

The need for Femtocells and WiFi access points

Chris Cox

Femto Forum - Promotional Council

Director of Marketing

ip.access



Agenda

- The Femto Forum
- Carrier services
 - Voice, SMS, MMS & content services+ mobility (handover)
 - Service continuity with the outdoor network
- General Internet services
 - Do we need to worry about service continuity?
 - Can't we use Wi-Fi only for data offload?
- Consumer research



The Femto Forum

- Promoting & enabling femtocells
- Not-for-profit, founded in 2007
- Independent, Inclusive, International

Aims

Ecosystem Development

Market Education

Driving open standards



End-to-end system providers



Network Elements



Products



Components and Software



Other enablers

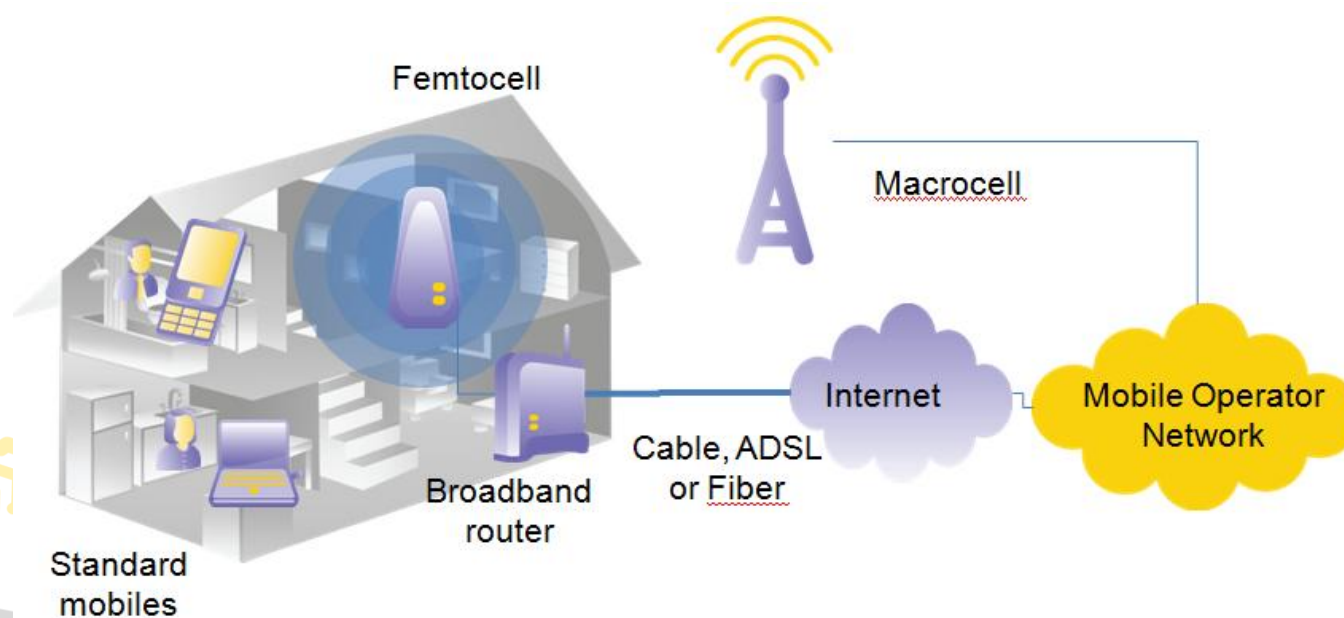


60 operators covering 1.7 billion mobile subscribers – 33% of total

74 providers of femtocell technology

About Femtocells

- Simple, low cost, easy-to-install cellular access point for homes (& offices & metro areas)
- Delivering fast, reliable service to standard phones over licensed spectrum
- Supported in 3G and next-generation standards by 3GPP, 3GPP2, WiMAX Forum, Broadband Forum



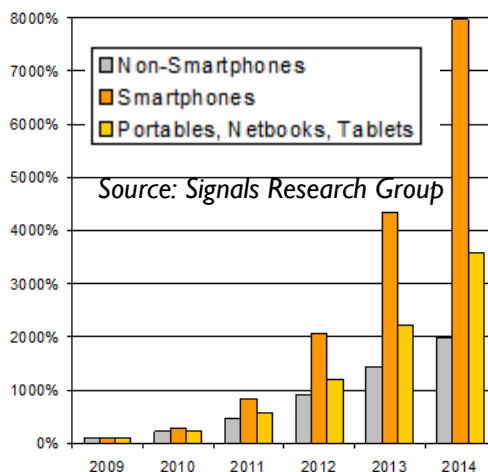
Why Femtocells?

- Dramatic growth in mobile broadband
- Consumers increasingly sensitive to coverage for both voice and data—especially at home and in the office
- Operators need to meet this demand – but quickly and at reduced cost-per-bit

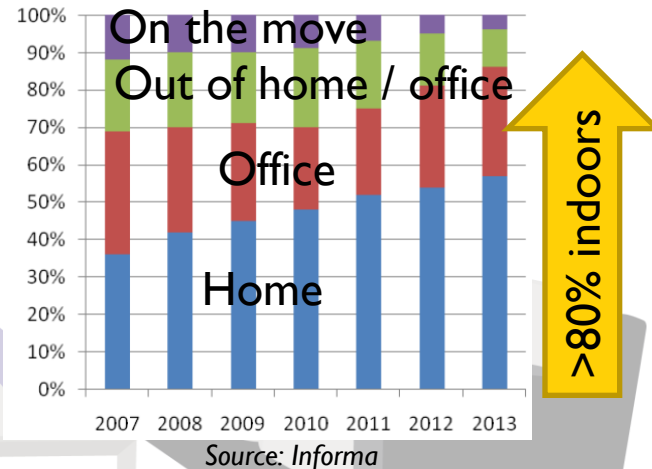
Explosion of internet connected devices



Exponential growth of mobile data traffic



Traffic increasingly indoors



Femtocell proposition

Challenge	Femtocell solution
Indoor user experience	<ul style="list-style-type: none"> • High quality voice calls • High-speed (HSPA) data • 'Femtozone' tariffs
Offloading data traffic from the macro network	<ul style="list-style-type: none"> • Significantly reduced cost of service delivery (via use of residential broadband for IP backhaul) • Extra capacity & improved QoS for outdoor users



Femtocell & Wi-Fi propositions

Challenge	Femtocell solution	Wi-Fi solution
Indoor user experience	<ul style="list-style-type: none"> • High quality voice calls • High-speed (HSPA) data • 'Femtozone' tariffs 	<ul style="list-style-type: none"> • Voice over Wi-Fi (UMA, SIP...) • High-speed (Wi-Fi) data • Homezone tariffs (with UMA)
Offloading data traffic from the macro network	<ul style="list-style-type: none"> • Significantly reduced cost of service delivery (via use of residential broadband for IP backhaul) • Extra capacity & improved QoS for outdoor users 	<ul style="list-style-type: none"> • Wireless carrier bears none of the cost (or responsibility) for delivering general Internet data services • Extra capacity & improved QoS for outdoor users





February 1, 2011

Benefits of Wi-Fi Beat Femtocells, Says Wireless Analyst

A couple of weeks ago, ABI Research issued a release touting the potential value of femtozones, describing them as applications that use femtocell technology. (For more, click [here](#)).

