

# U.S. EMBASSY MANAGUA, NICARAGUA

## PROJECT FACT SHEET

MARCH 2014



**Energy Service Company** Lockheed Martin

**Private Investment** \$15M

**Utility Savings** \$36M over 25-year contract

**Total Energy Savings** 2,543 mWh per Year

**Energy Reduction** 54%

**Carbon Offset** 1,286 Metric Tons \*\*

\*\* From The Climate Registry, 506g CO2/kWh

## ENERGY SAVINGS PERFORMANCE CONTRACTS

- Energy Savings Performance Contracts (ESPCs) allow Federal agencies to complete energy-savings projects without up-front capital costs.
- An ESPC is a partnership between a Federal agency and an energy service company. The company conducts a comprehensive energy audit of Federal facilities and identifies improvements to save energy. In consultation with the Federal agency, the company designs and constructs a project that meets the agency's needs and arranges the necessary funding and guarantees that the improvements will generate energy cost savings that pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the agency.

## BACKGROUND

- In October of 2011, energy service company Lockheed Martin was selected under an ESPC by the Department to analyze the U.S. Embassy in Managua and provide recommendations for improving the energy usage and production of the facility.
- The project will include the installation of solar photovoltaic panels, lighting upgrades, as well as building automation system optimization, and transformer and chiller upgrades.
- The installation is being executed by Lockheed Martin with institutional financing. The facility then will make annual payments based on actual energy savings.

## SOLAR PHOTOVOLTAIC INSTALLATION

- The primary driver of the project will be a 956 kilowatt (kW) solar photovoltaic (PV) installation on the grounds of the embassy. This system will produce renewable energy year round taking advantage of Nicaragua's abundant sunshine.
- The new PV arrays will be installed as a parking canopy, as well as ground mounted behind an existing annex on the Embassy complex. The arrays will:
  - Cover 4,761 square meters
  - Consist of 2,202 individual PV modules (solar panels)
  - Produce more than 1,276 megawatt hours (MWh) of electricity each year for the next 25-30 years.
  - Account for 37% of the load of the Embassy
- The parking canopy offers the additional benefit of protecting government owned vehicles from harsh sun and heat that will lengthen their service life as well as protect them from the elements.

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### PHOTOVOLTAICS



EXAMPLES OF PROTEK PARK® SOLAR TECHNOLOGY

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## FACILITY COOLING SYSTEM IMPROVEMENTS

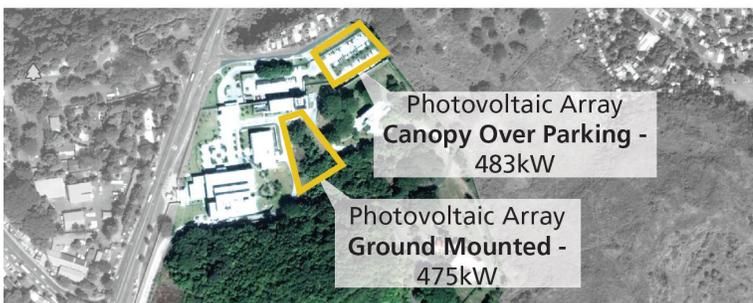
- The addition of a smaller capacity chiller to pick up night and weekend cooling load will limit the total run hours on the two larger chillers. The cooling capacity on nights and weekends is significantly lower than during regular business hours. The large existing chillers were running inefficiently at a small percentage of their capacity during these times. The night chiller is tuned to these loads to operate efficiently and will use only the energy needed to cool the facility.
- The night chiller will be integrated into the existing cooling system and used based on detailed control algorithms. The new night chiller can substitute for the larger chillers further reducing operating cost resulting in additional savings.
- Expected savings for the additional chiller are 304MWh per year.
- In addition to the new chiller, the complete Heating, Ventilation, and Air Conditioning (HVAC) system will be re-commissioned to ensure it is operating efficiently.
- Additional high-efficiency systems will be installed in buildings not served by the primary central chiller plant to improve the cooling efficiency. These new units will save an additional 87MWh each year.

## ELECTRICAL AND LIGHTING IMPROVEMENTS

- The project will replace 444 existing exterior and 1,794 interior light fixtures with new highly efficient fluorescent and solid state light-emitting diode (LED) fixtures.
- The exterior lighting will include color control and adjusted light levels to accommodate the better light produced by the LED fixtures.
- The interior LED lighting will be installed in all of the existing office spaces and support buildings.
- The LED lighting lasts 10-20 times longer than the existing high intensity discharge lighting and will greatly reduce the maintenance requirements for replacing lamps on a regular basis.
- The total savings expected from the lighting retrofit will be 468MWh per year.
- The project will also replace the interior power transformers with 23 new transformers, for an annual savings of 91MWh per year.

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## SUSTAINABLE FEATURES



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## CONTACT INFORMATION

**Tom Hamm**  
Information Officer  
U.S. Embassy Managua  
(505) 2 252-7100 ext. 7581 | HammT@state.gov

**Christine Foushee**  
OBO Director of External Affairs  
703-875-4131 | FousheeCT@state.gov