

Stakeholder Discussion
First Hawaii Energy Strategy 2007 Stakeholder Meeting
Hawaii State Capitol Auditorium
July 6, 2006

[Editor's Note: The following represents the best efforts of the HES staff note takers to capture stakeholder comments. They are labeled "DRAFT" to allow for feedback from the individuals who made statements and to allow revisions as required. We will also accept written comments for addition to this record through July 31, 2006.

The discussions are organized topically rather than in the actual sequence they were offered. The comments and responses are paraphrased. Additional information being provided after the meeting with the publication of this document is bracketed and labeled "Editor's Note".]

Topic 1: Model inputs and data

- A. Keith Yoshida (KY), The Gas Company: Mr. Yoshida asked if the model included distributed generation, combined heat and power, and end uses.

Response: Kyle Datta, Rocky Mountain Institute (RMI) Senior Director (KD): Mr. Datta responded in the affirmative, noting that in the model, customers that have thermal loads will make decisions about whether to cogenerate or trigenerate based on factors such as the price of fuels, capital costs, etc.

- B. Representative Cynthia Thielen (CT): Representative Thielen said she had noticed a void in the presentations. Given the RPS mandate to obtain 20% of electricity from renewable sources, as well as concerns of global climate change and high electricity rates, CT expressed a need to use a much amount of renewable energy. She specifically highlighted wave energy as one such technology which appeared to have been excluded from the presentations.

Response: KD explained that the model will incorporate all possible technology choices, including wave, concentrated solar, fuel cells, seawater air conditioning, etc., and would be comprehensive in terms of both demand-side and supply-side options. He stressed the HES team's desire to make sure that everyone understands that the modeling process is objective, which is why it's important to make the inputs transparent. The HES team will include in the model the existing energy supply as well as all the other future choices in county-specific data sets. The intention of the exercise is not dictate to the model which technologies it must use, but rather give it inputs on prices and other features to see what the model chooses as an optimal outcome. If the result falls short of the 20% renewables requirement, policy choices will be added to make up the difference.

KD further noted that RMI will be bundling renewables together into firm portfolios where practical and possible, but there will be some nonfirm renewable resources

included in the model as well. He invited anyone with interest or expertise in specific technologies to review our input sheets and send in comments.

[Editor's Note: If you are interested in recommending a specific technology for our consideration, please visit our web site to obtain an input sheet (go to: <http://www.hawaii.gov/dbedt/info/energy/planning/hes/>). Alternatively, please provide us with contact information for the vendor of the technology you recommend. We will contact wave energy companies recommended by Representative Thielen in an effort to obtain characteristics and performance information needed to model their potential use in Hawaii's energy system.]

- C. Daniel Mitsuda, consultant/researcher: Mr. Mitsuda asked whether the HES will utilize resources availability maps, superimposed with land use maps, to determine areas that would be available for energy generation.

Response: KD notes that there is a renewable assessment study by GEC doing exactly that, which the HES group hopes and expect to have access to.

[Editor's Note: DBEDT and the State Department of Land and Natural Resources have contracted Global Energy Concepts to produce a *Catalog of Potential Sites for the Development of Renewable Energy in Hawaii* for the Department of Land and Natural Resources to assist developers of renewable energy to identify appropriate sites for renewable energy and to comply with §196-41, HRS. The Catalog will be completed no later than December, but draft material will be made available earlier for use in HES 2007.]

- D. Charlie Senning, The Gas Company (CS): Mr. Senning asked what conditions unique to Hawaii have been identified that will go into the model.

Response: Jeff Amlin, President, Systematic Solutions, Inc. (SSI) (JA): Mr. Amlin explained that model uses Hawaii-specific historical data on end use for all different fuels, as well as historical prices, and determine from that how decisions were made in Hawaii on both supply- and demand-side responses.

Response: KD made a request for data, saying it would be extremely helpful to obtain any information stakeholders may have regarding load shapes for air conditioning, water heating, and lighting. He noted that much of the information on renewables is site-specific and thus unique to Hawaii, but there are differences on the demand side as well and the HES will rely on industry figures to provide data on that.

