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CSE: HEAT
OTCQB: HLRTF
FRA: 7HIA

Hillcrest Soft-Switching Technology Leads to Smaller, Lighter Inverters and Improved Power Quality

- New white paper demonstrates value of Hillcrest soft-switching technology on improving power density through the reduction of capacitor and overall inverter size
- Hillcrest EV commercial prototype inverter is designed with one-fifth to one-tenth of the capacitance of current systems
- Potential to disrupt power inverter designs across the automotive space

VANCOUVER, British Columbia, August 17, 2022 – Hillcrest Energy Technologies (CSE: HEAT) (OTCQB: HLRTF) (FRA: 7HIA) (the “Company”), a clean technology company developing transformative power conversion technologies and control system solutions for next-generation electric vehicles and electrical systems, is pleased to announce the release of a new technical white paper outlining the advantages of Hillcrest inverter technology and how its soft-switching capabilities relate to capacitors within the power conversion system.

A previous white paper from Hillcrest shared test results and demonstrated the value of operating electrical systems at higher switching frequencies with the ability to eliminate losses. The latest white paper explains how operating at higher switching frequencies can result in a significant reduction in the size of capacitors within the system, as well as improvements in power quality, system reliability and component life.

In an inverter, a capacitor allows for pulses of electrical current to happen at different times and at different frequencies—this is an energy buffer function—while it also smooths the pulses, reducing the amount of peak-to-peak ripple voltage in the process. There is typically a bank of capacitors within an inverter, often contributing to a large portion of the component’s overall size.

Enabling switching at higher frequencies with Hillcrest’s soft-switching inverter technology can result in a significant increase in power density, due to the reduction in the size of capacitors needed and in turn reducing the overall size, weight and cost of an inverter. The ability to operate at higher switching frequencies with Hillcrest soft-switching technology offers other substantial benefits – improved power quality, material elimination of switching losses and a reduction in electromagnetic compatibility issues.

MEASUREMENT	10kHz	30kHz	IMPROVEMENT % OF HIGHER SWITCHING FREQUENCY
Peak to peak capacitor current ripple	8.7A	5.6A	35.6%
RMS capacitor ripple current	3.2A	2.5A	21.9%
Peak to peak capacitor voltage ripple	9.5V	1.9V	80.0%
Peak to peak DC source current ripple	3.8A	0.7A	81.6%
RMS DC source current	2.7A	2.5A	7.4%

Comparison of the effect of switching frequency on DC-link parameters.

“Capacitance for a typical EV traction inverter today is between 600 micro farads and 1 millifarad, while the commercial prototype design of the Hillcrest traction inverter contemplates one-fifth to one-tenth of the capacitance,” says Ari Berger, Hillcrest CTO. “Such a significant reduction in capacitor and inverter size and increase in power density, coupled with improved power quality and system reliability, has the potential to disrupt power inverter designs across the automotive space.”

You can download the latest technical white paper from the Hillcrest website: [Reports - Hillcrest Energy](#)

The company continues validating its technology. This is the first in a series of anticipated reports demonstrating the value of Hillcrest’s high-efficiency inverter technology from various technical and sub-system aspects.

About Hillcrest Energy Technologies

Hillcrest Energy Technologies is a clean technology company developing high-value, high-performance power conversion technologies and digital control systems for next-generation powertrains and grid-connected renewable energy systems. From concept to commercialization, Hillcrest is investing in the development of energy solutions that will power a more sustainable and electrified future. Hillcrest is publicly traded on the CSE under the symbol “HEAT,” on the OTCQB Venture Market as “HLRTF” and the Frankfurt Stock Exchange as “7HIA”. For more information, please visit: <https://hillcrestenergy.tech/>.

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