

Femtocell Market Status

Issue. 6

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Purpose of this Document

The market status report provides regular updates on the status of femtocell market development as it pertains to service providers and femtocell ecosystem manufacturers, and also covers standards and regulatory aspects.

Informa Telecoms & Media is researching and producing this report on behalf of the Femto Forum. The news and analysis is based largely on news items submitted through the Forum by members and analyst houses, supplemented by research we have conducted through publicly available websites and sources.

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Latest Market Developments

- The femtocell market is starting to diverge with enterprise, public and rural femtocells appearing in the market. Femtocell technology is extending beyond the home environment and several operators are launching dual femtocell access points for consumer and enterprise environments. Vodafone, T-Mobile, Movistar, Singtel and Softbank have launched non-consumer femtocell services.
- Q4 2010 and Q1 2011 have seen important progress in femtocell technology - in addition to more powerful models that cover larger areas, new low power USB-connected femtocells designs promise to open up new service opportunities for operators.
- Tier-1 European mobile operators are now actively pursuing femtocell deployments, including Vodafone in the UK, Qatar, Spain and Greece and Telefonica in Spain. Smaller operators including Moldtelecom, Cellcom (US) and Mosaic are deploying or committing to femtocell deployments, illustrating the business case for smaller mobile operators.
- Informa estimates 1.7 million femtocell access points deployed in the market and 2.2 million macro base stations as of Q4 2010.
- Three major US operators have deployed femtocell services, improving network coverage across the US. Sprint and AT&T are now offering free femtocells to subscribers with coverage problems. Also, all three operators in Japan (NTT DoCoMo, Softbank and KDDI) have launched femtocell services.
- As of February 2011, there are 19 commercial services (from 18 in December 2010) and a total of 34 deployment commitments (compared to 30 in December 2010). Deployments and commitments have tripled during 2010.
- The Femto Forum has grown to include 60 mobile operators representing 1.71 billion mobile subscribers worldwide, across multiple wireless technologies (WiMAX, UMTS and CDMA) and account for 33% of total mobile subscribers worldwide plus 74 vendors, illustrating that the femtocell ecosystem is experiencing healthy growth.
- Broadcom's acquisition of Percello illustrates the on-going consolidation of the femtocell market; confirming the evolution from the early-stage to a more mature, lean value chain.
- Femtocell-specific 3GPP, 3GPP2 and WiMAX standards have been completed, signalling that femtocell technology has been ratified by the highest profile standardisation bodies worldwide.

Operator Aspect

The femtocell market experienced significant activity from Q4 2010 to Q1 2011, with several high-profile commercial launches making the headlines. Femtocell interest in the mobile operator community continues to grow, while deployments increased to 19 in 13 countries (from 18 in 12 countries) during Q1 2011. Femto Forum operator members currently represent 1.71 billion mobile subscribers worldwide, across multiple wireless technologies (WiMAX, UMTS and CDMA) and account for 33% of total mobile subscribers worldwide.

Figure 1 illustrates operator members in the Femto Forum. For updated information on the Femto Forum members and their activities, please see <http://www.femtoforum.org/femto/membership>.

Figure 1: Femto Forum mobile operator members



Source: Femto Forum

Femtocell Service Commercial Deployments and Announcements

The number of announced commercial launches has grown to 19 operators in 13 countries (from 18 in 12 countries during December 2010), with a total of 34 service commitments (from 30 in December 2010). The service offerings vary widely in pricing and bundling of services. Below is a list of current offerings from operators that have already deployed femtocell services, including commercial pricing details and capabilities.

Movistar has deployed femtocell services in the Spanish market, following Vodafone who first deployed femtocells in Spain during June 2010, targeting enterprise customers. Vodafone has also launched in other markets, including UK, Greece, Qatar and New Zealand and has committed to deploy in Ireland and Italy.

Other high profile femtocell launches include SFR, NTT DoCoMo, KDDI, Softbank and China Unicom. Softbank's offer is also significant in being first to offer free femtocell to subscribers.