[Editor's Note: The HES2007 team is in the process of developing specific data request forms. We will post these data request forms on the website as soon as they are available.]

CS followed up by asking that, aside from such price and end-use data which obviously varies everywhere, whether there was anything else that had been identified

as unique to Hawaii that would make the results noticeably different from model runs elsewhere.

Response: JA replied that space heating had been cut out of the model for Hawaii, and that it utilized actual Hawaii data on the energy profiles for all the industries and the residences, so it truly would be a unique result. He also noted that information on the existing supply infrastructure is specific to Hawaii, which provides another unique set of inputs.

Response: John Tantlinger, Manager, Energy Planning and Policy Branch, DBEDT: Mr. Tantlinger added that the E2020 model has been used twice before in Hawaii, in 1995 and in 2000, so it has been calibrated to Hawaii's situation.

Response: Steven Alber, HES 2007 Project Manager, DBEDT: Mr. Alber also noted that the HES team needs additional detail on diesel fuel final end uses. In addition, more information is needed from independent power producers regarding total generation and any purchases from the utilities, in addition to sales to utilities, which is available,

- E. Todd Scheibert, Scheibert Energy Company: Mr. Scheibert noted that improved technologies are under development, and gave as an example a highly efficient, less-polluting generator his company will be offering for distributed generation and combined heat and power applications. The technology can be used for existing cogeneration on-site power plants such as Pohai Nani Good Samaritan, Kaneohe. This engine design meets EPA Air Quality emissions standard. The engine design is efficient and also "sewer gas" friendly.

The engine solution comes with an active harmonic power conditioner that reduces the grid shut-downs from over 1000 per year of operation to less than 30 each year. This result is based on two years of data at Pohai Nani. Additional benefits of this design include:

1. Reduced maintenance. For example, this engine is surpassing 23,000 run hours without a head change and minimal valve adjustments. In normal preventive maintenance for this size engine, on the average, the engine head is changed every 7,000 – 8,000 run hours.
2. Longer equipment life and reduced fuel consumption by 7.6%

Response: KD asked Mr. Scheibert and anyone with knowledge of similar innovative technologies to assist the HES team by sending them the technical information and anything else that would be necessary to allow them to incorporate these choices into the E2020 model.

Topic 2: Model structure and assumptions

- A. Henry Curtis, Life of the Land (HC): Mr. Curtis asked whether the model dealt with a catastrophic climate change scenario.

Response: KD replied that the model deals with the question of what the state can do to mitigate the risks of an uncertain future. By developing a risk efficiency frontier, the model will give a variety of portfolios that can mitigate a series of risks. The results from the model will help the state design an energy system that is more resilient to changes caused by climate change, fuel price volatility, etc.

[Editor's Note: The model does not have a catastrophic climate change scenario, but to the extent HES is able to recommend options that reduce Hawaii's greenhouse gas emissions, Hawaii may be able to help the rest of the world avoid such an outcome. However, Hawaii's total contribution to world greenhouse gas emissions is very small compared to the total, so a global effort is needed.]

B. An unidentified speaker inquired as to what was the forecasted price of oil in the adequate supply scenario.

Response: KD stated that the model assumes a price around \$45 per barrel in real dollar terms for that particular scenario. He stressed that an important aspect of that scenario was the lack of volatility surrounding that price.

C. Another unidentified speaker noted that KD had mentioned that high energy prices lead to lower energy demand. He inquired whether, in the model, this referred to state demand or global demand.

Response: JA stated that the price of oil is determined on the world market, so as the global oil price goes up; the growth of the world economy would slow down along with energy demand. The model examines how global trends could impact Hawaii's economic outlook.

D. Keith Yoshida (KY), The Gas Company sought clarification on the concept of whole system efficiency improvements in the model.

Response: KD responded that when you evaluate the potential for efficiency improvements, if you look measure by measure you get one answer, but if you instead consider how different measures interact with each other, you get a different answer as to costs and benefit of the efficiency measures. He noted that in the model, we will include these system-wide interactions and feedbacks so as to obtain a more accurate picture of the true costs and impacts of efficiency measures.

