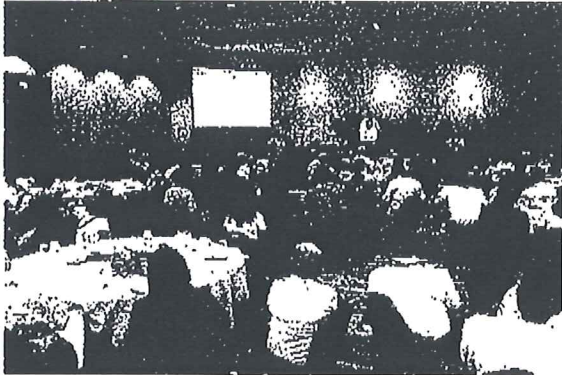


ENVIRONMENTAL MANAGEMENT REPORT

Changing Hawaii's dependence on tourism by moving away from oil and creating a smart grid

Participants at the World Congress on Zero Emissions Initiatives held in Hawaii discussed conventional wisdom and introduction of new technologies. Hawaii will set a goal of promoting moving away from dependence on oil and to by 2030 convert 70% of energy demand to clean energy. This will be accomplished through introduction of a smart grid and by grooming renewable energy businesses to switch from a tourism-dependent economy.

Reported by Shoichi Saito Photo by Kaz Tenabe



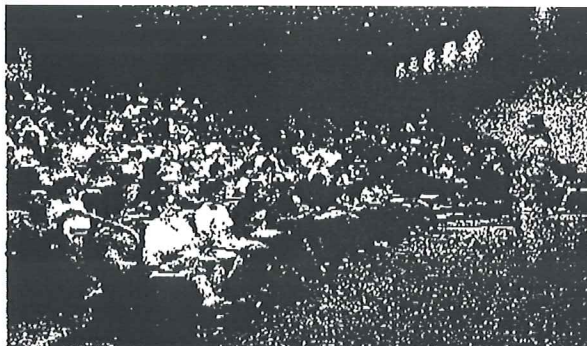
Lecturers were invited from Japan, Sweden, Bhutan and other countries and opinions were actively exchanged.

The World Congress on Zero Emissions Initiatives was held in Honolulu, Hawaii from September 13 to 17, with the keynote address delivered by Professor Gunter Pauli, who gained fame as the father of "Zero Emissions", which was advocated in 1994 by United Nations University.

Professor Pauli forcefully pointed out that "if Hawaii uses the wisdom that the people have from ancient times to 'redesign' the current business model, future sustainable economic development is possible."

In his speech, Professor Pauli frequently quoted from the English version of his recent book "The Blue Economy". The book, which is subtitled "10 Years, 100 Innovations, 100 Million Jobs," urges a switch from a green economy, an expensive system that depends on subsidies and tax money, to a blue economy, a term he coined, which is an economic model based primarily on less-expensive innovations.

Congress lecturers were invited from Japan, Sweden, Bhutan and other countries to discuss the concept from various angles and look at actual blue economy examples that will take the place of the green economy.



On the first day of the Congress, Professor Gunter Pauli (left) delivered the keynote speech. On the 16th, about 500 elementary and middle school students were invited to the venue and Professor Pauli explained how to grow mushrooms from coffee grounds (photo on right by Shoichi Saito).

Ancient Hawaii's *Ahupua'a*

One noteworthy lecture topic was a discussion of the introduction of *Ahupua'a*, which was a basic system of land management in ancient Hawaii. By dividing valleys into units called *Ahupua'a*, early inhabitants controlled the environment so as not to take too much food and resources and lived their lives with an attitude of gratefulness for the sun and the land. With a population 250 years ago of 400,000 to 800,000, the Hawaiian people achieved self-sufficiency.

Mark McGuffie, chairman of the World Congress on Zero Emissions Initiatives and one of the producers of the Congress, commented that "there is a proverb in Hawaii that says that 'the future is born from the past.' Currently, more than 90% of oil and 85% of food consumed on the islands depends on imports. We want to think about creating an environmentally friendly island by combining past wisdom and new technologies discussed during the Congress." In the Hawaii Clean Energy Initiative (HCEI) announced in 2008, Hawaii declared that it will promote a move away from oil by 2030, with one goal being to convert 70% of energy demand to clean energy.

