SECTION 9: SUCCESSFUL PLAN IMPLEMENTATION CONSIDERATIONS

A. Next Steps

The KESP final recommendations were presented to the Kaua`i County Council on April 14, 2010. Next steps could include the following, in part undertaken by the Mayor's Office and the Kaua`i County Council:

- Debate
- Craft legislation
- Adopt legislation, e.g. in the form of a resolution
- Work with Finance Department to levy taxes.

While the SENTECH Hawai`i Team does not want to be overly prescriptive in how the citizens of Kaua`i implement the KESP, it would urge the community to consider the following concepts.

B. Forming a Sustainable Energy Team

There are many stakeholders, vested interests, and strong opinions regarding the reduction of energy demand and the increase of sustainable energy supply on Kaua`i, which could create conflicting or competing interests in regard to the successful implementation of the KESP.

To increase the odds of the successful and timely implementation of the KESP, a ***Sustainable Energy Team*** (SET) should be formed with the following operational parameters:

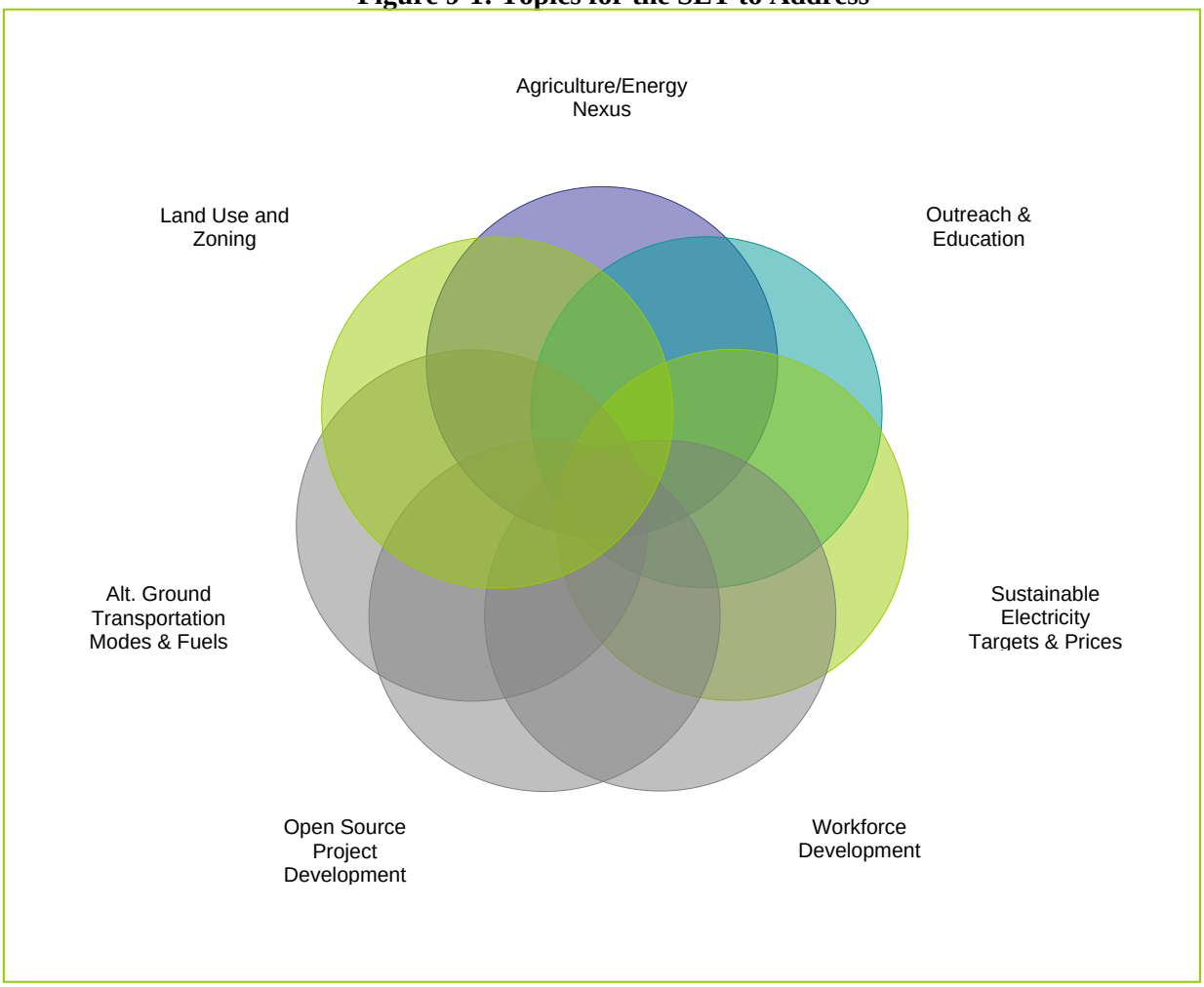
- Meet quarterly to ensure progress
- Report to Mayor's Office
- Funded by County Fossil Fuel Tax + KIUC Franchise Tax Increase
- Facilitated by third party to ensure objectivity.

