

Monetising Mobile Broadband Through Services and Applications



GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



WELCOME

Rajan Mathews, Director
General, COAI

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Goldman Sachs

FINANCIAL UPDATE ON MOBILE BROADBAND WORLDWIDE AND INDIA

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Marketing Director, GSMA



Goldman Sachs Research

Mobile broadband opportunity

View from an investment community perspective

Presentation at GSMA Workshop

May 2011

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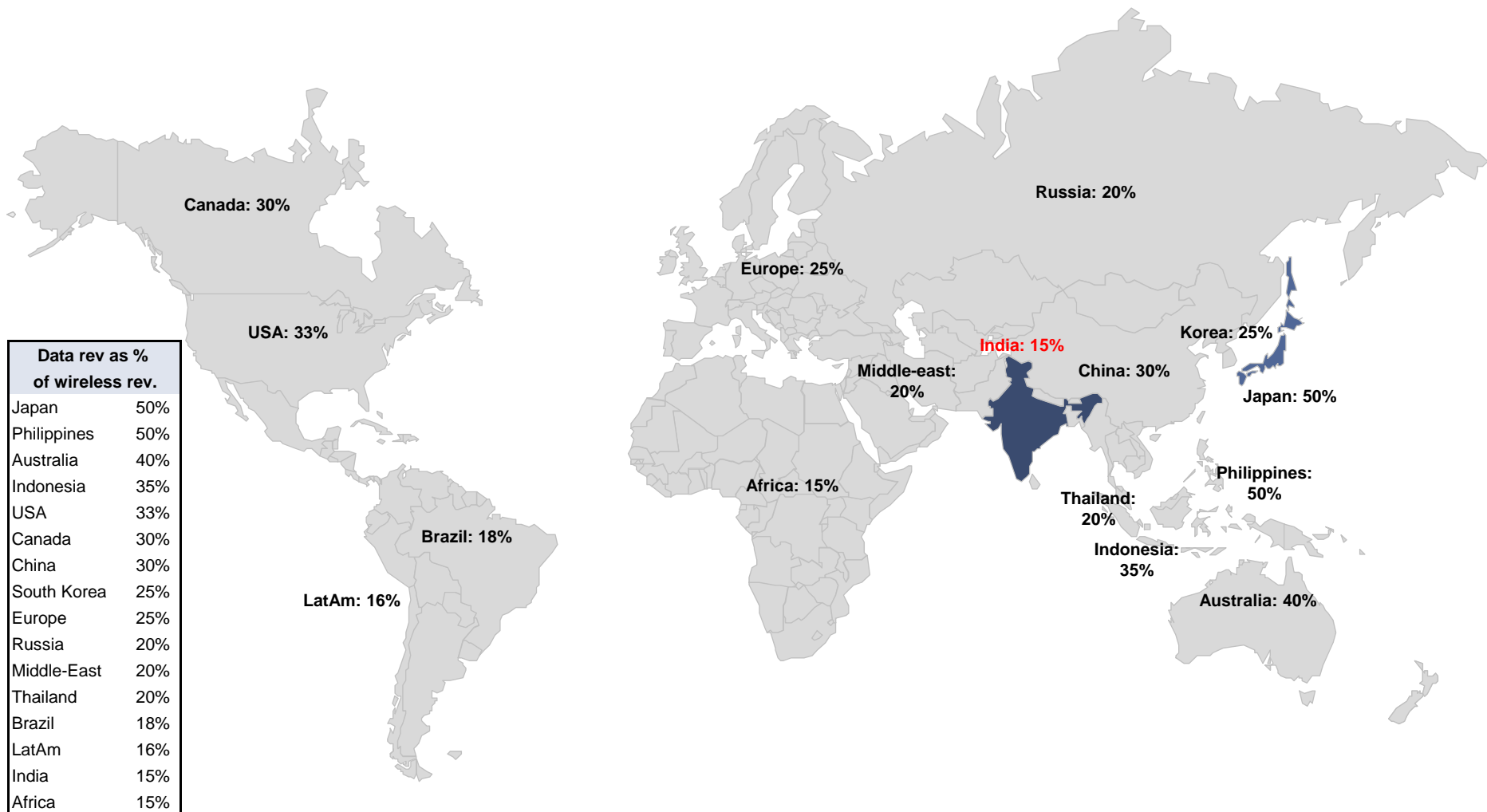
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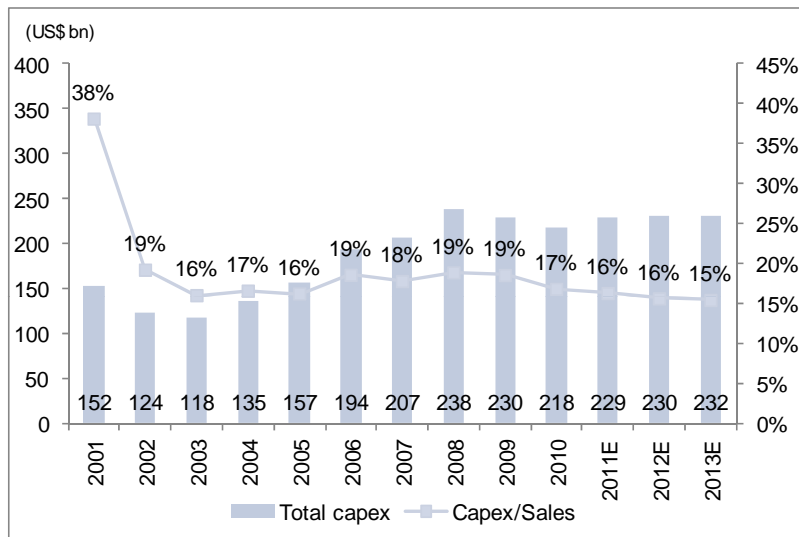
Non-voice revenue as a % of wireless revenue: India has room to catch-up



