

German Utility Vehicle Manufacturer Kässbohrer Drives Down Energy Costs By ~30% with SolarEdge Solar Energy System

The Challenge

Kässbohrer is a trusted German manufacturer of all-terrain recreational utility vehicles - a beacon of innovation and quality in the commercial vehicles industry. Previously, the company was buying most of its power from the grid, but like many energy-intensive plants, it had been negatively impacted by the continuous rise in electricity prices.

This prompted Kässbohrer to seek a PV management solution that could reduce their energy costs. Moreover, investing in renewable energy to power its manufacturing systems also aligned with the company's eco friendly vision and with its introduction of off-road snow-grooming electrical vehicles.

The new PV system had to address several fundamental challenges:

- It would have to meet Kässbohrer's very high safety standards for fire and high voltage electricity to ensure total safety for plant personnel and machinery
- The PV system would have to integrate an existing energy management system and several third-party components
- Adapt electrical generators for self-consumption of PV electricity

The local network operator had stringent requirements for reactive power control



Kässbohrer's snow groomer Pistenbully 600 E+ with electric drive

Kässbohrer was considering several PV solutions, when Markus Schäfer, CEO of Mein Solar GmbH EPC - a preferred partner of SolarEdge - recommended SolarEdge. After close evaluation, SolarEdge was chosen as the best solution to meet all these requirements.

The Solution

The new SolarEdge PV system was installed in April 2020 on a 6,000 m² rooftop at Kässbohrer's logistics center in Laupheim, Germany - yielding 750 kWp of power. The system was configured to control energy generation and distribution throughout the entire facility. Several pre-existing power generators were integrated, and a new transformer station was built to enable distribution of all the generated power to the electrical grid.

The SolarEdge system enables Kässbohrer to produce more power at lower cost, and to cut their energy bills by a 6-figure amount each year. It also reduces CO₂ emissions by 368 metric tons annually. Kässbohrer consumes ~80% of the power produced by its PV system and exports the remaining 20% surplus power to the grid, an impressive self-consumption ratio by any measure.

One of the determining factors for selecting SolarEdge was its warranty terms - among the longest in the industry: 25-year warranty for Power Optimizers and 12-year warranty for inverters.

Harnessing More Power with Power Optimizers and MPPT

The SolarEdge solution uses Maximum Power Point Tracking (MPPT) to maximize power extraction under any outdoor conditions. This is achieved by connecting each Power Optimizer to a pair of modules, enabling every individual solar module to perform independently at its maximum output. In the event that one module is underperforming, it will not impact the output of the other modules in the string. By contrast, in traditional PV systems an underperforming module will lower the performance of all other connected modules.

Safeguarding the Plant with Highest Safety Standards

Structural integrity and the safety of employees, facility and machinery were obviously of utmost importance to Kässbohrer. The SolarEdge solution complies with the most stringent international safety standards for high DC voltage systems. It has a built-in smart SafeDC™ feature that automatically shuts down power to the solar array to a touch-safe level of 1V whenever an inverter or the grid shuts down. In the unlikely event of a fire, this safeguards maintenance crews, electricians, emergency responders and employees as well as the entire facility and PV installation.

In addition to the emergency stop button, a firefighter gateway was added to the existing fire alarm system which enables automatic disconnect of the system in case of a fire. Finally, while arc-fault detection and interruption are not required by German regulations, they are commonly requested by insurance companies. SolarEdge inverters include a function that shuts down the inverter once an arc fault is detected, mitigating the effects of arcing faults that could pose a fire risk.

Running Factory Machinery on Free Solar Power

The SolarEdge system provides energy for several power-intensive machines, such as painting and ventilation, as well as warehouse robots. The Mein Solar Plant Controller was integrated into the new PV system, together with the plant's existing energy management system. This included a 100 kWp combined heat and power unit (co-generator), and two 640 kW test benches with vehicle tires spinning at high speeds coupled with generators producing electricity as a mechanical load. Adapting the pre-existing electrical generators for self-consumption of PV electricity was a highly complex challenge to overcome.

The installation is fully integrated into the control center of the grid operator (NetzeBW). This enables the grid operator to remotely adjust power output according to current demand on the grid in order to achieve grid stability. The entire system is managed via real time connection with the Mein Solar plant controller.

