Energy efficiency of 802.11n versus LTE Advanced femtocell networks based on a 3D deployment tool

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Abstract:

In this study, the GRAND (Green Radio Access Network Design) tool is proposed which allows to develop wireless access networks with a minimal power consumption based on 3D building information about the environment. Therefore, an algorithm is developed which combines Line-of-Sight (LoS) and non-Line-of-Sight (nLoS) propagation. It is shown that our algorithm estimates more accurately the required number of base stations to cover the area. Furthermore, the energy efficiency of a 802.11n network and an LTE Advanced fem tocell network is compared for a suburban area in Ghent, Belgium. Based on our assumptions, it was found that the LTE Advanced femtocell network is about 2.5 times more energy-efficient than the 802.11n network.