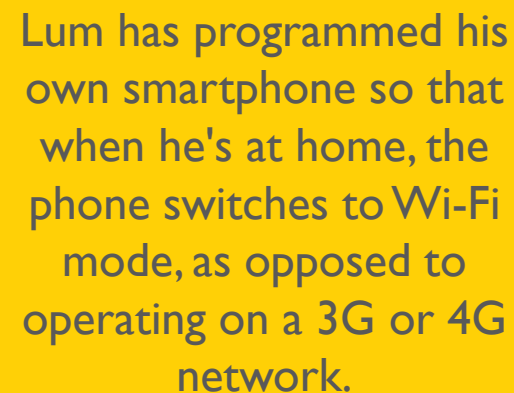
One example of a femtozone is a family alert system. A young person arrives at the family home, and the femtocell there registers the presence of his or her mobile phone, sending out a SMS notification to the parents.

But perhaps the femtocell industry is grasping for possible new uses for its product because the uptake of femtocells to enhance indoor cellular coverage has not been great.

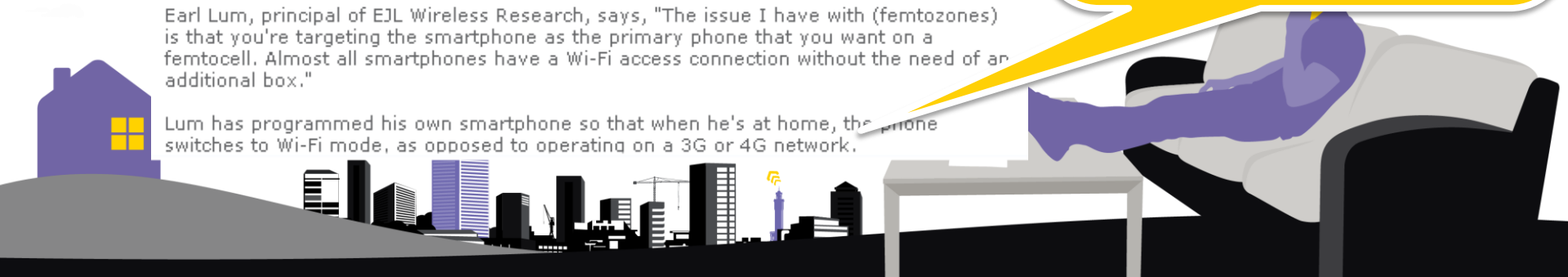
Earl Lum, principal of EJM Wireless Research, says, "The issue I have with (femtozones) is that you're targeting the smartphone as the primary phone that you want on a femtocell. Almost all smartphones have a Wi-Fi access connection without the need of an additional box."

Lum has programmed his own smartphone so that when he's at home, the phone switches to Wi-Fi mode, as opposed to operating on a 3G or 4G network.

The debate rages



Lum has programmed his own smartphone so that when he's at home, the phone switches to Wi-Fi mode, as opposed to operating on a 3G or 4G network.





I. Carrier services

Voice, SMS, MMS & content services
+ mobility (handover)

Service continuity with the outdoor network



Service continuity requirements

	 <p>Femtocell</p>	<p>Operator Voice-over-Wi-Fi (e.g. UMA, SIP)</p>
<p>Handset changes</p>	 <p>No changes</p>	<p>Wi-Fi + handset client needed</p>
<p>New CPE</p>	<p>Femto AP</p>	<p>None</p>



Content services

- Carrier content services generate significant revenues
 - Ringtones, music, videos, games, applications...
- On the carrier's own network (including femtocells)...
 - Identity of the end user is known automatically (required for billing)
 - Type of handset is known (required for automatically selecting the correct content format)

On Wi-Fi this is much harder to achieve

- Content downloads and purchases from the carrier's portal are quicker and easier with a femtocell
 - (and the carrier is able to take a share of the revenue)



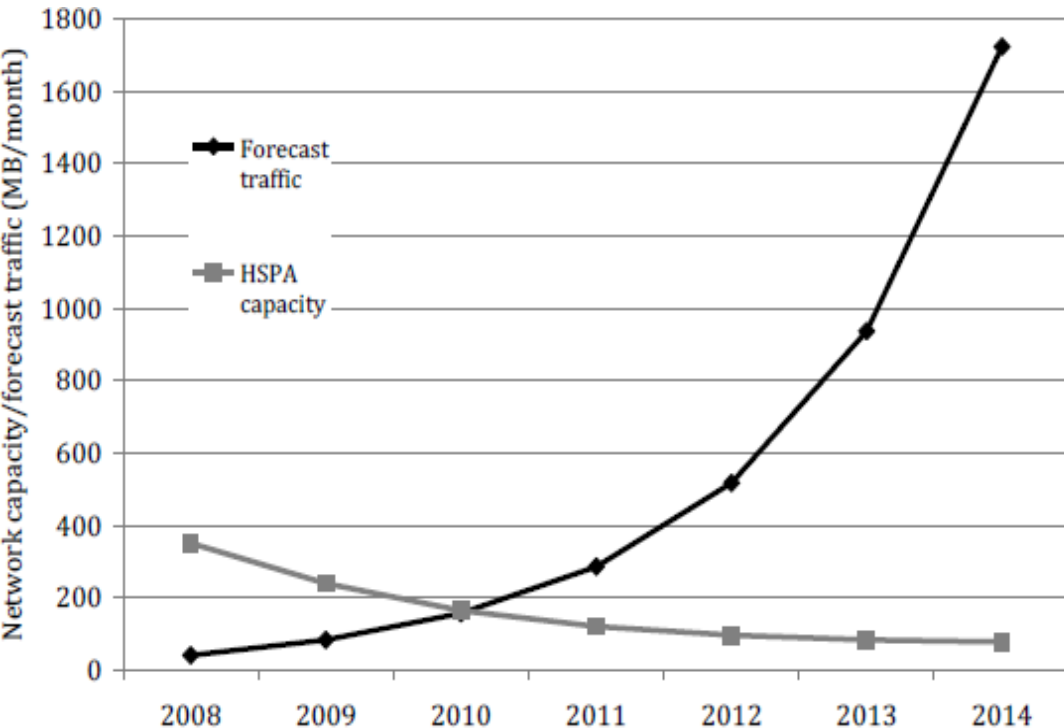
2. General Internet services

Do we need to worry about service continuity?