The SET could be structured along conventional committee lines, e.g.:

- ***Executive Committee***
  - Track funding & expenditures, set course for implementation, conduct outreach
  - Members could include County Office of Economic Development, KIUC, EPAC.
- ***Topical Issues Committees***
  - To assess information on special topics, make recommendations to Executive Committee
  - Participants could include KEDB, Farm Bureau, Environmental Groups, Kaua`i Community College, Investment Community, DBEDT, Auto Dealers, Refineries, Developers, Land Owners. Others are discussed below.

Figure 9-1illustrates topical issues that the SET may want to address and Topical Issues Committees that it would want to form; these issues will be explored in further detail below the illustration.

Figure 9-1: Topics for the SET to Address



1. Land Use & Zoning

Land use and zoning are key factors in achieving Kaua`i's's energy sustainability goals for both the ground transportation and electricity sectors.

Wherever ground transportation demand strategies are achieving some success, land use has been an important part of the mix of strategies. One way in which land use patterns will have a major impact on energy demand in the future is by influencing the number of vehicle miles traveled within a community. The challenge is to create communities where people can satisfy most of their daily needs by walking, biking or public transit. A study for Kaua`i conducted by the American Institute of Architect's Sustainable Design Assessment Team (SDAT) recommended a number of land use/smart growth projects to implement in Kaua`i in order reduce commuting distances. The SDAT land use group recommended concentrating implementation efforts on a few initial model projects in order to focus community attention on visible locations, maximize available resources, and demonstrate the principles and practices outlined in this report.[1] The ultimate goal is to reduce the miles traveled between home and work.

[1] Sustainable Design Assessment Team (November 2008). "Lihu`e, Kaua`i, HI SDAT: Building a framework for a sustainable future."

As an example, the Colorado city of Boulder capped Vehicle Miles Traveled (VMT) at 1994 levels in their 1995 transportation plan. While there has been some growth in VMT, it is very possible they will be able to bring down VMT to 1993 levels by their target date of 2014. Nationally, considerable attention is being focused on VMT growth, and especially per capita VMT. It is possible the new Surface Transportation Authorization bill will deal with VMT objectives nationally and may tie certain kinds of funding to VMT management objectives and strategies. If so, by including VMT targets in this energy sustainability plan, Kaua`i can get ready to qualify for potential federal funds.

