

Energy Efficiency and Renewable Energy Efforts in the Pacific Territories and Freely Associated States

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PACIFIC TERRITORIES

Background

In the summer of 2010, the Office of Insular Affairs (OIA) and the U.S. Department of Energy (DOE) executed an interagency agreement under which OIA provided funding to the National Renewable Energy Laboratory (NREL) to provide technical assistance through the support to the Energy Task Forces (ETFs). There were several areas of emphasis; the collection and tracking of energy data, site visits, conducting technical assessments, and assisting in the development of a draft strategic energy plan.

This Phase I has been completed to which NREL assisted with the establishment of ETFs, completed initial baseline energy benchmarks against which future progress can be measured, developed data tracking templates, created an analysis model to help visualize future scenarios, created Energy Assessment Reports, and developed draft Strategic Plans.

Currently in Phase II, the following exercises are being executed:

- Collection of current data to show progress to date
- Update energy tracking spreadsheets
- Run new fossil fuel reduction scenarios using the Island Planning Analysis Model
- Energy Task Force Support
- Develop document sharing site
- Conduct energy planning workshops on-island
- Assist in the development and delivery of a final Energy Action Plan

Utilizing all strategies and planning documents that have been developed, various technical assistance projects are being identified by the Energy Task Forces that will be supported by the technical assistance program. These projects serve as the next step in executing the identified strategies.

AMERICAN SAMOA

Vision

Create a sustainable future by reducing dependence on fossil fuels.

Mission

Enhance the well-being of our citizenry, ensure energy and economic security through energy independence and diversification, and improve environmental quality. Educate all stakeholders on the importance of our vision by embracing conservation, energy efficiency (EE) and alternative energy. The ASREC will be a forum for considering options and offering guidance related to the achievement of its energy goals through policy, projects and programs.

Current Projects

American Samoa formed the American Samoa Renewable Energy Committee (ASREC) through executive order. American Samoa Power Authority (ASPA) leadership spearheaded and facilitated ASREC development and momentum with a technical team that supported both the Executive Committee and participated in the Technical Subcommittee. Under Phase I of NREL's work in the Pacific Territories it produced a Technical Assessment Report for American Samoa and a draft Strategic Energy Planning Document. This plan reached consensus by the ASREC membership and has recently been updated for publication. A Dropbox site has been set up to store electronic documents and reports pertaining to American Samoa's energy system and EE and renewable energy (RE) efforts. The site will play an important role in sharing information and reports between NREL, OIA, and American Samoa. Although American Samoa has not set a specified fossil fuel reduction goal, desire to reduce fossil fuel dependence is expressed as reflected in their vision and mission statement. Current utility data is being gathered to update the Island Planning Analysis Model originally performed for the Strategic Planning Document. The data will reflect the status of the energy systems from 2010 to the present. The model illustrates fossil fuel consumption based on energy data. It is then able to take the actual fossil fuel consumption and develop scenarios for implementing EE and RE projects. It illustrates how much fossil fuel reduction can be reduced based on the projects implemented. This analysis is able to provide numerous scenarios, allowing for American Samoa to pick the one that best matches its resources and goals. Additionally, collecting more recent utility data will allow further updates to the model to track energy usage and costs and measure progress.

By utilizing the Assessment Report and Strategic Planning Document, an Energy Action Plan for American Samoa is being developed. NREL will work closely with American Samoa to gather input and feedback for the final Energy Action Plan by facilitating a workshop held on-island. The Energy Action Plan will provide a detailed roadmap of key EE and RE projects that have been recommended for implementation.

NREL will provide technical assistance to American Samoa designed specifically to achieve short-term successes, and accomplish the highest priority goals established in the Energy Action Plan

Vision

To create a sustainable energy future for the CNMI.

Mission

The CNMI Energy Task Force (ETF) is charged with development and oversight of a strategic energy plan for the CNMI with the overarching goals of reducing dependence on imported fossil fuel and establishing a sustainable energy solution for the Commonwealth in the interest of improving quality of life and promoting economic prosperity. It is anticipated that the strategy will be a living document, evolving as potential energy strategies are tested, and therefore beyond creation of the initial strategic plan. The role of the ETF will be to assess the efficacy of energy strategies implemented and to evaluate and recommend new approaches as appropriate.