Table 1: Femtocell commercial deployments as of Q1 2011 (19 in 13 countries)

	Offering	Example Pricing	Capabilities	Launch date
 USA	Airave (CDMA2000 EV-DO)	\$129 or Free of charge (for coverage improvement)	Up to 6 3G users	September 2007
http://bit.ly/sprint_us				
 Singapore	Home Zone (UMTS)	\$32.1 per month	Up to 4 3G (postpaid) users	November 2008
http://bit.ly/starhub_singapore				
 USA	Network Extender (CDMA 1xRTT)	\$249.99	Up to 3 2G 1xRTT users	January 2009
http://bit.ly/verizon_us				
 UK	Sure Signal (UMTS/HSPA)	Various options GBP160 (one-off) GBP5 monthly Handset bundles	Up to 4 3G users	July 2009 (Vodafone Access Gateway) Rebranded January 2010
http://bit.ly/vodafone_us				
 USA	3G MicroCell	\$159	Up to 4 3G users	September 2009
http://bit.ly/ATT_us				
 France	Home 3G (UMTS/HSPA)	€199 upfront	Up to 4 3G users	November 2009
http://bit.ly/sfr_france				
 Japan	My Area (UMTS/HSPA)	\$10 per month	Up to 4 3G users	November 2009
http://bit.ly/docomo_japan				
 China (Northern Provinces)	3G Inn (UMTS/HSPA)	FAP cost: CNY 1,200 Monthly fee: CNY 10	Up to 4 3G users	November 2009
http://bit.ly/china_mobile				
 Portugal	Sinal On (UMTS)	€99.99 upfront €7,8 monthly	Up to 4 3G users	December 2009
http://bit.ly/optimus_portugal				
 Singapore	CallZone (WCDMA)	Access point: SING\$323 Monthly charge: SING\$53.50	Up to 4 3G users	January 2010
http://bit.ly/singtel_singapore				
















 Spain	Voz y Datos Premium Oficina (WCDMA)	€15 per month	Up to 4 3G users	June 2010
http://bit.ly/vodafone_spain				
 Japan	Femtocell service (WCDMA)	Free of charge	Up to 4 3G users	June 2010
http://bit.ly/softbank_japan				
 Qatar	Femtocell service in public areas (WCDMA)	Metro coverage	Up to 4 3G users	Announced June 2010
http://bit.ly/vodafone_qatar				
 Japan	au Femtocell (CDMA2000 EV-DO)	Free of charge (in coverage deadspots)	Up to 6 3G users	July 2010
http://bit.ly/KDDI_japan				
 Greece	Vodafone Access Gateway	Free of charge (>€40 monthly contract. €75 (<40 monthly contract) €150 retail price)	Up to 4 3G users	July 2010
http://bit.ly/vodafone_greece				
 Spain	Mi Cobertura Movil	€9/month service charge Requires 3MB DSL service from Movistar	Up to 4 3G users	August 2010
http://bit.ly/movistar_spain				
 United Kingdom	Femtocell services for business customers			October 2010
http://bit.ly/t-mobile_UK				
 Moldova	Femtocell Unite	Femtocell tariff addons: Unlimited 3G voice, Unlimited 3G network, Unlimited 3G Internet.	Up to 4 3G users	November 2010
http://bit.ly/moldtelecom				
 New Zealand	Sure Signal	Home AP cost: NZ\$349 Enterprise AP cost: NZ\$1033.85	Home: Up to 4 3G users Enterprise: Up to 8 3G users	January 2011
http://bit.ly/vodafone_nz				

Source: Informa Telecoms & Media

There are several other operators that have expressed interest in past femtocell trials and have announced their plans to launch femtocell services in the future, including Free in France who aims to introduce femtocells in a home gateway product during 2012. Network Norway's and Celcom's commitments are significant in being the first instances of smaller operators committing to femtocells, showing that the femtocell business case also benefits smaller operators. Following after these two regional operators,

Moldtelecom is the latest operator to offer femtocells, confirming that the business case for smaller operators is positive.

