

# 2013

## ISLAND SUSTAINABILITY CONFERENCE

April 17-19, 2013 • Hyatt Regency Guam

# SOLUTIONS FOR A SUSTAINABLE FUTURE

ENVIRONMENT | EDUCATION | ENERGY  
ECONOMY | SOCIETY & CULTURE



Center for  
**ISLAND  
SUSTAINABILITY**



# 2013 ISLAND SUSTAINABILITY CONFERENCE

April 17-19, 2013 • Hyatt Regency Guam

This Conference was made possible through funding from University of Guam, Office of Naval Research [ONR], and U.S. Department of Energy.



## SPECIAL THANKS TO OUR CONFERENCE SPONSORS:



# Contents

2 CIS Year in Review

4 Green Dream Home

5 Conference Tours

6 Conference Agenda

8 Featured Speakers & Exhibits

10 Presentation Descriptions

21 Hyatt Conference Map



## Conference Steering Committee Members

**Dr. Robert Underwood**  
Conference Chair

**Elvie Tyler**  
Conference Coordinator  
UOG Center for Island  
Sustainability

**Norman Analista**  
UOG Development &  
Alumni Affairs

**Peter Calvo**  
Guam Energy Office

**CMDR Daniel Cook**  
Joint Region Marianas

**Manny Hechanova**  
UOG PIP/TADEO

**Dr. Frankie Laanan**  
UOG School of Education

**Evangeline D. Lujan**  
BSP Guam Coastal  
Management Program

**Jonas Macapinlac**  
UOG Integrated Marketing  
Communication

**Desiree Masterson**  
Joint Region Marianas

**Cathleen Moore-Linn**  
UOG Professional &  
International Programs

**David Okada**  
UOG Planning Office

**Dr. Mary Okada**  
Guam Community College

**Eric Palacios**  
Guam Environmental  
Protection Agency

**Dr. John Peterson**  
UOG Center for Island  
Sustainability



**Artemio Perez**  
Guam Power Authority

**Terry Perez**  
BSP GCMP

**Melissa Savares**  
Dededo Mayor

**Martha Suez-Sales**  
UOG School of Business  
and Public Administration

**Antonio Endaya**  
**Francisco Palacios**  
**Alison Hadley**  
**Phil Cruz**  
CIS Conference Staff

**Carlos Taitano**  
**Russell Ocampo**  
PIP Conference Staff



## Since the 3rd Regional Island Sustainability Conference in 2012,

the Center for Island Sustainability (CIS) has continued to pursue and implement island-based models of renewable, sustainable, and appropriate technologies that focus on indigenous energy alternatives that meet the needs of an island community. CIS has taken on solar and wind turbine projects, focused on energy conservation by installing low-e window tint and energy efficient appliances, and continues to educate the public and school community.

### Our Projects

#### CIS Wind and Solar Projects

##### **1kW Wind Turbine:**

CIS has installed a 1 kilowatt (kW) Whisper 200 wind turbine. The turbine will be used for educational purposes.



##### **School of Education:**

The UOG School Of Education's renewable energy 12 kW solar panel project was commissioned in May 2012. The 12 kW solar power saves 1,887 Kilowatt hours (Kwh) a month, which is equivalent to around \$660.



### **School of Business and Public Administration (SBPA or Leon Guerrero Building)**

SBPA installed seven-day-timers for its air-conditioning units. This resulted in energy savings of 9,422 kwh/month which is about \$3,102.

### **Tan Siu Lin Library**

The Library also installed seven-day-timers for its air-conditioning units which resulted in average energy savings of 16,267 kwh/month which is about \$488.

### **Humanities and Social Sciences (HSS) and English and Communications (EC)**

The HSS and EC buildings received low-e window tint on their outer facing windows, most of which are office windows. Those who received the window film have noticed a reduction of heat in their offices.

### **Dean's Circle House #6**

House #6 in the Dean's Circle received a 6kW solar panel grid tie system. This installation gives House #6 the average monthly savings of 1,100 kwh,/

month which is about \$330.

### **Dean's Circle House #15:**

House #15 is the building that houses UOG's ISLA Center for the Arts, and it has special requirements for lighting and temperature control. The house's air-conditioning units were replaced with three 2-ton split-units. The windows and skylight were replaced with double-paned windows and the halogen light bulbs were replaced with LED bulbs. House #15 has an average monthly savings of 5,198kwh/month which is about \$1,559.



### **Energy Literacy for Guam's Business Community**

To reach the business community, CIS has conducted

Energy Literacy presentations to the Guam workforce throughout the island. The goal is to get businesses to be more energy conscious and instill good energy conservation habits in the work environment.

### **Energy Career Expo**

CIS held an Energy Career Expo on September 15, 2012 at the Micronesia Mall. The purpose of this expo was to expose high school and college students to careers in the energy field as well as educate the general public on energy conservation.



### **UOG Green Projects**

#### **Educational Outreach:**

The Education and Outreach projects all have one goal, to educate the island community about the solutions for a sustainable future. UOG Green interns conduct presentations regarding environmental sustainability and energy conservation to various students from local schools grades K-12, as well as post-secondary students at the University of Guam.

#### **Community Projects:**

The UOG Green interns have taken part in various projects that involve the Guam community. ☺

# Green Dream Home

## High School Competition

April 6, 2013 Agana Shopping Center

**Below:** A group picture of third place winners George Washington High School.



**The Green Dream Home competition** was developed by Francisco "Kiko" Palacios, an energy technician at the UOG Center for Island Sustainability. The competition was designed to engage the island's youth in sustainable practices by allowing for full imagination and creativity in developing green dream homes.

The students were given the task to create and design a sustainable home and were expected to research sustainable building practices and techniques under the guidance of their teachers.

A total of nine high schools and 14 teams entered the competition which was held in the Agana Shopping Center on April 6. Each team had to explain the features of their green dream home model to the panel of judges which included representatives from UOG, GCC, Guam Environmental Protection Agency, Guam Energy Office, Guam Power Authority and NAVFAC.

The Green Dream Home models are on display at the Island Sustainability Conference. ☺

### WINNERS

#### 1st place

John F. Kennedy High School Team 1 —  
Angel Lee.

#### 2nd Place

Father Duenas Memorial School Team 1 —  
Jason Wu, Steven Dauterman, James Ma, Aaron Carballido.

#### 3rd Place

George Washington High School Team 1 —  
Eric Delfin, Cameron Dudkiewicz, Edward Saurez, Claret Aguon, Angelina Bagafono, Alistina Wheaton, Thealanie Monkeya.

#### Viewers Choice

George Washington High School Team 1



# Conference Tours Friday, April 19

**Tours will depart at 9 AM from the UOG School of Business and Public Administration Building.** Conference attendees who registered for the three-day conference can choose to participate in one of the three tours. First come, first served. Limited seating. Lunch will be provided.

## TOUR 1: HUMĀTAK WATERSHED ADVENTURE TOUR

Participants of the 'Humātak Watershed Adventure' will embark on an exciting field trip through the tropical La Sa Fu'a Watershed in the southern village of Humātak. The journey will begin in the hillsides of the watershed and culminate at Laso Fu'a (Fouha Rock) in enchanting Fouha Bay, the site of human creation according to Chamorro folklore. Participants will learn first-hand about Guam's natural resources, which are the foundations of our island culture. Scientific and cultural experts will meet participants at different stops along the adventure to share about watershed connections and the environmental threats they face.

## TOUR 2: MASSO RESERVOIR AND PITI BOMB HOLE TOUR

The Masso River is the largest river feeding into the Piti Bomb Holes



Humātak Watershed Adventure Tour

marine protected area. As such, it has been one of the largest sources of sedimentation into the reef flat of Piti. Work completed in the Masso watershed has reduced the amount of sediment input to the Piti MPA. Approximately 2500 native trees and 9000 acacia trees were planted in the Masso watershed to help stabilize soil as well as enrich badland areas. Additionally, the Masso reservoir was dredged and a fishing platform was installed to facilitate public use of the facility. Native fish have been placed in the reservoir. Participants should bring water, sunscreen, and wear comfortable walking shoes and a hat. This mile long hike will take 2.5-3 hours.

## TOUR 3: NAVY ENERGY TOUR

The tour to Naval Base Guam will look at the 250 kW photo voltaic array and the

inverter which converts the DC power to AC power which is placed on the base grid. This array has 1704 panels that produces between 1000 and 1200 kWh each month replacing power that would be purchased from oil burning power plants. Next we will visit the Central Utility Plant for our new LEED Gold Barracks to see the energy conservation measures and renewable energy systems installed. Both photo voltaic and thermal panels are installed to reduce total electrical loads and heat water. The building air conditioning is supplied by efficient compressors using ground water for heat rejection. The Compressor is a magnetic bearing, oil free variable speed compressor that uses 40% less energy than standard air conditioning compressors. Instead of installing cooling towers we draw water from 225 feet wells pass it through the chiller and then return the water to another well. The building air conditioning is run by a computerized control system. ☺

## SUSTAINABILITY CONFERENCE TUMON/TAMUNING BIKE RIDE Thursday, April 18

Come join I Bike and support safe biking on Guam Thursday, April 18th from 5-6pm. We will be riding from the Hyatt Hotel to the Hospital look out via San Vitores Road and Father Duenas drive. We will enjoy the view of the Philippine sea at a beautiful

look out and then return on the same route to the Hyatt. This is a safe four mile ride on the proposed central Bike Route. In conjunction with the sustainability conference, twenty bikes will be available on a first come first serve basis for anyone at the

conference who does not have a bike. If you do have a bike please join us but remember to bring your helmet and good shoes. Support Sustainable biking on Guam. For more information, contact I Bike Group on Facebook or Tom Renfro @637-0714. ☺

