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Commonwealth of Puerto Rico
Department of Natural & Environmental Resources
Energy Affairs Administration



RENEWABLE ENERGY PROJECTS COORDINATION

Solar Public Lighting

In the year 2002, the Puerto Rico Energy Affairs Administration (PREAA) granted \$600,000 for the development of Solar Public Lighting Projects in six municipalities: Juncos, Las Piedras, Barceloneta, Vega Baja, Caguas and Aguas Buenas. The last of these projects, consisting each one in an average of 30 lighting poles, was completed last year.

Design and Restoration of Photovoltaic Systems at the Department of Natural & Environmental Resources

As part of the restoration works to the Rangers' Headquarters of the Department of Natural and Environmental Resources (DNER) in Caja de Muertos Natural Reserve, all photovoltaic systems that provide electricity to the encampment were replaced by the month of September 2006. The Puerto Rico Energy Affairs Administration (PREAA), made the necessary recommendations on the design and replacement of the photovoltaic systems, which supply power to the museum, the conference room, and the Rangers' cabin. The system restoration includes new solar panels and batteries, wiring, inverters and controls. Also, the windmill and the solar heater were replaced.

These systems also supply power to compact fluorescent lighting, fans, and a radio communication system, among other equipment. The new design even includes a refrigerator that works with electricity from the solar panels. With the incorporation of the fridge, all systems that bring power to the museum, and to the cabin were fused into one system that generates around 10.5 KW in total.

In addition to the Caja de Muertos Headquarters redesign, PREEA designed the lighting and photovoltaic systems for the DNER's Jobos Reserve, the Aviary of the Río Abajo Forest, at Utuado, and the Fishing Laboratory of Cabo Rojo. For the José L. Vivaldi Aviary, at Río Abajo Forest, the EAA will make a \$200,000 contribution for the installation of a photovoltaic system.



Solar Assisted Hydroponics Projects

Last year, the Puerto Rico Energy Affairs Administration and the Education Department signed an agreement for the installation of Solar Assisted Hydroponics Systems in five agricultural schools. The Department of Energy the authorized the use of funds for this project, which includes the following schools:

José C. Rosario, from the Municipality of Isabela; Laura Mercado, from San Germán; Francisco Vicenty, from Maricao; Bernaldo Mendez, from San Sebastián; and Jose B. Barceló, from Adjuntas. The auction process for this project was completed on January 2007.

Hydroponics is the technique of growing plants without soil. Instead, plants are grown in an inert medium (or none at all) and an oxygenated, balanced nutrient solution is delivered to their root system. Photovoltaic panels will generate the electricity required for the water pumps of the systems in these projects.

Commercial Wind Farm Project

The Puerto Rico Energy Affairs Administration is the proponent government agency for commercial wind farm project. The project consists of 25 wind turbines with a generating capacity of 1.65 MW each and a total capacity of 41.3 MW. With an estimated investment of \$60 millions of private capital, the wind farm would generate approximately 110,000,000 kWh /year, which is equivalent to the energy consumption of approximately 23,000 families. The Environmental Impact Statement was produced for this project and it is now in the process of public hearings and evaluation for permits. This would be the first wind farm project for Puerto Rico.

ENERGY EFFICIENT PRACTICES AT STATE GOVERNMENT

Auction Process Completed for the Relamping Project at Government Agencies / Relamping Completed at Three Agencies.

The Board of Public Auctions of the Department of Natural and Environmental Resources (DNER) completed on September 2006 an auction process for the Energy Affairs Administration Relamping Project for 5 government agencies. These agencies are: the Administration of Juvenile Penal Institutions, the Institute of Puerto Rican Culture, the Department of Health, the Board of Retirement for Teachers, and the Office of Budget and Management. The purpose of the said project is to serve as a test pilot in order to demonstrate the benefits of replacing conventional lighting systems for more efficient ones in public agencies, as part of an energy efficiency plan. For example, the Puerto Rico Fire Department has succeeded in getting an annual saving of approximately \$12,000 dollars in their electric bill after replacing the lighting system of its Central Headquarters, in Carolina. This agency is also part of the PREAA project, but they paid for their relamping, and the investment was then reimbursed by the PREAA. The remaining funding from this projects- granted by the Office of Budget and Management in 2004- will be used for replacing the lighting systems of the DNER, now located at the State Environmental Building. After a lighting inspection made by EAA's technicians, this project could mean annual savings of \$181,295 dollars in energy bills for the DNER.