[Editor's Note: RMI recommends whole systems approach in the design of efficient systems. It is based on the observation that systems are interrelated such that improvements made to one system (e.g., advanced, lightweight vehicles) can help reduce the cost of making efficiency improvements for another system in (e.g., increased chassis strength and flexibility in choice of propulsion fuel).

A systems approach can increase the cost effectiveness of the overall project in comparison to the cost-benefit of each measure as individual projects. While the

marginal cost of the last efficiency measure may exceed the cost effectiveness threshold, the *average cost* of the efficiency measures in combination may not. Additionally, the *simultaneous* implementation of multiple measures on multiple sub-systems within and surrounding the facility can (in some cases) achieve efficiency reduction greater than the sum of the individual efficiency measures themselves.]

- E. Mike Poteet (MP), Hawaii Agricultural Research Center: Mr. Poteet asked whether there was a particular attitude or perspective underlying the HES regarding maintaining agricultural lands instead of partitioning them off to developers, in order to maintain their availability to produce fuel crops.

Response: KD noted that land availability, along with water availability are very germane concerns. The research team has tried to determine how many acres are available, both irrigated and non-irrigated, without cutting into other crops, in order to make sure that the right set of numbers going into the model. He asked anyone with reliable information on the issue to make it available to the HES team. KD also remarked that the reason to have implementation meetings is that even if the model determines growing crops would be the optimal choice for those lands, it will generally require coordination between various groups to make it actually happen in the real world.

MP followed up by asking what kind of impetus may be required to increase the shipment of vehicles that run on biofuels.

Response: KD responded that RMI has done quite a bit of work on the transport sector over the past several years on this issue. The different scenario cases consider the availability of flex fuel and other alternate fuel vehicles, and that should inform the HES as to when there will be a critical mass of these vehicles to justify putting in the necessary infrastructure in Hawaii. That in turn will inform the HES regarding transportation issues involved in growing feedstocks, moving feed stocks to where they need to go, and so on.

- F. Reb Bellinger, Makai Ocean Engineering: Mr. Bellinger asked how the HES would identify the full range of energy technology options and determine which may be presently viable and which may become so in the future if there is a technological breakthrough. He specifically gave the example of seawater air conditioning as a technology that is possible now but could improve further over time.

Response: KD noted that all technological options will be included within the model, including existing commercialized technologies as well as those we know are on the horizon. At that point, depending on which scenario is being run through the model, future technologies could be accelerated to become available more quickly. This does not come about because of the effects of Hawaii's choices, but because different scenarios assume different things about the broader world, which then influences technological developments that we can take advantage of. KD noted that the HES is a road map rather than a railroad line, which allows for a series of possibilities.

- G. Ivo Martinac, University of Hawaii-Manoa: Mr. Martinac asked what the five biggest weaknesses of the model were, and what needs to be done to address them.

Response: KD responded that any model is just a simulation that shouldn't be confused for reality or be a substitute for managerial or societal judgment. He emphasized that interested parties will get insight from the model but should be cognizant of its limitations.

Response: JA noted that certainly there are limitations on the data. If you compare Energy 2020 to other models such as NEMS, the DOE model, there is much less detail involved. He also stated that there has been some difficulty in calibrating such factors as the number of tourists visiting the state and tying this to larger economic trends, particularly for Japan.

Response: KD added that another way to look at it is what the HES team is working to improve upon from previous iterations. One such area is what quantities of biofuels each county can practically produce. Similarly, because RMI has done quite a bit of work nationally on vehicle fleets and fleet adoption, they hope to make a good module even better. KD concluded that any model is only as good as the inputs you put in, and the HES team hopes that their set of inputs is somewhat more accurate than what was used in the past.

H. Goals and application of the Hawaii Energy Strategy

- A. Representative Cynthia Thielen (CT): stated her belief that the focus and stated goal of the HES should be to reduce dependence on fossil fuels.