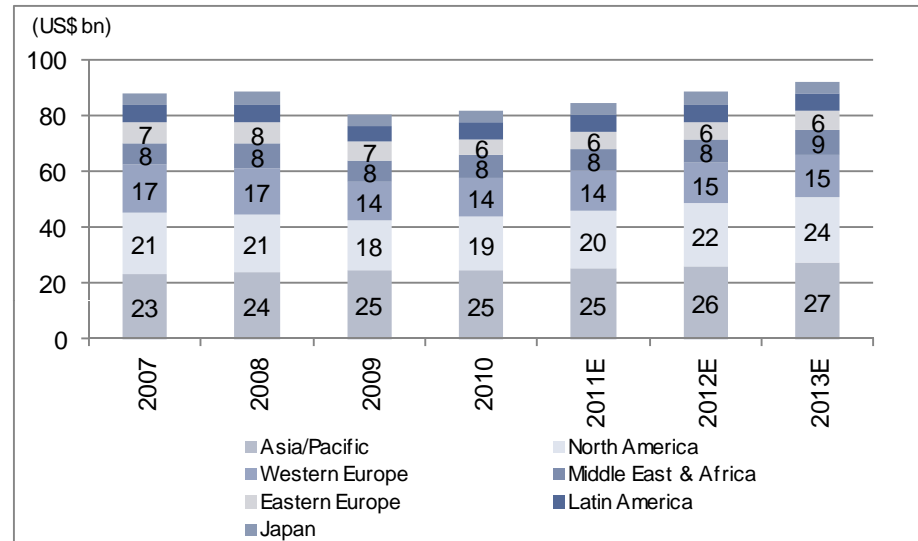
Source: Company data, Goldman Sachs Research estimates.

Global telcos capex: Investments towards mobile broadband are increasing...

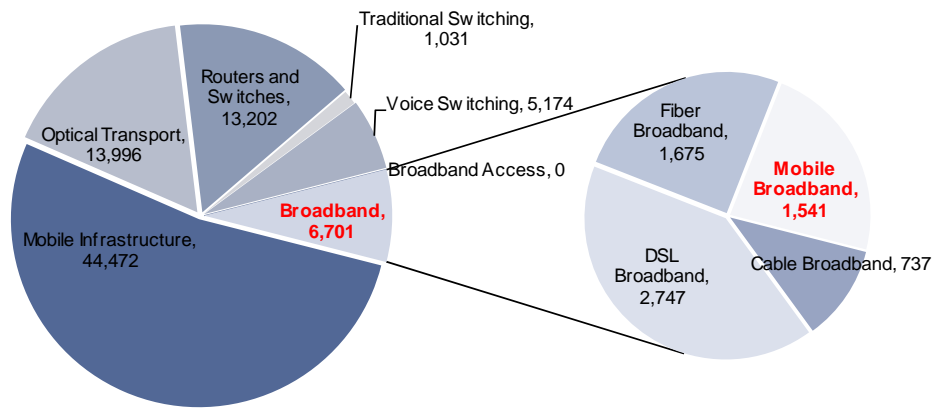
Global telcos capex: Capex intensity to remain steady



Network capex to remain highest in the APAC region



Mobile broadband currently 22% of total broadband capex



Expected to grow at a 2010-2013E CAGR of 41% and account for 35% of total broadband capex in 2013E

Broadband capex	2007	2008	2009	2010	2011E	2012E	2013E
Cable Broadband	13%	13%	10%	12%	11%	9%	7%
DSL Broadband	59%	54%	49%	45%	41%	38%	33%
Fiber Broadband	16%	18%	19%	21%	25%	26%	26%
Mobile Broadband	13%	15%	22%	22%	23%	28%	35%
Total	100%	100%	100%	100%	100%	100%	100%

Source: Gartner, Goldman Sachs Research estimates.

How does investment community view Mobile Broadband as an investment opportunity?



- **Most analysts/fund managers believe voice is likely to turn into a commodity business and estimate data as a % of revenue to continue to increase in the future for wireless operators. Access to the internet through smartphones/laptops is turning into a “killer app” for 3G in most markets.**
- **Current preferred area of investment to ride the “Mobile Broadband” wave are through handset, equipment, and chip manufacturing companies.**
- **Amongst operators, the investment opportunities in the “Mobile Broadband” space are currently in early adopter countries like Japan. Opportunities in mass market countries like China and India are still a few years away.**
- **Companies that are market leaders or that have a clear vision and strategy are preferred. Investors are more reluctant to invest in companies that adopt an untested technology.**
- **Gone are the days when investors were fooled with subs numbers and subs market share – revenue growth is the key. Issues like load on network, increase in back haul costs are considered “good-signs” that service is picking up.**
- **Investors are usually patient on EBITDA, FCF breakeven turnaround, as they understand the need for continuous investment.**
- **Specifically on India, currently there are no direct investment options to ride the broadband wave. HOWEVER, DEMAND IS SIGNIFICANT!!!**

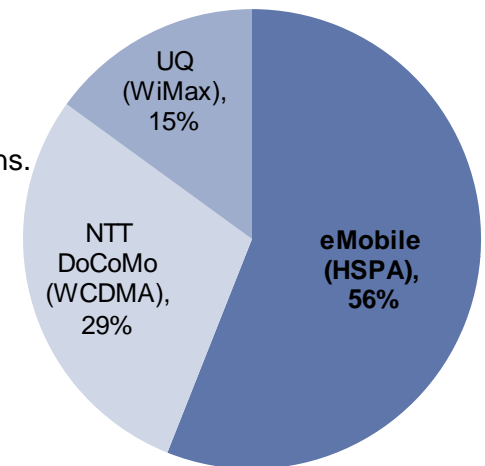
Japan: A unique market in terms of data uptake

Successful business model for broadband offerings

eMobile: HSPA

- eMobile: The dominant Mobile Broadband operator in Japan, with about 56% market share.
- Offers Mobile Broadband through HSDPA, with more than 3mn subs as of March 2011.
- Does not subsidize data cards/dongle, offers a 2 year contract.
- Price of a dongle US\$100-US\$150 and monthly charges of about US\$40 for “unlimited” data plans.
- Also a fixed line broadband operator (ADSL); launched mobile broadband operations in 2007.
- Began operations with a focus on urban centers (such as Tokyo, Osaka, and Nagoya) and moved on to semi-urban centers.
- Became EBITDA positive in 3 years and net income positive in 5 years.

