ECOVE

ECOVE's photovoltaic power plant generates electricity for the eastern coast of the United States, expanding the global supply of renewable energy

Lumberton Photovoltaic Power Plant

- **Area:** 165,921m2
- **Installed Capacity:** 9.5 MW (Phase 1)
- **Module Type:** Poly-crystalline PV module
- **Estimated annual output:** 12,000 MWh
- **PV mounting system:** Utility-scale ground–mounted system

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Powered:

1,413

households until the end of 2018

Sequestered:

17,530

tons of CO2 emissions until the end of 2018

Background

Lumberton is located in New Jersey, a state in the eastern United States, settled between Manhattan and Washington D.C. Following the passage of the 2009 American Clean Energy and Security Act, New Jersey implemented aggressive renewable energy goals, aiming for 24.5 percent of its energy to come from renewable sources by 2020. This created a sudden surge in demand for clean solar power. To keep track of solar power supplied to the grid, solar providers are given a Solar Renewable Energy Certificate (SREC) for every 1000 KWh of energy generated — SRECs are then sold to utility providers to help them reach their mandated renewable energy targets. As a result of these policies, New Jersey has the 5th largest installed photovoltaic (PV) power capacity in the United States.

"In 2016, the Lumberton plant generated 12,000 MWh of renewable energy — preventing the carbon dioxide emission equivalent of burning 4,082 metric tons of coal."

Overview

After careful planning, ECOVE Solar Energy Corporation (hereinafter called the 'ECOVE') invested $30 million into the first PV power plant in the United States, representing the third biggest Taiwanese investment on the eastern coast of the United States in the last ten years. Unlike many other Taiwanese companies that struggle to overcome cross-cultural legal challenges, ECOVE cooperated with professionals across fields to ensure we were able to surpass all legal barriers — including an unexpected anti-dumping tariff the United States government implemented halfway through negotiations. ECOVE not only received authority to construct the Lumberton PV power plant, we also represent the small minority of Taiwanese companies to have received a subsidy from the federal government, representing 30 percent of the installation cost. After construction, ECOVE worked closely with PSE&G, the local energy company, to ensure our plant passed the US technical standards
— in 2016, we successfully received approval to connect to the electricity grid and provide clean, renewable energy for New Jersey residents. Experts in solar energy and government officials from both Taiwan and New Jersey attended the opening ceremony for the Lumberton plant, the 7th largest PV power plant built in New Jersey in 2016.

"This project achieved success due to perseverance. Through determination and perseverance, we can accomplish great things."

Mr. James A. Calore
PSE&G Capacity Acquisition and Interconnection Manager

Why ECOVE?

Establishing Close Ties with International Professionals

ECOVE established strong relationships with American lawyers, consultants, and energy companies to install our first international PV power plant. Before we could officially begin construction, we actively worked with local professionals to ensure the site complied with local cultural and environmental regulations, even investigating claims that historical relics were buried at the site. We engaged community members throughout the construction process, sharing information about the influence the plant would have on the surrounding environment and the community. Because we diligently worked to assure the plant complied with strict environmental regulations, we passed the state environmental inspection — distinguishing us from other international and the US companies that fail to attain this standard. After the Electric Distribution Company (EDC) validated the Lumberton plant's technological viability, we began preparing to connect the Lumberton plant to the grid. An unexpected blizzard just days before the planned launch date nearly caused a delay in the schedule. In order to ensure the Lumberton plant could begin supply New Jersey with renewable energy before the deadline, ECOVE and PSE&G, the local energy supplier, worked in unison to overcome this final challenge.

Unbeatable efficiency

Generating electricity beyond expectations

High quality solar modules, solar inverters, and cables are crucial to efficiently generating PV power and extending the life of a PV facility. We demand high quality hardware from a reliable provider, working closely with our partner URE, a leader in the solar industry, to equip our PV power plants with high-efficiency solar modules. In our first year managing the Lumberton PV power plant we fine-tuned our equipment — setting the parameters of the inverter, adjusting the angle of the PV panels, and modifying the connection to the electricity grid — to such a degree that we produced average higher than 10 percent more electricity in past three years than originally predicted, and accelerating repayment of the original investment.

We have installed an advanced plant monitoring system at the Lumberton PV power plant, allowing solar energy technicians and ECOVE professionals to observe the Lumberton facility from a smartphone or laptop. Our technology instantly detects system malfunctions and notifies relevant parties via email. If a problem is unable to be solved remotely, ECOVE employs solar energy technicians in close vicinity to the plant to immediately respond to an issue.

As a result, ECOVE's losses are minimal in comparison to similar solar projects that regularly require 3-4 days to address maintenance issues, hampered by long distance and delayed notification.

In order to reduce losses from system malfunctions, we have installed the following hardware in our facility, saving an estimated USD 100,000-200,000 per year:

- power quality analyzer
- infrared thermal imager
- electroluminescence inspection system
- ohmmeter

Data-driven Operations

Globally Synchronized Cloud Monitoring Systems

ECOVE uses cloud monitoring systems to collect data on electricity generation, incident solar radiation and PV panel temperature to make sure the plant's equipment is operating normally. We have installed weather stations to collect current, accurate data for on-site weather conditions — using on-site weather data and NASA climate data on insolation, daylight hours and precipitation, we can account for discrepancies between actual and predicted electricity generation, allowing us to more accurately predict electricity generation.
We focus on daily changes in operational efficiency. By using a solar inverter, we gather data on the quality of electricity we supply to the grid — we can observe how adjustments to our operations improve daily efficiency, bringing us closer to our goal of optimal electricity generation efficiency.

Contribution and Collaboration

Zero-Waste Energy

At ECOVE, we place special emphasis on close cooperation with local governments and communities. All of the PV panels used at Lumberton are US-made, we employ the US professionals to maintain our facility, and we closely cooperate with the US government officials to ensure our facility exceeds all the US standards. ECOVE took every step to actively engage the community before installing its PV power plant — inviting discussion with locals regarding the impact the zero-pollution, zero-emission PV power plant would have on the community, successfully easing the concerns of some community members.

"We aim to operate the Lumberton photovoltaic power plant at optimal efficiency. By equipping the facility with the highest quality equipment and closely cooperating with local professionals, we have already reached our electricity generation target."

Yun-Peng Shih
President of ECOVE Solar Energy Corporation