



Ethanol Fuel and Hawaii's Energy Policy

Presentation to Ethanol Progress Report Workshop
February 9, 2006

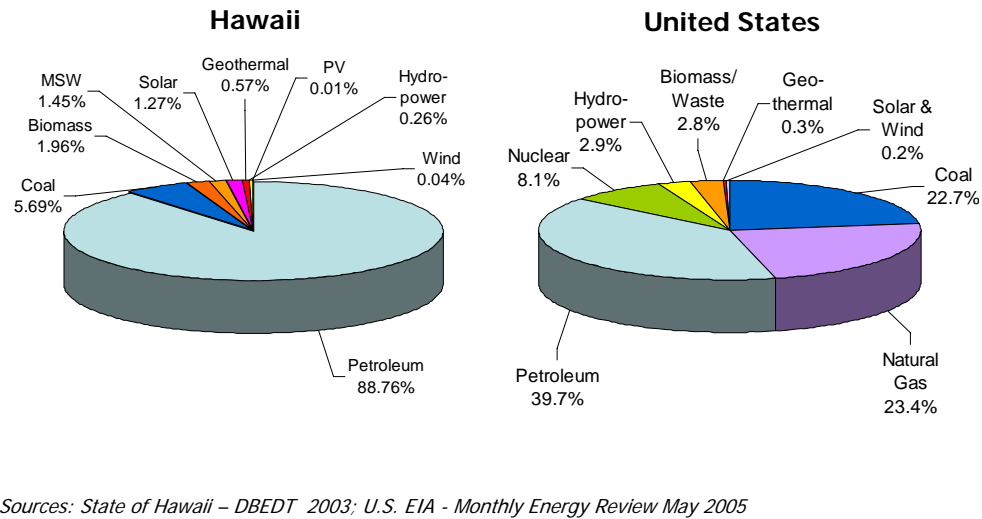
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Outline

- Hawaii's Energy Situation
- Elements of a Sound Energy Strategy
- Challenges
- Assets / Opportunities
- Past – Present - Future

I only have a few minutes, so this will be a very quick overview of Hawaii's energy situation, challenges, opportunities, and how to get from where we are to where we need to go, and how ethanol fuel fits into the overall energy picture for the state of Hawaii.

Primary Energy Consumption by Source, 2003



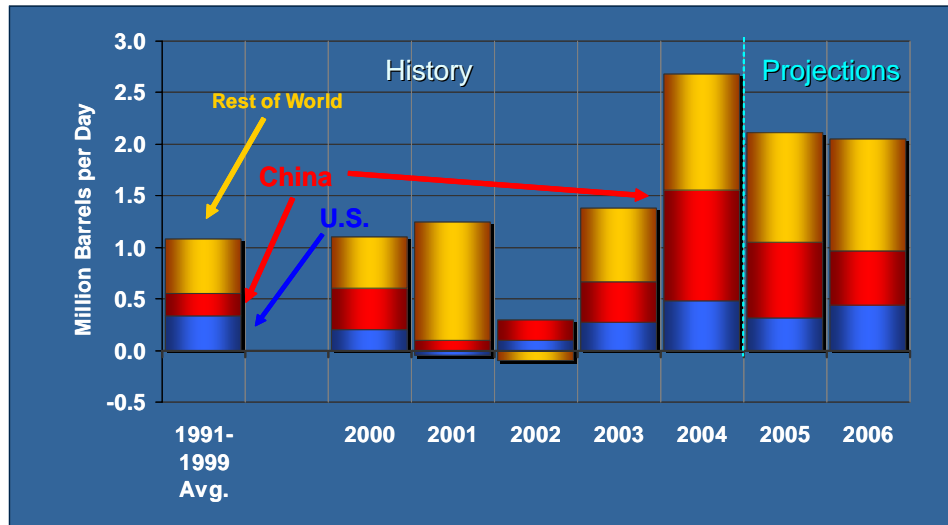
These two pie charts show that Hawaii is highly dependent on petroleum, significantly more than the U.S. as a whole. In fact, Hawaii is the most petroleum-dependent state in the nation.

Today's Oil Environment

- Industry, government, and research analysts agree: "A New Era"
 - Oil prices at new plateau, not simple high point in market cycle
 - Historic price trends not expected to return
 - Previous net oil exporters, like China, have become huge net importers
 - Oil production will increasingly concentrate in the Middle East
 - Oil imports will be strong with steady increase around the world, Asia-Pacific in particular
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This high level of dependence on petroleum is cause for concern, because of the impact it has on our energy prices. The next slide shows the global forces which are at work.

