

KWETTA LTD.

UNLOCKING THE POTENTIAL OF POWER GRIDS TO SHORTEN EV CHARGING TIMES WITH **3DEXPERIENCE** WORKS SOLUTIONS

Case Study



Kwetta relied on **3DEXPERIENCE** Works cloud-based modeling, design, data management, simulation, collaboration, and communication solutions to innovate its 200 kW power grid-optimized DCFC EV charging system, which charges EVs roughly twice as fast as conventional charging systems.

Challenge:

Quickly and cost-effectively develop, manufacture, and market electric vehicle (EV) charging systems that take advantage of the untapped capacity on power grids to optimize and reduce EV charging times.

Solution:

Implement modeling, design, data management, simulation, collaboration, and communication solutions from the **3DEXPERIENCE Works** portfolio, which operate on the cloud—based **3DEXPERIENCE** platform—including **3DEXPERIENCE SOLIDWORKS Premium**, **3DEXPERIENCE SOLIDWORKS Professional**, Collaborative Industry Innovator, and 3DSwymer roles—as part of the **3DEXPERIENCE Entrepreneurs Program**.

Results:

- Innovated 200 kW scalable power grid-optimized DCFC EV charging system
- Drastically increased speed of deployment of charging hubs
- Accelerated time to market
- Reduced testing time and costs via simulation

Kwetta Technologies Ltd. believes that unlocking untapped capacity in power grids is the key to accelerating the global transition to electric vehicles. Kwetta has flipped the script. Instead of designing vehicle-charging technology that relies on the grid to provide power, Kwetta has developed grid-focused technologies that are designed to manage loads while charging vehicles. The New Zealand-based company is working to accelerate the transition to automotive electrification through innovative technology that enhances the capacity and efficiency of existing electrical infrastructure to support public high-power charging hubs.

Kwetta stands at the forefront of EV charging innovation, merging cutting-edge technology with existing power grids to redefine the future of energy and mobility.

Traditional charging hardware connects at the low voltage side of the power grid, similar to a traditional home or business, competing for capacity with all



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— Andrew Hall, Mechanical Design Lead

the other users. When multiple high-power chargers are connected, local capacity on the low voltage grid is quickly exceeded. The traditional approach is to upgrade the local low-voltage network to add the available capacity, relying on multiple vendors as well as the utility company to build out the required capacity.

The Kwetta solution bypasses required upgrades to the low voltage grid, enabling a faster, cheaper connection to the existing infrastructure, accelerating the rollout of hub charging, and removing barriers to the transition to clean transport. A single high voltage connection can also be used to expand the site in the future without having to add additional touchpoints to the grid.

The Kwetta scalable charging platform combines their Prime Grid Gateway to deliver power via Kwetta's SkyHook charging station. Each Prime Grid Gateway can deliver up to 1 MW of power distributed across up to eight SkyHooks.

The Kwetta approach brings together traditionally separate fields of engineering—infrastructure hardware, power electronics, and consumer-facing interfaces—creating a unique technology stack which required a complete and high-performing design platform.

When Kwetta was established in 2021, company management understood that its designers and engineers would need access to advanced product development tools in order to move EV charging technology forward, according to Mechanical Design Lead Andrew Hall. "We evaluated the performance of available product development

platforms, including SOLIDWORKS®, Onshape®, and Fusion 360®,” Hall recalls.

“I had used SOLIDWORKS software in a previous position, and when the decision was made to join the **3DEXPERIENCE**® Entrepreneurs Program, I was initially quite skeptical of a cloud-based solution, even though I liked SOLIDWORKS, but it’s turned out to be quite good,” Hall adds. “The license management is really good and straightforward, and I have access to all of the SOLIDWORKS tools with which I’m familiar. Plus, we have transparent data management in the cloud.”

Kwetta chose to implement modeling, design, data management, simulation, collaboration, and communication solutions from the **3DEXPERIENCE** Works portfolio, which operate on the cloud-based **3DEXPERIENCE** platform—including **3DEXPERIENCE** SOLIDWORKS Premium, **3DEXPERIENCE** SOLIDWORKS Professional, Collaborative Industry Innovator, and 3DSwymer roles—as part of the **3DEXPERIENCE** Entrepreneurs Program.

