Case Study
Liberty Self Storage – American Flag Solar Array
S-5-PVKIT® 2.0 & S-5-V Mini

At-A-Glance

Project Name
Liberty Self Storage – American Flag Solar Array

Location
Covington, LA

S-5! Distributor
ONTILITY Powered by Smith, Houston, TX

General Contractor
The Next Energy Technology, Kenner, LA

Engineer
Renewable Design Solutions, Dallas, TX

Solar Installer
The Next Energy Technology, Kenner, LA

Module Manufacturer
Hanwha Q-Cell 390w modules, South Korea

Inverter Manufacturer
APsystems YC1000 Microinverters, Seattle, WA

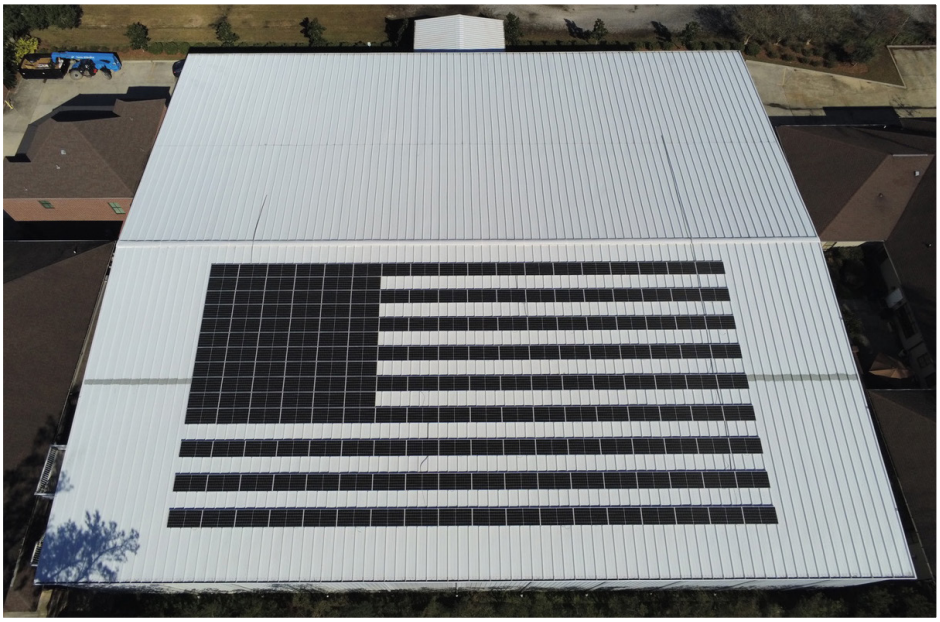
Roof Profile
MBCI Ultra-Dek

Industry
Commercial

Situation
Liberty Self Storage, dedicated to green energy, wished to do a solar conversion project for one of its locations and chose an American flag solar panel array. They required a penetration-free mounting system that would allow for flexibility in design and withstand the area's high winds.

Result
S-5!'s direct-attach, rail-less PV mounting solution enabled the customer to achieve a design engineered to withstand the area's high winds with zero penetration to the roof—distributing wind loads more prudently and uniformly into the structure.

Project Stats
- Roof Measured: H 72' x W 166' (south-facing roof surface)
- Roof Pitch: 14°
- Project Size: 74.88-kW DC
- S-5! Products Supplied:
    - S-5-V Mini (740)
    - S-5-PVKIT®2.0 (740)



The Project

Liberty Self Storage, a multi-site storage facility business in Louisiana and the state's largest solar-powered company, contacted The Next Energy Technology, a Louisiana-based solar power company, to do a conversion project for one of their locations. Liberty Self Storage dedicated itself to green energy in 2016, commissioning solar conversion for the first nine of 12 locations in St. Tammany Parish, but this time they wanted to do something different.

In line with the name of the company "Liberty" and what it represents, they chose an American flag solar panel array designed by The Next Energy Technology as a symbolic source of pride and unity for all Americans.

The facility features a 74.88-kW DC solar array securely mounted to the MBCI Ultra-Dek standing seam metal roof with the **S-5-PVKIT® 2.0** solar attachment solution. In trading string inverters for 64 APsystems microinverters in the project design, they created one of the most energy-efficient locations in the Liberty chain, and helped Liberty take the lead as one of the most progressive mid-sized companies in the South.

The Challenge

The Next Energy Technology was challenged with designing and installing solar panels in the arrangement of an American flag. A traditional rail-mounted system was not ideal because it would add additional weight to the array, and in certain areas, the rails would remain exposed and compromise the design. Additionally, Liberty Storage was adamant that the array be attached to the metal roof without any penetrations.