Response: KD responded that the state's policy objectives are guiding us toward greater energy security and lower reliance on fossil fuels, but the crux of the issue is in finding the practical steps to accelerate this process. He stated that the HES team does want to find ways to move towards a more energy independent future, but that it was important to do so within the context of a lot of uncertainty around prices and technologies.

- B. An unidentified speaker suggested compiling a list of best practices or best available technology options that come out of the model and distributing it for use as a reference.

Response: KD responded that the model does give consumers a set of technological choices ranging from existing conventional technology up to the best demonstrated practice under the scenarios and policies evaluated. He expressed support for the speaker's suggestion, noting that one of the values of the model may be in serving an educational purpose by alerting people to the best options available.

C1. Chris Steele, Grace-Pacific (CS): Mr. Steele expressed his belief that the infrastructure to use biofuels is in place, and that Hawaii is a unique location where it makes sense to use biofuels. He noted that a study or a strategy without action was meaningless, and urged everyone in the room to make a commitment to change.

C2. Ray Sweeney, Amron (RS): Mr. Sweeney echoed CS's call for action.

Response: KD remarked that a plan is merely a piece of paper, and the reason the HES group wanted to have these dialogue sessions is to be practical so that they know that the recommendations coming out of the strategy will be something people will actually implement. He also noted that major shifts cannot happen without a coordinated effort.

Topic 3: Process

A: Jeff Deren, KIUC: Mr. Darren asked as a point of clarification whether there would be any coordination or cooperation between the HES and parallel efforts, such as the Hawaii Energy Policy Forum.

Response: KD responded that the Hawaii Energy Policy Forum, the data generated through the utilities' IRP cycles, and work done by the Public Utilities Commission under Act 95 can all inform the work being done on the HES. Some of these efforts may use similar data but in different models, which could give different results and give us a more robust picture of how things may play out in the real world. In addition, the Policy Forum can provide a good sounding board for policy ideas, as well as being a source of suggestions for policies which we can then test quantitatively in our model.

B. Henry Curtis, Life of the Land, (HC): asked whether the model is transparent or proprietary.

Response: JA replied that the model is transparent and will be made available to the public, and noted that this would simply require organizing a time to do it.

Response: KD added that it is important to the HES team that the whole process be as transparent as possible, and that the people involved understood the inputs, algorithmic processes, and outputs of the model.

[Editor's note: Model data inputs and assumptions will be posted on DBEDT's HES website. Questions regarding the ENERGY2020 model algorithmic processes can be answered during stakeholder meetings as well as via email at any time: HES2007@rmi.org]

HC then inquired as to whether the various modules of the modeling process, such as the biofuels module, will enter the HES model without another public meeting. His

understanding was that furthermore, there was going to be a biofuels summit held sometime during August that is not open to the public.

Response: KD responded that the plan is to hold a combination of public and private meetings. Private meetings are helpful because they allow for deeper dialogues, whereas public meetings allow for a broader range of perspectives to be expressed. He noted that there will be a public meeting on biofuels, as well as the other modules, in the fall, after the summer analysis sessions have provided enough information to make such a discussion more worthwhile.

- C. Paula Helfrich, Economic Development Alliance of Hawaii (PH): PH expressed her concern that the group assembled appeared to be more a technical advisory group, rather than a collection of stakeholders. She cautioned against creating a situation where a lack of trust could develop, due to the perception that certain people's or group's interests were not being addressed. She recommended changing the language used to call the stakeholders group an advisory community.

Topic 4: Statements of support

- A. Chris Steele of Grace Pacific expressed enthusiasm for the HES as a mechanism to help the state shift away from fossil fuels. He noted that Grace-Pacific has been negatively impacted by fluctuations in oil prices, and has a strong interest in developing biofuels or other alternative energy sources. He urged all stakeholders to participate in the HES.
- B: Keith Yoshida of The Gas Company offered his assistance in providing data if it would be helpful.

Response: KD thanked the speakers for their comments, and encouraged everyone in the audience to email HES2007@rmi.org if they would like to be actively involved in the process and the practicalities of implementing Hawaii's Energy Strategy.