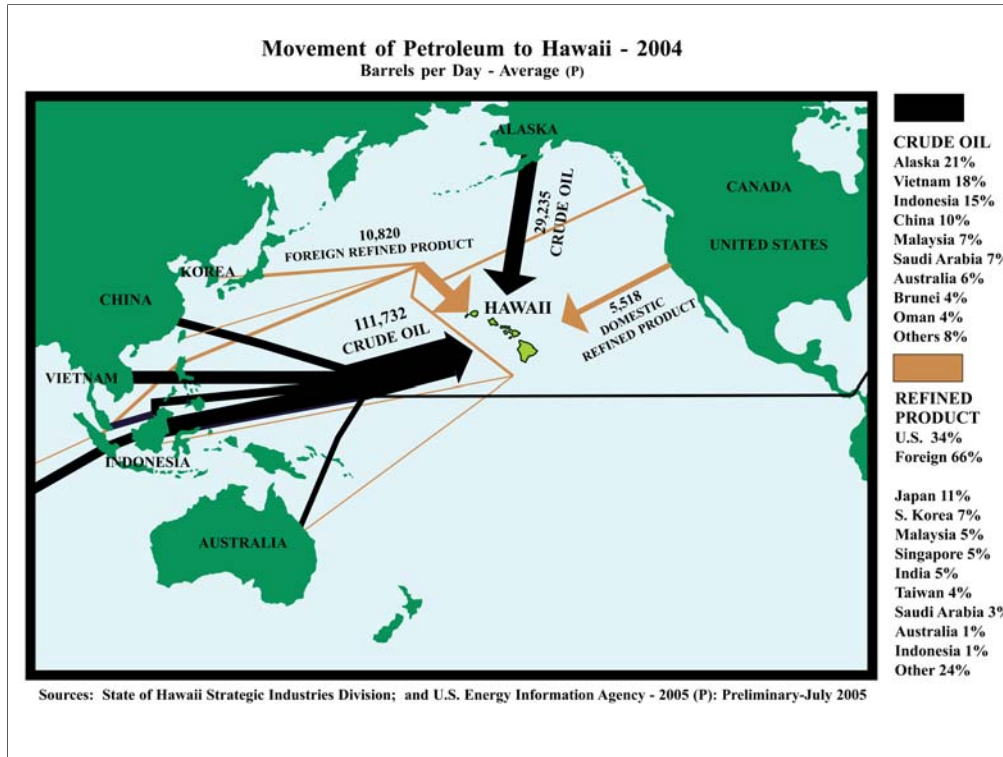
World Oil Demand Growth



*World oil demand growth currently surging at very high rates.
China's demand skyrocketed by about 1 million barrels per day in 2004!*

Source: History: USEIA; and Projections: USEIA, *Short-Term Energy Outlook, March 2005.*

Worldwide demand for oil is increasing. This is projected to continue.



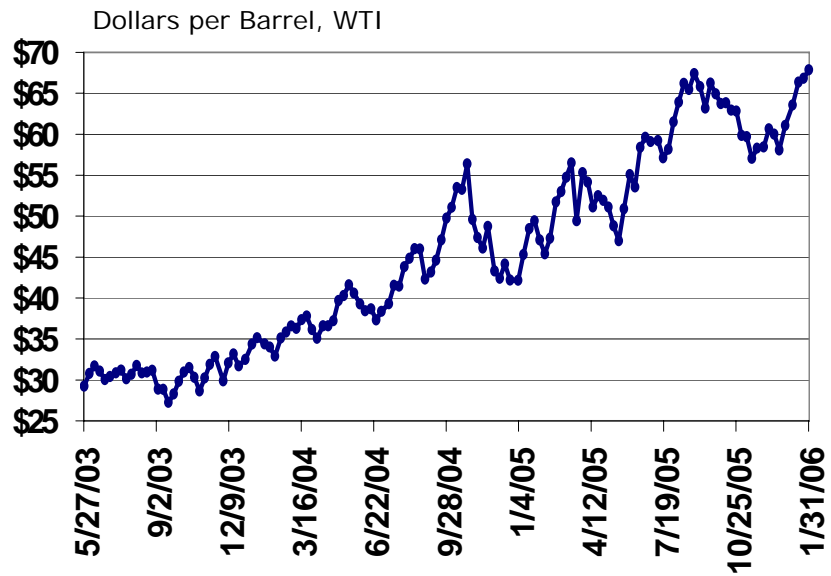
All of Hawaii's oil is imported.