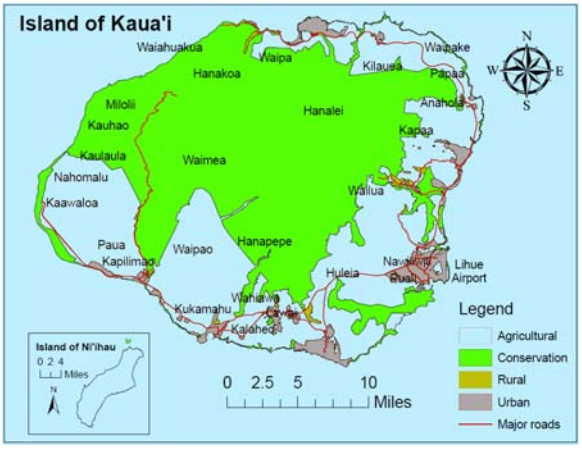
Smart growth is a pattern of development that concentrates growth in cities or towns to avoid urban sprawl, promotes multi-modal transportation, and expands the range of employment and housing choices within a community. Compact, mixed-use, interconnected, and pedestrian-friendly neighborhoods have proven to reduce the need to drive, and therefore the amount of energy used within a given area. In three American cities—Boulder, Portland and Boston—where progress is being made in reducing auto dependency, land use strategies have been pivotal. With some modification, they could be applicable on Kaua`i. Both Boulder and Portland worked with urban growth boundaries to contain growth within a certain radius of the city core. Urban growth boundaries around all the towns on the island could easily work on Kaua`i. It will provide multiple benefits: a land use pattern of towns linked by transit that will provide a sound foundation for an efficient transit system, the protection of agricultural lands, and lower cost of public and private infrastructure because the service areas will be compact and the people served per area will be greater.

Other applicable land use strategies could include:

- Extensive traffic calming and giving priority to pedestrian, transit and biking infrastructure improvements;
- Reducing parking requirements for new residential and commercial development while increasing requirements for non-auto transportation infrastructure—such as requiring a certain percentage of any development to be within a 5 minutes walk of a transit stop and ensuring pedestrian travel is as easy or easier than car travel within those developments; and
- Revitalization and/or preservation of the town cores and main streets.

Regarding land use for energy crops on the supply side, Kaua`i historically had 70,000 acres in sugar, but today land is being subdivided making it harder to do large-scale agriculture or energy park development. There is also stiff competition for land from seed corn companies and condo developers—each often offering higher returns for land than for energy crops. It may be beneficial for the SET to engage State land owner/manager entities (e.g. DLNR, DHHL, Land Use Commission) to find common ground between land conservation and energy sustainability from both liquid fuels and renewable energy.

Figure 9-2: Kaua`i Land Use Districts



The Hawai`i Bioenergy Master Plan notes that agriculture lands almost encircle the central highlands of Kaua`i, taking up most of the coastal lands from the Mana region on west Kaua`i southward to Hanapepe, around to Lihu`e, and along the eastern coast and the North Shore to Hanalei. Figure 9-2 illustrates the land use districts, as set by the State Land Use Commission in Hawai`i.[2] Major agricultural production on Kaua`i is of sugarcane along the southern coast, ranchlands

[2] Hawai`i Natural Energy Institute (2009). *Hawai`i Bioenergy Master Plan Project*. Volume 2: Land and Water Resources. Retrieved on 9/8/10 from http://www.hnei.hawaii.edu/bmpp/stakeholders.asp.

around much of the eastern side, and taro and other vegetable and fruit crops on the North Shore. Areas that could potentially serve as biodiesel crop cultivation zones are the Mana Plain, the region south of Kōloa, near the Waita Reservoir, and parts of the Lihu`e Basin—as seen at right in the *Islands of Kaua`i with State Land Use Districts* map from the Hawai`i Bioenergy Master Plan, Volume I.

The County's re-zoning of any properties which are not owned by the County is always challenging. Zoning Districts and "Generally Permitted Uses" within these districts are established in Chapter 8 of the County of Kaua`i Comprehensive Zoning Ordinance (CZO). Amendments to establish new uses and zoning districts are required to be approved by the Kaua`i County Council.[3]

2. Agriculture/Energy Nexus

Since land use for food and energy are both such large issues on Kaua`i, it will be beneficial to the community to engage the Kaua`i County Farm Bureau (KCFB). Food and energy are inseparable from each other in this model and it is vital in planning that the community recognizes the interconnection between the two.

