soars 31,824 feet – with only 13,796 feet visible above sea level. Photo courtesy of *Mountains from Space*.

I feel very blessed to be at OHA at this point in time. The organization is stable, mature, and has emerged from a prior phase of "growing pains." My skills, interests, and focus are in bridge building, partnership development, peace building, positive action, land management, economic development, and revenue generation. I am sure I will find areas where I will be able to advance OHA's Mission and be of service to our People.

I met Matt Hamabata (now Director of The Kohala Center) before The Kohala Center was created, probably back in 2000. John DeFries with Friends of the

Future set up a meeting for us at the Outrigger Keauhou Beach Hotel to talk about educational possibilities and potential here on Hawai`i Island. The thought was to use our Island as an Island for Learning, a “classroom without walls.”

I value the work of The Kohala Center because one of its foundational pieces is its sensitivity to the host culture and the host people of these Islands. Honoring and respecting the culture, the people, and the Island is at the heart of all that we do. In using the land, the water, and the sky as educational tools, *malama`aina* (kinship with the land) is foremost. Matt and his folks have found a way to bring science and culture, scientists and practitioners together, to advance education here on our Island. And I believe this is what makes The Kohala Center unique and special.

## Powerful Rewards

By Dana Shapiro



**Photo:** Dana Shapiro holding a green sea turtle, as a volunteer with the Hawai`i Preparatory Academy NMFS Sea Turtle Research Program.

By the end of my sophomore year at Cornell, I had become very uninterested in classes and frustrated with the institution's reward structure, which is and was largely based on competition among peers. I considered dropping out of college, but eventually decided to study abroad for one year instead. I spent the fall semester in Vienna, Austria and the spring in Hawai`i. Looking back, the semester in Hawai`i was probably the most exciting, intellectually fascinating, challenging, and rewarding semester of my entire college education. As a natural resources major, I found that learning about environmental science from a “systems” perspective in the field was much more stimulating and effective than in the lab.

Most of all, I benefited from working intimately with the professors, which I had never done previously at the Ithaca campus. The professors in Hawai`i inspired me with their ability to balance a serious and fruitful academic career with family, kindness and patience, and continuous good humor. In fact, these individuals were some of the most important role models I've ever had. Cornell should continue to offer the Hawai`i program to students because of the added value of a personal experience, which, in my opinion, is the most powerful learning medium for both intellectual and personal development.



**Photo:** Dana Shapiro holding some Island-raised meat in Merriman's Restaurant.

A few experiences in particular changed my outlook on life: an internship at Ola Honua, a permaculture-based bamboo farm on Maui, and a job directing Merriman's Farm Visits and Dinner (an agritourism venture on Hawai`i Island) during my last 3 months on the Island. These opportunities gave me the chance to actively participate in sustainable rural development efforts, and helped me better understand my niche - which involves the role of private firms, particularly agriculture and food businesses. The Hawai`i program also inspired me to pursue ambitions openly and intensely - which I learned by working closely with the professors and learning about Native Hawaiian culture. So while the program didn't directly lead me to Israel, it helped lay the foundation for me to begin thinking about sustainable rural development from an academic viewpoint and provided many of the tools needed to apply for a competitive scholarship.

Note that I didn't mention that the Hawaiian Islands provide an ideal "classroom" to learn about earth and environmental systems because I think this value has already been discussed at length. But, of course, this is

another profound reason why the Cornell Hawai'i program should continue. No other geographic location has such a diverse combination of resources, eco-zones, socio-cultural traditions, etc. - which ultimately helps us understand the interconnectedness of our planet and the importance of sustainable development.