Subs share of top 3 operators;
total subs 5.5mn (March 2011)



UQ Communications: WiMax

- WiMax-based Mobile Broadband operator (owned about 32% by KDDI).
- Operates on an MVNO model; has 52 MVNOs as of March 2011.
- Has a relatively less congested network given newer network. Tariffs comparable to eMobile.
- Offers a 1-year contract and retains 75% of monthly rentals from the MVNO operator.

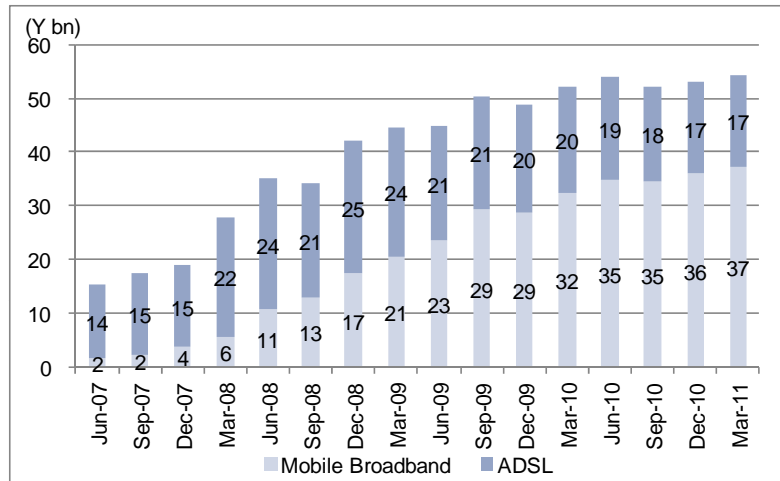
NTT DoCoMo: WCDMA

- Offers Mobile Broadband on WCDMA.
- Launched LTE data cards in December 2010 on a trial basis.
- Planning to use LTE for voice as well.

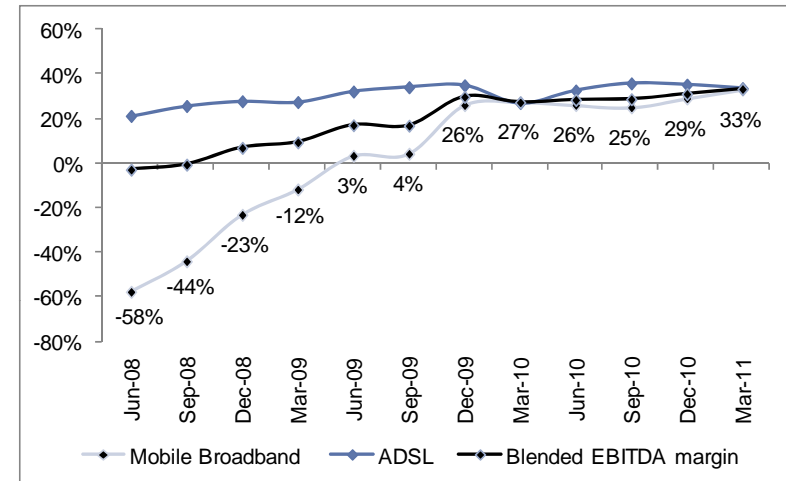
Source: Company data, Goldman Sachs Research estimates.

eMobile: Standalone wireless margins as high as 33%

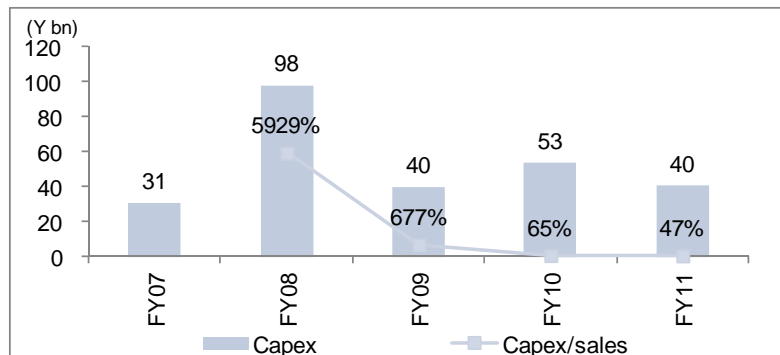
Revenue: Mobile broadband revenue rose, while ADSL contracted



EBITDA margins: Mobile margins continue to improve

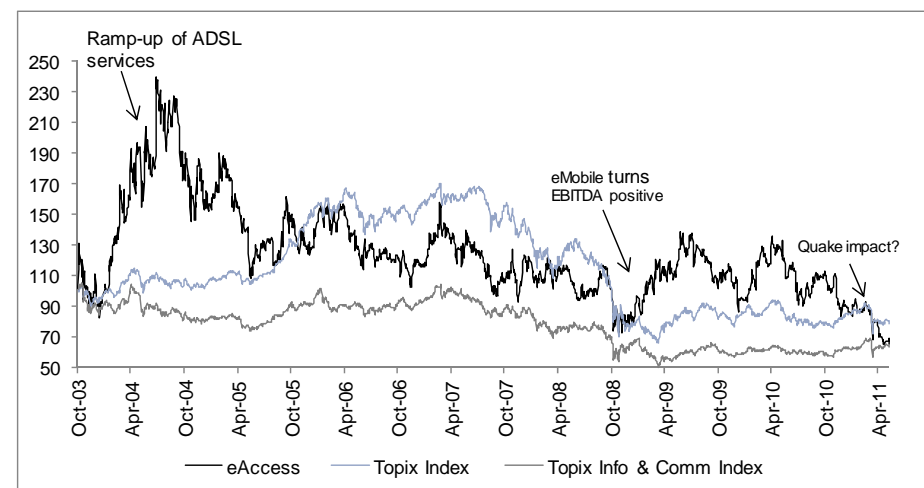


Capex: Capex intensity moderates



eMobile (Y bn)	FY06	FY07	FY08	FY09	FY10	FY11
EBITDA	(2)	(11)	(28)	(18)	18	40
Capex	0	31	98	40	53	40
EBITDA - Capex	(2)	(42)	(126)	(58)	(35)	0