Unlike ethanol, it is not likely that petroleum can be produced in Hawaii from locally-available materials.

Also, we are becoming more reliant on the Middle East for our oil. Ten years ago, we were predicting this would happen; now, we are seeing it happen.

For our energy and economic security, it is essential to diversify our energy sources.

Crude Oil Spot Prices

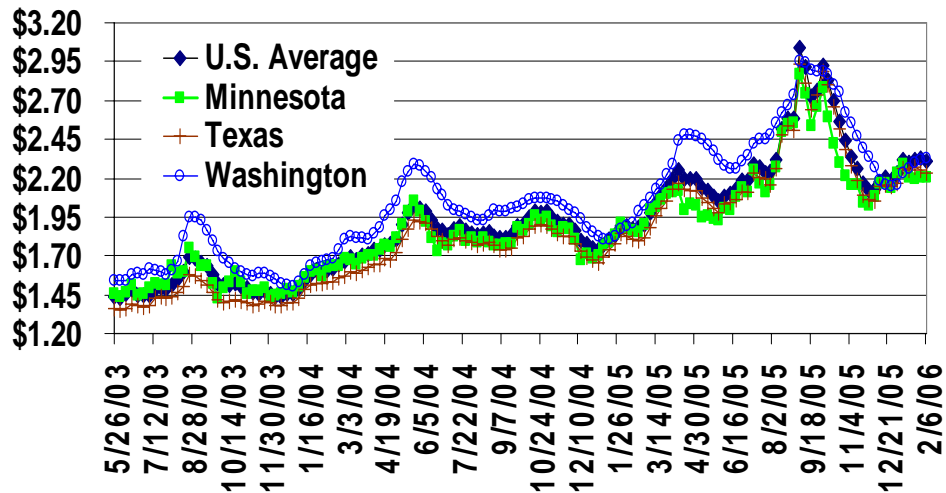


Source: U.S. Department of Energy, Energy Information Administration, pet_pri_spt_s1_d.xls

Here are crude oil spot prices.

Since gasoline is made from crude oil, we see a similar trend in gasoline prices.

Gasoline Prices, 5/26/03-2/6/06

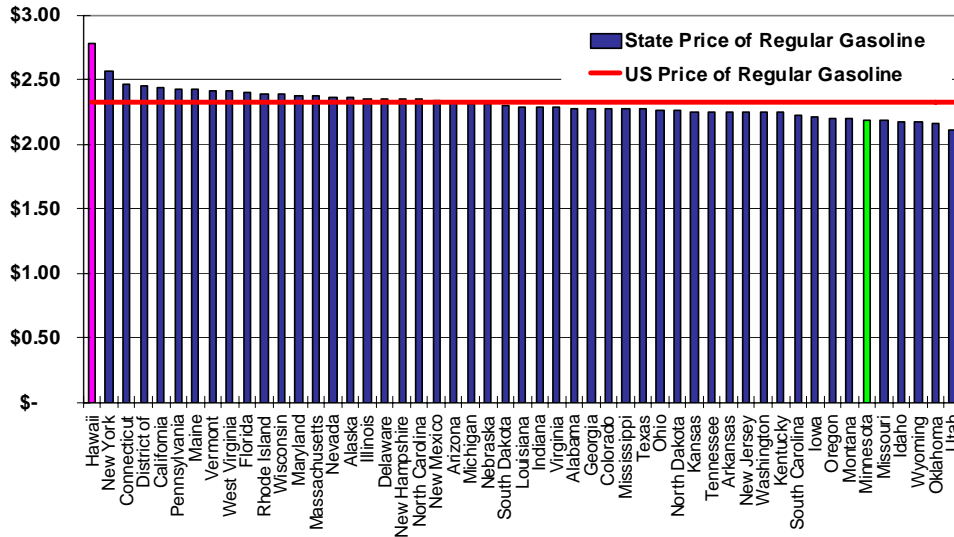


Retail Price of Regular Conventional Gasoline, 5/26/03-1/30/06, from EIA, PSWRGVVWCVL.xls

Here are some of the gasoline prices that are tracked by the United States Department of Energy.

I'd like to point out that Minnesota, which has had 10% ethanol in their gasoline since 1997, is generally near or below the national average gasoline price.