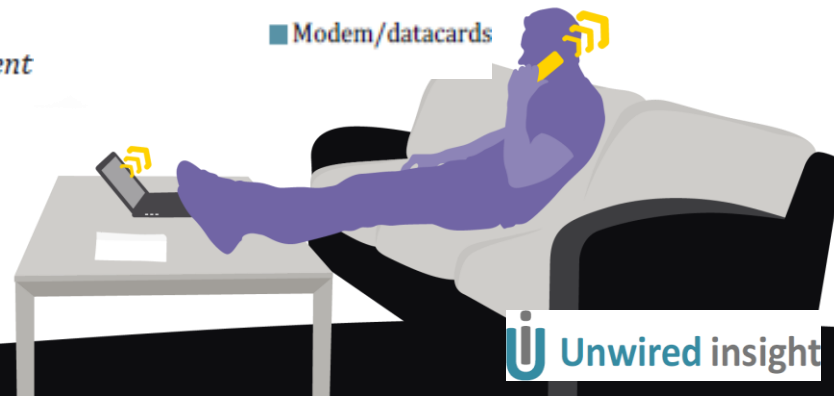
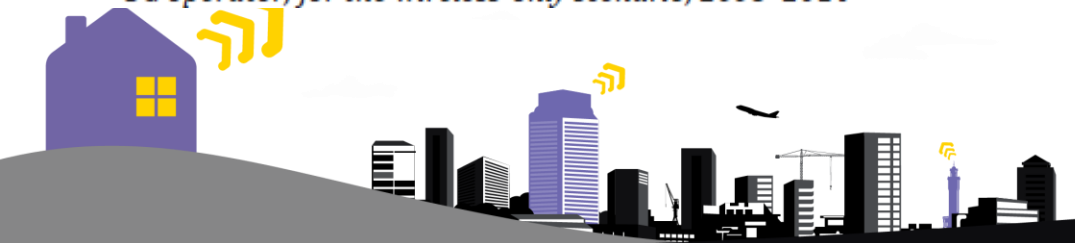
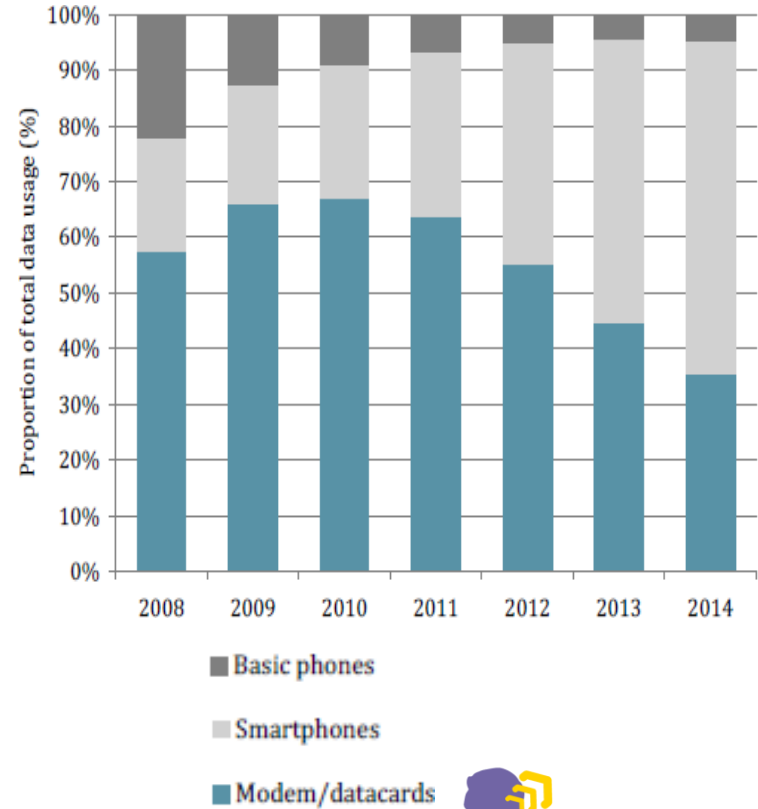
Can't we use Wi-Fi only for data offload?



The mobile data explosion

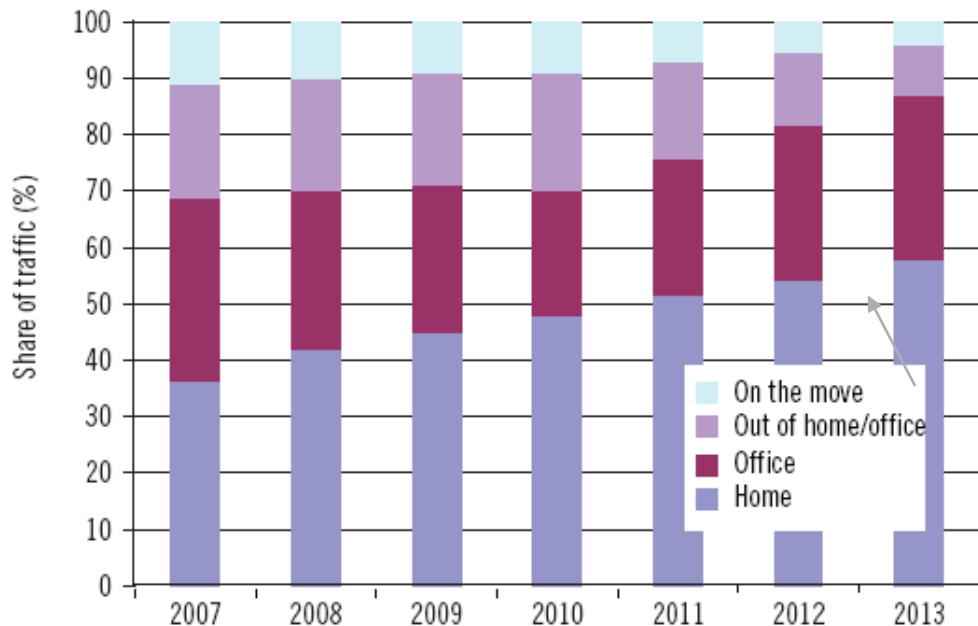


HSPA network capacity per device and forecast traffic per device for an incumbent 3G operator, for the wireless-only scenario, 2008-2014



Mobile data is increasingly used at home

Global mobile traffic distribution by zone area, 2007-2013



Source: Informa Telecoms & Media

- 42% of US mobile data is consumed at home¹
- 44% of data usage on smartphones occurs at home²
- 46% of UK 18-34 year olds watch mobile video & TV at home³
- 50% of US 18-24 year olds want to watch mobile TV at home¹
- 60% of mobile data traffic will be generated in the home by 2013⁴
- 75% of UK mobile broadband users access the internet via their dongle while at home⁵
- 75% of mobile traffic will be generated indoors by 2015, and 95% of that traffic will be data⁶