KCFB represents over 300 members on Kaua`i, including farm families, agricultural businesses, individual growers, resource people and friends of farmers. KCFB works actively with agricultural commodities grown on Kaua`i through the government affairs and commodity group committee, which currently includes representatives from the professional associations for coffee, floral/nursery, cattle and livestock, seed industry, tropical fruit, as well as other crops grown for our farmers markets and for export. By working with KCFB, it will help ensure regular communication between the two sectors, to ensure that strategies to implement energy on Kaua`i complement other uses of our natural resources and minimize conflicting use where possible, and to ensure that the needs of some of rural residents and businesses are considered to maximize benefits of the plan throughout the island community.

KCFB has already made some helpful recommendations, including:

- Conducting an inventory of land and water resources before any land is used for growing biofuels and/or the placement of renewable energy facilities. Protecting prime, irrigated agricultural land is a top priority. It would not be recommended to appropriate agricultural lands for biofuels without insuring that these prime lands are set aside for diversified agriculture and livestock. Already agricultural lands have been reduced due to development and "gentleman's estates." Infrastructure is in need of maintenance and repair.
- Consider opportunities to rebuild the island's seriously depleted soils through the use of biomass byproducts and opportunities to reduce on-farm fossil fuel and chemical usage, which cause dependence on increasingly expensive outside inputs.
- Realizing that water is a resource that requires planning and protection. While renewable energy is a mechanically driven resource, it must function in complete harmony with nature.

KEDB's Renewable Energy Committee, and perhaps its Membership and Executive Committee, could also play an important guiding role on these issues.

[3] Personal correspondence with the Kaua`i County Planning Department.

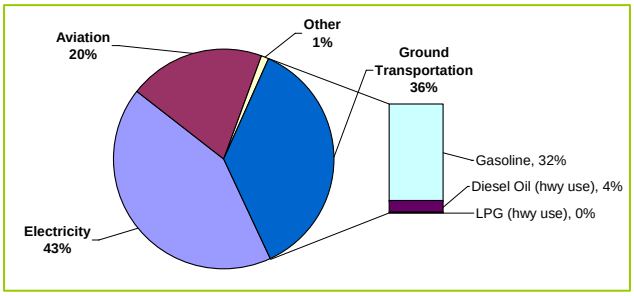
3. Outreach & Education

The SET will need to conduct thoughtful and targeted outreach and education, based on listening as well as saying, to facilitate community buy-in to the KESP. The costs of the KESP have received a fair amount of attention by the community, but the benefits of the KESP have not realized the same degree of attention.

Benefits of the KESP may include:

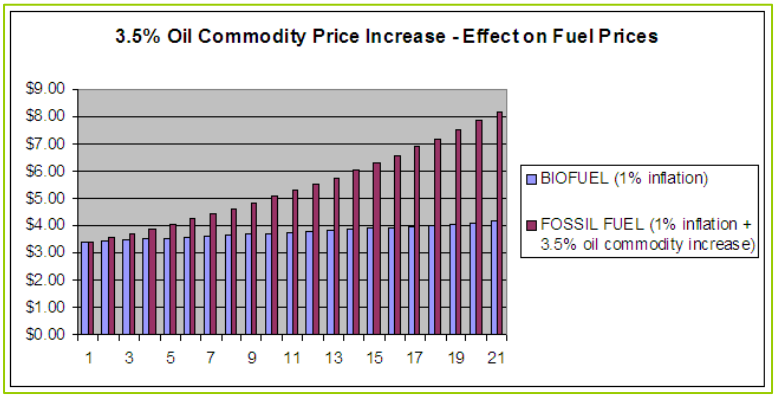
- Economic development by keeping energy dollars local
  - As shown in Figure 9-3, in 2009, Kaua`i spent **$56,684,483** on imported oil
    - 36% for Ground Transportation = **$20,406,414**
    - 43% for Electricity Generation = **$24,374,328**
- Creating or retaining jobs
  - The U.S. Office of Management and Budget (OMB) has stated that for every $92,000 expended on renewable energy, 1 job will be retained or created[4],
  - If $1.5B is invested over 20 years, **16,304 renewable energy-related jobs could be created**
  - More jobs from ground transportation, e.g., biomass-to-liquids, algae-to-liquids, vehicle maintenance, etc.
- Keeping Kaua`i's environment cleaner and healthier
- Living a model of sustainability for the world to emulate
- Less dependence on imported oil
- A greater role in the Island's self destiny
- Hedging Kaua`i's energy bets.

