

Small Cells Will Play a Very Large Part In 4G: Worldwide Femto, Pico, and Microcell Market Analysis

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Introduction to Update

When wireless operators first setup their cellular networks more than 25 years ago, they were built to support voice, which was all that was available back then. To accomplish this task, operators used widely spaced macrocell base stations paired with the now familiar cellular tower. Then ten years ago, operators had to rethink this, as they prepared to deploy their 3G networks. For the most part, operators used their existing 2G sites, in which they had invested billions of dollars to develop, and added a 3G base station to each site (or upgraded the 2G base station for CDMA), and then added extra sites as needed, more to support all the additional subscribers as opposed to adding more coverage. Pico and microcells were added as needed, for indoor coverage or in areas where a macrocell was overkill and not cost-effective.

Many operators are currently deploying or at least considering the deployment of 4G networks, and in the process, these operators have realized they need to totally rethink their deployment strategies. In these first phases of 4G deployment, operators are installing LTE and WiMAX base stations in all their existing 3G locations because it's quick and easy and it will let them get broad coverage very quickly, but in the years that follow, small cell base stations are going to play a very large role in this process.

Femtocells and enterprise femtocells are going to help operators provide indoor coverage to their subscribers, while at the same time, relieving them from some backhaul and infrastructure costs. Indoor picocells will become smaller and cheaper due to new compact base station technology, and they will be used in many new ways. Outdoor metropolitan compact picocell base stations, also only possible because of new compact base station technology, will be used outdoors to form giant metropolitan mesh networks, and new smaller, cheaper, and power-efficient microcells will take on a new role of providing medium-capacity with a very small footprint.

Table 1 below contains In-Stat's latest forecasts for femtocells, enterprise femtocells, indoor picocells, outdoor metropolitan picocells, and microcells. Each class of device has a unique purpose that allows an operator to build a solid, robust, high-capacity network, and each class will be required by operators going forward. Some of these devices, such as indoor picocells and microcells, have been around for years, but will now be used in slightly different ways. Others, like enterprise femtocells and outdoor

HIGHLIGHTS

- Small cellular infrastructure cells are expected to surpass XX million units by 2014.
- A new class of base station, called the compact base station, will enable pico and micro base stations to be smaller, cheaper, and more power-efficient than ever before.
- Enterprise femtocells are another brand new segment, offering the benefits of femtocells to the business market and shipments are expected to start this year.
- In the next five years, metropolitan picocells are expected to grow quickly and greatly help operators deploy technologies like LTE.

metropolitan picocells, are new classes of base stations only possible in the last year or so because the technology is just developing to make them possible.

In terms of sheer numbers, femtocells will take the lead since femtocells are low-cost consumer devices supporting only a few connections at a time. In-Stat forecasts that shipments of femtocells will total almost XX million units by 2014.

Another new class of user-installed devices is the enterprise femtocell. This device allows a business customer to get the same advantages of coverage and capacity that a home user does with a femtocell, but in a business environment. In-Stat forecasts that this market will grow to over XX units by 2014.

Table 1. Worldwide Annual Small Cell Devices, 2009–2014 (Unit Shipments)

XX

In the group of operator-installed small cells, In-Stat believes that the new class of metropolitan picocells has a very bright future. These devices will allow an operator to provide excellent coverage, capacity, and data speed to users in dense areas and other public spaces. Metropolitan picocells, using a compact base station form-factor, will often have embedded wireless backhaul support allowing a network to be set-up and maintained by an operator very inexpensively. By 2014, In-Stat forecasts that almost XX million metropolitan picocells will be shipped to operators worldwide. Operators in Asia are expected to take the lead in this area.

In-Stat believes that indoor picocells will be used for 4G services much the same way as they were used for 3G, which was to fill in coverage or for indoor spaces, but for 4G technologies, they will also be used where capacity also needs a boost. In-Stat forecasts that over XX indoor femtocells will be shipped in 2014.

Lastly, In-Stat forecasts that large, rack-type microcells will disappear in the next XX years, and be replaced with compact base station form-factor microcells, which are less than XX% of the size, but still offer their same high-capacity. In-Stat believes that the number of these microcells shipped will almost double between 2009 and 2014, resulting in more than XX shipped in 2014.

Report Summary

As operators start to plan and deploy their 4G networks, the way they deploy and the type of infrastructure they deploy will be quite different from what they have used for 3G. This report covers the way operators are deploying their 4G networks and looks at the small cell base stations that are making the deployment of 4G possible, including a new class of base station—the compact base station—which has the capacity of a large base station but in the form factor of a Wi-Fi access point.

This report contains 5-year forecasts and analysis of femtocells, enterprise femtocells, indoor picocells, outdoor metropolitan picocells, and microcell base stations. A 5-year revenue forecast is also included.

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Methodology

Data for this report was obtained from publicly available sources, including Internet sources, company financial reports, and briefings with cellular providers, base station manufacturers, and semiconductor manufacturers who manufacture components for femtocell, picocell, and/or microcell base stations. Briefings with these companies occurred from February 2010 to June 2010.

This report covers cellular microcell, indoor picocells, outdoor metropolitan picocells, enterprise femtocells and femtocell base stations installed, leased, or sold by operators who are serving the public. Equipment in this report operates on the following technologies: GSM, CDMA, WCDMA, TD-SCDMA, LTE, and TD-LTE. Not included is equipment used for private purposes and repeaters, or other equipment that does not increase cellular capacity or WiMAX equipment, although much of the discussion in this report applies to both LTE and WiMAX. All of the data in this report are subject to minor rounding discrepancies, as they are calculated at a higher precision than shown. All forecasts are worldwide and revenue is in US dollars unless otherwise stated.

In-Stat uses the term “4G” in this report to refer to those technologies that are beyond the technologies typically characterized as “3G,” which for purposes of this report include WiMAX, LTE, and TD-LTE. In-Stat is aware that the International Telecommunications Union (ITU), the body that regulates communications issues globally has not designated any of these technologies as 4G nor has it designated any technology at this point as 4G, but has chosen to use the term 4G to remain consistent with other press and new articles that report these technologies as 4G. This in no way is to imply that In-Stat believes that these technologies will be designated as 4G by the ITU.

Related In-Stat Reports

- #IN1004710GW *1Q10 Cellular Contracts, Deployments, and Subscriptions Database*, March 2010
<http://www.instat.com/catalog/wcatalogue.asp?id=29#IN1004710GW>
- #IN0904370GW *Global Five-Year Cellular Macro Station Forecast*, December 2009
<http://www.instat.com/catalog/wcatalogue.asp?id=29#IN0904370GW>
- #IN0904603GW *Big Pipes-The Global Market for Cellular/WiMAX Backhaul*, May 2009
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