1 Gordon Mansfield, Director of RAN planning at AT&T, Jun 08

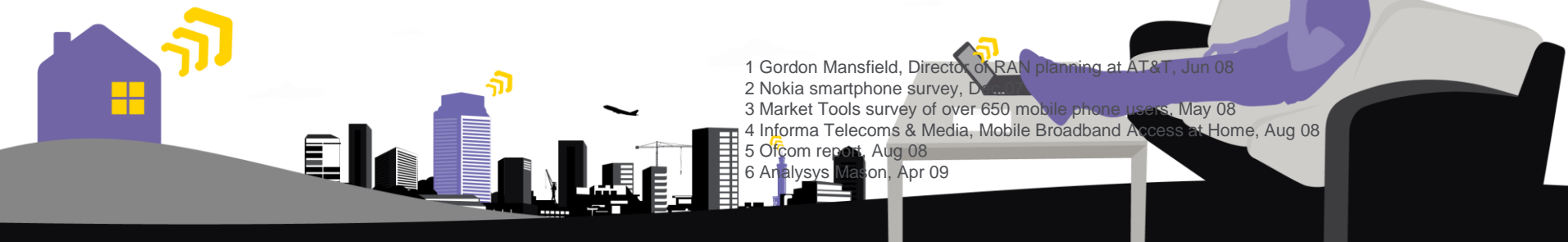
2 Nokia smartphone survey, Dec 08

3 Market Tools survey of over 650 mobile phone users, May 08

4 Informa Telecoms & Media, Mobile Broadband Access at Home, Aug 08

5 Ofcom report, Aug 08

6 Analysys Mason, Apr 09



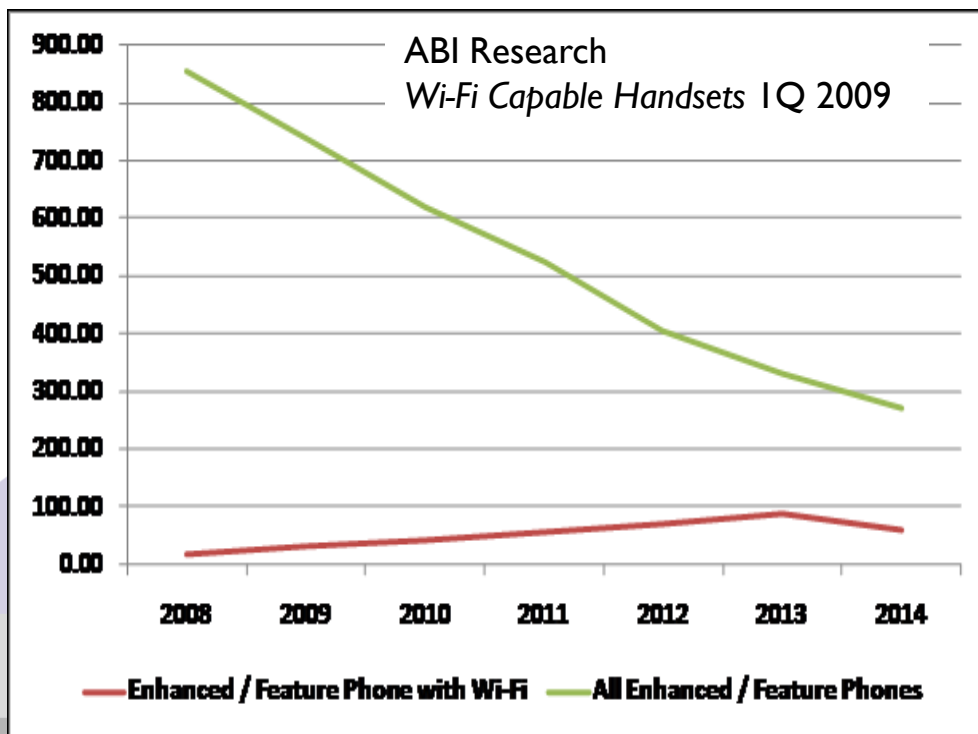
Why not just use Wi-Fi for data offload?

- Wi-Fi is available in most smartphones, and these are the devices causing most of the problems for the network
- Wi-Fi is already available in most broadband homes
- Why don't operators simply encourage smartphone owners to use Wi-Fi at home instead of using femtocells?
- Answers:
 - Handset support
 - Managed service proposition
 - Simpler user experience



Femtocells work with all 3G phones

- Smartphones will peak at less than 25% of total handset shipments
- Many 3G feature-phones will continue to be produced without Wi-Fi



Popular 3G feature phones with no Wi-Fi...

Samsung Tocco



LG Viewty

Why should we care about feature phones?

- Consumers are rapidly adopting data services even on basic 3G handsets
- For example, 65% of owners of INQ Mobile's low-end (Wi-Fi-less) 3G handsets on the 3 UK network use Facebook on their phone almost every day*



* <http://www.fiercebroadbandwireless.com/story/low-end-devices-driving-data-usage-3-uk/2009-06-14>



Even if the phone does have Wi-Fi...

- Some users will turn Wi-Fi off to preserve phone battery life
 - Having two radios on simultaneously (both the 3G radio and the Wi-Fi radio) drains the battery faster than having only the 3G radio switched on
 - Apple recommends this for the iPhone...



iPhone

Paying attention to just a few commonsense pointers will pay off with a longer battery lifespan

- **Turn off Wi-Fi:** If you rarely use Wi-Fi, you can turn it off to save power. Go to Settings > Wi-Fi and set Wi-Fi to Off. Note that if you frequently use your iPhone to browse the web, battery life may be improved by using Wi-Fi instead of cellular data networks.

<http://www.apple.com/batteries/iphone.html>

Not the case with a femtocell - your phone will consume much less power

Managed services proposition

- Single point of contact for support
 - Support for femtocell and services is provided directly by the mobile network operator
 - Femtocells offload the data traffic, not the customer
- Operator control over QoS using licensed spectrum
 - Wi-Fi does work well for most people most of the time
 - But unlicensed spectrum is less reliable & less controllable
 - Licensed spectrum gives the carrier control over QoS

"Sometimes it works, sometimes it doesn't. Sometimes your login credentials work, sometimes they don't,"

George Polk
founder of The Cloud



The Register[®]
Biting the hand that feeds IT

Ofcom works out why Wi-Fi doesn't work
Four times faster in Bournemouth than London?
By [Bill Ray](#)

An Ofcom-commissioned report into Wi-Fi performance concludes that it's baby-listeners and TV-senders that are mucking with the signal, not to mention the "Free Public Wi-Fi" virus, without which we'd all be connecting faster.

Simpler end-user experience

- Wi-Fi usually requires some configuration on the mobile device
 - Many older smartphones require the end user to manually make the switch between networks, which can be cumbersome
 - On some phones there are application level settings that need to be changed when using the Wi-Fi network
 - Wi-Fi security settings can be cumbersome
- 3G femtocells are simpler – no end-user configuration at all
 - Can potentially make a big difference to consumer adoption
 - Compare the success of push vs pull mobile email services



"Only 20% of people who have access to free public wi-fi on O2 tariffs actively use it despite the majority of devices being wi-fi enabled,"

