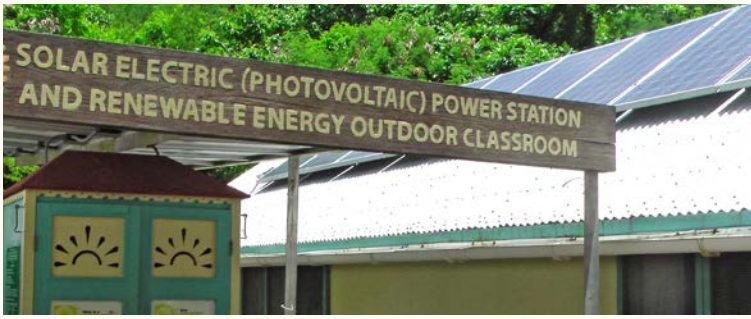
ENERGY TRANSITION INITIATIVE
Islands

# Playbook Lesson Learned
## Phase 4: Project Execution and Quality Control

# U.S. Virgin Islands Clears the Way for Unprecedented Levels of Solar Energy

In the U.S. Virgin Islands (USVI), solar energy is helping to alleviate the territory's dependence on fossil fuel while stabilizing and reducing energy costs.




Almost 1,500 solar water heating and PV systems have popped up throughout the territory since the EDIN-USVI project launched in February 2010, and 15 MW of distributed solar PV are either in place or under construction. *Photo from Don Buchanan, VIEO, NREL 20152*

### Challenge

The territory's successes with solar energy started in 2010 when USVI Gov. John P. de Jongh Jr. set an aggressive goal to reduce the USVI's dependence on fossil fuel 60% by 2025. Like many island communities, USVI was almost 100% dependent on imported oil for electricity and transportation, leaving it vulnerable to global oil price fluctuations with potentially devastating economic effects.

### Solution

Collaborating with the U.S. Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL), the Virgin Islands Energy Office and the Virgin Islands Water and Power Authority (WAPA) worked with a diverse set of public and private stakeholders to establish the territory's baseline energy use, assess its clean energy resources, and identify the most viable and cost-effective solutions to address its energy challenges.

The resulting strategy, while incorporating a diverse mix of renewable energy and energy efficiency technologies, identified larger and distributed scale solar resource development as an important first step on the road to meeting USVI's aggressive clean energy goal. In addition to having an excellent solar resource, USVI had established policies that provided an opportunity for developers to capitalize on this abundant source of clean, renewable energy.

In May 2011, WAPA released a Request for Proposal (RFP) to install 10 megawatts (MW) of solar photovoltaics (PV) by December 2013. In order to achieve this milestone, WAPA needed to reduce the risks associated with renewable energy development, attract quality developers, and ensure that proposed solar projects could be financed successfully.

Tapping into the technical expertise and renewable energy project development experience DOE and NREL brought to the table, WAPA was able to address these common project development challenges by:

- Helping identify optimal sites for solar PV systems
- Identifying policy and regulatory changes that would address current barriers, such as uncertainty around interconnection procedures and agreements
- Updating the USVI's solar resource assessment to more accurately gauge the potential impact of solar energy in the territory
- Modeling the WAPA grid and developing a strategy to avoid grid integration issues by distributing PV systems geographically

- Analyzing financial and resource data—including 1-minute data from a 451-kilowatt-hour (kWh) solar PV system installed at the airport on St. Thomas—to model the effects of high-penetration renewable energy on the existing WAPA generation system and grid.

These measures, which helped break down many of the common barriers to renewable energy project development, resulted in an overwhelmingly positive response to WAPA's solar RFP. On June 4, 2012, it signed six power purchase agreements for a combined 18 MW of solar energy.

As a result, three companies are investing a total of $65 million to install 18 MW of solar in the USVI—9 MW on St. Thomas and 9 MW on St. Croix.

The PV systems will generate 9 MW of solar power in each district, which WAPA will purchase at an average cost of approximately $0.18/kWh over the 25-year term of the projects. Not only is this significantly less than what it would cost the utility to produce the same amount of diesel-generated power at its plants, but it represents a groundbreaking shift in the territory's energy economy—and sets a new standard for community renewable penetration.

On St. Croix specifically, 9 MW of solar power represents nearly 20% of the island's peak demand, an unprecedented level of renewable energy penetration for a community of its size.

### Key Takeaways

The USVI's successful solar projects provide a model for other islands to follow in developing their renewable resources, showcase the technical and economic viability of high-penetration renewable energy on islands, and guide other island communities in fundamentally changing the way they generate and use energy. Through its leadership on the clean energy front, the USVI is charting the course to a more secure energy future for the Caribbean region and for islands around the world.

### Airport Solar System Largest in the Caribbean

- Solar energy is making its mark in USVI, as evidenced by the large-scale solar PV system installed at the Cyril E. King Airport in St. Thomas.
- In 2011, more than 1,800 PV panels were installed along the runway of the Cyril E. King Airport, totaling 451-kilowatt (kW)—one of the largest solar PV systems in the Caribbean.
- The 451-kW PV system flanking the airport's landing strip was funded by a $2.9 million DOE grant through the Recovery Act. At 1,500 feet long and 14 feet wide, the installation is the largest solar project in USVI and will produce approximately 15% of the airport's energy needs, or 600,000 kWh annually.
- The project, a joint effort between the Virgin Islands Port Authority and WAPA, received technical assistance from NREL through the EDIN initiative. The Port Authority planned to use energy produced to meet the airport's energy load and feed any excess back into WAPA's grid to receive credit toward its power bill. The Port Authority projected that this would reduce its utility bills by as much as $400,000 a year—representing an annual energy cost savings of approximately 15%.

"I don't know of another area or jurisdiction anywhere that has that significant of a portion of their peak demand in a renewable resource such as solar, so this is not only a significant event for the territory but for solar energy everywhere."

—Hugo Hodge Jr., WAPA Executive Director

This lesson learned is one of many provided in the Energy Transition Initiative Islands Playbook—an action-oriented guide to help island communities successfully initiate, plan, and complete a transition to a clean energy system and eliminate dependence on imported fuels. See the full Islands Playbook at **www.eere.energy.gov/islandsplaybook**.

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The Energy Transition Initiative leverages the experiences of islands, states, and cities that have established a long-term vision for energy transformation and are successfully implementing energy efficiency and renewable energy projects to achieve established clean energy goals. Through the initiative, the U.S. Department of Energy and its partners provide government entities and other stakeholders with a proven framework, objective guidance, and technical tools and resources for transitioning to a clean energy system/economy that relies on local resources to substantially reduce reliance on fossil fuels.