# AGENDA

## DAY ONE, WEDNESDAY, APRIL 17, 2013

TIME	ACTIVITY				
Time	Economy	Energy	Environment	Education	Society & Culture
<b>BREAKOUT SESSION A</b>					
1:00 P.M. - 2:00 P.M.	<b>Ballroom A</b>  Island Workforce Development: Examples of Island-Focused Solutions  Michael Jon Stoil, Associate Professor of Political Science and Micronesian Studies	<b>Ballroom B</b>  Renewable Technology Demonstrations on Navy Base Guam and Andersen Air Force Base and Sea Water Air Conditioning at Navy Base Guam and Andersen Air Force Base  Desiree Masterson, Regional Energy Program Manager, Joint Region Marianas	<b>Ballroom C</b>  Food Waste Utilization for Sustainable Agriculture in Guam  Mari Marutani, Yoshio Kishida and Yoshitaka Kimura	<b>Santa Rita Mezzanine</b>  Fostering Sustainable Behavior in the Classroom and Our Communities  Sabina Perez and Mary Garvilles	<b>Santa Rosa Mezzanine</b>  Comprehensive Assessment of Local Perceptions, Affecting Change and Engaging the Community  Eva Cruz, Moneka De Oro, Jessica Nanguata
<b>BREAKOUT SESSION B</b>					
2:15 P.M. - 3:15 P.M.	<b>Magellan Mezzanine</b>  Pacific Municipal Recyclers: Sustaining Guam's Beauty Through a Recycling Business Opportunity  <u>Alan Cepeda</u>  <b>Ballroom A</b>  Large Scale Automated Composting for a Sustainable Solid Waste Management System  Mohammed Golabi	<b>Ballroom B</b>  Alternative Energy Options for Micronesia  Bruce Best	<b>Santa Rosa Mezzanine</b>  Targeted Aerial Application of Oral Toxicants for Controlling Brown Tree Snakes on Guam  Daniel S. Vice, Craig S. Clark, Will Pitt, and Brian Dorr	<b>Santa Rita Mezzanine</b>  Engaging Community Stewardship: Guam Community Coral Reef Monitoring Program  Marybelle Quinata	<b>Ballroom C</b>  American Samoa Tsunami Study – an Example of Sustainable Land Use and Community Resilience Following a Catastrophic Event  Daniel M. Savercool, CSE
<b>BREAKOUT SESSION C</b>					
3:30 pm - 4:30 pm	<b>Ballroom B</b>  Biofuel and the Coconut Industry in the Federated States of Micronesia.  Olivier Wortel, Communications Officer for Vital Energy and Navigator for the Vital FSM Biofuel Initiative	<b>Ballroom A</b>  GPA's 2013 Integrated Resource Planning  Jennifer Sablan, P.E. and John J. Cruz Jr., P.E., MBA	<b>Santa Rosa Mezzanine</b>  No State Left Behind: Improving and Increasing Participation in the Palau Protected Areas Network  Lolita Gibson-Decherong	<b>Ballroom C</b>  Sustaining Human Health Resources  Roseann M. Jones, PhD, Kyle Blas, Ashley Charfauros, Ashlee Cabreza, and Richard S. Colfax, PhD	<b>Santa Rita Mezzanine</b>  Social Perceptions on Sustainability: Giving Voice to the People of Guam  Dr. Michael Ehlert, Suzanne B. Bernardo, and Diana C. Carlos
<b>INTEREST GROUP MEETING &amp; COCKTAIL RECEPTION</b>					
4:30 pm - 8:00 pm	<b>Ballroom A</b>  STEM Networking with Margaret Ashida	<b>Ballroom B</b>  Graduate Studies with Dr. Mari Marutani and Dr. Diambra Odi, Hauhouot	<b>Ballroom C</b>  GETF Networking with Misty Conrad Networking Reception	<b>RECEPTION HOSTED BY:</b>	
					

# AGENDA

## DAY TWO, THURSDAY, APRIL 18, 2013

TIME	ACTIVITY
8:00 A.M.	Sign-in and Continental Breakfast
8:30 A.M.	Plenary Speaker — <b><i>Building Resilience Against Climate Change: Micronesians in Action</i></b> , Noah Idechong
9:45 A.M.	Plenary Speaker — <b><i>A Comprehensive Perspective on Sustainability</i></b> , CAPT John Heckman, USN, Regional Engineer, Joint Region Marianas and Commanding Officer, NAVFAC Marianas
10:45 A.M.	Plenary Panel 2 — <b><i>Community Relations and Public Understanding</i></b> , Desiree Masterson, Joint Region Marianas, Bob Shambaugh, President, Recycling Association of Guam, Virginia Liu, PITI; Austin Shelton, Doctoral Candidate UH Manoa
11:30 A.M.	Lunch — Green Dream Home Competition Winners

Time	Economy	Energy	Environment	Education	Society & Culture
<b>BREAKOUT SESSION D</b>					
1:15 P.M. - 2:15 P.M.	<b>Ballroom B</b> How to Afford Photovoltaics to Sustain Your Lifestyle  Scott Hagen and Tommy Blas	<b>Ballroom C</b> Predicting Hydropower Potential on Ungaged Streams in Kosrae Island, FSM  Shahram Khosrowpanah, Director, Professor of Water Resources Eng., University of Guam, Water & Environmental Research Institute of the Western Pacific	<b>Ballroom A</b> The Humåtak Project: Reviving our Watersheds, Coral Reefs, and Fisheries  Austin Shelton	<b>Santa Rita Mezzanine</b> Sustainability of Wastewater Treatment Practices in Micronesia  Joseph D. Rouse, Associate Professor, University of Guam, Water and Environmental Research Institute of the Pacific	<b>Santa Rosa Mezzanine</b> Social Work for a Sustainable Micronesia  Dr. Vivian Dames, Dr. Lisalinda Natividad, Dr. Gerhard Schwab, and Joliene Hasugulayag MSW (UOG Social Work Faculty)  <b>Magellan Mezzanine</b> Research and Education for Sustainable Development: Challenges at a National University in Japan  Yukiko Inoue-Smith

Time	Economy	Energy	Environment	Education	Society & Culture
<b>BREAKOUT SESSION E</b>					
2:30 P.M. - 3:30 P.M.	<b>Ballroom B</b> An Update on Guam's Island-Wide Zero Waste Initiative  Mark Calvo, Director of the Guam Military Buildup Office & Special Assistant to the Governor Eddie Baza Calvo	<b>Ballroom A</b> GPA Environmental Strategic Plan  “Paz” Maria A. Tison E.I.T., C.E.M., John J. Cruz Jr., P.E., MBA, Sylvia Ipanag and Gale F. Hoffnagle, CCM, QEP	<b>Ballroom C</b> Developing Stewardship Through Service Learning and Volunteering  Jo Nita Q. Kerr, Assistant Professor, Guam Community College	<b>Santa Rosa Mezzanine</b> Marine Mania: Twenty Years of Environmental Protection on Guam  Natividad Rosario, President, Marine Mania	<b>Santa Rita Mezzanine</b> Survival of Traditional Healing on Guam  Tricia A. Lizama, Ph.D., LCSW  <b>Magellan Mezzanine</b> Assessment of Local Perceptions, Affecting Change and Engaging the Community  Laura Biggs, PhD

Time	Economy	Energy	Environment	Education	Society & Culture
<b>BREAKOUT SESSION F</b>					
3:45 P.M. - 4:45 P.M.	<b>Ballroom C</b> Guam Buildup Environmental Initiatives: Integrating Biosecurity with Beneficial Reuse  Albert Borja, NAVFAC Marianas, Env. Compliance Specialist and Nadia Wood, SWCA Biological Monitor (Consultant to Hensel-Phelps Granite JV)	<b>Ballroom B</b> Guam Power Authority Smart Grid: Enabling Infrastructure  Roel A. Cahinhinan, P.E., Special Projects Engineer in the Strategic Planning & Operations Division  John J. Cruz Jr., P.E., MBA, GPA's Strategic Planning & Operations Division (SPORD) manager	<b>Santa Rosa Mezzanine</b> Guam's Independence... From Fossil Fuels  Allison R. Rutter	<b>Santa Rita Mezzanine</b> The Status of Guam's Native Birds: Historic and Future Efforts for Recovery  Celestino F. Aguon, Suzanne Medina, Laura Duenas, and Jeffrey Quitugua	<b>Ballroom A</b> Community Gardens, Social Work, and Sustaining Healthy (Physical and Mental Health) Communities  Lisalinda Natividad, Ph.D., Tricia A. Lizama, Ph.D., Jordan Guerrero, Shirley Gustillo, Feliciana Tainatongo and Antonio Diaz, Graciela Jimenez, Michael Gombar, and Wes Tomokane

Time	CLOSING
4:45 P.M.	

# 2013 ISLAND SUSTAINABILITY CONFERENCE

# Featured Speakers & Exhibits

## SPECIAL GUEST SPEAKERS



### The STEMx Solution: Local Innovation, State Leadership, National Impact 9:35am, Wednesday, April 17, 2013

**Margaret Ashida** is the Executive Director of the STEMx nationwide network of state STEM organizations that are working together to transform science, technology, engineering and mathematics education at the grassroots level. STEMx is managed by Battelle, the world's largest independent research and development organization.



### Building Resilience Against Climate Change: Micronesians in Action 8:30am, Thursday, April 18, 2013

**Noah Idechong** is an environmentalist, Marine Fellow, is a member of the Pew Charitable Trust, a Goldman Environmental Prize recipient, and named one of Time Magazine's "8 Heroes of the Earth."



### A Comprehensive Perspective on Sustainability 9:45am, Thursday, April 18, 2013

**Captain John V. Heckmann, Jr.**, Civil Engineer Corps, United States Navy is the Commanding Officer of Naval Facilities Engineering Command Marianas. A native of Miles, Iowa, Captain John V. Heckmann attended NROTC at Iowa State University and graduated with distinction with a Bachelor of Science degree in Physics. He was commissioned an Ensign in the Civil Engineer Corps in 1986. He holds a Master of Science degree from the University of Washington. He is a registered Professional Engineer in the State of Iowa and a member of the Acquisition Professional Community.

