TERRA WATTS

Subsurface wireless transmission

Introduction

Terra Watts transmits electricity using the Earth as a propagation medium, delivering simultaneous power and data communication transfer. The transmitter resembles a borehole where generated power is injected into the ground. The energy is captured via a receiver that directly operates electrical devices, without requiring batteries.

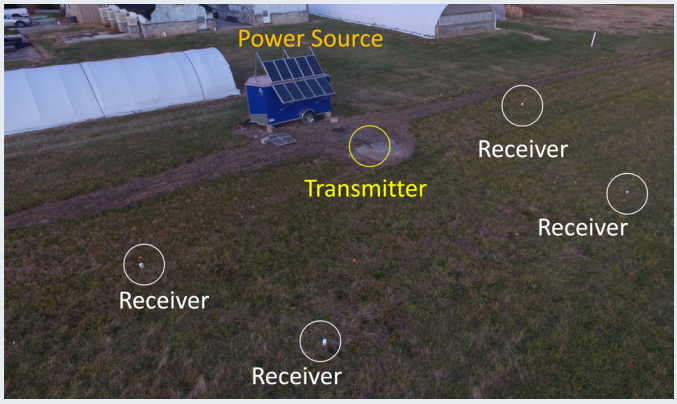

Fig. 1. Four receivers (white) simultaneously receive power and send data back to the centralize transmitter (yellow). Transmitter is energized by solar panels (orange)

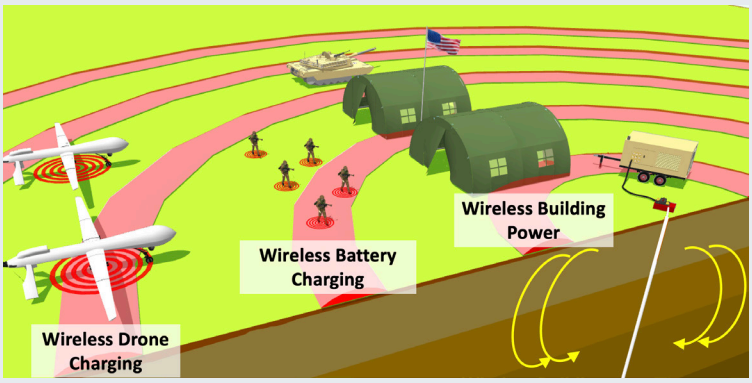

Fig. 2. Con-Ops of Terra Watts power an data distribution to military infrastructure.

Our Advantage

Defense. Near term: Our technology provides advanced sensing with subsurface IoT system.

Long term: We support expedient basing in a combat/theater operations environment.

Commercial. The go-to-market strategy is to provide 4D subsurface monitoring for carbon storage, geothermal, oil/gas, and mining applications.

Progress so far

We deliver **power and data using through rock/soil.** Our prototype currently transmits up to **5 W over 50 m at 6% efficiency**. Our theoretical models predict >1 kW, >1 km, and >50% efficiency capabilities at optimal performance. In a long-distance test, we captured power from a source **1 km away, supporting our models**. R&D is supported by National Science Foundation grants.

Next Steps

We aim to secure **$1 million** to achieve these milestones within the next 18 months:

- Redesign transmitters and receivers
- Improve numeric simulations
- Increase distance, power, efficiency

Technology progression 2021 to 2023:

Efficiency improved from **0.6%** → **6%**

Power increased from **0.3 W** → **5 W**

Distance expanded from **20 m** → **50 m**

Data Communications: **30 kbits per second**

Partners

NSF Activate Rose Rock Bridge

Contact



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Innovating the future of wireless transmission