Current Projects

The CNMI created an ETF through executive order. NREL is assisting the ETF with fulfilling its responsibility by the development of an energy plan. The Strategic Energy Plan highlights key projects and strategies for reaching the ETF's energy goals. The strategies include outreach campaigns, education and training, EE measures, RE projects, and methods for reducing energy on providing potable water. The EE measures include an energy audit program, alternative cooling, and a cool roof program for buildings. The enforcement of building codes and adaptation of additional codes for enforcing EE building designs is also recommended. The Strategic Energy Plan also presents an analysis showcasing several scenarios in reduction opportunities.

Through the refinement of the Island Planning Analysis Model, CNMI will have updated scenarios to which will visualize progress for the CNMI based on current data. CNMI and its utility, the Commonwealth Utilities Corporation (CUC), have provided the necessary data for these updates and this information is currently being entered into the model. The data, along with all pertinent documents, are being stored electronically on a Dropbox site.

CNMI is currently preparing for an action planning workshop to develop an Energy Action Plan. CNMI's Energy Action Plan will provide a detailed roadmap of two-three priority EE and RE projects in which the ETF, through consensus have recommended for implementation. The Action Plan will be a detailed, step by step instruction guide on how to implement these identified strategies. Some of the high priority projects that are being considered in the CNMI Energy Action Plan include; for EE, an energy audit program and cool roof initiatives, for RE projects, wind anemometry studies, education and training programs, solar hot water installations and replacements, solar data studies, and location identification for future solar facilities.

Short term, early win projects are being identified by the ETF that are directly related to the Energy and Action plans of which NREL will provide technical assistance.

GUAM

Vision

The Guam Energy Task Force's vision is a secure, sustainable, and economically prosperous future for Guam.

Mission

As stated in Executive Order No. 2010-15, GETF's Mission includes the following objectives:

- Reduction of reliance and expenditures on fossil fuels
- Development of indigenous and RE sources
- Improvement of energy generation infrastructure
- Resource preservation, restoration and enhancement
- Training and education regarding EE and conservation
- Development of funding and financial strategies for sustainability and economic development
- Engagement in national and regional efforts to address island energy concerns
- Develop funding and financial strategies for sustainability and economic development
- Engage in national and regional efforts to address island energy concerns
- Support energy literacy curriculum in all educational institutions
- Develop a vision, mission and goals for reducing dependence on fossil fuels, improving EE, and developing RE resources
- Establish an organizational structure to appropriately develop a comprehensive, long-term Strategic Energy Plan for Guam

Goal

The goal is to secure Guam's energy future and increase autonomy by diversifying fuel sources and reducing fossil fuel energy consumption 20% by 2020.

Current Projects

The Guam Energy Task Force (GETF) participates in frequent and consistent meetings. At the forefront of their agenda has been the completion of a Strategic Energy Plan and Energy Reduction Goal through an engagement process that is representative of all stakeholders.

Guam Power Authority (GPA) has provided updated data that is currently being used to track progress. The Island Planning Analysis Model illustrates fossil fuel consumption based on energy data. It is then able to take the actual fossil fuel consumption and develop scenarios for implementing EE and RE projects. Utilizing current data, it will estimate how Guam can reach its 20/20 Goal.

An Action Planning session will be conducted in March involving experienced specialists that will produce an Action Plan by providing a detailed road map to implementation of the strategies that been identified. Education and outreach regarding EE and RE have been identified by the GETF as the most crucial for implementing successful projects, reduction of fossil fuel use and realizing energy transformation. Workshops and outreach activities to educate community leaders and ratepayers will be taking place.

As Guam and the GETF begin to implement projects for meeting the 20X20 goal, customized technical assistance is being delivered to help achieve short-term success. This assistance will be aimed at high priority projects and will be based on the budget available. Depending on funding, NREL will provide technical assistance for either one short-term project, two short-term projects, or in depth analysis and assistance on one project. The projects will be selected based on the Energy Action Plan.

THE FREELY ASSOCIATED STATES

Background

The OIA expanded the current work between NREL and the Pacific Territories to include the Freely Associated States (FAS). Through this agreement, NREL supports the FAS with their needs in energy transformation to The Federated States of Micronesia, The Republic of the Marshall Islands, and the Republic of Palau.