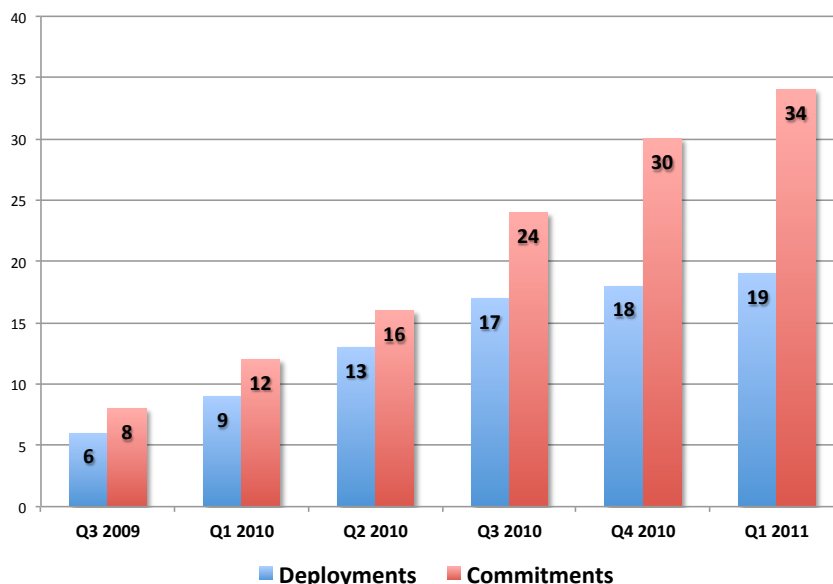
Table 2: Femtocell deployment commitments

Operator	Details
 France	Expects to include femtocells in home gateway during 2012
 Norway	Intention to offer femtocells to enterprise customers
 United States	Intention to deploy an IMS-based femtocell network
 United States	Intention to deploy femtocell network to improve coverage and promote quad-play services
 Korea	Intention to deploy data-only femtocell, as part of a broader plan to increase network capacity
 United Arab Emirates	Intention to deploy a femtocell to improve coverage and capacity. Commercial service expected during 2H 2010
 Australia	Intention to deploy enterprise and consumer femtocells during late 2010 and early 2011 respectively
 Taiwan	Intention to deploy femtocells after regulatory approval. All three operators in Taiwan report that they will offer femtocell services from 2011 onwards with subsidies.
 Taiwan	
 Taiwan	
 Turkey	Intention to deploy an lu-h femtocell access point during Q3 2011.
 United Arab Emirates	Intention to deploy femtocells during 2011 to bridge fixed and mobile services
 Italy	Intention to deploy femtocell services for commercial and business use during Spring 2011. In commercial trials with 50 customers as of Q1 2011.
 USA	Intention to deploy femtocell services during 2011.
 Ireland	Intention to deploy femtocell services during 2011. Femtocell service webpage is active although no new activations are taking place.

Source: Informa Telecoms & Media

The following chart illustrates a historical representation of deployments and commitments, both of which have increased almost 300% within a year.

Figure 2: Historical femtocell service deployments and commitments



Source: Informa Telecoms & Media

Operators continue to identify a number of major user segments for femtocell and exciting service scenarios. All femtocell deployments had previously been focused on consumer deployment, so it is significant to see that several operators have now commercialised a femtocell service specific to enterprises. Additional segmentation is being considered, including open access, metro and rural applications. The following table summarizes femtocell offerings segmented according to target group.

Table 3: Femtocell deployment segmentation according to target group

Target group	Number of deployments	Examples
Consumer only	19	All operators
Enterprise	6	T-Mobile UK, Singtel, Vodafone NZ, Movistar
Public	1	Vodafone Qatar (shopping malls)
Rural	1	Softbank (using satellite backhaul)

Source: Informa Telecoms & Media

From a regional perspective, the distribution of femtocell service deployments is expanding year on year in all regions. As of Q1 2011, no next-generation (WiMAX or LTE) femtocell services have been deployed, but Tier-1 mobile operators have expressed the view that LTE and subsequent high-capacity air interfaces are most likely to be deployed through hierarchical cell structures, including femtocells. The publication of the

3GPP and WiMAX Forum standards for LTE and WiMAX femtocells respectively is a key-enabling factor towards this.

Table 4: Commercial service launches by Geography and Technology

Regional view	UMTS femtocell launches	CDMA femtocell launches
APAC	6	1
EMEA	9	-
Americas	1	2

Source: Informa Telecoms & Media

Trial Status

Trial activity has been very healthy during 2009 and 2010 and has created a good pipeline for deployments during 2010 and later during 2011. Although the majority of trials remain behind closed doors and no public announcements are made, the increase in announcements shows a healthy growth in the femtocell market. ABI research has estimated that there have been approximately 60 ongoing trials during early 2010.

Publicly announced femtocell trials are set out in Figure 3 below.