## Plenary Panels

### Smart Energy

*Panel: Senator Tom Ada, 32nd Guam Legislature; Joaquin Flores, GPA; Scott Hagen, Pacific Solar & Photovoltaics; Senator Michael Limtiaco; Stephen Ricci, Battelle | 10:30am, Wednesday, April 17, 2013*

### Community Relations and Public Understanding

*Panel: Desiree Masterson, Joint Region Marianas; Bob Shambaugh, President, Recycling Association of Guam, Virginia Liu, PITI; Austin Shelton, Doctoral Candidate UH Manoa | 10:45-11:30am, Thursday, April 18, 2013*



## Luncheon Speakers

"Building Blocks for a Sustainable Future"  
**Senator Tom Ada**  
32nd Guam Legislature  
11:45am, Wednesday, April 17, 2013

Green Dream Home Competition Winners  
11:30am, Thursday, April 18, 2013

# Poster Presentations 4:30pm, Wednesday, April 17, 2013, 2nd Floor

## Making Recycling Accessible: A continuing study at the University of Guam

Presented by: Diana C. Carlos, Michael B. Ehler

Thompson (2010) supports the IPCC (AR, 2007) report that human activity contributes substantially to climate change; and unless we learn how to mitigate the impact we will be forced to ultimately adapt or suffer.

In 2009, the University of Guam founded the Center for Island Sustainability to promote sustainable living in Guam. There were opportunities to recycle at the University, yet they lacked strategic planning.

We tested the effects of increasing the number of recycling stations as well as placing recycling bins beside all trash bins.

**Diana Carlos** is a senior at the University of Guam, majoring in Psychology, with a minor in Biology. She is currently a research assistant for the Center for Island Sustainability.

**Michael B. Ehler** (Ph.D., University of New Hampshire) teaches experimental psychology and behavior analysis at the University of Guam.

## Solar Powered Aquaponics Model for Teaching & Backyard Farming

Presented by: Gary M. Baxter, Peter-Joseph C. San Nicolas, Jathan R. Muna-Barnes Prem Singh, PhD., and Jonathan K. Davis

Aquaponics is the combination of fish culture and horticulture. Creating a self-sustaining aquaponics system for home use is feasible. After some initial research and start up money, almost anyone can have their own homegrown fish and plants/vegetables. The concept displayed is suitable for a stand-alone backyard system. This system has a three-part design: aquaculture, hydroponics, and a solar power system. The basic principles of aquaponics is using a closed, recirculation system, using the effluent from the fish tank to provide nutrients for the plants. With our current system, a solar panel is used to charge a battery, which is connected to the AC/DC converter, and the electric pump plugs into the inverter.

**Dr. Prem Singh** is an Agricultural Engineer with the College of Natural and Applied Sciences (CNAS), University of Guam (UOG). His expertise is in the area of soil and water management with emphasis in microirrigation.

**Gary Baxter** is pursuing a Bachelors of Science in Agricultural at University of Guam. Sustainable living is a goal of his and he looks forward to new and interesting ways to make it available for everyone.

**Jathan Muna-Barnes** is a Junior at the University of Guam studying Tropical Agriculture. His goal upon completing the Agriculture program is to influence islanders about the importance of Agriculture and environmental sustainability.

## The Guam Plant Extinction Prevention (GPEP) Program for Saving Rare Plants in Guam

Presented by: James McConnell, Jonathan K. Davis, Justin Santos, and Mari Marutani

The US Forest Service supported the establishment of the Guam Plant Extinction Prevention (GPEP) program in 2011 as a rare plant restoration project by the Guam Department of Agriculture Forestry & Soil Resources Division and the University of Guam in collaboration with the Hawaii Department of Land & Natural Resources and Hawaii Plant Extinction Prevention program. The main objective of the program is to protect and restore rare plants in Guam's natural forests.

**Justin Santos** is a Forester working at the Guam's Department of Agriculture/Forestry & Soil Resources Division. With the State of Hawaii's Division of Forestry and Wildlife and UOG, he has developed the Guam Plant Extinction Prevention Program (GPEP program) to protect rare and endangered plants for Guam's future generations.

**Jonathan "Kawika" Davis** is a senior working on a B.S. degree in Tropical Agriculture with an Applied emphasis at the University of Guam and is a Research Assistant II with GPEP (Guam Plant Extinction Prevention program).

**Dr. James McConnell** received a B.S. in Horticulture from Pennsylvania State University and M.S and PhD in Horticulture from the University of Hawaii. Currently, a Professor of Horticulture at the University of Guam.

**Dr. Mari Marutani** obtained a Ph. D. in Horticulture from the University of Hawaii at Manoa. Dr. Marutani is teaching horticultural science, vegetable production and agroecology at the University of Guam as a professor of horticulture and sustainable agriculture.

## Can Local Plants Produce Biofuels in Guam?

Presented by: Mario Martinez and Mari Marutani

If Guam were to develop their own source of fuel, reliance on foreign sources could be eliminated. Da'ok (*Calophyllum inophyllum*) or Jatropha (*Jatropha curcas*) could be the answer. Both are nuts that are grown on Guam. Da'ok is known for its medicinal uses and is a possible biofuel source. Jatropha is being used in different countries as a biodiesel. The project was to collect local sources of these two nuts, extract the oil, and send the oil to the University of Alaska for analysis. It takes approximately 1.3 kg of dried Da'ok seeds to make 1 liter of oil and 7 kg of Jatropha seeds to produce 1 liter of oil. If the analysis indicates that the oils from Guam seeds are viable sources of biodiesel, it would be possible for Guam to grow their own source of fuel.

**Mario Martinez** is a student at UOG pursuing a degree in Tropical Agriculture with a emphasis in research. He works for Dr. Mari under the biofuel project. He collects and processes the nuts that are pressed for oil. ☺

# Presentation Descriptions - Breakout Sessions A, Day 1

**Island Workforce Development: Examples of Island-Focused Solutions**  
**Michael Jon Stoil, Associate Professor of Political Science and Micronesian Studies**  
**1pm-2pm, Ballroom A**

Human resources represent an often-neglected issue for sustainability of small island states. Leaving workforce development entirely up to market forces and individual preferences results in high rates of unemployment



and underemployment among island states, and the departure of talent to seek better employment off-island. Some island-states, however, have applied private-public sector governance, focusing on secondary and higher education resources. These island-specific solutions hold promise for more sustainable long-term workforce development.

**Renewable Technology Demonstrations on Navy Base Guam and Andersen Air Force Base**  
**Desiree Masterson, Regional Energy Program Manager, Joint Region Marianas**  
**1pm-2pm, Ballroom B**

Navy and Department of Energy's National Renewable Energy Laboratory are conducting Joint Technology Demonstrations at Navy Base Guam and Andersen Air Force Base. The scope is to demonstrate multiple high potential newly commercialized energy improvement technologies at DoD facilities in Guam. Joint Region Marianas has also completed a "concept of design" for Sea Water Air Conditioning (SWAC) systems at Naval Base Guam. An in-

house study completed in 2011 determined the technical and economic feasibility of implementing SWAC at installations on Guam. SWAC uses cold seawater as a renewable resource to offset air conditioning electricity demand, which is virtually baseload power on Guam.



**Desiree Masterson** is a civil engineer and a Certified Energy Manager. Ms. Masterson currently supports the Naval Facilities Engineering Command, Joint Region Marianas, as the Regional Energy Program Manager. Here she coordinates the facilities energy program for both Naval Base Guam and Andersen Air Force Base.

**Food Waste Utilization for Sustainable Agriculture in Guam**  
**Mari Marutani, Yoshio Kishida and Yoshitaka Kimura**  
**1pm-2pm, Ballroom C**

In 2010, a collaborative project between University of Guam and Okayama University began to explore utilization of food waste for island agriculture in Guam. The first study collected current information on food waste disposal system used by hotels, restaurants and other food catering operations in Guam. Another survey was conducted among pig farmers to evaluate the status of food waste usages in their operations. Both surveys were done by phone or by site visit during the period of November 2010-January 2011. In the collaborative project, Guam representatives visited Japan to learn different wet garbage management systems. Our observations have guided us to conduct a pilot study of waste oil collections and food waste processing to make compost. Further studies will be needed to produce animal feeds from food waste.



**Dr. Marutani** obtained a Ph. D. in Horticulture from the University of Hawaii at Manoa. Dr. Marutani is teaching horticultural science, vegetable production and agroecology at the University of Guam as a professor of horticulture and sustainable agriculture. She also conducts research and extension programs on sustainable agriculture.

10

**Dr. Kimura** is a professor in Graduate School of Environmental and Life Science in Okayama University. His research field is "Establishment of Sustainable System to Utilize Waste and Biomass by Chemical Engineering Method."

**Dr. Kishida** had been teaching agricultural science, stock raising production systems at the University of Okayama as an associate professor of agriculture. Dr. Kishida is currently teaching community development at the Okayama Shok University as a professor of business administration.

**Fostering Sustainable Behavior in the Classroom and Our Communities**  
**Sabina Perez and Mary Garvilles**  
**1pm-2pm, Santa Rita Mezzanine**

The findings by Wray-Lake, Flanagan, and Osgood from their study entitled “Examining Trends in Adolescents Environmental Attitudes, Beliefs and Behaviors Across Three Decades” reveals declining trends of environmental concerns and conservation behavior amongst adolescents during the years of 1976-2005. Because the mindset of our youth is a predictor of societal changes, a cause of concern exists, regarding the future sustainability of our islands. In light of the findings of this study, the role of environmental education in nurturing the next generation of environmental stewards should be considered as an important component of sustainable practices.

**Sabina Perez** is a fourth year science teacher at Simon Sanchez High School, where she is co-piloting a Permaculture course. Sabina is also currently a co-instructor for the Mariana Islands’ Forest Ecology for Educators with the University of Guam Professional and International Programs.

**Mary Garvilles** is a twelve year Science teacher with GDOE and is currently teaching Biology and Physical Science at Simon Sanchez High School. Mary is also currently a co-instructor for the Mariana Islands’ Forest Ecology for Educators with the University of Guam Professional and International Programs.