eAccess' stock price outperforms during growth phases



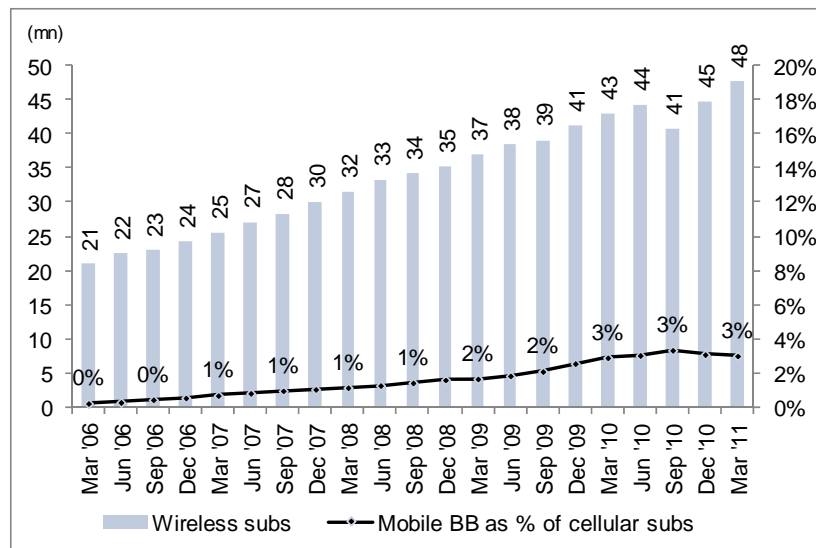
Source: Company data, Datastream, Goldman Sachs Research estimates.

Philippines: Mobile Broadband showed a promising start but could not hold on...

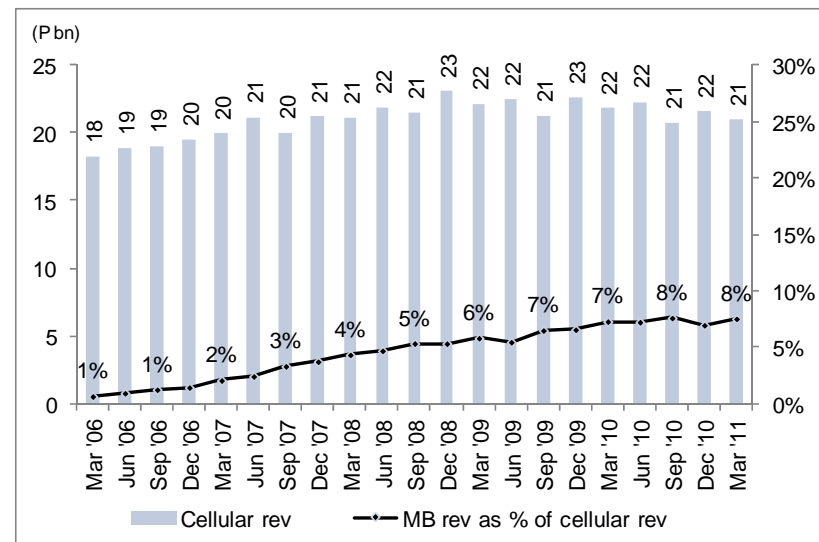
Philippines: Mobile Broadband uptake failed to show material uptake

- The Philippines was one of the first emerging market countries in Asia to show uptake in wireless subs. But is now lagging other countries such as Indonesia, Malaysia
- It's the product that is more important and not the technology for wireless broadband uptake: Philippine operators offered wireless broadband using technologies like Canopy, Wimax, HSPA but the lack of an attractive offering and a weak ecosystem affected the uptake of the service.
- In addition, as SMS formed 40%-50% of their revenues, operators were reluctant to aggressively push data at the risk of cannibalizing its revenues.

Mobile Broadband subs growth did not show a material uptake...



...and neither did Mobile Broadband revenues



Source: Company data, Datastream, Goldman Sachs Research estimates.

Mobile Broadband uptake in India: Still a few years away, but the right time to invest

Crowded data market too: Should help increase consumer awareness

- Catalyst for data growth intact: Falling 3G handset prices, increasing awareness on data service, 3G application content increasing.
- Consumer stickiness to increase. Data will be the key differentiator and trigger for consolidation.
- Companies with first mover advantage to be likely rewarded by financial community.