Figure 3: Femtocell worldwide trial activity



Source: Informa Telecoms & Media

Ecosystem – Industry Support

The Femtocell ecosystem continues to grow in both breadth and depth as the femtocell market transitions from early adopter phase to early market growth. At a high level the femtocell ecosystem can be segmented by

- End-to-End solution providers: These vendors provide a complete femtocell solution which includes Femtocell Access Points (FAP), femto gateways, necessary middleware and other parts that complete a large scale femtocell deployment. This segment includes NSN, ip.access, Ericsson, Huawei, Cisco and Alcatel-Lucent.
- Femtocell Access Point (FAP) providers: Vendors who offer FAPs directly to operators or through other partners, including Ubiquisys, ip.access, Airvana and Netgear.
- Femtocell Core Network providers: Vendors that focus on provisioning femtocells in the mobile core network, including Kineto Wireless and Spidercloud.
- Software and Component providers: Vendors who focus on specific parts of the femtocell software stack or provide the necessary silicon to power FAPs. Vendors include Picochip, Percello, Continuous Computing, Texas Instruments and Qualcomm.
- Others, including test and certification houses, research institutes and other enablers that may focus indirectly on femtocells operation.

It is common for vendors to focus in more than a single market segment, especially end to end providers that may offer specific parts of a femtocell deployment standalone.

There are 74 vendors in this ecosystem today focusing on products and services in the emerging femtocell marketplace. There are currently 9 providers of End-to-End and System Integration worldwide and more than 27 FAP providers covering most licensed spectrum types; their number is increasing rapidly as component manufacturers are introducing flexible reference platforms for femtocell access points. There are more than 21 equipment providers providing core network components that can support femtocell services and in excess of 21 component, software and tools vendors providing a health supply to various parts of the solution space.

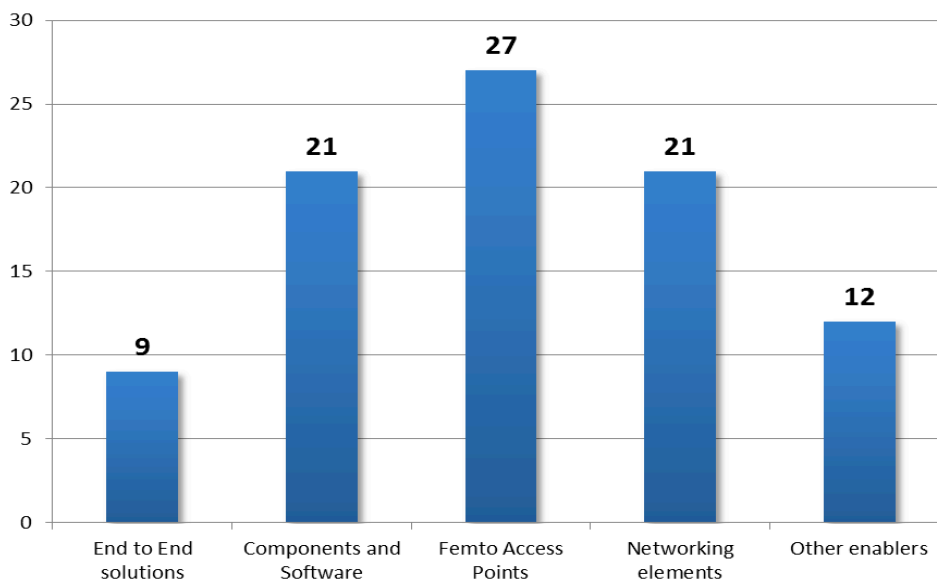
All major infrastructure vendors have now joined the Femto Forum and there are several smaller companies targeting smaller, specialist segments, including test and certification, femtocell specific silicon and core network components.

Figure 4: Femtocell ecosystem



Source: Femto Forum

Figure 5: Segmentation of vendors in femtocell ecosystem



Source: Femto Forum

End to End Solution Providers & System Integrators

At present there are 9 providers of end-to-end femtocell systems worldwide. Solution providers made good progress in 2009 and early 2010 assembling trial and initial market solutions. All solution providers have

committed to supporting open standards, especially the 3GPP Iu-h interface standard that was ratified during 2009. Several Tier-1 vendors are in this segment, including NSN, Alcatel-Lucent, Huawei, ZTE and Cisco. The presence of all Tier-1 vendors is evidence of the perceived potential of the market.

