Researchers develop “rectenna” to convert radio waves to electricity

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Researchers from Nihon Dengyo Kosaku Co., Ltd, (DENGYO) a Japanese communications infrastructure company, have developed a device they call the “rectenna” that can convert radio waves moving around in the air, to electricity. The name comes from combining the word “rectifier” (a device that is normally used to convert AC power to DC, but can also be used to detect radio signals) with “antenna”.

In the demonstration video, the researchers say that the rectenna can convert both WiFi and digital terrestrial broadcast signals, though the amount it converts depends of course on the amount of radio waves in the vicinity. The rectenna comes in two sizes, one for converting WiFi signals, the other for terrestrial. The WiFi version is small, just 12 mm thick, while the terrestrial version is 30 mm thick. Each looks like a plain soft-white pad.

Engineers demoing the two devices say electricity produced by the WiFi version is in the microwatts at a distance of just 10cm from the source, not a lot of course, but enough to power a small sensor or tag, they say. As for the terrestrial version, they were able to generate about 1.2mV and 0.06μW of power inside the exhibition hall, where the video was made, at the Tokyo Big Sight. The signals received were from a digital terrestrial broadcast sent from the Tokyo Tower which was about 5.5km away.

While neither device converts very much power, the team is confident

that uses could be found for such converters, or perhaps new devices created that could take advantage of small amounts of power. They also note that in some areas, such as very near the Tokyo Tower, the rectenna is able produce much more power; in one case it was able to produce 6mW of power, at a distance of 3 or 4 kilometers from the tower.

In practical terms it appears the devices might be useful for capturing radio waves in the home and using the electricity produced to power LED monitor lights or as sensors that wake-up other gadgets when someone wants to use them. If enough rectenna's were connected in a home, consumers might even see lower power bills at the end of the month.

Via DigInfo TV