Data players in India

	(Rs mn)	MTNL/BSNL	RIL-Infotel	Bharti	RCOM	Idea	VOD	DoCoMo	Aircel	STel	Qualcomm	Tikona	Augere	Data players
Metros	Delhi	3G+BWA	BWA	3G	3G		3G				BWA			6
	Kolkata	3G+BWA	BWA	BWA	3G		3G		3G					6
	Mumbai	3G+BWA	BWA	3G	3G		3G				BWA			6
Circle A	Andhra Pradesh	3G+BWA	BWA	3G		3G			3G+BWA					5
	Gujarat	3G+BWA	BWA			3G	3G	3G				BWA		6
	Karnataka	3G+BWA	BWA	3G+BWA				3G	3G					5
	Maharashtra	3G+BWA	BWA	BWA		3G	3G	3G						6
	TN (incl. Chennai)	3G+BWA	BWA	3G			3G		3G+BWA					5
Circle B	Haryana	3G+BWA	BWA			3G	3G	3G			BWA			6
	Kerala	3G+BWA	BWA			3G		3G	3G		BWA			6
	Madhya Pradesh	3G+BWA	BWA		3G	3G		3G					BWA	6
	Punjab	3G+BWA	BWA	BWA	3G	3G		3G	3G					7
	Rajasthan	3G+BWA	BWA	3G	3G			3G				BWA		6
	Uttar Pradesh (E)	3G+BWA	BWA			3G	3G		3G			BWA		6
	Uttar Pradesh (W)	3G+BWA	BWA	3G		3G		3G				BWA		6
	West Bengal	3G+BWA	BWA	3G	3G		3G		3G+BWA					6
Circle C	Assam	3G+BWA	BWA	3G	3G				3G+BWA					5
	Bihar	3G+BWA	BWA	3G	3G				3G+BWA	3G				6
	Himachal Pradesh	3G+BWA	BWA	3G	3G	3G				3G		BWA		7
	Jammu & Kashmir	3G+BWA	BWA	3G	3G	3G			3G+BWA					6
	North East (NE)	3G+BWA	BWA	3G	3G				3G+BWA					5
	Orissa	3G+BWA	BWA		3G				3G+BWA	3G				5

Source: DoT, Goldman Sachs Research .

LTE launch in India to create a new tablet market; likely to propel data growth

- All BWA license holders are now keen to launch LTE and not Wimax. RIL is likely to focus on the nascent zero penetrated tablet market. Other LTE operators to use LTE as a backhaul support. Mobile Broadband ecosystem to develop over the next 12 months and consumer awareness to increase.
- Case-studies from other markets like Hong Kong show that any potential cannibalization led by tablet offerings is more on fixed broadband versus the cell phone market as the tablets are more likely to be used as a replacement for fixed broadband and complement the cell phone market. We expect the cellular data to also grow post LTE launch.
- In a market like Hong Kong, we have seen a rapid penetration of smartphones (particularly the iPhone) leading to a significant (5%-10% increase) in ARPUs over the past 12 months and 20%-30% of EPS upgrades by consensus. The stock price of Smartones (pure play wireless operators) increased 127% in 2010 (vs. Hang-Seng Index increase of 6%).
- BWA market may turn more competitive if the government auctions further BWA spectrum. Recent media articles indicate that around 160MHz of spectrum for 4G will be made available in 2012.

BWA industry-revenue opportunity

	FY10	FY11E	FY12E	FY13E	FY14E	FY15E
Fixed Broadband subs (mn)	9.0	11.9	15.6	20.0	25.3	31.7
Net adds (mn)	4.1	2.9	3.6	4.4	5.3	6.4
Fixed bband pent'n (Households)	4%	5%	7%	8%	11%	13%
Fixed bband pent'n (Pops)	1%	1%	1%	2%	2%	3%
3G handsets (mn)	13.9	27.8	49.0	77.7	111.8	139.8
3G subs (mn)	4.4	8.9	22.1	42.7	72.7	104.8
3G penetration (Pops)		1%	2%	4%	6%	8%
Tablet Users (mn)			6.2	12.0	25.3	38.0
Net adds (mn)				5.8	13.3	12.7
Tablet penetration (Households)			3%	5%	11%	16%
Tablet penetration (pops)			1%	1%	2%	3%
BWA ARPU (Rs)			1,200	1,080	994	924
% change				-10%	-8%	-7%
BWA Revenue (US\$ bn)			2.0	3.5	6.7	9.4

Source: Goldman Sachs Research estimates.

Disclosures

May 20, 2011

Disclosures



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CREATING AN INVESTMENT PROOF ENVIRONMENT

Robindhra Mangtani, Senior
Director, Government and
Regulatory Affairs, GSMA

About the GSMA



Representing more than 800 GSM mobile phone operators across over 200 territories and countries of the world and 200+ manufacturers and suppliers. initiatives as associate members.

The primary goals of the GSMA are to ensure mobile phones and wireless services work globally and are easily accessible, enhancing their value to individual customers and national economies, while creating new business opportunities for operators and their suppliers. The Association's members serve more than **5 billion customers.**

Connecting the World

Fixed



1.1 Billion Lines

Mobile



Over 5 Billion Connections

Mobile networks are connecting the world...