Femto Access Point

There are currently 27 femtocell CPE vendors and between them they have more than 50 available or announced product offerings. The breadth of CPE solutions varies in both technology and integration of other broadband access technologies. Standalone and integrated CPE have already entered the market. FAP vendors have provided a variety of intelligent algorithms for interference mitigation and this is a critical turning point for mobile operator acceptance. These vendors are also starting to expand their product lines to enterprise and larger area femtocells, representing a healthy competitive development in a key part of the ecosystem.

Femto Core Network

21 vendors now provide core network components for femtocells with several solutions covering security, provisioning and integration of the femtocell services into the existing mobile operator core network. The categories included in this section are security gateways, femto gateways (FNG or HNB-GW), Convergence Servers (e.g. MFIF) and HNB management.

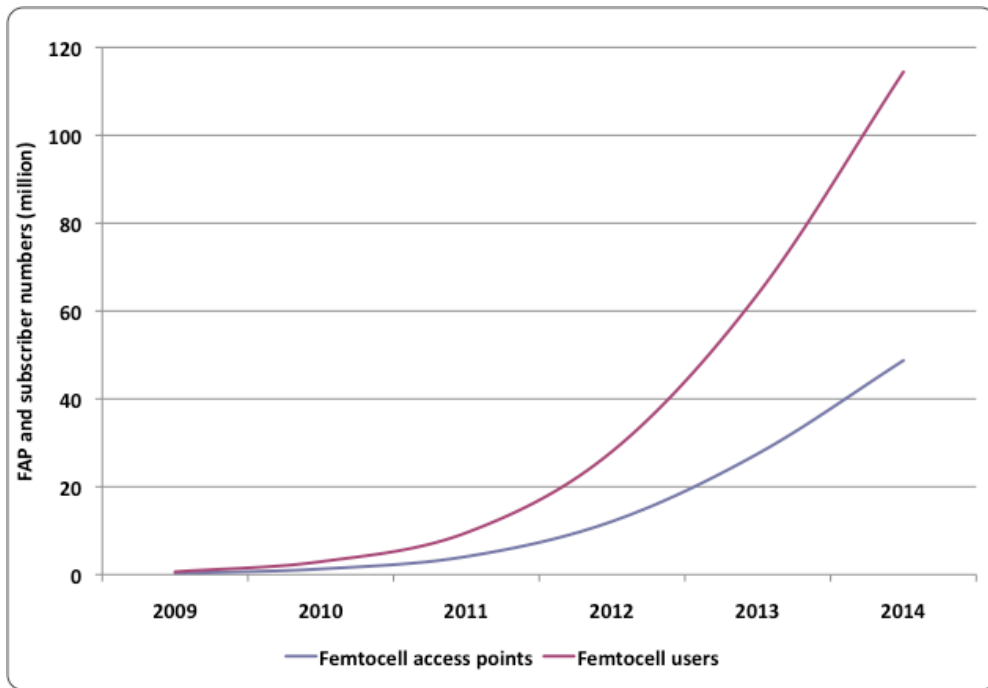
Components, Tools and Software

An important factor contributing to rapid market development is a healthy ecosystem of component vendors, development and test tool as well as protocol/system software. Silicon providers are continuously evolving hardware platforms to enable FAP vendors to offer femtocell access points that are more efficient and capable of higher capacity.

Market Forecasts

Informa Telecoms & Media expects the femtocell market to experience significant growth over the next few years, reaching just under 49 million femtocell access points (FAP) in the market by 2014 and 114 million mobile users accessing mobile networks through femtocells during that year. Healthy growth is reported throughout the forecast period with femtocell unit sales reaching 25 million in 2014. The following chart illustrates Informa's forecasts (January 2010) for femtocell access point shipments and users.

Figure 6: Femtocell access point and user forecasts



Source: Informa Telecoms & Media

In addition, many industry analysts who cover a number of aspects of the femtocell ecosystem have begun to track and forecast the progress of the femtocell market. The following table provides a summary of publicly announced statements, sorted by reverse chronological order. The table is followed by more information regarding each statement:

- Strategy Analytics expects femtocell access point shipments to reach 2 million during 2010 (Strategy Analytics – *November 2010*).
- ABI research expects 1 million femtocells to have been shipped by the end of 2010, increasing to 54 million femtocell shipments during 2015. ABI research estimates that 1.3 million femtocells have been shipped to operators from vendors during 2010. The estimate for femtocell shipments for 2011 is 3.8 million and 70 million for 2015 (ABI Research – *September 2010*).
- IDate has updated its femtocell market forecasts, with 11.7 million femtocell access point shipments during 2013, increasing to 23 million during 2014 (iDate – *September 2010*).
- Alcatel Lucent has performed research on consumer attitudes to a variety of femtocell marketing propositions and forecasts more than 34 million femtocell users in the US, UK, Germany, Singapore and Taiwan by 2014, at which point the market will be worth over €6 billion (Alcatel-Lucent – *September 2010*)

- In-Stat has published updated femtocell forecasts, and expects that worldwide annual enterprise femtocell revenue CAGR will be 125.7% from 2009-2014 (In-Stat, *September 2010*).
- Dell'Oro expects estimates 1 million femtocell access points to ship this year, reaching 62 million during 2014, more than 80% of which will be WCDMA femtocells (Dell'Oro – *August 2010*).
- iSuppli forecasts that shipments will rise to 1.9 million during 2010, up from 571,000 in 2009. A period of expansion then will follow, with shipments reaching 7.2m units in 2011, up 289% from 2010. Shipments are forecast to rise by 232% to reach 23.9m units in 2012 and by 657% to hit 39.6m units in 2013. (iSuppli, *March 2010*).
- GIA projects the femtocell market to surpass 75.8 million by the year 2015, driven by the ongoing migration of mobile operators from smaller access points to large base stations. (Global Industry Analysts, *March 2010*).

Standards Development

The majority of industry standards have ratified femtocells in their activities, including 3GPP, 3GPP2 and WiMAX. Ongoing standardisation activities are taking place to enhance the operation of femtocells in these networks.

3GPP Femtocell Standardisation

3GPP Release 9 was functionally frozen during December 2009 and extends significantly by fully supporting LTE femtocells for the first time thereby allowing upcoming rollouts to incorporate the technology from the outset. It also supports a greater number of simultaneous users, emergency warning systems and both private and public usage models.

Release 9 provides end-to-end support for LTE femtocells, including all radio and OAM aspects, enabling the development of the first standardised devices. It also supports hybrid access so femtocells can be used in retail environments to provide open access to customers yet also provide prioritised usage for a closed group such as staff. WCDMA uplink bandwidth requirements have been revised allowing a major increase in the amount of calls that can be simultaneously supported. Finally, the standard also supports public warning services so that areas without macro coverage can receive emergency messages such as Tsunami warnings.

3GPP Release 10 is targeted to be frozen in June 2011 and will introduce support for mobility enhancements for Home eNodeBs. The Stage 2 architecture for the enhancements was ratified in the RAN Plenary in December 2010, which introduces a new lurch interface between the femtocell access points and supports soft and hard handover between femtocells. Other important additions to Release 10 include Self Optimizing Networks (SON), Selective IP Traffic Offload (SIPTO) and Local IP Access (LIPA).

Proposals to consider new functionality, including support of Cell_FACH for HNBs and inter-CSG handover for HeNBs were removed from the Release 10 work item, and are now likely to be considered during Release 11.

Broadband Forum Standardisation

- Broadband Forum TR-196 “Femto Access Point Service Data Model” was published in April 2009.
- A new update to TR-196 to include enhancements for LTE and CDMA2000 networks is expected during Q1 2011.

3GPP2 Femtocell Standardisation

The 3GPP2 formal publication of femtocell specifications was published during March 2010. The following list describes the technical specifications of the new standard:

- SIP/IMS is used in the core network to integrate femtocell services, allowing a variety of components from different vendors to interoperate.
- Enhanced System Selection is supported for improved handset battery life, faster femtocell and macrocell system acquisition, improved handoff between femtocell and macrocell and femtozone awareness.
- Local and Remote IP Access is supported, allowing allowing packet data traffic to be directly offloaded from femtocells to customers’ home networks, corporate intranets, or to the public Internet. When mobile devices are operating outside of the femtocell subsystem, the 3GPP2 specifications also include a remote access capability to allow mobile devices to connect to the user’s IP network at home and exchange IP data with their home network via a secure remote tunnel

The 3GPP2 specifications provide a complete security architecture that allows CDMA2000 femtocell networks to support large numbers of femtocells via standard commercial IPsec/IKEv2-based security gateways. The 3GPP2 security architecture and protocols are compatible with the security architecture for 3GPP radio technology-based femtocell devices. This architecture not only protects system operators’ core networks, but also provides for highly secure authentication of FAP devices using secure certificate-based mechanisms and protocols that are widely deployed and validated for security, robustness, manageability, and scalability.