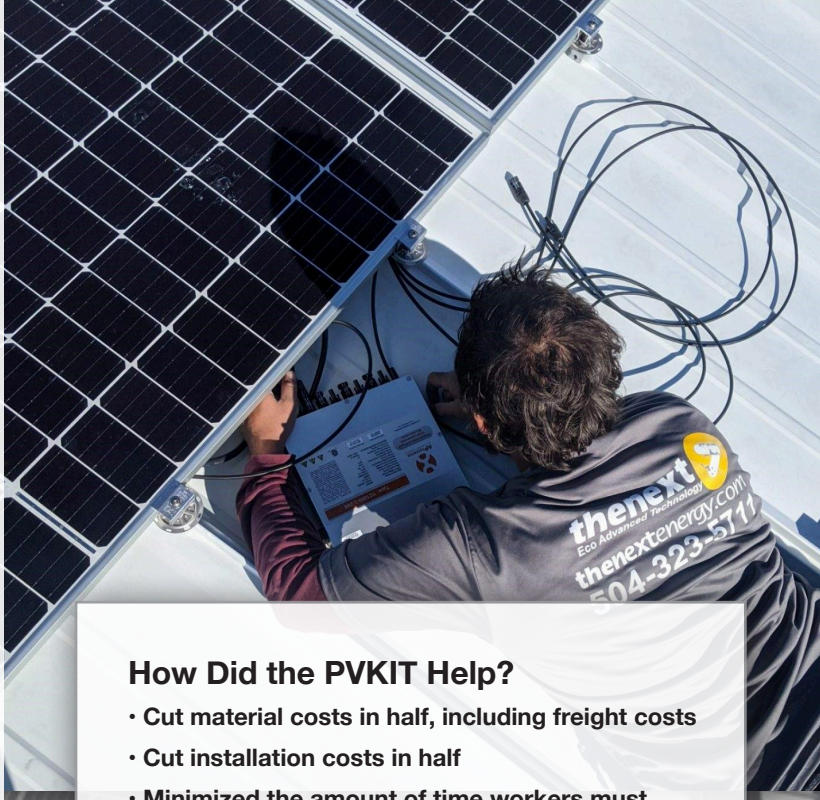
Another challenge was the area's high wind speeds due to its proximity to the Gulf coast. The design wind load requirements for the roof necessitated a solar mounting product capable of withstanding up to 140-mile-per-hour winds.

The Solution

Solar solution provider, Ontility recommended the **PVKIT** direct-attach™ (rail-less) solar solution paired with the **S-5-V Mini** clamp to provide a secure, economical and penetration-free method for attaching solar modules to the metal roof, enabling solar installers to "lay & play" PV modules with tested, engineered, cost-saving, attachment. The S-5! solution also allowed a precise physical module arrangement to achieve the artistic objective.

In high-wind areas such as this, wind forces will try to tear a roof from its mountings. The exceptional performance of metal roofing in these conditions is due in part to its attachment methods and interlocking installation where panels are interlocked and attached to the structure of the building, reducing the ability of wind to disrupt the roof panels.

Standing seam metal has a distinct advantage over other roof types because it serves as a "structural" covering, meaning it can be engineered to withstand almost any force imposed by wind. It also serves as the perfect platform for mounting solar PV because the structural ribs or seams can be used as inherent (and cost-free) "rails" for mounting solar PV via reliable mechanical attachments.



How Did the PVKIT Help?

- **Cut material costs in half, including freight costs**
- **Cut installation costs in half**
- **Minimized the amount of time workers must spend in harnesses**
- **Improved aesthetics**
- **Eliminated the risk of a voided roof manufacturer warranty—no holes/no damage**

Long-Term Outlook

With the standing seam metal roof, good southern exposure, no obstructions and a clear objective, The Next Energy Technology was able to overcome any and all challenges.

As a result, they transformed a solar array into a symbol of freedom in the Deep South – an American flag.

"This project was a great candidate for the S-5-PVKIT 2.0 solution. Our client was adamant that we attach the array without any penetrations. Initially, this was a concern due to the high wind load in the area, but with assistance from S-5! support, we found the PVKIT together with the S-5-V Mini was the right choice for our project. The installation was quick and straightforward, even when we were challenged with creating an American flag solar array. Overall, the quality and design of S-5! solutions are unrivaled. We couldn't be more satisfied with the results."

— Roger Timoteo, The Next Energy Technology, Kenner, LA