MOBILE BROADBAND WILL CONNECT THE WORLD TO THE INTERNET

Ubiquity of Smartphones

By 2013, the number of smartphones will exceed the number of PCs



1.82 Billion Units



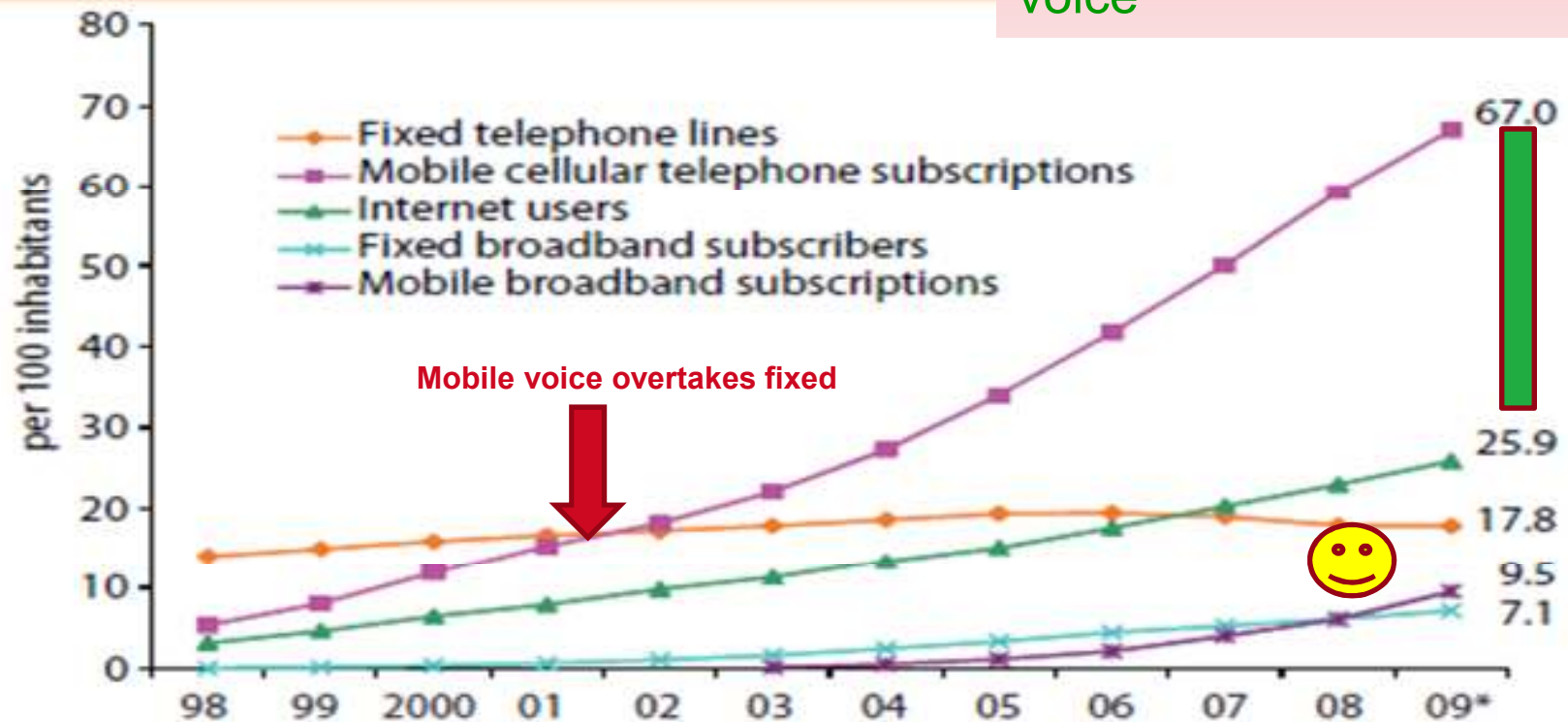
1.78 Billion Units

MOBILE WILL BECOME DOMINANT INTERNET ACCESS DEVICE

The opportunity : 5 billion + MBB users

Chart 1.1: Global ICT developments,

Mobile BB to be as ubiquitous as mobile voice



Note: * Estimates.

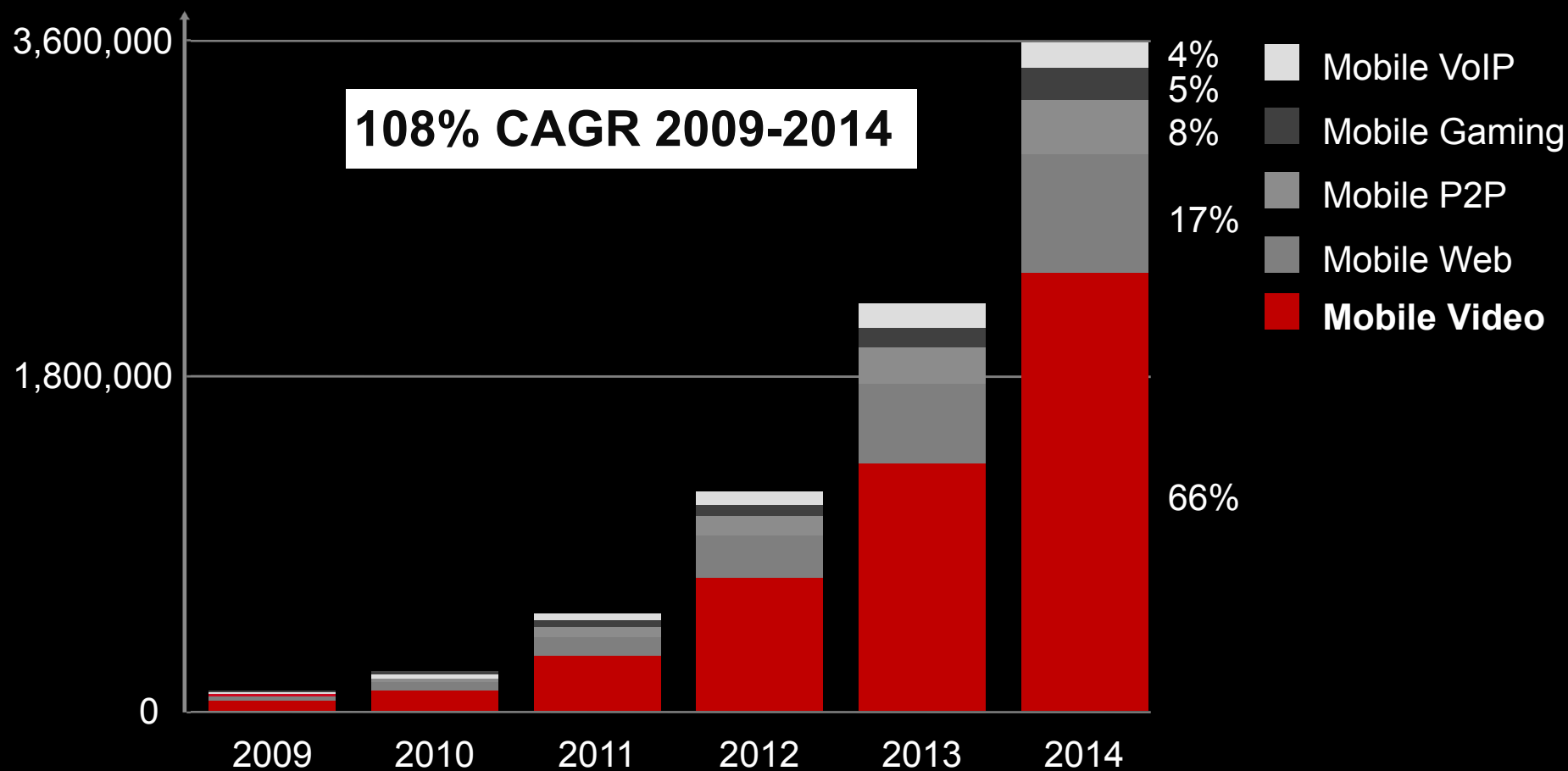
Source: ITU World Telecommunication/ICT Indicators database.