**Comprehensive Assessment of Local Perceptions, Affecting Change and Engaging the Community**  
**Eva Cruz, Moñeka De Oro, Jessica Nanguata**  
**1pm-2pm, Santa Rosa Mezzanine**

The Guam Environmental Education Committee (EEC) is a consortium of public, private, nonprofit and community representatives united for the common goal of raising awareness of and affecting change towards Guam’s unique ecology. The committee’s mission is as follows: to instill environmental responsibility and pride, the perpetuation of Chamorro culture, to increase scientific and environmental literacy, support activities and publications, to retie people with the environment, and provide facilitation between other groups. The Tasi (sea) committee, a

sub committee within the EEC, has a focus of creating an engaged and informed public as it relates to Guam’s ocean resources. In order to most effectively address the needs of the community, our committee plans to conduct a needs assessment to better understand the barriers that prevent residents from actively engaging in marine resource activities and management.

**Eva Aguon Cruz**, graduated from the University of Guam with a BA in Interdisciplinary Arts and Sciences with an emphasis on Culture, Literature and the Arts in 2012.



**Moñeka De Oro** is a Micronesian cultural preservation advocate and



indigenous rights activists. Her affection for the the region’s rich history and natural beauty led her to pursue a degree in Anthropology at UOG, where she is a Masters candidate in the Micronesian Studies Program.

**Jessica Nanguata** is a senior in the Tropical Agricultural Science Program at the University of Guam. She has worked with the Coconut Rhinoceros beetle eradication project. Her interest is in finding ways and means to improve sustainable organic agriculture systems on Guam.



## Presentation Descriptions - Breakout Sessions B, Day 1

### **Pacific Municipal Recyclers: Sustaining Guam's Beauty Through a Recycling Business Opportunity** **Alan Cepeda | 2:15pm-3:15pm, Magellan Mezzanine**

Pacific Municipal Recyclers is a concept developed to address the lack of attractive recycling bins, offer advertising opportunities for



businesses, and also provide jobs in the manufacturing sector to produce the recycling bins. The goal is to create a self-sustaining business that delivers

an advertising medium to private businesses via recycling bins, as well as providing recycling bins that can

be purchased by the local government to place in public areas to improve the experience of local and off-island visitors. The student entrepreneur is currently seeking funding from either private investors or public sources.

**Alan Cepeda** is currently attending the University of Guam working on his bachelors in business administration with a concentration in entrepreneurship and tourism.

### **Large Scale Automated Composting for a Sustainable Solid Waste Management System** **Mohammad H. Golabi | 2:15pm-3:15pm, Ballroom A**

There is an urgent need to develop a comprehensive solid waste management and recycling plan on Guam to minimize cost and avoid undesirable environmental effects of legal and illegal dump sites and to enable utilization of recyclable as well as green and other refuse as a resource which is currently discarded in land-fills. Currently land-filling is the only discard method available to the island. Land-filling of huge volume of organic waste material not only causes environmental problems for the island, but it is in fact loss of valuable resources which could be composted and made available for land application as soil amendment in forest lands, farm field, and home gardens. Composting on the other hand reduces both the volume and mass of the raw material while transforming them into a valuable

soil conditioner. A zero waste management strategy will be presented and examined for possible implementation in Guam and the other islands in the western pacific. A large scale composting methodology that is being developed at the University of Guam's research station for organic waste recycling of municipal origin will be presented to demonstrate the effect of recycled organic waste application for crop production and agricultural sustainability.



**Dr. Mohammad Golabi** is an Associate Professor of Soil and Environmental Sciences at the University of Guam. Dr. Golabi has received several federal and local grants for conducting research in the area of soil, natural resources, and environmental sciences. He has also taught many graduate and undergraduate courses in the area of Soil, Environmental Sciences and Waste management.

### **Alternative Energy Options for Micronesia** **Bruce Best | 2:15pm-3:15pm, Ballroom B**

There are alternatives to the current carbon based fuel (oil) driven power generating systems found across Micronesia. The rapid paced presentation will provide a brief survey of the current and near prime time non-carbon based power systems that are viable and appropriate for small island communities.

**Bruce Best** has a Pacific-wide reputation for his research efforts related to the research and development of remote

solar-powered health and education related communication networks across Micronesia. With his years of practical solar-powered computer-integrated installation experience combined with his knowledge of the region and his understanding of how to use alternate energy technology as a basis from promoting sustainable health & development, Bruce is trying to make a difference in the lives of Pacific islanders living on over 60 remote atolls across Micronesia.



**Engaging Community  
Stewardship: Guam Community Coral Reef  
Monitoring Program**  
**Marybelle Quinata**  
**2:15pm-3:15pm, Santa Rita Mezzanine**

The Guam Community Coral Reef Monitoring Program gives local residents an opportunity to get involved with protecting our coral reefs. Volunteers gain hands-on experience of Guam's reefs by conducting biological surveys to collect data on Guam's reef flats to help track the overall health of Guam's coral reefs. Current data results will be discussed in addition to program's progress. As a partner of the Humåtak Project, the lecture will briefly explain connection between upland Fu'a watershed projects with coral reef monitoring of Fu'a Bay. The program is designed to encourage community

stewardship of the island's marine resources and promote open communication between local reef managers and Guam residents. Understanding the state of our coral reefs can foster a proactive attitude toward island sustainability among Guam residents.



**Marybelle Quinata** is the program coordinator for the Guam Community Coral Reef Monitoring Program. Quinata has an extensive background in service learning projects that emphasize collective community improvement. The Guam Community Coral Reef Monitoring Program is funded by the National Oceanic and Atmospheric Administration under the Coral Reef Conservation Program.

**Targeted Aerial Application of Oral Toxicants for Controlling Brown Tree Snakes on Guam**  
**Daniel S. Vice, Craig S. Clark, Will Pitt, and Brian Dorr**  
**2:15pm-3:15pm, Santa Rosa Mezzanine**

The brown treesnake (*Boiga irregularis*, BTS) is an introduced pest that has caused catastrophic changes to the avifauna and economy on the island of Guam. An upcoming BTS control project, administered by the USDA, Wildlife Services program on Guam, has received immense media coverage lately. The objective of this project

is to deploy toxic baits aerially by helicopter to reduce snake populations in the forests adjacent to reduce BTS populations.

Thawed dead neonatal mouse (DNM) baits treated with 80 mg acetaminophen are individually attached to paper flag streamers with cardboard on each end of the paper streamer. The baits and streamers are deployed by hand via a helicopter over the project site at 36 baits per hectare. The double-ended cardboard streamers form a loop in the air and entangle the treated dead neonatal mice in the canopy, where they can be consumed by brown treesnakes.



**Daniel Vice** is the Assistant State Director for the USDA, APHIS, Wildlife Services Hawaii/Guam/Pacific Islands program, and is

based in Barrigada, Guam. Mr. Vice has worked as a senior wildlife biologist in the tropical western Pacific region for over 15 years, and has extensive experience managing invasive species and mitigating their impacts to native wildlife conservation on islands.

**American Samoa Tsunami Study – an Example of Sustainable Land Use and Community Resilience Following a Catastrophic Event**  
**Daniel M. Savercool, CSE**  
**2:15pm-3:15pm, Ballroom C**

American Samoa is located only 120 miles away from one of the fastest moving subduction zones in the world, the Tonga Trench. On September 29, 2009, the South Pacific Tsunami was generated by a series of strong earthquakes originating from the Tonga Trench. The U.S. Army Corps of Engineers, Honolulu District conducted the American Samoa Tsunami Study under USACE's Planning Assistance to States program, and contracted with EA/HHF Joint Venture to assist in completing this study. The Tsunami Study was designed to provide a high level, comprehensive overview of key considerations relevant to building coastal community resilience. It represents a comprehensive starting point and also identifies a number of promising, ongoing initiatives

that are critical to building resilience. There is an urgent need to bolster risk knowledge and preparedness practices to maximize community resilience to future catastrophic events.

**Savercool** has been employed in the environmental field for over 30 years. Areas of specialty include marine and estuarine benthic invertebrates and fish, wetland vegetation (estuarine to freshwater), and habitat level ecology. Mr. Savercool possesses unique expertise in the ecology, restoration and creation of freshwater and estuarine marshes, mangrove forests, seagrass meadows, coral and worm rock reefs, streams, rivers, and adjacent upland habitats throughout the Pacific Rim. Mr. Savercool has completed numerous natural resources surveys, impact analyses, and natural resources management plans on Guam.



# Presentation Descriptions - Breakout Sessions C, Day 1

## **Biofuel and the Coconut Industry in the Federated States of Micronesia: A Case Study in Corporate Social Responsibility, Leadership for Sustainable Development, Addressing Climate Change and Energy Issues in Small Island States and Creating Long-Term Socio-economic Sustainability and Opportunity for Island Families and Communities**

**Olivier Wortel | 3:30pm-4:30pm, Ballroom B**

In order to meet the socio-economic and environmental challenges of the nation beyond 2023, when Compact funding from the U.S. will end, the FSM must maximize the use of all local resources at its disposal. One such resource that has remained below its maximum potential is the

coconut tree and its products. Coconuts and copra are the main source of pride, sustenance and livelihood for the majority of the FSM population. The sector remains underdeveloped, undercapitalized and dependent on annual appropriation of subsidies. Overall the current business model and structure of the industry does not contribute to the macro-economic framework, instead adding to the mounting fiscal losses for the nation. As part of the broader push by the nation to strengthen and grow the four local sectors of agriculture, energy, tourism and fisheries as the cornerstones of long-term national sustainability, Vital has begun to implement its Energy for Life (E4L) program of work. This program will proactively assist the FSM meet the challenge of quadruple bottom line sustainability - climate, economic, social and environmental balance – and actively engage in the low

carbon, community and state-focused transformation within the FSM. The E4L initiative aims to transform the coconut industry into a sustainable sector through a market led, private sector driven, government supported development process.

**Olivier Wortel** is the Communications Officer for Vital Energy, a state-owned enterprise which operates in the islands of Kosrae, Chuuk, Pohnpei and Yap in the Federated States of Micronesia, and in Guam. In this role, Mr. Wortel oversees the implementation of the Vital Communications Strategy. Wortel has played a central role in Vital's long-term Energy for Life (E4L) strategy to assist island governments and utilities in the region.