*Tim Sefton
O2's business
development director*

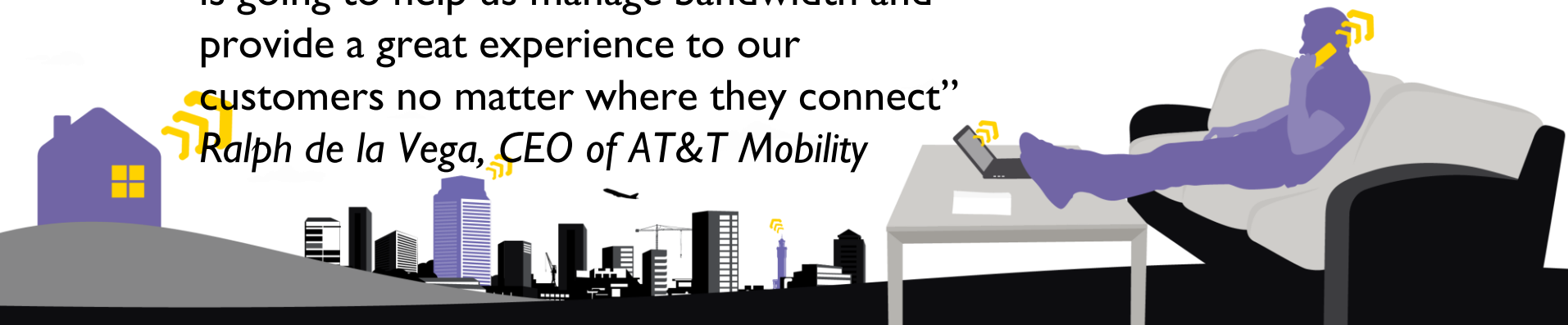
Carriers are adopting dual network strategies

- Wi-Fi is important
 - AT&T's iPhones already connect to (free) Wi-Fi automatically in AT&T hotspots
- But both Wi-Fi & femtocells are needed
 - 2/3 of carriers say that ubiquity of Wi-Fi does not undermine the need for femtocells*
 - "...Wi-Fi and femtocells - a combination... is going to help us manage bandwidth and provide a great experience to our customers no matter where they connect"

Ralph de la Vega, CEO of AT&T Mobility



* Infonetics *Femtocell Strategies: Global Service Provider Survey Dec 2009*



Summary

**Carrier services
(voice, SMS, MMS,
content downloads...)**

**General Internet services
(browsing, YouTube,
3rd party content...)**



Femtocell

- ✓ Full service continuity for free
- ✓ No handset changes
- ✓ Nothing for the end user to do
- ✓ Nothing for the operator to do

Femtocell

- ✓ Supports all 3G handsets
- ✓ Managed services proposition
- ✓ Simplicity for the end user



Wi-Fi

- ✗ Service continuity is quite hard to achieve

Wi-Fi

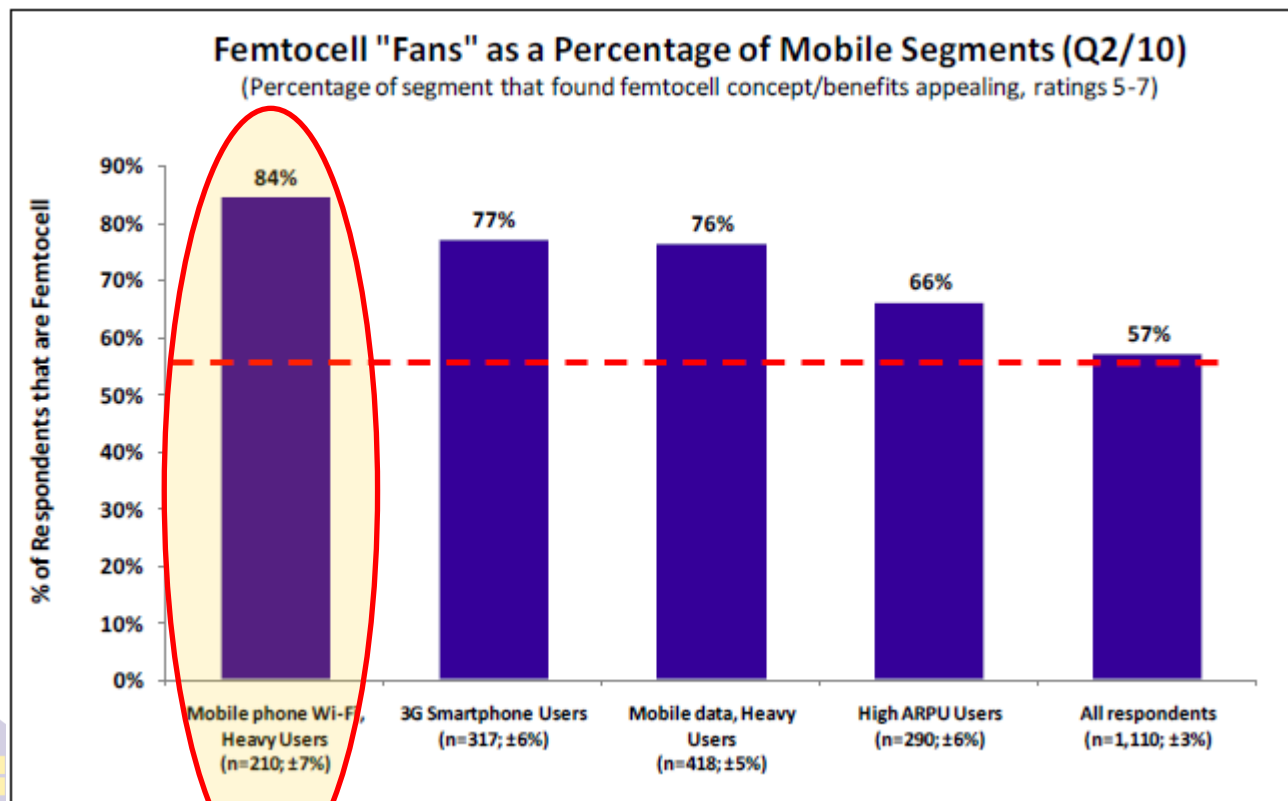
- ✓ Very cheap
- ✓ Already in most broadband homes
- ✓ Carrier independent