WiMAX Forum Femtocell Standardisation

The WiMAX Forum and the Femto Forum announced the publication of the first WiMAX™ femtocell standard during June 2010 (<http://www.femtoforum.org/femto/pressreleases.php?id=139>).

The specifications incorporate a security framework that allows WiMAX networks to support a large number of access points via standard commercial IPsec based security gateways. This phase of specifications also

contains simple Self Organizing Network (SON) capabilities to allow automatic configuration of large numbers of femtocells. Future revisions will further enhance the SON capabilities to standardize automatic interference management between femtocells and macro base stations.

The standard also incorporates support for three usage models to support different deployment scenarios such as residential, enterprise and outdoor environments. The 'Open Model' allows the femtocell to operate like a normal WiMAX base station by allowing anyone to use the service; 'Closed Subscriber Group (CSG) Closed' allows a limited number of pre-allocated subscribers to use the femtocell. The 'Closed Subscriber Group (CSG) Open' extends the previous model to allow the subscriber to add users themselves.

Regulatory Developments

Several national and international regulatory bodies have taken specific steps to clarify issues of policy and regulation relating to femtocells.

- In January 2011, the FCC announced that adding new spectrum is not sufficient to meet traffic demand and that technologies including femtocells should be used, while a 35x increase in mobile traffic is expected in the next 5 years¹:

"We need to encourage more innovative and efficient uses of spectrum. We'll continue to encourage dynamic spectrum sharing and secondary markets for spectrum, as well as development and deployment of femtocells, smart antenna technology, and devices that can access unlicensed spectrum like Wi-Fi to off-load traffic from cellular networks."

- In November 2010, the Taiwanese National Communications Committee (highest level national communications regulatory body) announced that they had approved the island's telecom carriers to supply femtocell units to enable them to extend mobile broadband connections to users' houses. As a result, Taiwan's top three telecom carriers said they would start a major femtocell procurement campaign and would be offering subscribers a subsidy on the devices in 2011².
- In October 2009, in a speech at CTIA, Julius Genachowski, Chairman of Federal Communications Commission (FCC) stated³:

"Spectrum is the oxygen of our mobile networks. While the short-term outlook for 4G spectrum availability is adequate, the longer-term picture is very different. I believe that the biggest threat to the future of mobile in America is the looming spectrum crisis."

¹ http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0120/DOC-304191A1.txt

² http://www.ncc.gov.tw/chinese/files/10071/260_1677_100714_1.doc

³ http://reviews.cnet.com/8301-12261_7-10369871-10356022.html

Genachowski proposed that the FCC will look at secondary markets to add more spectrum and will look to make its spectrum policies more flexible to encourage the use of unlicensed spectrum. He also said the FCC will encourage the use of smart antennas and femtocells.

- In September 2009 at the China Femtocell Symposium, XieFeibo, Director of State Radio Regulatory Committee, MIIT stated:

“Femtocells are an excellent technology that combine the technical advantages of wireless and fixed line. From my point of view, femtocells should be adopted, and enthusiastically promoted”,

While HouZiqiang, Commission Member of Telecom and Science Division, MIIT said

“Currently we are facing a very serious challenge regarding the dead zone of wireless telecommunications in cities, especially with 3G network indoor service. We note that femtocell technology is very helpful and effective in resolving the weakness of the network signal in cities. From my point of view, the femtocell, as a solution for a home base station, will have a very bright future.”

- In July 2009 the International Telecommunications Union⁴ provided a common description of ‘Femto Access Nodes’, reflecting the current state of the industry and not constraining future developments.
- In June 2009 the UK communications regulator Ofcom provided clarity on its approach to femtocell regulation⁵. It clarified that regulations on the provision of emergency call location and national roaming access to emergency calls applied equally to femtocell users as to macrocell users. It also proposed to vary the existing operator 3G licences to remove the requirement to keep records of the location and technical details of femtocell equipment, recognising that this may be impractical for a wide deployment of femtocells. This clarity followed previous statements from Ofcom recognising the potential significance of femtocells, such as⁶:

“They form part of a vanguard of a long-promised technology that has the potential to enable new forms of competition across communications networks: fixed-mobile convergence.”