After the of the auction process, relamping was also completed at the Department of Health and the Office of Budget and Management. The project in the Administration of Juvenile Penal Institutions is also near culmination. The purpose of this relamping pilot project is to promote relamping at government agencies, which is one of the proposed measures of the Energy Efficiency and Conservation Plan for the Executive Branch of the Commonwealth of Puerto Rico developed by the PREAA.

PUERTO RICO

ENERGY STAR

Energy Awareness Month Proclamation and ENERGYSTAR Change a Light Campaign

On October 4 2006, the Sub secretary of the Department of Natural & Environmental Resources, Javier Rúa Jovet, presented the Commonwealth of Puerto Rico's "Energy Awareness Month" Proclamation, celebrated on October. This proclamation was officially read and delivered to the Energy Affairs Administrator, Dr. Javier A. Quintana Méndez, in an activity where more than sixty guests were present at the State Environmental Building, San Juan.

As part of the "Energy Awareness Month" proclamation activity, the PREAA announced the beginning of the "Change a Light, Change the World" campaign. This campaign was developed with Sam's and Wal-Mart stores to motivate the public to change at least one incandescent bulb for an "ENERGY STAR" compact fluorescent light (CFL) in their homes. PREAA personnel promoted the use of "ENERGY STAR" qualified lights and other products at the Sam's and Wal-Mart stores through the entire Island during the month of October. General Electric, supplier of the CFLs for these stores, took also part in the campaign and published a newspaper ad about ENERGY STAR qualified CFLs. These commercial institutions, as well as the Energy Affairs Administration, are "ENERGY STAR" partners.

\$336,000 annual savings estimate for Public Housing Projects after relamping with ENERGYSTAR qualified CFL's

In Puerto Rico, the U.S. Department of Housing & Urban Development (HUD) provides funds to the Public Housing Administration (PHA) for public housing projects. This agency requested energy inspections from the PREAA technicians for these public housing projects. PREAA submitted to the PHA an inspection report with an estimate of \$336,000 annual savings for the replacement of incandescent lighting bulbs with CFLs in 352 public housing projects. In addition, as part of the "Change a Light" campaign, General electric donated 1,176 CFLs, for a housing project under the Public Housing Administration.

HUD participates in a collaborative effort with the U.S. Environmental Protection Agency and the U.S. Department of Energy to improve the energy efficiency of America's existing housing stock. This effort, called the "Partnerships for Home Efficiency", has the purpose of increase energy efficiency in homes and to reduce energy use by an average of 10% in ten years. This saving could mean almost \$20 billions per year. The use of "ENERGY STAR" qualified products, standards and tools, are an important part of this effort.

Development of a procedure for the Certification of Construction Designs

As part of the Low Energy for Puerto Rico Project, the Puerto Rico Housing Department will begin the construction of 50 homes at the Municipality of Juncos during this year. "Low Energy Homes" is a project of the Housing Department and the Energy Affairs Administration, with funding from the Environmental Protection Agency, for the designing and construction of a model home that can qualify for the "Energy Star" mark. Pilot homes are in the process to be constructed at the Municipality of Juncos for the development of a procedure for the Certification of Construction Designs

ENERGY COMMUNITY EDUCATION SERVICES

Solar Energy RACE at Toa Baja

The Puerto Rico Energy Affairs Administration and the Municipality of Toa Baja realized the "Solar Energy

Race” in the parking lot of the municipal coliseum, last November 6, 2006. The Solar Energy Race has the purpose to educate students about solar energy use. In the last two years, the PREAA coordinated this race with the junior high pre-technical schools of the entire Island. This year, the activity was coordinated with the Municipality of Toa Baja.