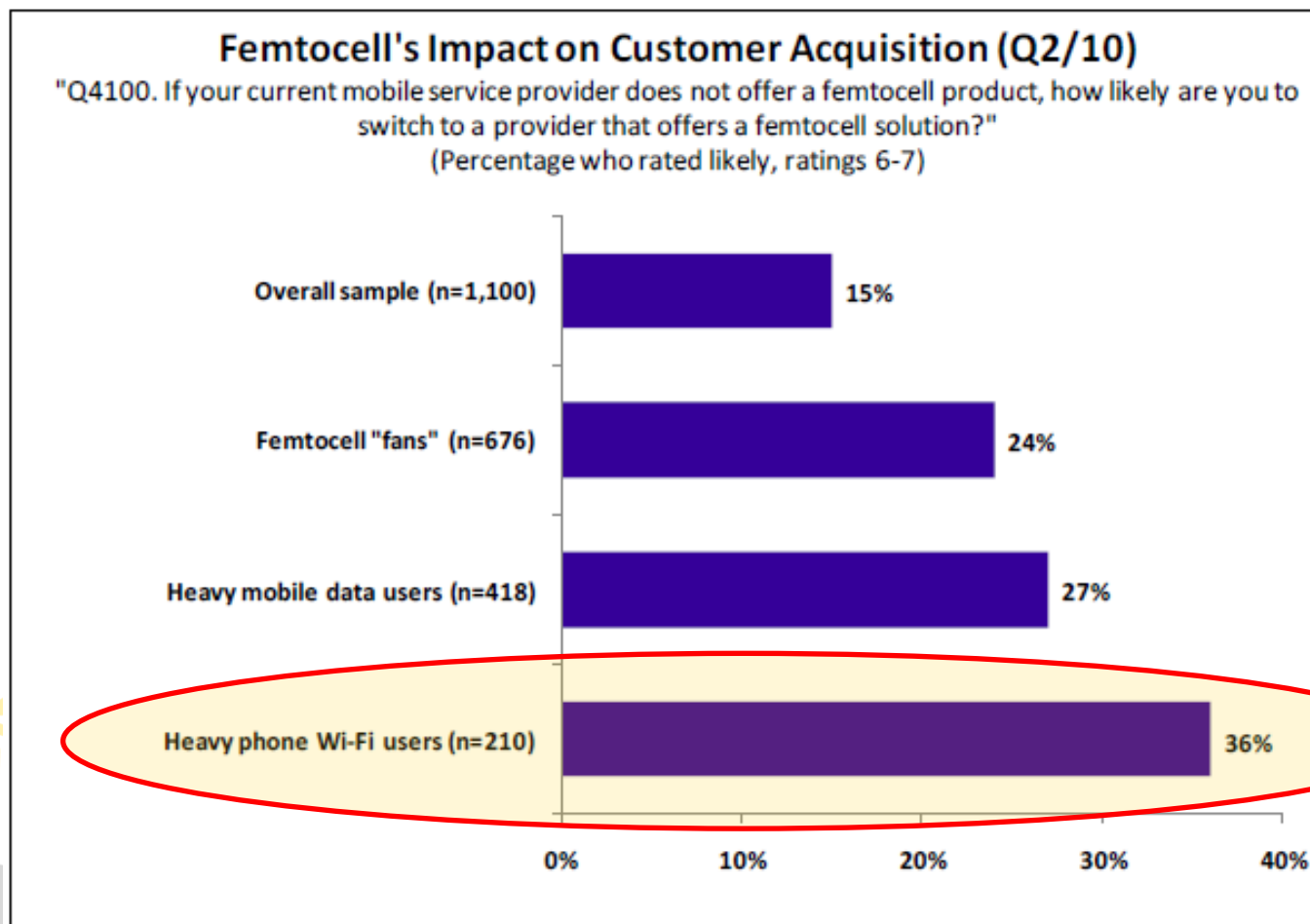
3. Consumer research



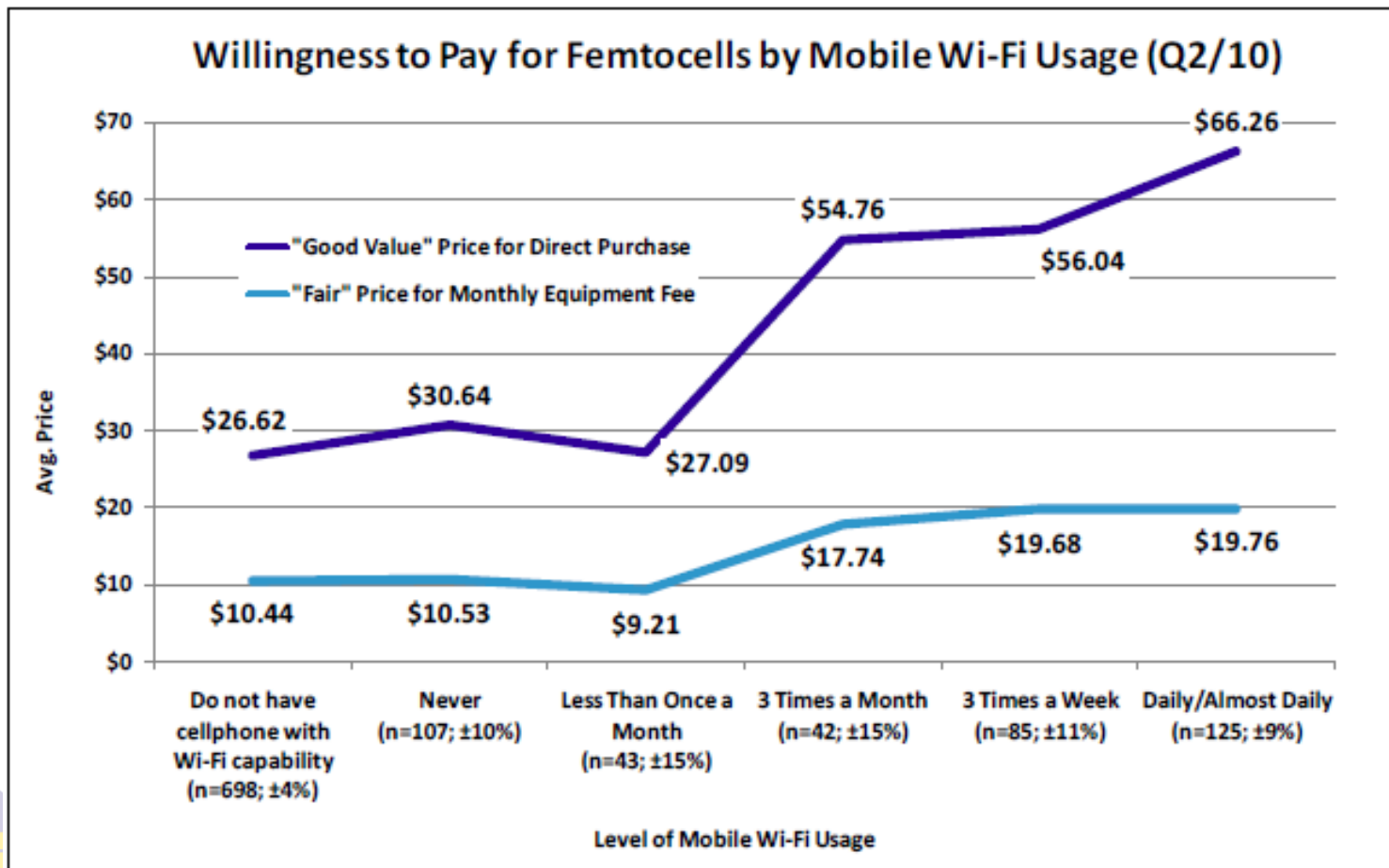
Heavy WiFi users are more attracted to femtocell