## **GPA's 2013 Integrated Resource Planning**

**Jennifer Sablan, P.E. and John J. Cruz jr, PE, MBA | 3:30pm-4:30pm, Ballroom A**

This presentation summarizes the process, scope, drivers, results, and recommendations from Guam Power Authority's 2012 Integrated Resource Plan. The Guam Power Authority (GPA) has adopted an Environmental Strategic Plan (ESP) to guide its actions through the next five years as it strives to continue to maintain an environmentally sound effort to provide safe, affordable electrical power to the people of Guam. This paper and presentation summarizes this Environmental Strategic Plan.



**John J. Cruz Jr., P.E., MBA**, has a B.S.E.E., a B.A. in mathematics, a general business minor, and an MBA. John worked seven years in the Radar Systems Development Laboratories, Mode Development Department at Hughes Aircraft Company before joining GPA. John, GPA's Strategic Planning & Operations Division (SPORD)

manager, has worked on numerous projects and developed key studies at GPA. He developed GPA's Performance Management Contracting Model.

## **No State Left Behind: Improving and Increasing Participation in the Palau Protected Areas Network**

**Lolita Gibbons-Decherong | 3:30pm-4:30pm, Santa Rosa Mezzanine**

The Palau Protected Areas Network (PAN) is an innovative mechanism designed to protect Palau's critical biodiversity and ensure that natural resources are effectively conserved. The Palau PAN is also an implementing mechanism for the Micronesia Challenge. Palau will meet its commitments of 20% terrestrial protection and 30% near shore marine protection only through membership of sites registered to the PAN. The Palau PAN can serve as a model for biodiversity conservation and climate change resilience not just for small island states but for the world. Palau Conservation Society and the PAN have overlapping and complementary objectives, thus Palau Conservation Society has dedicated

programmatic effort and significant communication outreach to enable state governments and communities to access the PAN. This presentation will illustrate the pivotal role that Palau Conservation Society, an NGO, assumed in facilitating the implementation of the Palau PAN and highlight efforts to build the desire and commitment of Palau's communities for the Palau Protected Areas Network.

**Lolita Gibbons-Decherong** works as Program Manager for Conservation and Protected Areas at Palau Conservation Society, and also serves on the Board of Directors of Palau International Coral Reef Center as Secretary / Treasurer. With over 10 years of experience in conservation work that began with NGO fundraising, today her area of focus is in community-based protected area management planning and capacity building.



## **Sustaining Human Health Resources**

**Roseann M. Jones, PhD, Kyle Blas, Ashley Charfauros, Ashlee Cabreza, and Richard S. Colfax, PhD | 3:30pm-4:30pm, Ballroom C**

This presentation provides an introduction to an ongoing study of Guam's healthcare workforce. The purpose of the study is to catalogue the island's supply of health workers within identified professional classifications. Data has been collected with benchmarks to measure the adequacy of workforce supply to population demand. The study collected trend data from the years 2001, 2006, and 2011 for all segments of Guam's healthcare workforce, where available. The study also references demand for healthcare from US Census data and surveys of population health status. From these data, the study team will determine areas of shortage or surplus and forecast future healthcare workforce demand. Externalities such as regional demand and supply flows for healthcare are examined in a model of sustainable health provision.

The study is funded by an AHEC (Area Health Education Centers) grant from the Health Resources Services Administration (HRSA) to the University of Guam School of Nursing and Health Sciences.



**Dr. Jones** is a tenured Professor of Economics at the University of Guam. She is a member of the

faculty of the School of Business and Public Administration and is a member of the graduate faculty of College of Natural and Applied Sciences Environmental Science Program,

where she teaches and conducts research in environmental economics.



**Kyle Blas** is one of the Research Assistants for the project and a recent graduate of the University of Guam with a bachelor degree in Business, concentration in Economics and Finance. He is currently working on a study on Guam's school lunch and breakfast cost at UOG's Cooperative Extension Service.



**Ashley Charfauros** is a senior at the University of Guam majoring in Business Administration with concentrations in Human Resource Management and Finance and Economics.



**Dr. Colfax** is the tenured Professor of Human Resource Management in the School of Business & Public Administration at the University of Guam. He is a member of the undergraduate and graduate faculties at UOG where she teaches and conducts research in human resource management.

## **Social Perceptions on Sustainability: Giving Voice to the People of Guam**

**Dr. Michael Ehlert, Suzanne B. Bernardo, and Diana C. Carlos | 3:30pm-4:30pm, Santa Rita Mezzanine**

Opportunities for sustainable practices for civilians in Guam have been limited, particularly in contrast to those available for the U.S. military presence on island. Recently, isolated large-scale infrastructure changes and community projects have increased the opportunity for sustainable living. However, there remains a significant lack of published scientific articles related to the assessment of the social perceptions and current environmental attitudes of the people on Guam, if any at all. This project surveyed residents on issues associated

with sustainable living. We modified an existing survey (Ansolabehere, 2007) to develop questions more tailored to island residents and local issues. We surveyed more than 400 residents throughout the island and employed a stratified random sampling technique identifying region and age. The results of this survey and the information gathered give a voice to the people of Guam about their future and will be vital for businesses and governmental agencies as they make data-based decisions and develop sustainability-conscious practices. Guam is just beginning to incorporate a comprehensive sustainability paradigm, and the results of this study will allow us to better gauge where we are and what progress needs to be made to achieve a more sustainable future.

**Michael B. Ehlert** (Ph.D., University of New Hampshire) teaches experimental



psychology and behavior analysis at the University of Guam. His research interests include choice under uncertainty (currently investigating brown tree snake foraging), the effects of cancer on minority populations and improving practices for sustainable living.



**Diana Carlos** is a senior at the University of Guam, majoring in Psychology, with a minor in Biology. She is currently a research assistant for the Center for Island Sustainability. Her poster, "Making Recycling Accessible," was developed out of her Psychological Research Seminar class in Spring 2011.

# Presentation Descriptions - Breakout Sessions D, Day 2

## **How to Afford Photovoltaics to Sustain Your Lifestyle** *Scott Hagen, Pacific Solar & Photovoltaics and Tommy Blas | 1:15pm-2:15pm, Ballroom B*

It's no secret that renewable energy is expensive. On Guam we have very little

financial incentives to work with to help with paying for a renewable solar powered system. A short presentation will be made on the technology readily available that have been tried and proven for many years. We will dive right into showing you how renewable energy pays for itself. We will also

discuss the various financial benefits available to you just for purchasing a photovoltaic system. We will also talk a little on what types of financing is available on island. In the end you'll be a believer.

## **Predicting Hydropower Potential on Ungaged Streams in Kosrae Island, FSM** *Shahram Khosrowpanah, Director, WERI | 1:15pm-2:15pm, Ballroom C*

The cost and availability of energy resources is one key factor in the economic development of and quality of life in any developing country. This is especially true in Kosrae, Federated States of Micronesia (FSM), where nearly all of the energy produced is from costly, non-renewable, and potentially environmentally damaging fossil fuel (oil) resources. The cost of fuel to operate the local power plant has risen dramatically over the past years and no doubt will continue to rise in the future. Exploring the feasibility of using hydropower as an additional energy source for Kosrae requires defining the variability of flow available in the streams where the hydropower plants might be constructed. The problem in Kosrae, as in most locations, is that stream

flow information is not available for all possible sites where development could occur. In the FSM this problem is even more acute since the streamflow gaging network has been abandoned for almost 30 years.

**Dr. Shahram Khosrowpanah**, Director of WERI, is a professional civil engineer and professor of water resources engineering with more than 25 years of experience in research, teaching, and engineering practices in the area of water resources in Guam and the other islands of the Western Pacific. His research interests include surface water hydraulics, computer modeling of water distribution system, GIS application, watershed management, and erosion & sedimentation.



## **The Humåtak Project: Reviving our Watersheds, Coral Reefs, and Fisheries** *Austin Shelton | 1:15pm-2:15pm, Ballroom A*

How do island communities maintain and build resilience against global and local stressors impacting their environment? One example can be found here in Guam, where a community effort called the Humåtak Project is dedicated to restoring watersheds, coral reefs, and near-shore fisheries. The Humåtak Project



addresses the local environmental stressor, accelerated erosion, which is caused by poor land-use practices. Erosion is associated with the loss of native forests and the resulting sedimentation on coral reefs, which smothers and kills corals and destroys essential fish habitat. Come listen to this presentation to find out how this project uses a combination of educational outreach, erosion control initiatives, and

scientific research to build resilience against environmental destruction.

**Austin Shelton** is the coordinator of the Humåtak Project, a community-led initiative working to restore Guam's watersheds, coral reefs, and fisheries. Austin is currently a marine biology Ph.D. student in the Biology Department at the University of Hawai'i at Mānoa. He is also the president of the 'Ilima SACNAS Chapter at University of Hawai'i, an organization dedicated to advancing underrepresented minorities in science.

## **Sustainability of Wastewater Treatment Practices in Micronesia** *Joseph D. Rouse, Associate Professor, University of Guam, WERI | 1:15pm-2:15pm, Santa Rita Mezzanine*

A survey of wastewater treatment methods in the Federated States of Micronesia revealed a lack of functional treatment systems and conditions that could lead to adverse environmental impacts and public health concerns. Due to a lack of operable equipment and inadequate training, the amount and composition of wastewater entering the plants as well as the degree of treatment being obtained is unknown. Furthermore, in some cases raw sewage is being discharged directly into the ocean and waste excess sludge is regularly taken and used by local residents for agricultural purposes without adequate prior treatment. In addition, the need to establish best management practices for placement

and maintenance of septic tanks is being sought after with a sense of urgency. Comparisons of methods being used and problems encountered at different locations in the islands will provide valuable information needed by decision makers to develop sustainable treatment practices throughout Micronesia.

**Dr. Joseph D. Rouse** is a professional engineer and associate professor of water resources and environmental engineering at the Water and Environmental Research Institute of the Western Pacific of the University of Guam. With a background in both academia and industry, he has more than 25 years of experience in research and development of water and wastewater treatment processes and environmental remediation methodologies.