Regular Gasoline Prices Ranked by States January 16, 2006

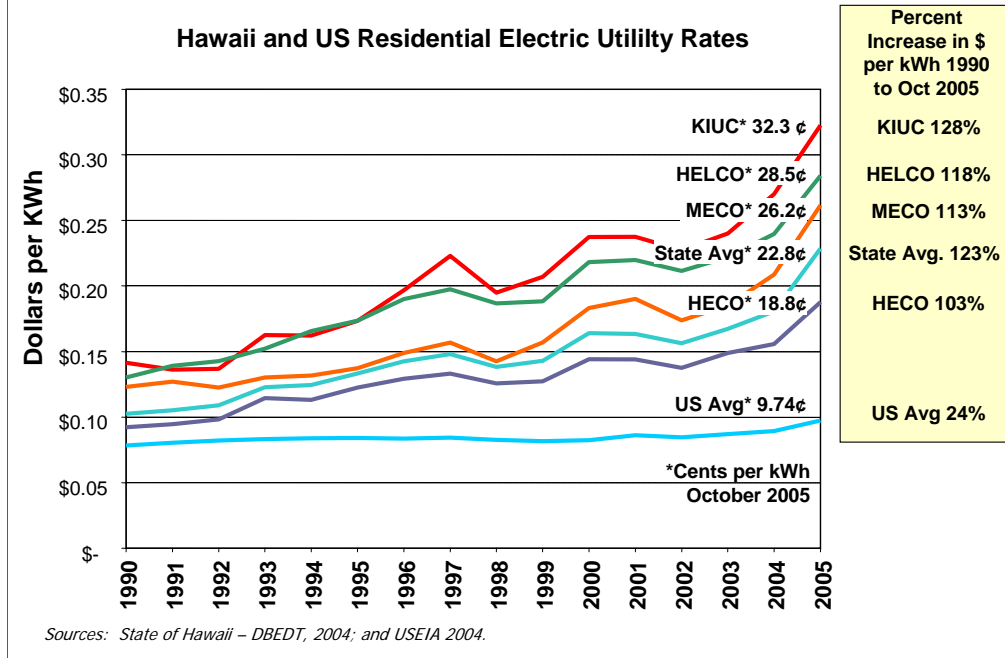


Source: American Automobile Association - Daily Fuel Gauge Report

Here are the retail gasoline prices of all the states. There's Hawaii on the left and there, in the lower cost section, is Minnesota.

Since we're talking about energy policy, I'm going to briefly mention electricity prices.

Hawaii's Electricity Rates Are the Nation's Highest



This reliance on petroleum is not only causing higher prices in the transportation sector; it is also causing higher prices in the electricity sector. I will explain later how this can be an opportunity for Hawaii.

Challenges in Hawaii

- ❑ Small state, small market
- ❑ No fossil fuel resources
- ❑ Barriers to entry
- ❑ High energy costs
- ❑ External forces are significant
 - Technology
 - Global supply/demand
 - Geopolitical events

We face unique challenges, many of which are beyond our direct control.

Opportunities/Assets in Hawaii

- ❑ Abundant renewable resources (biomass, ag lands, wastes)
- ❑ High energy costs in all sectors make integrated energy projects* viable
- ❑ Federal and State support for renewable energy
- ❑ Local knowledge & ability
- ❑ Public support

* Transportation fuels AND electricity

However, we also have unique assets.

We have many renewable resources; high energy costs in all sectors make integrated energy projects viable; there is significant Federal and State support for renewable energy, especially in places with high energy costs; we have local knowledge and ability, and we have strong public support.

Elements of a Sound Energy Strategy

- Energy efficiency
- Renewable energy
- Alternate transportation fuels
- Long-term: hydrogen as an energy carrier
- Policy that sends the right signals to the market

Challenges, opportunities, and large quantities of information and research are incorporated into the energy strategy.

There are short term objectives, mid-term objectives, and long-term objectives.