Heavy WiFi Users are more likely to switch networks to get a femtocell



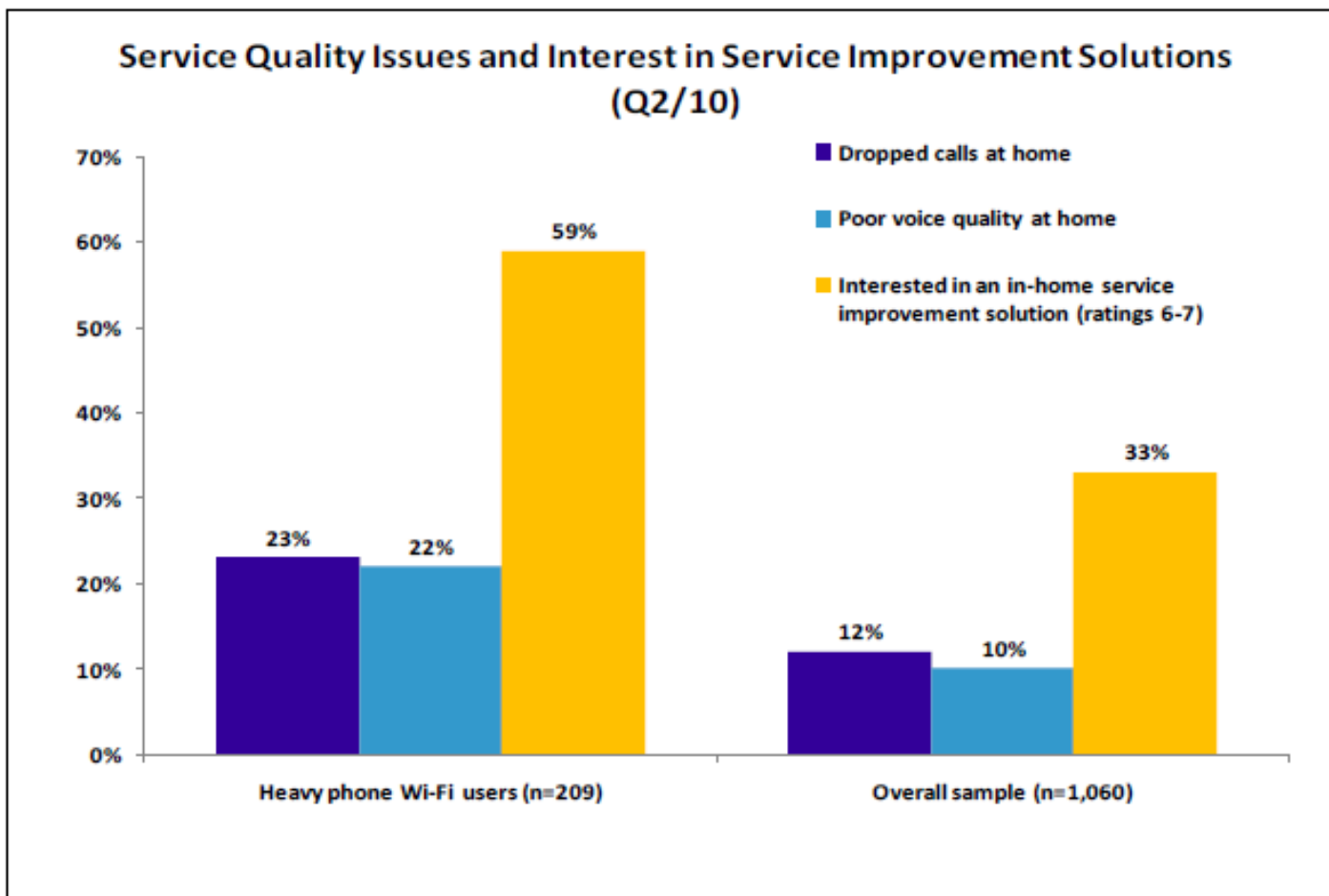
...and prepared to pay more for one



Possible explanations?



They have more service quality problems



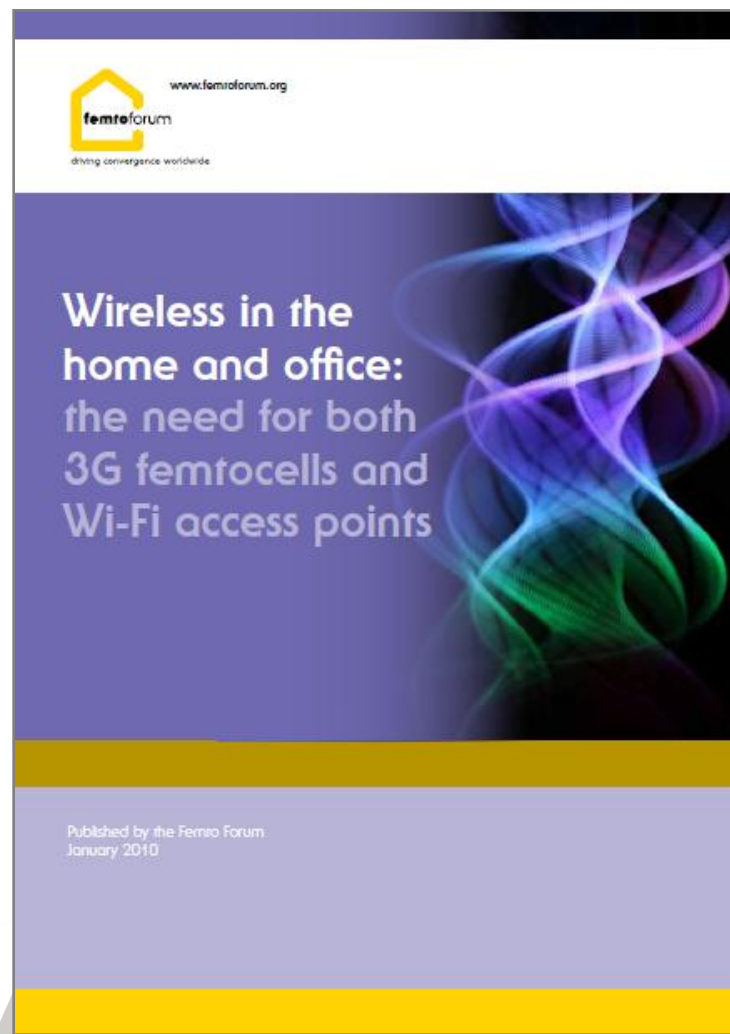
But also value battery life more than other segments

	Femtocell Fans	Heavy Mobile Wi-Fi Users	High Service ARPU HHs	Heavy Mobile Data Users
Top Driver	Better in-home coverage/signal strength	Better in-home coverage/signal strength	Better in-home coverage/signal strength	Better in-home coverage/signal strength
Second Driver	Higher mobile Internet speed	Improved phone battery life	Higher mobile Internet speed	Cheaper in-home calling/data rate
Third Driver	Cheaper in-home calling/data rate	Enhanced video/audio download/streaming	Improved phone battery life	Higher mobile Internet speed



Get the full story...

- 3G femtocells and Wi-Fi access points will coexist, often in the same box
- Consumers & enterprises will benefit from having both technologies available



Thank you!