FASTER DESIGN, SHORTER TIME TO MARKET

Using **3DEXPERIENCE** Works solutions, Kwetta has quickly developed its SkyHook EV charger, Prime Grid Gateway charging hub, and its world-leading Power Electronics Building Block (PEBB), a multi-function, bidirectional, networked inverter, which can be used within a Prime Grid Gateway to support even higher charging rates ranging from 200 kW to 1 MW (1,000 kW). “We really needed to hit the ground running with product development, which is one of the reasons why we chose **3DEXPERIENCE** Works solutions,” Hall explains.

“SOLIDWORKS software is pretty much a de facto standard in New Zealand and is used by many of our manufacturing partners,” Hall says. “We believed **3DEXPERIENCE** Works solutions would eliminate any interoperability problems with partners because they are completely compatible with SOLIDWORKS. We are very comfortable with **3DEXPERIENCE** Works tools because they act predictably, and enabled us to efficiently design a product with more than 1,300 unique parts and assemblies in 10 weeks with a single designer, which is why the **3DEXPERIENCE** platform certainly contributed to our faster time to market.”



Using **3DEXPERIENCE** Works simulation tools, Kwetta shortened time to market for its Prime Grid Gateway charging hub, which supports up to eight, 200 kW power grid-optimized DCFC Sky Hook EV chargers, while simultaneously reducing testing requirements and associated costs and delays.

REDUCING TESTING WHILE ENSURING SAFETY

With the linear static stress simulation tools included with the **3DEXPERIENCE** SOLIDWORKS Premium role, Kwetta was able to save time and money by reducing the amount of testing required, while simultaneously ensuring the structural integrity of the product.

Ensuring the Prime Grid Gateway was safe to lift and transport to the site was an essential part of bringing the product to market. The simulation tools in **3DEXPERIENCE** SOLIDWORKS allowed Kwetta to iterate quickly during the design stage, optimizing for cost and manufacturability.

“We had to pass safety compliance testing to bring the Prime Grid Gateway to market, and made great use of the simulation tools in **3DEXPERIENCE** SOLIDWORKS Premium to make sure that our

integrated solution met the appropriate factor-of-safety requirements in New Zealand,” Hall notes.

“The simulations gave us confidence that our design was safe from the beginning, and when the design was reviewed by certifying engineers, no modifications were required,” Hall points out. “This saved a lot of time and money because we were able to eliminate costly iterations.”

INTEGRATED DATA STORAGE AND MANAGEMENT IN THE CLOUD

Another factor in Kwetta’s selection of **3DEXPERIENCE** Works solutions is the transparent, cost-effective, cloud-based data management that it provides. “With the cloud-based **3DEXPERIENCE** platform, not only can users securely access data and tools from anywhere and on any device, they can also rest assured that the design data they are working on is being managed,” Hall stresses.

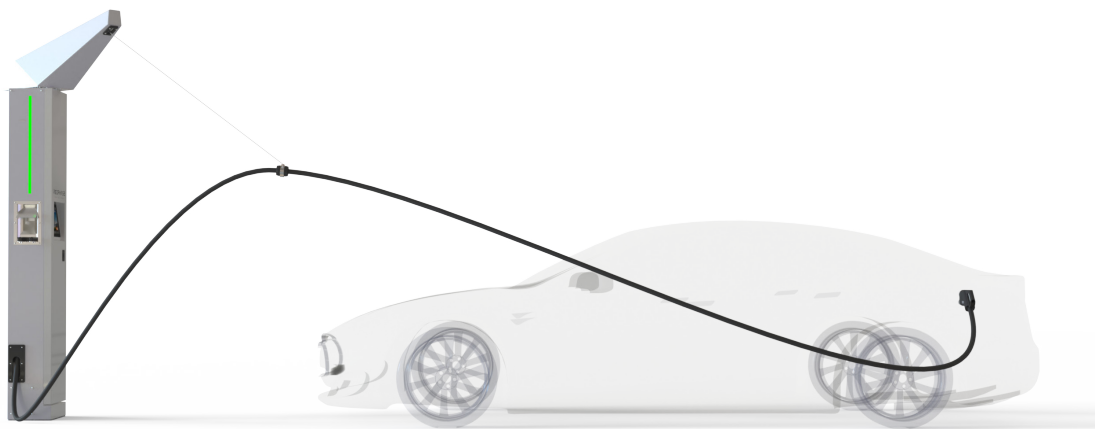
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