Current Projects in the Freely Associated States

NREL completed literature reviews for the Republic of Palau, the Republic of the Marshall Islands (RMI), and the Federated States of Micronesia (FSM). The literature reviews collected existing information and data on the FAS' energy systems, renewable resources, policies, and important departments and stakeholders. This was an exploratory exercise meant to inform the technical teams as they engage in assessment work and as a foundation for the assessment reports.

A collection of baseline data is underway to create a detailed picture of existing energy system. This data will include fuel consumption, energy costs, energy demands, energy system efficiency, grid system designs, and general utility information and will be utilized within the Island Planning Analysis Model to run reduction scenarios.

Stakeholder workshops will be conducted in each FAS country. They will involve interested parties to discuss energy issues, technologies, costs, policies, and programs. These meetings will be critical in gaining local participation and support for future action plans and technical assistance. Several workshops have already been conducted in Majuro and Ebeye, RMI in December of 2012.

Renewable and energy efficiency technical assessments will be developed for each country. These assessments will be guided by the 2006 Territorial Energy Assessment and the literature reviews including feasibility of RE projects including, but not limited to wind, solar, biomass, waste to energy, and hydro. EE evaluations will assess building technologies and other EE technologies currently in place.

As energy transformation efforts continue and evolve, the more important an island energy outreach and education program becomes. This program design will attempt to address social barriers to RE and EE and outline the most effective and efficient strategies in achieving energy literacy. The program will seek to develop techniques and strategies that can be adopted by local, grassroots organizations working on energy issues that can be deployed within various sectors.

UNITED STATES VIRGIN ISLANDS

Background

As part of an Energy Development in Island Nations (EDIN) project launched in 2009 to address these challenges, the U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) is partnering with the Department of the Interior (DOI), the USVI government, the utility, business leaders, community organizations, and clean energy champions to bring about transformational change in the way energy is used and generated in the territory.

Through DOE-funded technical support that includes energy policy and analysis, community outreach and education, and workforce development and training, NREL's Integrated Deployment team is helping the USVI develop and follow a road map for reducing fossil fuel use 60% from business as usual by 2025.

EDIN-USVI formed working groups tasked with developing a holistic, multi-faceted strategy for reaching the 60%-by-2025 goal. Each working group is focused on one of five key areas: energy efficiency, renewable energy, transportation, education and workforce development, and policy and analysis.

Working collaboratively, these five groups developed a detailed road map charting the course to a clean, sustainable energy future through energy efficiency improvements and renewable energy development. Check marks denote milestones where significant progress has been made toward the following goals.

Energy Efficiency Accomplishments:

- Provided training that enhances the capacity of the local workforce to perform energy efficiency audits
- Provided training designed to motivate architects, drafters, contractors, and others to comply with building codes aimed at reducing building energy use and costs
- Installed high-efficiency light-emitting diode (LED) street lights on St. John
- Developed building efficiency educational materials
- Installed a reverse osmosis system at the St. Croix WAPA plant to generate half of desalinated water
- Installed an HRSG at the St. Croix WAPA plant, adding 19 MW of power without burning more oil
- Prepared a policy brief for the USVI Senate
- Wrote new vehicle specifications for the USVI Department of Property and Procurement
- Set up a mentoring program to assist hotels in converting waste grease to biodiesel
- Established an energy efficiency business unit at WAPA

Renewable Energy Accomplishments:

- Signed PPAs to install 18 MW of solar PV on St. Croix and St. Thomas
- Updated USVI solar resource maps
- Established a SWH rebate and loan program that resulted in 815 loan approvals and of 471 systems
- Implemented net-metering program
- Installed 176 kW of small PV systems
- Installed a 451-kW solar PV system—the region's largest—at Cyril E. King Airport on St. Thomas

- Developed USVI low-resolution wind maps
- Identified sites with high potential for utility-scale wind
- Completed an analysis of wind resource, site, and permitting constraints to identify and reduce development risk
- Signed contracts to install wind anemometers at high-potential wind sites
- Identified potential for approximately 2 MW of energy generated from landfill gas
- Supported development of an 850-kW landfill gas system on St. Thomas
- Developed biomass crop-potential maps
- Completed biomass chemical and heat content analysis
- Conducted an analysis of state-of-the-art WTE and pollution control technology

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