Chris.cox@ipaccess.com



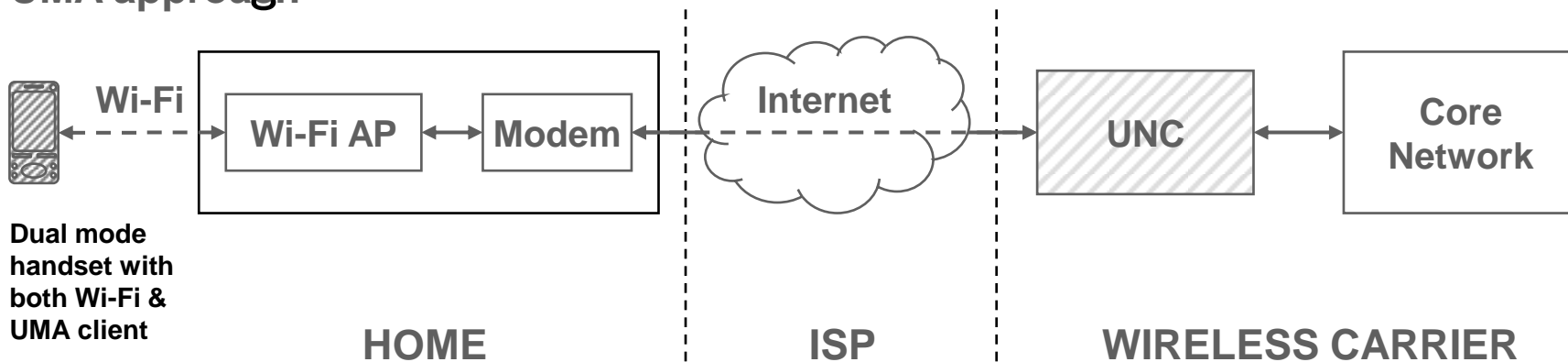
Supplementary slides



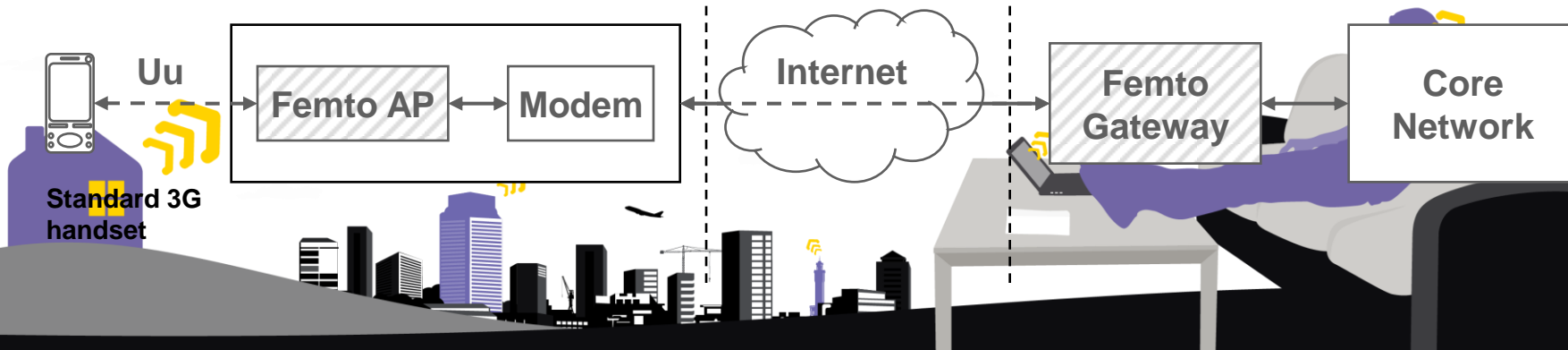
Service continuity with Wi-Fi

Service continuity can be achieved with Wi-Fi – for example

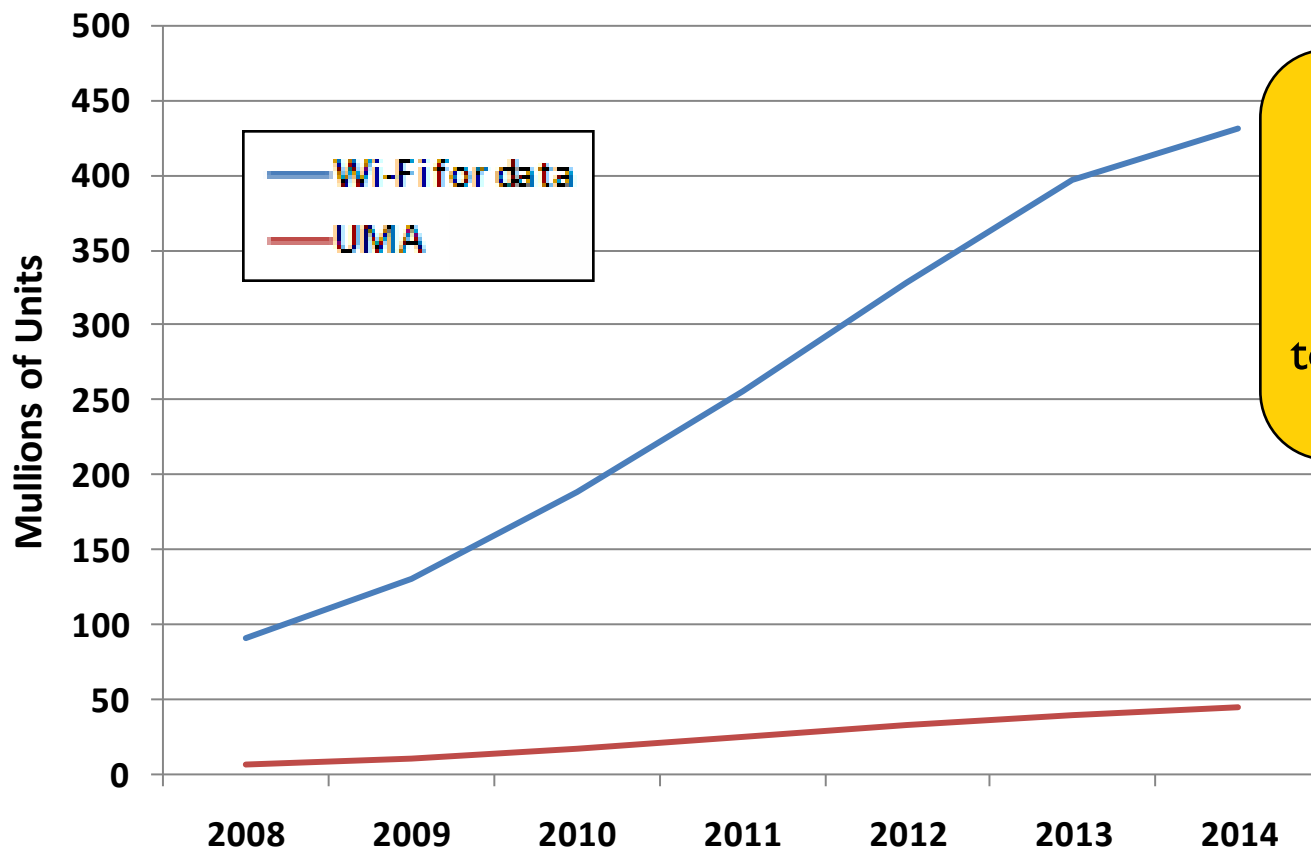
using UMA



Femtocell approach



Handset shipments



”There is not enough subscriber take-up to excite handset manufacturers enough to add UMA throughout their portfolios.”



Dean Bubley
Disruptive Analysis

Global handsets with Wi-Fi support versus UMA support
ABI Research, *Wi-Fi Capable Handsets* IQ 2009