Figure 9-3: Kaua`i Energy Use (2009)



For example, because Kaua`i is dependent on imported oil for its ground transportation needs, it is not hedging its energy bets, or taking precautions against high and volatile energy prices. Biofuels could provide such a hedge. The U.S. Department of Energy's 2010 Annual Energy Outlook predicts that "crude oil" as a commodity will double in price from 2010 to 2030[5], which averages out to an annual 3.5% price increase as illustrated in Figure 9-4.

Figure 9-4: Crude oil vs. Biofuel Prices Over Time



[4] The White House Website (May 2009). *Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009.* Retrieved on 9/8/10 from http://www.whitehouse.gov/administration/eop/cea/Estimate-of-Job-Creation/.

[5] U.S. Energy Information Administration (December 14, 2009). *Annual Energy Outlook Early Release Overview*. Department of Energy. Retrieved on 7/27/10 from http://www.eia.doe.gov/oiaf/aeo/overview.html.

Note that in 2030, fossil fuels would cost over $8/gallon while biofuels would cost a little over $4/gallon—assuming they could be produced economically at today's prices and that only inflation would add to their costs.

4. Sustainable Electricity & Prices

To meet the 100% energy sustainability goal in the electricity sector, Kaua`i needs to close a gap of 94.2% by 2030, so the KIUC and renewable energy developers will need to be part of a committee to oversee Sustainable Electricity Capacity Targets and Price Targets.

For example, KIUC will need to agree on capacity targets that will meet KESP sustainability targets, work with developers on prices as a starting point for Power Purchase Agreement (PPA) negotiations, etc.

And since renewable energy is not "dispatchable" or "firm," KIUC will need to make sure that their power grid remains safe and reliable with sufficient energy storage, dispatchable biomass or biofuels, and matching of load and generation profiles. As renewable energy increases in its total capacity and is integrated onto the KIUC grid, the utility will probably need to reassess demand response.

In addition, KIUC and developers will need to stay attuned to the needs of the Pacific Missile Range Facility (PMRF), a unique opportunity for significant renewable energy development and utilization. Current house load is 2MW; and near-term future house load is expected to rise to 6.5MW. It may be possible in not-so-distant future for power demand to exceed 40-50 MW in support of potential increased mission requirements.

As emerging technologies become economically attractive, and as Federal laws may change in the future, KIUC and developers will need to adapt to those changes. For example, Ocean Thermal Energy Conversion (OTEC) is a renewable energy technology which holds promising potential to supply Kaua`i with a cost-competitive, sustainable base-load energy source in the not-too-distant future. And while wind is not currently part of the KESP Sustainable Electricity Targets, Federal regulations may change that would allow wind energy to be developed on Kaua`i.

5. Workforce Development

If $1.5B is invested over 20 years, around 16,000 renewable energy-related jobs could be created; and a few thousand more jobs from the ground transportation sector would also be expected. Ideally, the County would grow its own resident-trained technical workforce specializing in energy efficiency and renewable energy technologies and best practices.

Kaua`i Community College (KCC) can play an important role on this issue. KCC currently offers training related to sustainable energy, e.g., the Facilities Engineering Technology program which trains students in electrical applications and practices, air conditioning systems, and construction methods. Internal policies and support from ARRA funding may allow KCC to broaden the offerings.

