

# Voltree Power leading the way with **bio-energy** harvesting technology

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*Operating on converted metabolic plant energy, Voltree Power's Climate Sensor Network collects environmental data to predict forest fires.*

In September 2009, Voltree Power announced its first Climate Sensor Network contract with the United States Department of Agriculture (USDA) Forest Service and Bureau of Land Management at the National Interagency Fire Center in Boise National Forest, Boise, Idaho, USA. Voltree has been collaborating with these governmental agencies and Vaisala for nearly two years to integrate their breakthrough technology to create a low-cost, low-maintenance way to collect a new level of detailed environmental data.

The Climate Sensor Network complements the USDA Forest Service's Remote Automated Weather Stations (AWS) network which includes Vaisala solutions. Voltree Power's patented Bio-energy

Harvester technology converts metabolic plant energy into usable electricity by collecting the energy that is naturally produced by living trees and other large plants and using low-power radio transceivers, sensors to trickle charge and run low-power circuit. This pioneering alternative eliminates the impracticality of battery replacement in extensive mesh networks. The University of Washington has independently confirmed the viability of operating low-power circuitry from tree power.

## **Environmentally sound solutions to real world problems**

Voltree provides a reliable and cost-effective method of collecting



*Stella J. Karavas with a demonstration system installation.*

microclimate, 'under-the-forest-canopy' weather data that serves as a valuable tool for weather and climate modeling as well as climate change research. Voltree's wireless mesh network of low-power sensory nodes transmits data signals from one unit to another until they reach a Vaisala-built central monitoring station. These stations subsequently provide a satellite microwave uplink connection that allows the collected information to be shared with numerous government agencies and many other users worldwide.

Vaisala's technology enhances the network system because of its reliability and the company's global presence. This is why Vaisala was chosen to be a strategic partner in

providing environmentally sound solutions to real world problems.

The Climate Sensor Network's predictive approach will enable government land agencies strategically prioritize and provide better pre-positioning resources to maximize public and firefighter safety as well as reduce losses and lower costs. The data can be used to assist in the prediction of areas in the forest at higher risk for fires at the time the information is collected.

Voltree's collaboration with the Bureau of Land Management project includes a Vaisala HydroMet™ Automatic Weather Station as well as assistance from Vaisala for software integration. The automatic weather station is portable and specifically developed for temporary installations. It includes a lightweight aluminum tripod with adjustable legs for use on uneven terrain.

The product line is field-proven in a wide range of application with a basic suite of sensors typically measuring wind, pressure, temperature, relative humidity, and precipitation. In addition, measurements can be taken of e.g. multi-level soil temperature, soil moisture, global and net solar radiation, water level, and temperature.

## Patented technology with a variety of applications

The USDA Forest Service and the Bureau of Land Management are not the only major entities to recognize the potential of Voltree Power's patented technology. Applications range from ultra local, short-latency, microclimate data collection and delivery for wildfire prediction and monitoring to climate research and agricultural sensing to covert security and defense solutions for motion and ionizing radiation early warning systems.

Voltree Power researches, designs, manufactures and maintains energy harvesting modules, low power radios and other elements of mesh-networked telemetry systems for a variety of customers. The company received the 2009 Best of What's New Award from Popular Science in the Green Tech category for their Javelin product and was also awarded the Green Energy TV "Two Green Thumbs Up" for their energy innovation and green inventions.

Formed in 2005, Voltree Power has a market focus of low-power wireless sensing networks and automation systems for homeland



*Eric Keith of Vaisala (left kneeling) with Voltree Power's Project Manager Scott Keller (right kneeling) and Science Advisor Dr. Andreas Mershin integrating a portable automatic weather station from Vaisala with Voltree's demo system.*

security, environmental and agricultural monitoring, meteorology and climate science, residential and commercial fire detection and prevention, and other security applications.

**Further information:**  
[www.voltreepower.com](http://www.voltreepower.com)