Biofuels are a Basic Part of the Strategy

- Biofuels for use in existing vehicles
 - E-10: 10% blend of ethanol with gasoline
 - Biodiesel: can be blended with diesel or used 100% in diesel engines
- Biofuels for use in flexible-fuel vehicles
 - E85: 85% ethanol, 15% gasoline
- Biomass for electricity
- Waste-to-energy
- Biorefineries
- Sustainable renewable energy

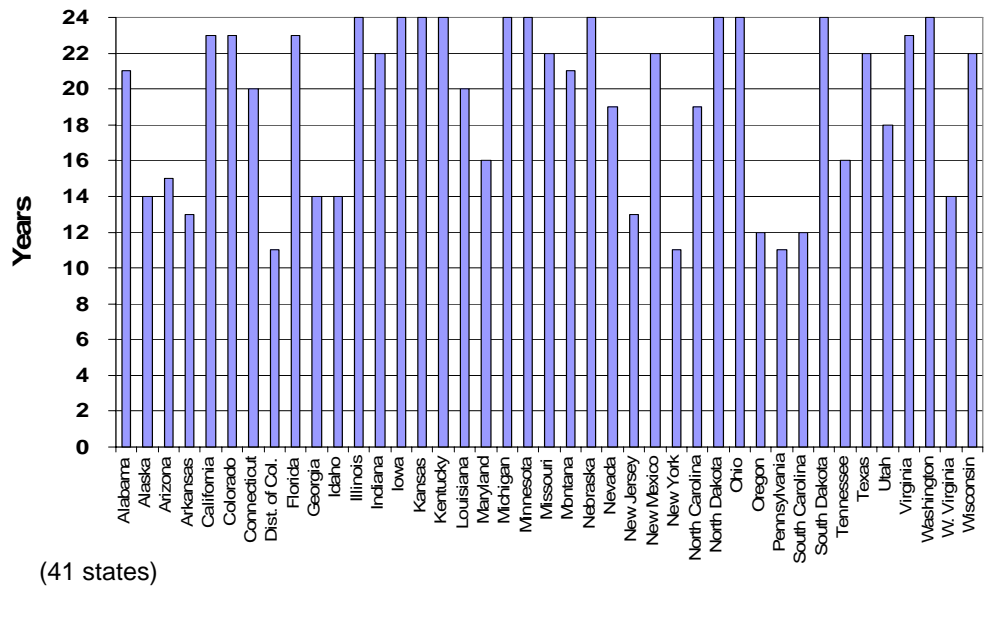
Biofuels are a basic part of the strategy.

And the use of ethanol fuel is an important near-term step in the transportation fuel area.

It has the potential to diversify Hawaii's energy supplies, support local agriculture, make better use of existing resources in Hawaii, including wastes, keep money in the state, and provide a measure of energy security in the face of oil supply or market disruption.

And it is in wide use across the U.S. In 2005, over 40% of the gasoline sold in the U.S. contained up to 10% ethanol.

States With 10 or More Years of Fuel Ethanol Use



Gasoline containing up to 10% ethanol has been available in more than 41 states for more than 10 years.

Hawaii is one of the few remaining states in which E-10 is not available ... in spite of our high energy prices and unique assets.

I have one slide which shows a little bit of recent history.

Hawaii Ethanol History (abridged)

- 1984 **C. Brewer cancels plans to construct an ethanol plant on the Big Island.** According to their press release, "...we cannot invest \$15 million in capital to produce a product we cannot be assured of marketing ..."
- 1991 "Ethanol blending letter" sent to gasoline distributors asking: "for ethanol/gasoline blends to be cost-competitive, ethanol would have to be available for \$_____?" Responses indicate a lack of interest, regardless of price.
- 1992 Meetings and reports indicate ethanol & electricity opportunities at Hamakua.
- 1994 Numerous articles on ethanol.
- 1994 Ethanol Content Requirement** law states: "DBEDT shall adopt rules ... to require that gasoline ... contain 10% ethanol..."
- 1995 National Energy Policy Act requires fleets to purchase **alternative fuel vehicles**.
- 1995 *Transportation Energy Strategy* completed. Various approaches considered. **E10 recommended as cost-effective first step.**
- 2000 Ethanol facility incentive signed into law.
- 2002 Ethanol working group formed; workshops, "**Ethanol Fuel: Coming Soon to a Car Near You**" held on all islands.
- 2003 Rules drafted to implement 1994 ethanol content requirement law. More studies indicate feasibility of ethanol production and use in Hawaii. Reports stress importance of "date certain" for implementation of blending mandate.
- 2004 Rules finalized and promulgated;** blending required to start on 4/2/06.
- 2005 Preparation, planning, design, construction, and training underway for ethanol-capable infrastructure. Financing secured for ethanol production facilities.
- 2006 April 2, 2006: At least 85% of gasoline in Hawaii is to contain 10% ethanol.**

This list illustrates some of what's happened recently in the ethanol area in Hawaii. If we were to include every report and study and task force and demonstration over the years, it would take us all day just to talk about history.