As the first step to implement this, in July this year, Hawaii put a state law into effect to address food and energy security and newly introduced a \$1.05 per barrel tax on imported oil. With this new tax revenue, Hawaii is promoting conversion to non-oil energy sources.

The core for implementation of HCEI is to improve electric power efficiency and groom renewable energy businesses by introducing a smart grid. During the Congress, a panel was held on this theme and there was heated discussion among participants as to what the new energy landscape should look like.

Power company changes policy for the move away from petroleum

A conspicuous difference from Japan is that Hawaii's only power company, Hawaiian Electric Company, is proactively engaging in renewable energy. Until a few years ago, the company was dismissive but now says "We significantly changed our policy for the sake of Hawaii's independency from oil energy."

Sopogy, based in Honolulu, is a leading renewable energy enterprise in Hawaii that engages in large-scale concentrated solar power generation and expects \$30 million (approximately ¥2.55 billion) in sales this term (as of December 2010). Sopogy President and CEO Darren Kimura addressed this, saying, "Our concentrated solar power generation is a best fit with the smart grid because energy can be stored and no inverter is required."

In the first phase of Hawaii's smart grid scheme, one pillar is to supply renewable energy cable from three islands, Molokai, Lanai, and Maui, to Oahu, which is a large power consumption area. This massive project is projected to cost \$16-\$20 billion (¥1,360 billion - ¥1,700 billion) and will take about 20 years to complete.

The "Aloha Accord" was adopted on the last day and the World Congress on Zero Emissions Initiatives drew to a close. As mentioned in Mr. McGuffie's comments, the future challenge will be how to implement the ideas that were confirmed in the Congress with new technologies such as a smart grid.

Currently, both the United States and Japan are aiming to develop a sustainable clean energy model on the isolated islands of Hawaii and Okinawa and in the process send a message to the world. Ted Peck, State Energy Administrator of the Department of Business, Economic Development & Tourism in Hawaii, commented that "We want to collaborate with Okinawa and stimulate each other to establish a business model on an isolated island. We want Hawaii to be an international test site to confirm whether new technologies such as the smart grid function well as a system."

Next year's Asia-Pacific Economic Cooperation Conference (APEC) will be held in Hawaii. It is thought that the Hawaii-Okinawa joint project may be announced at the conference. At that time, if it is presented to the leaders of each country together with traditional systems represented by Ahupua'a, we may be able to reaffirm that this Congress was a significant event.



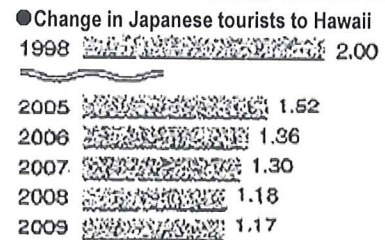
At an exhibitor's area set up in the venue, many exhibits were presented by enterprises rolling out renewable energy in Hawaii, including Sopygy.

The number of tourists visiting Hawaii has decreased and the focus is now on attracting new business customers

By the late 1990s more than two million Japanese tourists visited Hawaii each year, but the number of tourists from Japan has been declining. In fact, by 2009, tourist numbers had plunged to 1,170,000, less than 60% of the peak. The primary cause of this drop was loss of interest in trips by the young adult segment. For young people who seem to have less willingness to buy, overseas trips are no longer attractive.

In 2009, 6,520,000 tourists from all countries of the world visited Hawaii, down 1,100,000 from 2007. Factors behind this decline include the impact of the fall of Lehman Brothers and a new influenza virus. In the past several years, an increase in Chinese tourists has made up for some of the losses but there is a sense of crisis that sustainable development of tourism; which is the major industry in Hawaii, cannot be expected by simply relying on efforts to attract more tourists.

With that in mind, the focus is on attracting visitors other than tourists. Of them, expectations for business customers are high. A platform for large scale conferences, the Hawaii Convention Center opened in 1998 and was the venue for this year's World Congress on Zero Emissions Initiatives. The selling points of this center are that, with a capacity of more than 10,000 people, it can be used to host international conferences and exhibitions. It already has hosted many different international academic conferences. Hawaii Convention Center director of international sales and marketing June Matsumoto said, "We want to emphasize inviting business customers from Japan."



Unit: 1 million people
Source: Hawaii Tourism Authority, etc.

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