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3G going green with active antennas

Caroline Gabriel / Rethink Wireless | September 21, 2009

With mainstream base station technology becoming commoditized, suppliers are looking for margin, and differentiation, in new architectures. In particular, they are looking for projects that will bring them a close relationship with a key operator, and allow them to compete on more than just price.

Green technology is one of the main areas of activity, with large operators aiming to reduce energy consumption and increase cost efficiency. One such initiative is NICE (Networks Innovation Center), set up by Nokia Siemens Networks and Vodafone to focus on "joint innovation around new concepts, products and architectures".

That was only announced in June, but has already delivered its first results, in the shape of the first use of active antenna technology in commercial W-CDMA networks.

This approach aims to reduce the base station footprint and lower power consumption by incorporating base station elements and an amplifier within the antenna. The partners have worked on this technology in Madrid, and say it will reduce carbon emissions and improve cost effectiveness. It will be marketed to the whole operator base, not just Vodafone, and was tested last month on the cellco's commercial 3G network in Italy.

The active antenna system, which will be incorporated into NSN's Flexi Base Station range for GSM, W-CDMA and LTE, conforms to the industry Single RAN specification. Vodafone was a key contributor to this standard, which is geared to including multiple air interfaces and functions within one base station design, supporting approaches like software defined radio. One of the first vendor collaborations that Vodafone announced in this area was with Huawei, which worked with Vodafone to create a Single RAN software defined base station, unveiled last year.

Regarding the NSN development, the vendor has been working on active antennas for some time and in August 2008 announced a collaboration with Ubidyne, a specialist in the area. Ubidyne integrated its uB900 Antenna Embedded Radio into the NSN Flexi. The uB900 integrates the functionality of the active radio frequency parts in a base station with a passive antenna, in one enclosure.

This is connected to Flexi by an interface based on the OBSAI (Open Base Station Architecture Initiative) standard.
NSN is targeting its active antenna solution at operators rolling out or enhancing 3G, or moving to LTE in future, and it sees a particular opportunity for flexible, low-power architectures when carriers are refarming their GSM spectrum for 3G.

Tommi Uitto, head of wireless access product management at NSN, commented in a statement: "We see active antennas as the next logical step in base station site evolution,

where the trend is to move RF parts closer to the antenna." This can boost performance and lower opex by reducing site rental, maintenance and energy costs.

As for the actual green impact of such BTS solutions in general (in terms of carbon reduction rather than just lower opex), a July report from Juniper Research claimed that operators that implement a "transformational" strategy focused on reducing site inefficiencies and non-renewable energy sources would see CO2 emissions peak in 2010 and drop 30% from today's levels (22 megatonnes) to 15.6 Mt by 2014.

However, Juniper noted that operators should take their green plan seriously - a patchwork, incremental approach to greener base stations would be so ineffective that emissions would still rise over 6% to nearly 35 Mt.

This article originally appeared on Rethink Wireless [1]

Tags
3G [9] base stations [10] Green telecom [11] Huawei [12] NSN [13]