

# SB2970

# Testimony

Authorizes the issuance of special purpose revenue bonds to assist Biotork Hawaii, LLC with the planning, permitting, design, construction, equipping, and operation of a facility to convert agricultural crops and byproducts to biofuels and various feed.



February 5, 2013

**TO: The Honorable Michael Gabbard, Chair  
Senate Committee on Energy**

**The Honorable Clarence Nishihara, Chair  
Senate Committee on Agriculture**

**FROM: Eudes de Crecy, CEO  
BioTork Hawaii, LLC**

**SUBJECT: S.B. 2970, RELATING TO THE ISSUANCE OF SPECIAL PURPOSE REVENUE BONDS  
ASSISTING BIOTORK HAWAII LLC**

**POSTION: Support**

Aloha Chairs Gabbard and Nishihara and Members of the Senate Committees on Energy and Agriculture:

My name is Eudes deCrecy and I am the Chief Executive Officer of BioTork Hawaii, LLC. I appreciate your efforts to hear this bill as I would like to provide testimony in strong support of SB 2970 that could catapult Hawaii to be a global leader of microbial strain development used to support Zero Waste Programs in its conversion of low to no-value agricultural products into high value co-products like biofuel and high protein feed.

Since 2010, the Pacific Basin Agricultural Research Center has been continuously collaborating with BioTork to develop microbes (algae, fungi, etc.) and processes for the production of renewable oil and high-protein feed from agricultural byproducts. One of the keys to success has been the use of BioTork's evolutionary optimization technology to generate highly specialized microbes capable of converting specific agricultural byproducts into oil-rich microbial biomass rapidly, in high yield and with maximal conversion of the feedstock in a relatively short period of time. In the case of papaya the conversion process is 14 days.

Another key to success has been the optimization of culture conditions by PBARC allowing for the most efficient conversion of feedstock into oil and high-protein meal with BioTork's oil-producing microbes. The major advantage of this approach is that it uses low-cost feedstocks without any cost-prohibitive pretreatment, thus enhancing the prospects for economically viable enterprise.

Impressive research and development has been made in the program since its inception and the main conclusions are briefly summarized in the order that they were researched:

**Papaya.** This crop is a great model because it is Hawaii's second most important fruit crop and 35% of the harvested crop that is brought to the packing houses is discarded as culls. Heterotrophic algae (*Chlorella prototheoides*) were adapted to feed on papaya; conditions were identified for high mass production as well as oil production.

At this point we have reached and surpassed the economic threshold of oil production from papaya through our technology. Beyond that, Biotork has also adapted oil producing fungi to grow on the papaya 'solids' that are not utilized by the algae, and thus increase the amount of oil we recover from papaya.

The high protein algae meal is also as important as the oil due to its very high value to create fish and other animal feeds. It is the overwhelming consensus that the high cost of importing animal feed is the most important bottle neck that limits profitability of raising fish, chickens, other land animals in Hawaii. This technology can assist in producing local feed.

**Albizia.** Albizia is a fast growing tree that is the most invasive (weedy) tree in Hawaii. It is present in communities, roadsides, and also in native forests in Hawaii. Strong winds can cause large limbs to drop, potentially causing costly damage to homes and power lines. As a potential feedstock for the fungi, it represents a huge waste product resource for producing biofuel and feed.

Biotork successfully adapted mixture of fungi to feed on crystalline cellulose with very little glucose (0.1 gram glucose to 9 grams of cellulose). And, it showed evidence that the fungi grew on dilute puree of ground albizia wood. The fungi were further characterized and identified at PBARC and preliminarily analyzed for their ability to grow on cellulose and sugarcane bagasse.

The albizia effort is still at the research and development stage, but the initial observation that the adapted fungi can grow on cellulosic material has been demonstrated.

**Waste Glycerin.** Waste glycerin is a byproduct that is produced in ethanol production as well as biodiesel that is produced from waste fats. Hawaii's biodiesel refineries use waste fats from restaurants for producing fuel. Biotork obtained waste glycerin from a Hilo bio-refinery in 2012 and successfully adapted algae to grow robustly on its waste glycerin that can be converted in more oil as well as high protein feed.