Real-Time Alerts

To ensure smooth operation of the PV plant, SolarEdge's proprietary Monitoring Platform enables the tracking of the system's performance remotely down to the module level. Automatic notifications including real-time remote fault-detection alerts are transmitted to the Monitoring Platform from sensors located on each Power Optimizer. Additionally, energy production metrics are presented on a monitor in the plant's main lobby.

Installer insight



"The Kässbohrer installation was highly complex. We were thrilled about the flexibility of SolarEdge technology and were impressed with the company's exceptional level of commitment and support. SolarEdge proved highly capable and willing to take on this challenging project. SolarEdge was the only company that met our unique specifications for the installation and integration of the new Kässbohrer PV system. For that reason we chose to recommend the SolarEdge Technology to Kässbohrer in our offer."

Markus Schäfer, CEO of Mein Solar GmbH

Customer insight



“Collaboration with Mein Solar GmbH and the SolarEdge team was remarkable. They embraced every challenge willingly and proactively, demonstrating complex problem-solving skills and providing outstanding service. Support was prompt and efficient, and collaboration with the Mein Solar installer ran smoothly from design through commissioning, including the integration of the Mein Solar power controller and with the existing energy management solution. Despite the challenging nature and complexity of the project, and its scheduled timing which coincided with the outbreak of the COVID pandemic, installation progressed as planned with no delays.

Like Kässbohrer, SolarEdge drives innovation in its smart technologies. In this collaboration, we were impressed by the commitment with which SolarEdge skillfully met our stringent requirements. When we add up the investments we have made in sustainability in our vehicles and also our manufacturing site in recent years, I see us as a pioneer in the industry.”

Michael Hofmann, Project Manager, Kässbohrer



SolarEdge system installed at Kässbohrer manufacturing complex in Laupheim, Germany, on its vast warehouse roof

Installation at a Glance:

- // Company: Kässbohrer
- // Location: Laupheim, Southern Germany
- // EPC/Installer: Mein Solar GmbH
- // Capacity: 750 kWp
- // Installation date: April 2020
- // Inverters: 7x SE82,8k + 1x SE55k
- // Power Optimizers: 1100 P730 Power Optimizers
- // Solar modules: 2200
- // Power output: 750 kWp

The Bottom Line

With rising electricity costs, more and more German industries are investing in renewable energy to power their factories. For plants with large, unutilized roofs and ground space, operating power-intensive machinery, PV energy is a sensible investment. In fact, the larger the manufacturing facility, the greater its yield and long-term savings, as the cost per watt paid by the plant for a solar system decreases as the system size increases. Since most of the energy at manufacturing facilities is consumed during the daytime (when solar systems are running at their peak production) these systems can supply most or even all of a plant’s energy needs.

Finally, going green poses a huge opportunity for factories, as customers - knowing that their favorite products are manufactured using sustainable energy - are more likely to remain loyal to the brand.

“When we add up the investments we have made in sustainability in our vehicles and also our manufacturing site in recent years, I see us as a pioneer in the industry,” added Michael Hofmann, Project Manager, Kässbohrer.



Energy information transmitted from the SolarEdge Monitoring platform and displayed on monitor in the lobby



SolarEdge Synergy Inverters Installed at Kässbohrer

About Mein Solar

Mein Solar GmbH is a solar power EPC located in southern Germany, which operates in Germany and across Europe. Mein Solar GmbH installs for its customers utility and industrial scale PV, battery, and EV charging systems, as well as systems for residential installations. The company installs a broad range of PV systems for applications including rooftops, greenfield projects, floating PV, carport PV, and agrivoltaics. Mein Solar GmbH is a valued and respected partner of SolarEdge.

About SolarEdge

SolarEdge is a global leader in smart energy, delivering innovative commercial and residential solutions that power our lives and drive future progress. Leveraging world-class engineering and worldwide experience, SolarEdge developed a ground-breaking intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. As a result of this and other innovations, today SolarEdge is the world's #1 solar inverter company in revenue with millions of systems installed in 133 countries. SolarEdge addresses a broad range of smart energy market segments through its PV, storage, EV charging, battery, UPS, and grid service solutions.

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