Scaling up the Lattice Energy Converter (LEC) Power Output

*Frank Gordon [1], Harper Whitehouse [2]
[1] Inovl, Inc, U.S.A.
[2] Inovl, Inc, U.S.A.
Email: feg@inovl.com Corresponding Author's address

As presented at ICCF-24, multiple Lattice Energy Conversion (LEC) devices and configurations for direct energy conversion have experimentally demonstrated the ability to self-initiate and self-sustain the production of a voltage and current through an external load impedance without the use of naturally radioactive materials. These results have been reported by the authors and replicated by independent researchers. While the ability to self-initiate and self-sustain the production of electrical power in a load impedance is a significant development, output power must be scaled up by 6 to 10 orders of magnitude to become a useful energy source.

Following ICCF-24, we have made two changes in the design of the experimental cells. One change was to replace the gas electrolyte which requires approximately 35 eV per ion pair, with a liquid, gel, or solid-state electrolyte which spontaneously produces mobile ion pairs. A second change was to mix Pd-H particulate into the electrolyte to augment the spontaneous ionization thereby increasing the number of ions present in the electrolyte. As shown in Fig. 1, these changes resulted a peak power of 478 µW of power at a load impedance of 100 Ω at a temperature of approximately 20 °C, or more than one hundred microwatts of power per square centimetre. This is a 2 to 3 orders of magnitude increase over the results presented at ICCF 24. Additionally, another 4 orders of magnitude increase are anticipated by increasing the active electrode surface area to 1 square meter. At ICCF-25, we will report on these and other advances.

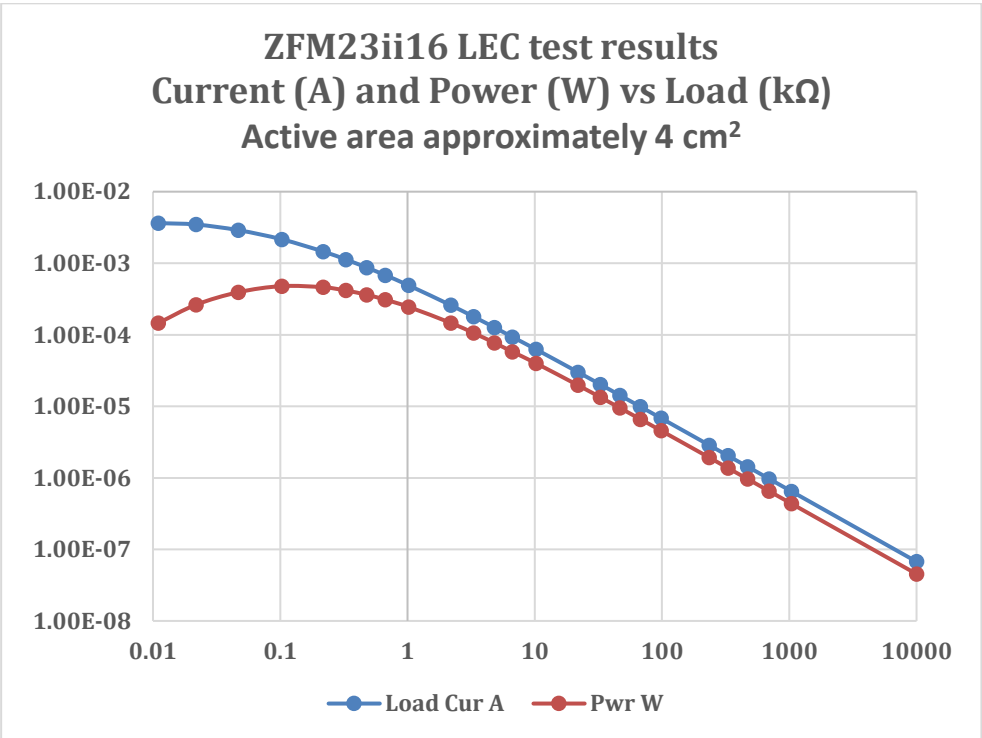

Fig. 1. Plot of Current (A) and Power (W) versus Load Impedance (kΩ)