Junior and high schools in the municipality of Toa Baja participated in the race. The students had to design and prepare a car that can run through a 50 feet racetrack, using solar energy. The Energy Affairs Administration provided the panels, motors, gears, shafts and wheels to prepare the car, and offered orientation to the students.

Teacher’s Workshop

On October 24, 2006, the Puerto Rico Energy Affairs Administration in coordination with the Department of Education, Culture and Tourism of the Municipality of Toa Baja, held a workshop for 5th and 6th grade science teachers of the area. The purpose was to present the “Energy Education Manual” that the PREAA prepared with the Science Program of the Education Department.



The Energy Education Manual was designed to be integrated with the science curriculum for 5th and 6th grades. It contains information and activities about energy conservation, sources, and environmental impact.

Personnel from the PREAA offered lectures about these themes and demonstrated activities that the teachers can carry on in the classroom. 27 teachers from the Municipality to Toa Baja and Bayamón Educative Region participated in the workshop. PREAA is coordinating this workshop for the other regions of the Department of Education.

“Renewable Energy Sources” Drawing Contest

Thirteen students from different schools in the Island won the “Renewable Energy Sources” Drawing Contest of the Energy Affairs Administration. Mr. Víctor A. Rodríguez, General Supervisor of the Department of Education’s Science Program, delivered the trophies to the winners in an activity celebrated on October 30, 2007. The selected drawings will be part of a 2007 calendar to be prepared by the PREAA. 702 students from 57 schools y 32 municipalities participated in this contest.

The Energy Affairs Administration has been coordinating this contest, with different energy related themes, during the last 8 years.



PUERTO RICO

Lectures & Information Centers:

The Puerto Rico Energy Affairs Administration offer lectures about energy efficiency (including ENERGYSTAR) and renewable energy, and participates on information centers through the Island. For example, for the quarter ending on September 30, 2006, 84 lectures and 60 information centers were offered in schools, municipalities, agencies, industries and universities to promote energy conservation and renewable energy sources. Most lectures were offered at elementary schools. Also 25 lectures on “Saving Gasoline” were offered at government agencies. More than 5,000 participants and 4,450 brochures distributed in these activities. 200 calls requesting energy related information or information about our services and activities were received and answered.

For the quarter ending on December 2006, 50 lectures were offered in schools (mostly from 5th to 9th grade). 22 lectures were offered in government agencies, communities and other institutions, including Energy Star lectures at the Agricultural Extension Services offices, and gasoline saving lectures at government agencies. Around 1,800 people participated in these lectures and 5,000 brochures and flyers were distributed. Also for this quarter, 52 information centers were offered where we distributed brochures and flyers about energy related themes and oriented people. These centers include de ones held on Wal-Mart (15 stores), and Sam’s (9stores), and information centers at municipalities, government agencies, schools, universities, malls and other institutions. Around 8,000 people were reached through these information centers and 24,000 brochures and flyers were distributed.

Energy Conservation Services / Car Care Clinic

Personnel from the Energy Affairs Administration participates during all year in information centers, lectures about energy conservation and saving gasoline, and provides the Integrated Conservation Services (lectures, energy audits and car care clinics) to municipalities, agencies, industries and other institutions. 2,263 Car Care Clinic (Electronic Diagnostics) were offered to vehicles at municipalities, government agencies and industries (mostly pharmaceuticals) for the two last quarters of 2006.

INDUSTRIAL TECHNOLOGIES PROGRAM

Industrial Association adopts the Puerto Rico Industrial Energy Council

As part of the Industries of the Future Program, the Puerto Rico Energy Affairs Administration developed a proposal to promote the creation of the Puerto Rico Industrial Energy Council and coordinate a Workshop for this purpose and to provide best energy practices to its members. The Puerto Rico Manufacturers Association adopted the Energy Council and turned it in the “Energy Alliance”. A workshop to present this alliance was held on February 28, 2006. The workshop included also a best energy practices panel, and was the beginning of a series of meetings for this alliance, with the purpose of promoting energy efficiency in the industries.