**Molasses.** The value of our zero waste approach was further displayed when Biotork was contacted and partially funded by the state of Hawaii (ADC) to determine if algae could be adapted to utilize molasses produced by HC&S following an unfortunate spillage of molasses in Honolulu Harbor. After just a month of evolving there were impressive results to report that within another 2-3 months it would exceed economic threshold and have the ability to move into the mini-pilot stage.

We are confident that we will continue making progress in these areas so we could:

- provide additional revenue stream for farmers to sell off-grade or overripe fruit
- provide secondary market during high supply / low demand periods
- provide additional diversification for bio-fuel
- provide locally developed feed for fish, poultry and cattle production

- produce biofuel and high protein meal from the selected fungi that use albizia as a carbon source which will also be a major technology 'game changer'

The issuance of the special purpose revenue bonds will assist us in providing the necessary infrastructure beyond the research and development phases in Hilo, Hawaii, and on the islands of Maui and Oahu to accomplish this. It also important to recognize Hawaii's Department of Agriculture and the Agribusiness Development Corporation for their constant support and guidance. We all share the same vision to provide Hawaii with the tools needed to achieve its goals related to energy sustainability and food security.

I thank you for your time and consideration in this matter and ask again for your support to continue moving this project forward to help Hawaii improve profitability for our farmers, create a lower cost animal feed, and increase our sustainability.

**From:** [mailinglist@capitol.hawaii.gov](mailto:mailinglist@capitol.hawaii.gov)  
**To:** [AGL Testimony](#)  
**Cc:** [autumnrose2010@yahoo.com](mailto:autumnrose2010@yahoo.com)  
**Subject:** Submitted testimony for SB2970 on Feb 6, 2014 15:30PM  
**Date:** Thursday, January 30, 2014 11:11:42 AM

---

**SB2970**

Submitted on: 1/30/2014

Testimony for AGL/ENE on Feb 6, 2014 15:30PM in Conference Room 225

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Autumn Rose	Individual	Oppose	No

Comments: Please do NOT support growing of "fuel crops." That's a waste of land, water, fertilize/chemicals to turn the crop into fuel. Yes, I support REUSING WASTE from crops and agriculture RESIDUE like sugar cane bagasse, to turn it into fuel -- that makes ecological sense. But please, I hope this company does NOT mean to grow albizia trees for fuel! That's an INVASIVE SPECIES.

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email [webmaster@capitol.hawaii.gov](mailto:webmaster@capitol.hawaii.gov)

February 5, 2013

TO: The Honorable Michael Gabbard, Chair  
Senate Committee on Energy  
The Honorable Clarence Nishihara, Chair  
Senate Committee on Agriculture

FROM: Marie C. Blanco  
Falls Church, Virginia

SUBJECT: S.B. 2970 - RELATING TO THE ISSUANCE OF SPECIAL PURPOSE  
REVENUE BONDS ASSISTING BIOTORK HAWAII LLC

Thursday, February 6; 3:30 PM  
Conference Room 225, Hawaii State Capitol

TESTIMONY IN SUPPORT

Aloha Senators Gabbard, Nishihara and members of the Committees on Energy and Agriculture. I respectfully request acceptance of my testimony in support of Senate Bill 2970.

I had the honor and privilege to work for the late United States Senator Daniel K. Inouye, for 34 years, and also served as his Chief of Staff for his Washington, D.C. office. Although I no longer am in public service, I continue to monitor the Senator's funding initiatives especially as it relates to agriculture and energy. One of these initiatives is the United States Pacific Basin Agricultural Research Center (PBARC) in Hilo, Hawaii, which the United States Congress recently renamed the Daniel K. Inouye United States Pacific Basin Agricultural Research Center.

In the establishment of PBARC, it was Senator Inouye's vision, among other things, to move the State of Hawaii to the forefront of leading agriculture research and technologies, and to work with then PBARC Director Dr. Dennis Gonsalves, to provide this pathway forward. In fact, it was Dr. Gonsalves, who introduced BioTork's technology by way of his research relating to Zero Waste.

In this regard, I am extremely pleased with the progress that PBARC and BioTork have made in the conversion of low and no-value agricultural products to higher value oil and high protein feed. I am also excited about the potential opportunities this technology provides in the conversion of molasses into fish feed.

I have had the opportunity to work on many agriculture initiatives, and am proud to say that this is another example of how Senator Inouye's legacy continues to touch the heart and soul of our Aloha State. Mahalo.