**Social Work for a Sustainable Micronesia**  
**Dr. Vivian Dames, Dr. Lisalinda Natividad, Dr. Gerhard Schwab, and Joliene Hasugulayag MSW (UOG Social Work Faculty) | 1:15pm-2:15pm, Santa Rosa Mezzanine**

This panel presentation is a summary and critique of the book chapter with the title "Social Work for a Sustainable Micronesia" (authored by the presenters and recently published in Social Welfare in Asia and the Pacific; Columbia University Press, New York, 2013). The presenters describe social development in the Micronesian

context, outline the dimensions for the development of a sustainable model of social work in Micronesia, and conclude with a call to actualize social work as cultural and political work.

**Vivian Dames** is a retired Social Work and Women and Gender Studies Professor of the University of Guam. Among other volunteer activities in the community, she anchor-hosts the weekly radio-show "Beyond the Fence" on Guam's Public Radio.



**LisaLinda Natividad** is an Associate Professor and Chair of the Division of Social Work at the University of Guam. She is also President of the Guahan Coalition for Peace and Justice.



**Gerhard Schwab** is a professor of Social Work at the University of Guam. He has been involved in environmental projects, movements and organizations since 1978.



**Research and Education for Sustainable Development: Challenges at a National University in Japan**  
**Yukiko Inoue-Smith | 1:15pm-2:15pm, Magellan Mezzanine**

Since 2007, the UNESCO Chair at Okayama University (a Japanese national university, established in 1949) has promoted projects related to Education for Sustainable Development (ESD). This presentation discusses such projects, as they address the several challenges that Okayama University faces as a regional center for ESD. These include challenges in international collaboration, domestic collaboration, school education, and social education, in addition to the work of a newly opened graduate school of environmental science, which focuses on research and education for sustainable development. There are many ways that the University of Guam can learn from Okayama

University's research and educational activities for a sustainable future. This presentation also previews the UNESCO World Conference on Education for Sustainable Development, to be held in 2014 in Okayama and Nagoya, Japan.



**Yukiko Inoue-Smith, Ph.D.**, is a professor at the University of Guam, where she teaches educational psychology and research. Her research interests include: education for sustainability; interdisciplinary studies on student learning and development; improving university teaching and learning; online education for diverse learners; and the social context of learning with a higher education focus.

## Presentation Descriptions - Breakout Sessions E, Day 2

**An Update on Guam's Island-Wide Zero Waste Initiative**  
**Mark Calvo, Director of the Guam Military Buildup Office & Special Assistant to the Governor Eddie Baza Calvo | 2:30pm-3:30pm, Ballroom B**

In 2011, the Government of Guam began a planning process to identify new policies, programs and facilities needed to implement an island-wide zero waste program. In February 2012, key public and private-sector solid waste stakeholders were invited by the Governor to a Visioning Session to discuss new and/or expanded policies, programs and/or infrastructure projects that could be implemented to reduce the volume solid waste being disposed at the Landfill, and create a sustainable Zero Waste Vision on Guam through: upstream source reduction options; midstream reuse options; and downstream recycling and organics diversion options. No single initiative, alternative or strategy can be

put in place to achieve zero waste; multiple layered strategies and initiatives will be needed to develop an effective zero waste program for Guam. Accordingly, the Governor's Office and Guam EPA selected fifteen of the options identified during the Visioning Session most likely to advance a zero waste initiative on Guam for further detailed analysis. This study is ongoing. An overview of the fifteen alternatives will be presented.



**Mark Calvo** is a Special Assistant to the Governor of Guam and serves as the Military Buildup Director for the Government of Guam. Calvo earned a Bachelor of Arts degree in Psychology from the University of Guam in 1985. He was a Distinguished Military Graduate of the U.S. Army Senior ROTC program at the university and was commissioned a second lieutenant in May 1982.

## **GPA Environmental Strategic Plan**

**"Paz" Maria A. Tison E.I.T., C.E.M., John J. Cruz Jr., P.E., MBA, Gale F. Hoffnagle, CCM, QEP | 2:30pm-3:30pm, Ballroom A**

This presentation summarizes the process, scope, drivers, results, and recommendations from Guam Power Authority's 2012 Integrated Resource Plan. The Guam Power Authority (GPA) has adopted an Environmental Strategic Plan (ESP) to guide its actions through the

next five years as it strives to continue to maintain an environmentally sound effort to provide safe, affordable electrical power to the people of Guam. This paper and presentation summarizes this Environmental Strategic Plan.

## **Developing Stewardship Through Service Learning and Volunteering**

**Jo Nita Q. Kerr, Assistant Professor, Guam Community College | 2:30pm-3:30pm, Ballroom C**

Developing a sense of stewardship in island residents is critical to the success of sustainability programs and education is the key to that process. Partnering relevant objectives with hands-on experiences is a powerful way to impress students with the importance of protecting their environment for future generations. As an educator and environmentalist, I use service learning and volunteering to provide students with knowledge supported by sound scientific research. Most importantly, many students regard their experiences as transformative – they develop a deeper understanding of why it is important to protect their



natural resources and change their behavior accordingly. Here, I will present examples of service learning and volunteer experiences of students, some of whom are GCC ecoWARRIORS, or students who worked with government agencies such as Guam Coastal Management Program and Department of Agriculture, Division of Aquatic and Wildlife Resources.

**Joni Quenga Kerr**, Assistant Professor at Guam Community College, currently teaches Marine Biology, Anatomy and Physiology, and Introductory Chemistry. As a teacher, Advisor of the GCC ecoWARRIORS, and a member of the Environmental Education Committee-Tano Group, she enthusiastically promotes protection and stewardship of Guam's unique natural resources.

## **Marine Mania: Twenty Years of Environmental Protection on Guam**

**Natividad Rosario, President, Marine Mania | 2:30pm-3:30pm, Santa Rosa Mezzanine**

Marine Mania (MM) is the marine biology club of George Washington High School. MM operates according to two main objectives: To improve our environment in any way possible and to have fun. With these two goals, MM effectively creates environmentally conscious community members who have the confidence to stand-up and speak for what they believe. Our first venture into sustainability was a recycling program for aluminum in



1994. We have grown every year since. Today we reach out to elementary schools with puppet shows targeting watershed protection for fifth grade and plastic awareness for fourth grade. We partner with other local high schools to visit third grade classes with a program called Guardians of the Reef. We have planted over 23,000 seedlings to reduce erosion in

the southern hills, cleaned and painted environmental messages on 1,350 storm drains, monitored sea turtle nest site locations, and participated in more clean-ups than can be counted. We partner with (and impose upon) the Environmental Education Committee, GEPA, Guam Coastal Management, Division of Aquatics and Wildlife Resources, WESPAC, Payless Markets, i\*Recycle and many more organizations to make our work possible.

**Natividad "Dottie" Rosario** joined Marine Mania as a Freshman and has been increasingly active every year. Her favorite part of Marine Mania is working with children and spreading the word through Guardians of the Reef, and the Plastic Isn't Fantastic and Watershed puppet shows.

## **Survival of Traditional Healing on Guam**

**Tricia A. Lizama, Ph.D, LCSW | 2:30pm-3:30pm, Santa Rita Mezzanine**

Chamorros, the indigenous people of Guam, have a tradition of herbal medicine and therapeutic massage that pre-dates Spanish colonization of the 17th century and notably, continues to be practiced in modern times. The purpose



of this study was to describe how healers perpetuate and preserve traditional practices. Analysis indicates that traditional healing practices are actively preserved despite centuries

of colonization, cultural denigration, western modernization/militarization, and continuing encroachment on lands where native plants might be gathered

for medicinal use. Measures such as influencing policy need to be in place to sustain the practices of the suruhanu and suruhana.

**Tricia Atoigue Lizama, Ph.D, (MSW, LCSW)** focuses on the traditional healing practices of the suruhanu and suruhana of Guam. She is an alumni of the University of Guam, receiving a double major in social work (BSW) and psychology in 1997. In 2011, she received her Ph.D in Human Services from Capella University.

## **Assessment of Local Perceptions, Affecting Change and Engaging the Community**

**Laura Biggs and Joyce Beouch | 2:30pm-3:30pm,  
Magellan Mezzanine**

Chamorros, the indigenous people University of Guam Sea Grant program (UOGSG) in collaboration with Palau Conservation Society (PCS) aims to assess community perceptions towards renewable energy technologies in Palau and Guam so as to better inform community leaders and businesses. UOGSG and PCS are dedicated to fostering a sustainable future for Guam and Palau. Together, our offices will develop a comprehensive needs assessment and administer it in each respective community. The focus of the integrated needs assessment would be to gather anthropogenic data as it relates to the public's: 1) understanding of renewable energy technologies 2) perceived impacts of



renewable energy technology (positive and negative), and 3) understanding of barriers to integrating renewable energy on Guam and Palau. The information garnered from this needs assessment will be used to inform governmental and public agencies. Under the guidance of UOGSG and PCS, survey specialists will plan, design, implement and evaluate a needs assessment and generate a final report for dissemination to public and governmental agencies.

**Laura A. Biggs, Ph.D.** serves as Assistant Professor of Extension and Education with University of Guam Sea Grant. Since then she has worked to create a Sea Grant presence on Guam through the development of educational curriculum and targeted extension projects.

## **Presentation Descriptions - Breakout Sessions F, Day 2**

### **Guam Buildup Environmental Initiatives: Integrating Biosecurity with Beneficial Reuse**

**Albert Borja, NAVFAC Marianas, Env. Compliance Specialist and Nadia Wood, SWCA Biological Monitor (Consultant to Hensel-Phelps Granite JV) | 3:45pm-4:45pm, Ballroom C**

The Department of Navy (Navy) is implementing a number of biosecurity initiatives for on-going construction projects for the Guam Buildup program, such as Hazard Analysis and Critical Control Point Planning (HACCP) and vegetation management procedures to reduce the risk of unintentional introduction or spread of invasive species. The Navy also strives to meet its goal to reduce the waste disposed to landfills by 50% or greater through source reduction, reuse or recycling. As plant matter or "green" material stockpiles awaiting reuse

could be potential breeding sites for the invasive Coconut Rhinoceros Beetle (CRB), the default procedure requires the piles to be spread to make it less suitable for breeding. Through application of simple solutions, an integrated approach that combines biosecurity with more effective green material reuse was recently implemented at the Navy's Government of Japan funded J-001 Utilities and Site Improvements (Commercial Gate) project at Andersen AFB. Instead of the normal mulch-and-spread procedure, the J-001 Navy-Contractor HACCP team decided to compost stockpiles of green material within the project site to better utilize space, reduce volume of soil needed for final stabilization and lower handling/transportation costs.