Source : <http://www.itu.int/ITU-D/ict/publications/idi/2010/index.html>

Traffic Growth Forecasts



Mobile Traffic (TB per Month)



Source: Cisco VNI Global 2010

Mobile Beyond Voice



Healthcare



Transportation



Utilities



Consumer Electronics



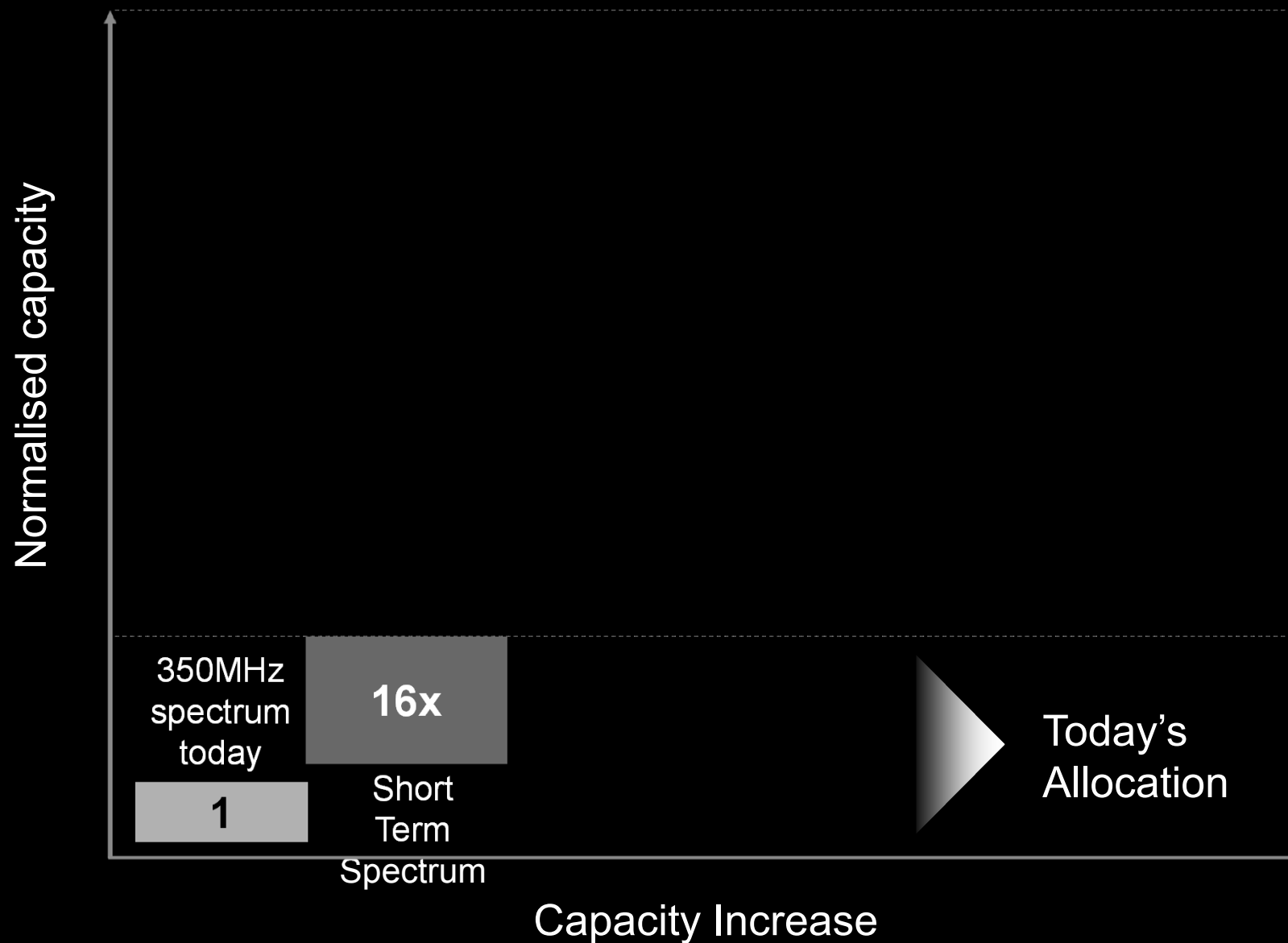
Government



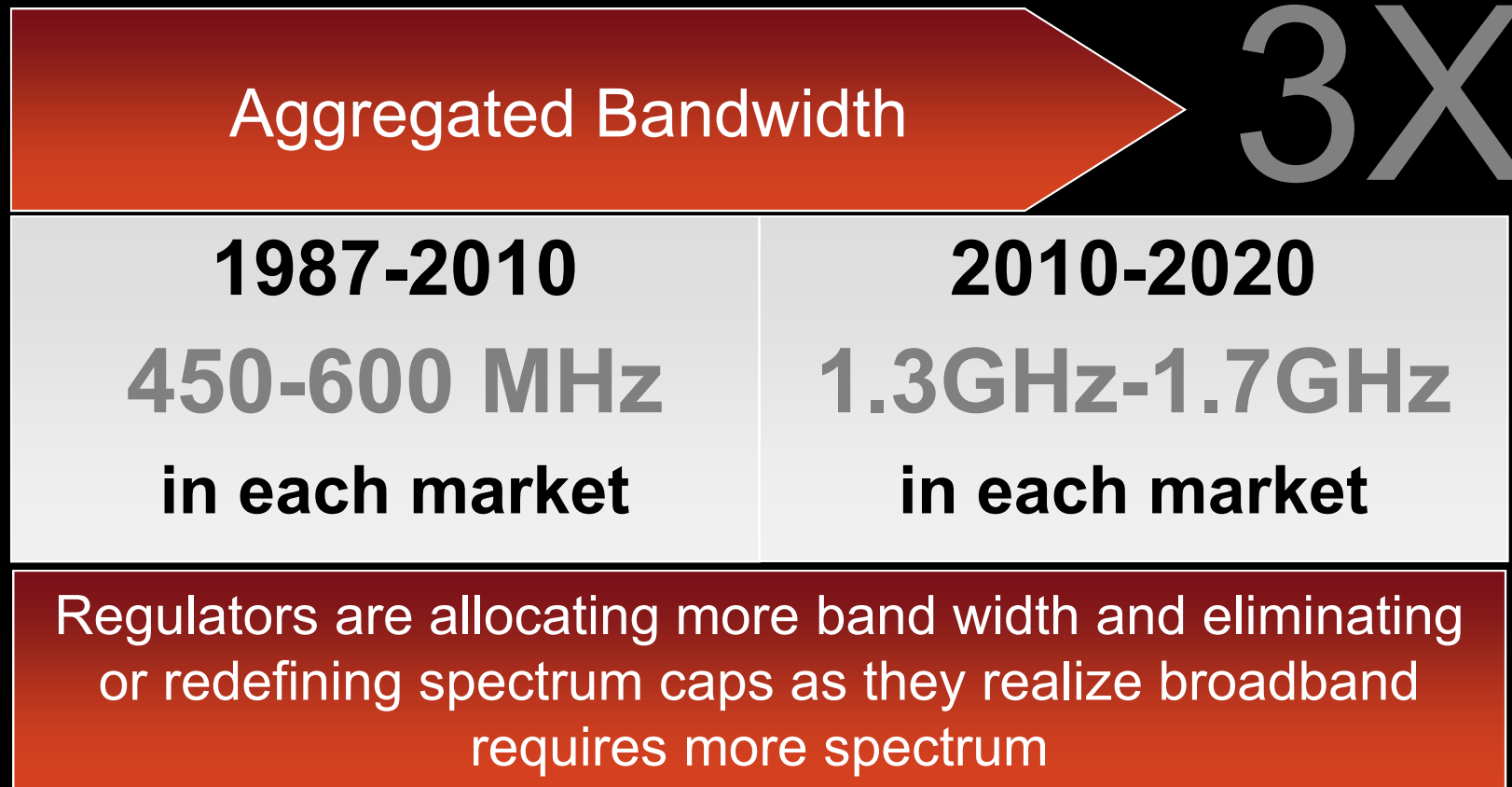
A WORLD OF CONNECTIONS...

Meeting the capacity shortfall

Forecasted 2025 Capacity Need



Mobile Industry Spectrum Requirements



According to the **ITU-R Report M.2078** by the year 2020 mobile services (IMT-2000) will need:

- 1.280 MHz for low market demand (rural areas)
- 1.720 MHz for high market demand (urban areas)

From voice to mobile broadband



Aggregated bandwidth X 2? X3? X4?



By 2020 IMT will need:

- 1280 MHz bandwidth for rural areas
- 1720 MHz bandwidth for urban areas



Australian 2020 estimates:
1100 MHz required