This starts in 1984. C.Brewer was ready to build an ethanol plant on the Big Island. But they canceled the project because there was no market – in other words, "the petroleum industry was not ready."

I'll spare you the details of why in Hawaii the blending of ethanol into gasoline needs the active participation of the petroleum industry. You'll probably hear directly from them what is involved.

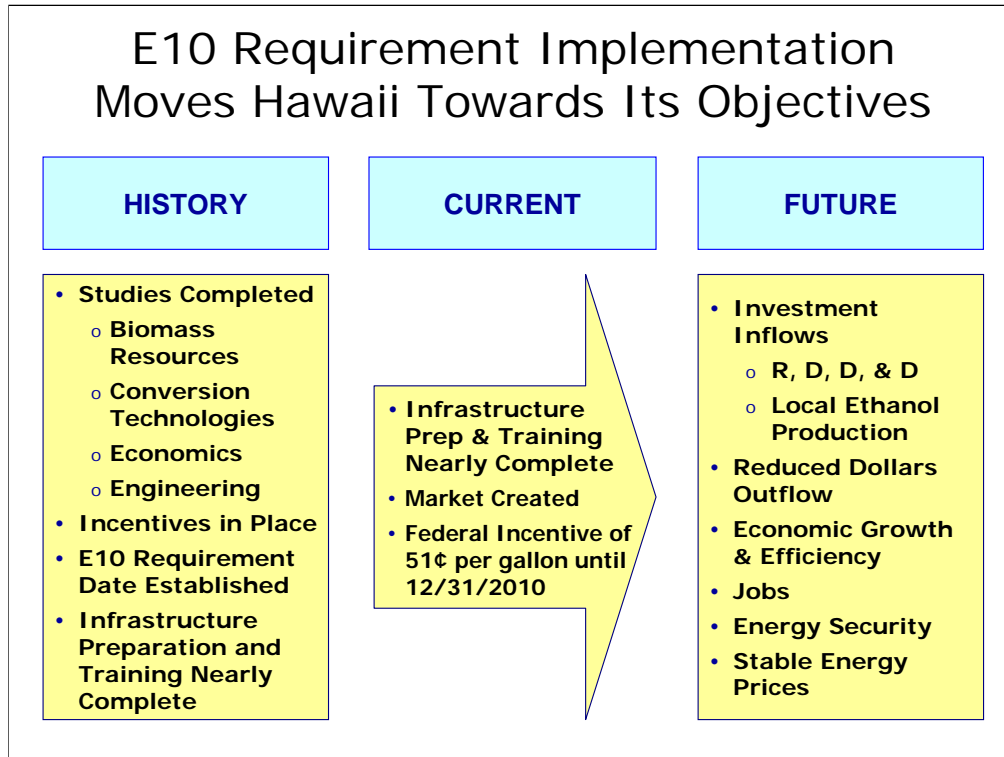
Ten years later, in 1994, the ethanol content requirement became law.

During the next ten years, more studies were done, incentives were put into place, workshops were held, special purpose revenue bonds were authorized, and so forth.

Finally, in 2004, rules implementing the 1994 law were promulgated, through the state's rulemaking process, with public notice and public hearings and all of the steps involved in establishing a regulation.

Today you will hear more about the progress that has been made toward implementing the requirement.

E10 Requirement Implementation Moves Hawaii Towards Its Objectives



The objective is, ultimately, for local ethanol production to be able to supply the mandate.

However, the law cannot require, and does not require, that Hawaii ethanol be used. That is a violation of interstate commerce laws. So, it is true: until Hawaii ethanol production facilities come on line, the ethanol will be imported.

The yellow arrow shows where we are now.

It is a critical bridge from the past to the future.

Thank you

- Visionaries, Lawmakers, Decisionmakers;
- Researchers, Economists;
- Petroleum Industry;
- Agricultural Industry;
- Regulators and Public Servants;
- Retailers, Vendors, Engineers, Mechanics; and
- People of the State of Hawaii

Today I would like to congratulate and thank those present, who have worked so hard for many, many years, for their dedication to the people of Hawaii and to Hawaii's energy future...

And to those who are working diligently, and learning new things every day, to ensure the continued delivery of high quality fuels for Hawaii's motorists.

Thank you.