- In Japan, noting that there were several aspects of the existing regulations that were not entirely aligned to femtocells, the Japanese regulators conducted a series of consultations during 2008, and announced the outcome in December 2008. The outcome included a relaxation of a previous requirement for trained personnel to apply power to all classes of base station, enabling femtocells to be installed by end users. For this purpose a particular definition of femtocells was provided, including a specified low

4 ITU-R Working Party 5D, “Liaison statement to external organizations on femtocells, “Femto Access Nodes”, Document 5D\TEMP\195(Rov.1), July 2009

5 “Ofcom and Femtocells: Regulation Principles”, Ofcom, Femtocells World Summit, June 2009

6 “Mobile citizens, mobile – Adapting regulation for a mobile, wireless world”, Ofcom, August 2008

output power and requiring that transmissions only occur when connectivity to the operator network is available.

- In Europe, the body responsible for developing measures to implement common radio spectrum policy issues across the 27 member states of the European Union is the Radio Spectrum Committee (RSC). In 2008 RSC considered spectrum issues for femtocells. It decided that, in view of the control which operators can exert over femtocells as part of their existing network, femtocells could operate under the existing spectrum licensing regimes of member states and there was no current need for RSC to take action. They also noted that the increased spectrum efficiency available from femtocells was a positive development⁷:

“Noting that femtocells operate as part of the operator’s existing network (using the same frequencies) and that the operator remains in control of the femtocell at all times, it is reasonable therefore to assume that femtocells will comply with the existing technical licensing conditions in each specific case.”

⁷ “Regulatory Aspects of Femtocells”. Radio Spectrum Committee, RSCOM(08)40, European Commission, 2008

Latest News from Femto Forum

The Femto Forum published its goals for 2011. These are:

1. Encourage operator deployments - Communicate the lessons learnt from existing deployments in order to ensure deployments result in the best possible experience for consumers and operators alike.
2. Consumer attitudes and value proposition - To guarantee that operators are giving consumers what they really want, the Forum will also be continuing its research into end-users' attitudes to femtocells.
3. Metro/outdoor cells - Work to achieve consensus on the optimum architecture options for these new models as well as how to maximise radio resources, enable open access and best integrate with the macro network.
4. Integrated femtocell Wi-Fi Networks - The Forum will be focusing on intelligent offload by employing combined femtocell Wi-Fi networks. This will allow operators to most effectively use their network to deliver all users all the services they expect as well as the best possible experience.
5. LTE femtocells - Work to achieve consensus on the optimum architecture options for LTE femtocells and agree best deployment practices and options.
6. Enterprise femtocells - Work to achieve consensus on the optimum architecture options for enterprise femtocells and agree best deployment practices and options.
7. Service enablement - With a good deal of progress made on APIs that enable advanced femtocell services, the Forum will be working with the key innovators in applications development and the growing number of bodies in the space to enable the widespread adoption of the technology.
8. Open interoperability - The Forum will maintain its close work with standards bodies to ensure that best practice is enshrined in future generations of equipment. It will continue to vet these standards through our programme of plugfests.

The world's second femtocell plugfest successfully took place at the close of January. The primary objective was to demonstrate the effectiveness of the Broadband Forum's femtocell management standard in supporting interoperability between femtocell access points and network equipment from different vendors. The standard allows mobile operators to simplify deployment and enable automated remote provisioning and configuration, radio environment monitoring, diagnostics-checking and software updates. It had

widespread vendor support with 13 companies participating, including vendors of network equipment and femtocell access points as well as component providers.

A Parks Associates study, commissioned by the Femto Forum, found that femtocells are proving a compelling proposition to consumers in developed markets. The survey, which included 6,100 consumers across six countries (China, Germany, Japan, Spain, the United Kingdom and the United States), found that nearly 60% of broadband households with mobile phones are interested in femtocells, with improved indoor voice coverage serving as the leading driver for interest. Further findings show that femtocells could prevent large numbers of consumers from changing carriers due to poor voice coverage, while also strongly appealing to heavy mobile data customers. A detailed presentation of the findings is available at <http://www.femtoforum.org/femto/pdfs01.php>

Contact Information

Femto Forum would be pleased to respond to further queries on femtocell deployment.

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