Case Study

Cleaner Power Fuels Traditional Spirits Production

Challenge: Merging modern sustainability on a heritage site

With roots dating back to the early 1800s by one of the forefathers of the American spirits industry, Castle & Key Distillery, located in the heart of Kentucky's bourbon country in Frankfort, is known for more than its craft spirits.

As it was planning to construct a new bottling operation adjacent to its warehouse in nearby Versailles, the distillery decided to invest strategically in a large-scale photovoltaic (PV) project. In addition to reducing Castle & Key's carbon footprint and lower long-term energy costs, solar power would set a precedent for renewable energy adoption in Kentucky's spirits industry. But integrating PV services into a historic property presented unique hurdles, from aesthetic considerations and preservation requirements to the practical realities of power generation for a production facility.

Castle & Key saw the bottling expansion as the perfect opportunity to operate more sustainably. Currently served by Louisville Gas and Electric and Kentucky Utilities, both of which rely heavily on coal and natural gas, the distillery recognized that producing its own electricity could deliver both cost stability and meaningful environmental impact.

Solution: Leveraging proven expertise and trusted suppliers

To meet this challenge, the distillery partnered with Solar Energy Solutions (SES), the largest fully integrated solar installer in the region, to engineer and construct the on-site system.

From the outset, the project faced challenges due to aggressive deadlines. The first half of the solar array needed to be installed, energized and inspected by Dec. 31, 2024 to qualify for tax credits and maximize grant funding from the USDA Rural Energy for America Program. The journey from concept to completion required strategic planning, close collaboration with partners and creative problem-solving.

The timeline pressure meant that delays at any stage – whether in design, component availability or utility approval – could jeopardize millions in financial incentives.

Technical hurdles also needed to be addressed. The PV system had to be carefully engineered to integrate with the distillery's operations, then connected to the utility grid under strict safety standards – particularly given the flammable spirits stored at the site. Permission to operate could only be granted once inspectors confirmed the system met all codes. In addition,

Sized at 1.2 MW DC, Castle & Key's initial solar photovoltaic (PV) is designed to deliver 960 kW AC of clean power to help run its spirits production. A second-phase project is in development to generate an additional 600 kW for the distillery.

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Castle & Key wanted the system to be robust enough to perform reliably for decades, which required careful attention to component durability, maintenance needs and scalability for a second construction phase.

With 20 years in the business, SES leveraged its strengths as a vertically integrated Engineering, Procurement and Construction (EPC) firm to deliver a turnkey solution. This approach ensured accountability and coordination across the fast-moving Castle & Key build.

A key part of the SES solution was a partnership with Weidmuller, which has supplied PV components to the international market for 15 years. The U.S. arm, Weidmuller USA located in Richmond Va., was called on to meet the year-end deadline and provide the required PV DC combiner boxes that could be delivered quickly and installed without delay. Weidmuller USA stepped up to provide those units, ensuring SES had the necessary enclosures on-site to complete wiring, connection and testing before the critical year-end energization.

Benefits: Clean energy and stable operation

The selected combiner boxes bundled multiple DC strings from the solar panels, protected them with integrated fuses and surge protection, and provided a single aggregated feed to the inverters. By streamlining the system design, the Weidmuller equipment not only saved time but also provided a durable solution – coupled with an industry-leading 5-year warranty – built to last.

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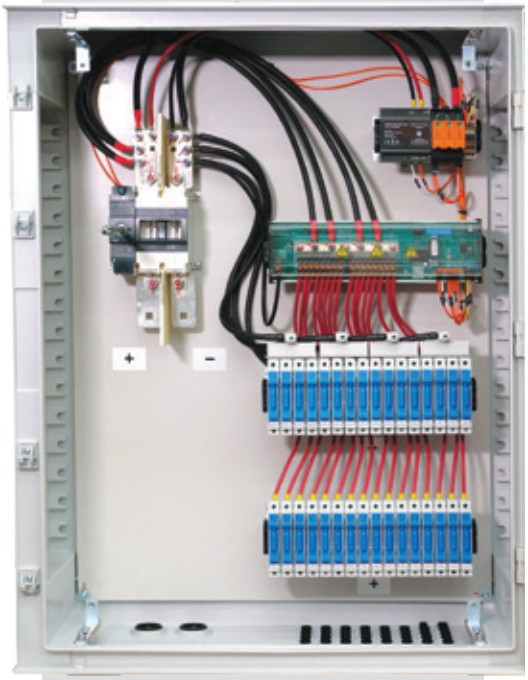
By managing the timeline, providing robust equipment and ensuring seamless integration with the grid, SES – with Weidmuller's support – delivered a system that positioned Castle & Key to achieve:

- **On-time commissioning:** The first half of the solar array was energized before the year-end deadline, securing federal tax incentives for Castle & Key.
- **Improved system performance & ROI:** Combiner boxes ensured reliable aggregation and protection of PV strings, while retrofit-ready monitoring options positioned the system for future optimization.
- **Reduced carbon footprint:** The PV system offsets a significant portion of the distillery's grid usage, which greatly reduces its reliance on fossil-fuel-generated electricity.
- **Long-term reliability:** Robust combiner boxes, coupled with warranty support, will provide decades of stable operation with minimal maintenance costs.
- **Business model validation:** Castle & Key's successful project reinforces the viability of solar for other distilleries and commercial operations seeking both cost savings and sustainability impact.

This case study is a collaboration among Castle & Key, SES & Weidmuller USA.



Project Overview

Project Install PV system for reduced carbon footprint

Customer Castle & Key Distillery

Solution 1.2 MW DC PV system delivering 960 kW AC of clean power with plans for 2nd phase with an additional 600 kW

Scope Deliver PV DC combiner boxes quickly to secure federal tax incentives and run a PV system to offset a significant portion of the distillery's grid usage.

Project Teams

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