THE UNCOMMON BENEFITS OF **LOW-VOLTAGE MICROGRIDS**

by Chris Beitel, Chief Operating Officer, SimpliPhi Power

As solar energy continues to proliferate and energy storage costs continue to decline, the ability of low-voltage microgrids to deliver power is turning it into a viable option for on-site access to reliable, uninterrupted power – particularly in the case of the Maui Brewing Company in Hawaii.

Chris Beitel, Chief Operating Officer, SimpliPhi Power.

Chris Beitel is the Chief Operating Officer (COO) of SimpliPhi Power. In his role as COO, Mr Beitel runs global, manufacturing and supply chain, focusing on capacity expansion of SimpliPhi's diverse product range. In addition, he runs the company's sales, marketing and business development functions chartered to grow both upstream and downstream partnerships to scale the business.

Microgrids can be thought of as intelligent, small-scale versions of the centralised electricity system that provide local businesses and communities the resources and flexibility to achieve specific on-site distributed energy goals and objectives. Today, low-voltage microgrid solutions are offering greater on-site energy stability and resiliency, as well as increased reliability, safety and energy independence for businesses and communities.

A microgrid is effectively a localised and interconnected grouping of electricity generation assets and energy storage that supports electrical loads that can operate in conjunction with the traditional centralised distribution grid. It can also disconnect from the main electrical grid and function autonomously as physical, environmental or economic conditions dictate.

In 2014, the Maui Brewing Company worked with architects and engineers to develop a multi-phase microgrid plan that would meet the facility's energy needs using on-site renewable energy sources.

The first phase of the project – an off-grid solar power system – was completed at the end of 2014.

Comprised of a 16 kW rooftop PV array and 96 kWh of SimpliPhi power storage, this system powers equipment at the brewery, including two EV charging stations.

In 2015, a net-energy metering agreement was approved by the utility. The original rooftop solar PV that was generating power for the off-grid system was redirected to sell power to the utility.

This beautiful solar array has been constructed from structural steel beams and Lumisol's bi-facial solar modules.

Future phases of the project's plan include additional energy storage systems, solar arrays, solar thermal and backup generators. Maui Brewing Company's microgrid will set the bar for how the industry can take advantage of cleaner sources of power while lowering energy costs and staying operational through grid interruptions.

Like many businesses and communities, Maui Brewing Company found the microgrid solution attractive because of elements beyond clean energy and carbon reduction. A microgrid offered the company greater energy reliability, a diversification of energy sources, peak shaving benefits and backup power resources. Additionally, Maui Brewing saw a campus-wide microgrid as a chance to educate its community on how solar, energy storage and electric vehicle charging can work together to create an integrated and robust power solution.

Beyond these more obvious advantages, microgrids are less vulnerable to terrorist attacks and natural disasters. According to a report compiled by the US-based National Research Council in 2012, *Terrorism and the Electric Power Delivery System*, microgrids and expanded use of distributed resources would help limit cascading failures and safeguard islands' power within a rural or urban region during a short or prolonged blackout.

Additionally, when high-voltage microgrids go down, bringing them back online requires the same specialised labour that is needed with utility grids. In times of critical grid failure, these highly skilled professionals are in peak demand by the utility, causing microgrids to take a back seat to utility priorities.

By contrast to high-voltage microgrids that require specialised labour, low-voltage microgrids are safe enough for general electricians to repair – thus providing low-voltage microgrids and their owners with more resilience and flexibility. This effectively creates localised islands with much-needed power during catastrophic events or massive grid failure.

Microgrids can be a catalyst for the long overdue overhaul of our national energy infrastructure and the increased proliferation of renewable energy. Coupled with low-voltage energy storage, they hold the key to improving the lives of millions around the world. eco

Mr Beitel will present a session titled 'Microgrid Deployment – Maui Brewing Company: Safety, Accessibility & Power Security in the Age of Climate Change, Cyber Attack & Political Uncertainty' at the **2016 Australian Energy Storage Conference**. The conference will take place at the Australian Technology Park in Sydney 1–2 June 2016.