**Albert Borja** is an Environmental Compliance Specialist with Naval Facilities Engineering Command Marianas (NFM). He earned his BA in Biology from UOG in 2003, and currently provides



environmental compliance oversight for ongoing "Guam Buildup" construction projects as well as environmental planning support for analyses and studies required by the program.



**Nadia Wood** is an Environmental Monitor and HACCP Specialist with SWCA Environmental Consultants. Since receiving her BA in Biology from the University of Guam in 2002, she has worked extensively in the environmental field, specializing in environmental regulations associated with construction, waste management and environmental protection.

### **Guam Power Authority Smart Grid: Enabling Infrastructure**

**Roel A. Cahinhinan, P.E. and John J. Cruz Jr., P.E., MBA, | 3:45pm-4:45pm, Ballroom B**

GPA's smart grid program does not stop with the completion of the DOE grant. The Smart Grid Grant paid for enabling infrastructure. GPA must mine the capabilities of this infrastructure to improve operational performance, lower costs, and increase customer satisfaction. This paper discusses the next steps.



**Roel A. Cahinhinan, P.E.** has a B.S.E.E. from the University of Illinois Chicago. He has worked at

GPA in the Engineering - Customer Services Department for several years. He is now a Special Projects Engineer in the Strategic Planning & Operations Division (SPORD).. Roel led GPA's 2010 long range transmission plan and most recent load study. Finally, leveraging his work experience in Engineering - Customer Services and SPORD projects, Roel is the lead for GPA's Smart Grid Program.

**John J. Cruz Jr., P.E., MBA,** has a B.S.E.E., a B.A. in mathematics, a general business minor, and an MBA. John worked seven years in the Radar Systems Development Laboratories, Mode Development Department at Hughes Aircraft Company before joining GPA. John, GPA's Strategic Planning & Operations Division (SPORD) manager, has worked on numerous projects and developed key studies at GPA. He developed GPA's Performance Management Contracting Model.

### **Guam's Independence... From Fossil Fuels**

**Allison R. Rutter | 3:45pm-4:45pm, Santa Rosa Mezzanine**

What can one person, one business, or one island do to reduce and eventually eliminate fossil fuel use? Guam is completely reliant on outwardly sourced carbon based fuels, just as each of us seem inextricably linked to using power from oil, gas, plastics, and other unsustainable resources. In this presentation, we discuss meaningful examples of actions that we can take as individuals, businesses, and communities that will start us on the path to energy independence. No idea is too small, big, or impossible; from baby steps to paradigm shifts, let's start the transition to a



sustainable future.

**Allison Rutter** helps architects, building owners, contractors and communities create highly efficient buildings that save both energy and money. Allison has worked on projects ranging from community centers in Hawaii to the Empire State Building. Currently, Allison is Principal of Guam Sustainability Solutions LLC, a firm focused on promoting sustainability efforts in the Marianas. She holds a BS in Mechanical Engineering from the University of Portland and is a licensed Professional Engineer in the state of Colorado.

### **The Status of Guam's Native Birds: Historic and Future Efforts for Recovery**

**Celestino F. Aguon, Suzanne Medina, Laura Duenas, and Jeffrey Quitugua | 3:45pm-4:45pm, Santa Rita Mezzanine**

For the past thirty years the Guam Division of Aquatic and Wildlife Resources (DAWR) Wildlife Section, has focused on saving Guam's endangered wildlife, with the vision of repatriating Guam's unique native and endemic birds to the wild. Captive breeding of Guam rails (ko'ko', Gallirallus owstoni) and Guam's Micronesian kingfisher (sihek, Halcyon cinnamomina), in partnership with mainland zoos, supports the establishment of populations in conservation areas on Guam. Efforts to establish ko'ko' on the snake-free island of Rota were initiated in the 1980s and are ongoing; current census results indicate the releases have netted small distinct groups of rails. As DAWR continues the effort to establish rails on Rota, Guam must be preparing local conservation areas for recovery efforts. Military buildup mitigation sites, the Guam National Wildlife Refuge, and locally managed conservations areas are well suited for recovery efforts. Besides repatriation,

reintroduction of congeneric species from the other areas in the region is an option for rebuilding Guam's avifauna, as new areas are available for bird releases. DAWR is in a position to provide captive breeding efforts for Guam rails, the Mariana Crow, and Micronesian kingfishers. The program for a sustainable native birdlife on Guam is to repatriate, and establish populations, while maintaining the viability of Guam's native forest habitat. The Mariana Moorhen, (pulatat, Gallinula choropus) continues to exist in the wild, taking advantage of many human ponding basins. Preserving wetland habitats, and ponds will surely enhance their survival.



**Celestino F. Aguon** is the Chief of the Department of Agriculture's Division of Aquatic and Wildlife Resources. He received a BA from the University of Guam and a Master's of Zoology from the University of Hawaii,

Manoa. He has worked with endangered species recovery since 1978 including the capture of the last remaining Guam rails from the wild.

**Suzanne Medina** is the project leader for Guam Agriculture's Division of Aquatic



and Wildlife Resources Endangered Species Recovery Program. She has been working for 15 years in captive breeding and release of the Guam rail, the Guam Micronesian kingfisher, Halcyon cinnamomina cinnamomina, and the Mariana crow, Corvus kubaryi.



**Laura Duenas** is the project leader for the Guam Agriculture's Division of Aquatic and Wildlife Resources Captive Breeding Program, of the Guam rail, Gallirallus owstoni.



**Jeffrey Quitugua** is the Guam Agriculture's Division of Aquatic and Wildlife Resources Technical Assistance Wildlife Biologist. He provides technical responses to the clearing and grading permit requests, and other related environmental issues.

### **Community Gardens, Social Work, and Sustaining Healthy (Physical and Mental Health) Communities**

**Lisalinda Natividad, Ph.D., Tricia A. Lizama, Ph.D., Jordan Guerrero, Shirley Gustillo, Feliciana Tainatongo and Antonio Diaz, Graciela Jimenez, Michael Gombar, and Wes Tomokane | 3:45pm-4:45pm, Ballroom A**

Community gardens afford people an opportunity to grow and access fresh produce, engage in physical activity, provide a positive outlet for stress and offer a shared space for communities to work together. Community gardens can be a tool for Social workers to help clients and consumers improve individual and community health and well-being. Two examples of community garden projects at Guam Mami and the University of Guam will be shared.

