



> GreenPeak Technologies *Cees Links*

GREENPEAK'S TECHNOLOGY targets "green" power

A global pioneer in ultralow-power wireless-sensor and -control networking crafts battery-free wireless networks.

GREENPEAK TECHNOLOGIES is a global pioneer in ultralow-power wireless-sensor and -control networking. The company offers OEM designers a revolutionary communications technology that incorporates energy-harvesting to enable maintenance-free operation in a completely wireless environment. Based in Utrecht, the Netherlands, GreenPeak distributes wireless-transceiver chips and modules in the United States, Europe, and Asia. To find out more about the technology and its international implications, *EDN* questioned Cees Links, an engineer and chief executive officer at GreenPeak. A portion of that interview follows. To read more, go to www.edn.com/global08cs.

Briefly explain GreenPeak's technology and the current applications for it in a global market.

GreenPeak is a fabless-semiconductor company offering wireless and "green" ultralow-power network-communication technology for sense-and-control applications. GreenPeak's new Emerald GP500C transceiver chip and its wireless-sensor-network-communication technologies are based on a unique low-power architecture that can use energy harvested from the environment. GreenPeak's mesh networks can be powered by energy-harvesting devices without compromising performance range, data rate, or reliability. Implementing a GreenPeak-connected network powered by energy harvesting can greatly reduce the cost and difficulty of maintaining wireless-sensor networks.

How do the differing standards, regulations, and wireless-spectrum allocations between regions affect your product designs?

Wireless communication prospers best within the space of industry standards. In addition, standards offer OEMs the freedom to purchase from a larger pool of suppliers. Standards also allow devices from different vendors to interoperate, a feature that is paramount in applications ranging from building automation to industrial automation. For wireless-sensor transceivers, the dominant and probably only real standard is the IEEE 802.15.4 specification.

There have been efforts to use Bluetooth and Wi-Fi for sensor applications. However, in all these reported applications, Bluetooth and Wi-Fi were used in a nonstandard way, in fact weaving the principles of

IEEE 802.15.4 in their native implementation. Nowadays, it is widely accepted that the IEEE 802.15.4 offers the best basis for wireless-sensor applications.

GreenPeak is fully committed to development based on open industry standards. Designs using the Emerald GP500C communications controller are fully IEEE 802.15.4-compliant, running in the 2.4-GHz [band],

which allows worldwide certification for single products. The GreenPeak technology also supports the open global standards of the ZigBee Alliance.

What is your assessment of the worldwide-market conditions for wireless technology, and how does it affect your product-development plans?

The enclosures for the sensor units used in wireless-sensor networks are often very small. ... As a result, the batteries must be regularly replaced, which creates a real maintenance challenge. GreenPeak has overcome this problem by developing alternative solutions for powering wireless-sensor networks based on a different and low-power architecture that can utilize energy harvested from the environment.

There are other low-power wireless networks in development—based on Wi-Fi, ZigBee, and other wireless-networking technologies, but none offer the levels of connectivity, robustness, minimal power consumption, and ability to function in radio-unfriendly environments that the GreenPeak solution offers.

The Emerald GP500C communications controller greatly reduces energy consumption and enables end nodes to run on energy harvesting. GP500C-driven networks can be truly wireless, free of power cords and free of batteries. The biggest technical challenge is managing the energy consumption without reducing range, functionality, speed, and standards compliance. The resulting elimination of the need for ongoing, regular battery replacement simplifies and reduces maintenance-labor costs and provides a higher level of safety and comfort.

—Interview conducted and edited by Warren Webb

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