Apprenticeships with the private sector would also be effective in training a sustainable energy workforce for the future. The Workforce Development Division, State Department of Labor and Industrial Relations, is the state-approving authority for registered apprenticeship programs in the State of Hawai`i. Currently, over 7,000 apprentices are registered with the Division in over 55 programs, with most

programs in construction trades. The Division also serves as staff to a State Apprenticeship Council, which advises the Director on matters concerning apprenticeship programs, consisting of a combination of classroom instruction and a year of supervised work. "Green jobs" skills have been incorporated into many apprenticeship programs; however, as more products become available to renew or conserve energy, additional quality training is necessary to ensure that these products are being installed properly.

6. Open Source Project Development

To address identified barriers and community feedback, and to make renewable energy projects more viable from 2010-2030, an *Open Source Project Development* process has been recommended which would include the following elements:

- Early community engagement
- Environmental assessments
- Developer's project data checklist
- KIUC grid data share
- Standardized project technical/economic feasibility study specifications
- Sustainable Electricity Capacity Targets and Price Targets
- Open-book Power Purchase Agreement negotiations
- Streamlined project permitting.

This will put an additional burden on KIUC; the SET could reduce that burden by facilitating targeted communications between KIUC and the project development community.

From the County's side, it will need to increase its capacity to conduct community outreach, manage the SET, coordinate with the Renewable Energy Facilitator, and to conduct high-priority Environmental Impact Assessments.

7. Alternative Ground Transportation Modes & Fuels

There are several uncertainties related to this set of activities:

- It is uncertain that the County Council will pass the *2% Fossil Fuel Tax.*
- Since the recommended *2% Fossil Fuel Tax* and its revenues are tied to an internationally-traded commodity that DOE predicts will double in price from 2010 to 2030, it is uncertain exactly how much money would be raised.
- It is uncertain which, if any, of the following *Alternative Ground Transportation Modes & Fuels Fund*-funded activities would be supported by the County Council:
  - An improved public bus system.
  - Incentives for efficient Hybrid Electric Vehicles (HEVs) that would cost Kaua`i citizens 40% less to operate than conventional internal combustion vehicles.
  - A rental vehicle program for the visitor industry which would take rented vehicles off the road while improving the Aloha Spirit shared with visitors.
  - Inexpensive conversion kits that would turn conventional gasoline engines into Flex Fuel engines capable of using either gasoline or ethanol—to support local ethanol production.
  - Purchase of five vegetable oil presses which would allow local small farmers to produce Straight Vegetable Oil (SVO) for off-road vehicles, and potentially public buses.
  - Incentives for efficient Plug-in Hybrid Electric Vehicles (PHEVs)—in a few years when KIUC has sufficient night-time renewable energy to charge PHEVs at night—which would cost Kaua`i citizens 50% less to operate than conventional internal combustion engine. These

incentives would also be for residential chargers, and KIUC Smart Grid enhancements to enable night-time charging of the vehicles with a 220-Volt charger at people's homes.

The SET can play a role in mitigating these uncertainties, by, for example, tracking funds and expenditures of the *Alternative Ground Transportation Modes & Fuels Fund.* In doing so, the SET will align the priorities and the goals of the community. With a lower 2% Fossil Fuel Tax, based on a percentage of a global commodity, the fund will grow at a slower and more unpredictable rate and result in a lower total than originally proposed, which means energy sustainability goals in the ground transportation sector will also need to be adjusted downward.

The SET can use the *Alternative Ground Transportation Modes & Fuel Model* developed by SENTECH Hawai`i to help the County decide for itself what level of Fossil Fuel Tax should be levied, and how those resulting funds should be allocated. The SET should also set a hard cap on how much money is raised in the event of rapidly escalating oil commodity prices.

The SET may also want to remain engaged on initiatives that will affect energy demand, e.g., the long-term *Integrated Ground Transportation Demand Management Plan.*