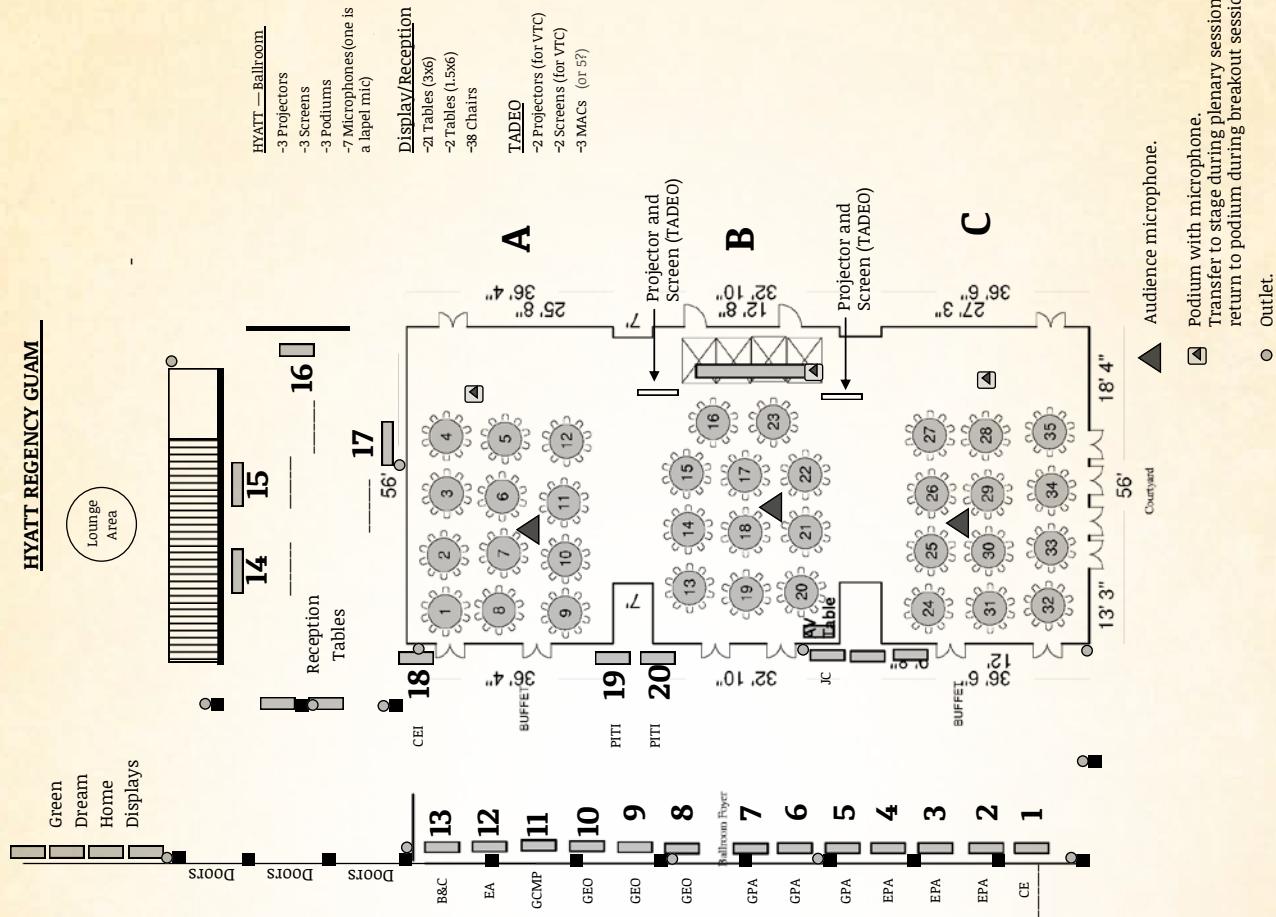


# HYATT MEETING ROOMS

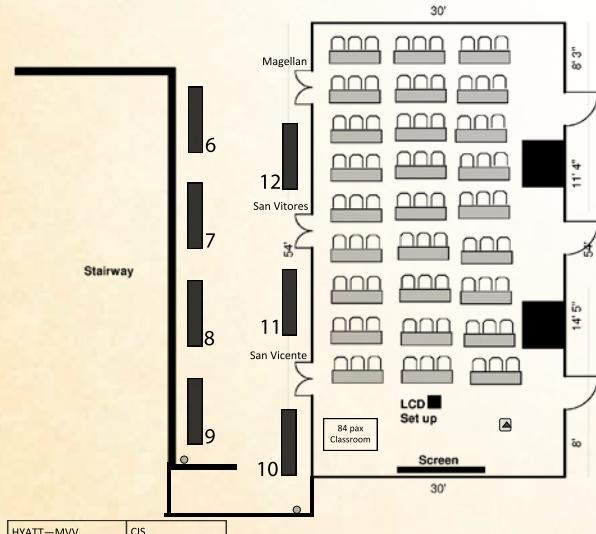
## Grand Ballroom A, B, and C



### HYATT REGENCY GUAM



### Magellan, San Vitores, and San Vicente Rooms

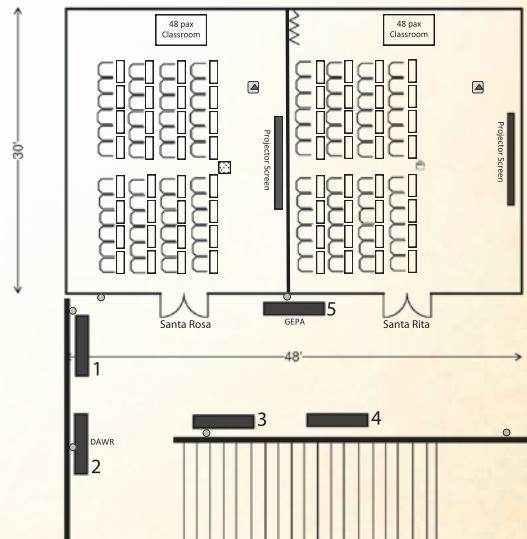


**HYATT—MVV**  
 -1 Screen  
 -1 Podium  
 -1 Microphone  
 -1 Table for projector  
**Display/Reception**  
 -7 Tables (3x6)  
 -14 Chairs

**CIS**  
 -1 Computer  
 -1 Projector

▲ Audience microphone.  
 ■ Podium with microphone.  
 ○ Outlet.

### Santa Rosa and Santa Rita Rooms

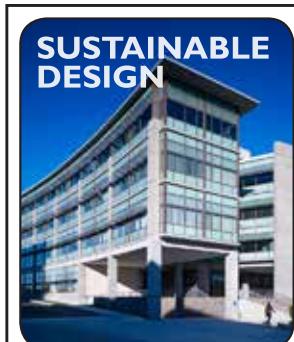


**HYATT—Rosa Rita**  
 -2 Screens  
 -2 Podiums  
 -2 Microphones  
 -2 Tables for projector  
**Display/Reception**  
 -5 Tables (3x6)  
 -10 Chairs

**CIS**  
 -2 Computers  
 Pres Office  
 -2 Projectors

▲ Audience microphone.  
 ■ Podium with microphone.  
 ○ Outlet.

Table Displays: DAWR, Island Tinting, SBDC/Buy Local, SolCom, Recycling Association of Guam



## Multidiscipline Engineering Design

Civil  
Structural  
Mechanical  
Electrical  
Corrosion



**ACOFFMAN**  
ENGINEERS

[www.coffman.com](http://www.coffman.com)

414 W. Soledad Ave. Ste 903, Hagatna, Guam 96910 | 671.300.7531

Providing solutions that sustain our natural environments.



**Brown AND  
Caldwell**

: essential ingredients®

Engineers | Scientists | Consultants | Constructors

Guam | Honolulu | Maui | Offices Nationwide

100% Environmental | Employee Owned | [BrownandCaldwell.com](http://BrownandCaldwell.com)

©2013 Brown and Caldwell.

# THE TIME FOR CHANGE IS NOW!

With GPA rates continuously increasing, there is no better time to switch to renewable energy! With over 10 years of experience in Renewable Energy Systems and a proven track record all across Micronesia, we deliver the best renewable energy systems to fit your needs.

### We Provide:

- Solar PV Systems - Solar Thermal Systems - Wind Power Systems
- Solar Water Heater Systems - LED Products - Construction Services

### Get 10% Off Your Next Purchase.

Discount is only valid until June 30, 2013 and must present this coupon upon purchase. Select items only.

Call our office at 969-5689 or visit our web site at [www.pacificgreentech.com](http://www.pacificgreentech.com) for more information.



27th

# Pacific Islands Environment Conference

June 26 - 28, 2013 - Hyatt Regency, Tumon GU

Reduce. Balance. Enhance



Guam - CNMI - American Samoa



**EA** EA Engineering,  
Science, and  
Technology, Inc.

**Improving the quality of the environment in which we live, one project at a time.**

- Creating Energy Efficiencies
- Harnessing Renewable Energy
- Reducing Environmental Impacts
- Integrating Environmental Management Systems
- Developing Advanced Methodologies
- Applying New Technologies

1001 Army Drive, Suite 103  
Barrigada, Guam 96913  
671-646-5231  
[www.eaest.com](http://www.eaest.com)

## 2013 Island Sustainability Conference

### JOHNSON CONTROLS

Johnson Controls is a global diversified technology and industrial leader, serving customers in more than 150 countries. Our 162,000 employees create quality products, services and solutions to optimize energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and interior systems for automobiles. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat. We have been involved in more than 500 renewable energy projects including solar, wind and geothermal technologies. Our solutions have reduced carbon dioxide emissions by 13.6 million metric tons and generated savings of \$7.5 billion since 2000.



Johnson Controls has made a commitment to invest and support the island of Guam not only through our products and services, but by establishing a permanent local branch comprised of a 100% local staff. The Guam Branch is honored to take part of the 2013 Island Sustainability Conference and looks forward to partnering with the community to achieve our collective sustainability goals.



*Sustainability...*

**PROTECTING GUAM'S NATURAL RESOURCES  
FOR PRESENT AND FUTURE GENERATIONS**

**BUREAU OF STATISTICS AND PLANS  
GUAM COASTAL MANAGEMENT PROGRAM**

**2013 ISLAND SUSTAINABILITY CONFERENCE**

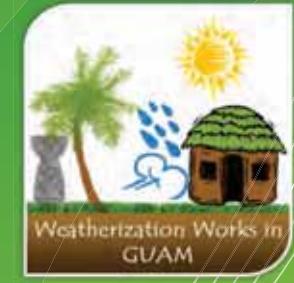
**BUREAU OF STATISTICS & PLANS**  
SAGAN PLANU SHAYAN EMFOTMASION

Photo by Dave Burdick



# THE WEATHERIZATION ASSISTANCE PROGRAM

# IS THIS YOU?



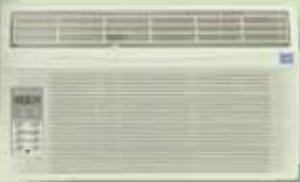
Family Size	1	2	3	4	5	6	7	8
Maximum Income (not to exceed)	\$28,700	\$38,760	\$48,820	\$58,880	\$68,940	\$79,000	\$89,060	\$99,120

**NOTE: Income eligibility is based on the family size and the total household income that is equal to or less than the maximum income stated above. Income limits are subject to change without notice.**

## If so, you may qualify for....



Replacement of refrigerator  
and/or window air conditioner



Installation of heat pump  
water heater



and additional energy saving measures



Installation of smoke and/or  
carbon monoxide detectors



Installation of compact  
fluorescent light bulbs



Replacement of shower  
heads and faucet aerators

## all for FREE!



Call GHURA at 477-9851 or  
Guam Energy Office at 646-4361  
Visit [www.guamenergy.com](http://www.guamenergy.com)

Made possible by U.S. Department of Energy American Recovery and Reinvestment Act



# SMART ENERGY GUAM



**smart** Smart grid saves money by lowering the cost of delivering electricity to your family.

**safe** Smart Meters are safe. They pose no threat to human health.

**secure** Smart Meters contain no personal information. Consumption and power quality data is protected from unauthorized access.



Center for  
**ISLAND SUSTAINABILITY**

## ENERGY SOLUTIONS FOR A SUSTAINABLE FUTURE

### smart

Smart grid saves money by lowering the cost of delivering electricity to your family.



#### Lowering energy costs.

With more information from Smart Meters you and your family can monitor your energy use, find ways to save, and predict your monthly bill before it arrives in the mail.



**Diversifying our island's energy sources lowers power cost over time.** Smart Grid allows use of alternative fuels and renewable power from solar and wind installations.



#### Support of latest energy solutions!

For example, the Smart Grid will facilitate electric vehicle charging stations. Guam will be ready to use other new technologies and more innovations in future decades.

**GPA is at the leading edge of modern power distribution technology.**



Bringing Energy Solutions to You

for more information call: **647-5787**  
or visit our website : [http://guampowerauthority.com/smart\\_energy\\_home.html](http://guampowerauthority.com/smart_energy_home.html)