300 MHz to be added



Colombia to auction 300 MHz of spectrum



Statements
On making
500 MHz

of new
bandwidth
available



More than

600 MHz to be released



Spain to release 310 MHz mobile spectrum



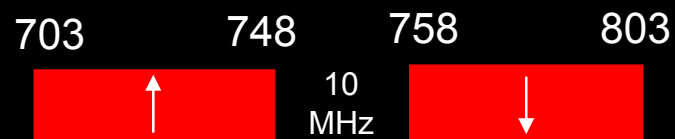
Chairman Genachowski in October 2009:

"In fact, I believe that that the biggest threat to the future of mobile in America is the looming spectrum crisis."

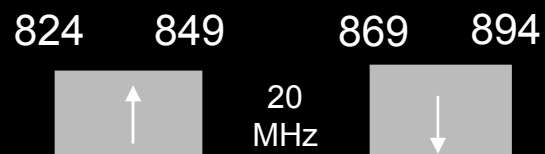
Candidate mobile bands Asia Pacific



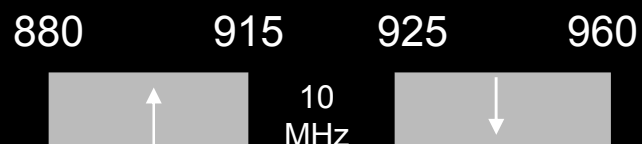
The coverage bands



The 700 band: 2X45 MHz

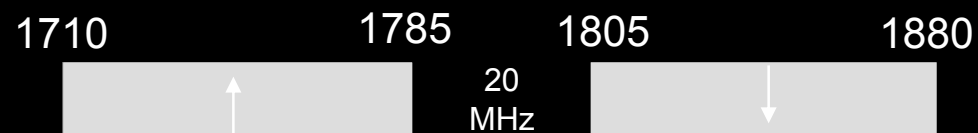


The 850 band: 2X25 MHz

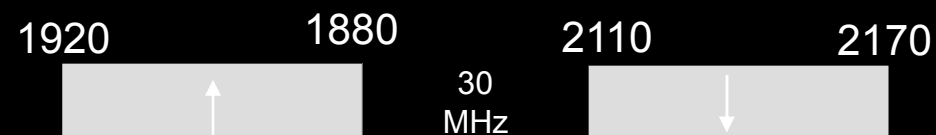


The 900 band: 2X35 MHz

The capacity bands



The 1800 band: 2X75 MHz



The 2100 band: 2X60 MHz



The 2300 band: 100 MHz



The 2600 band: 2X70 MHz and 50 MHz unpaired

How Harmonisation brings down device costs



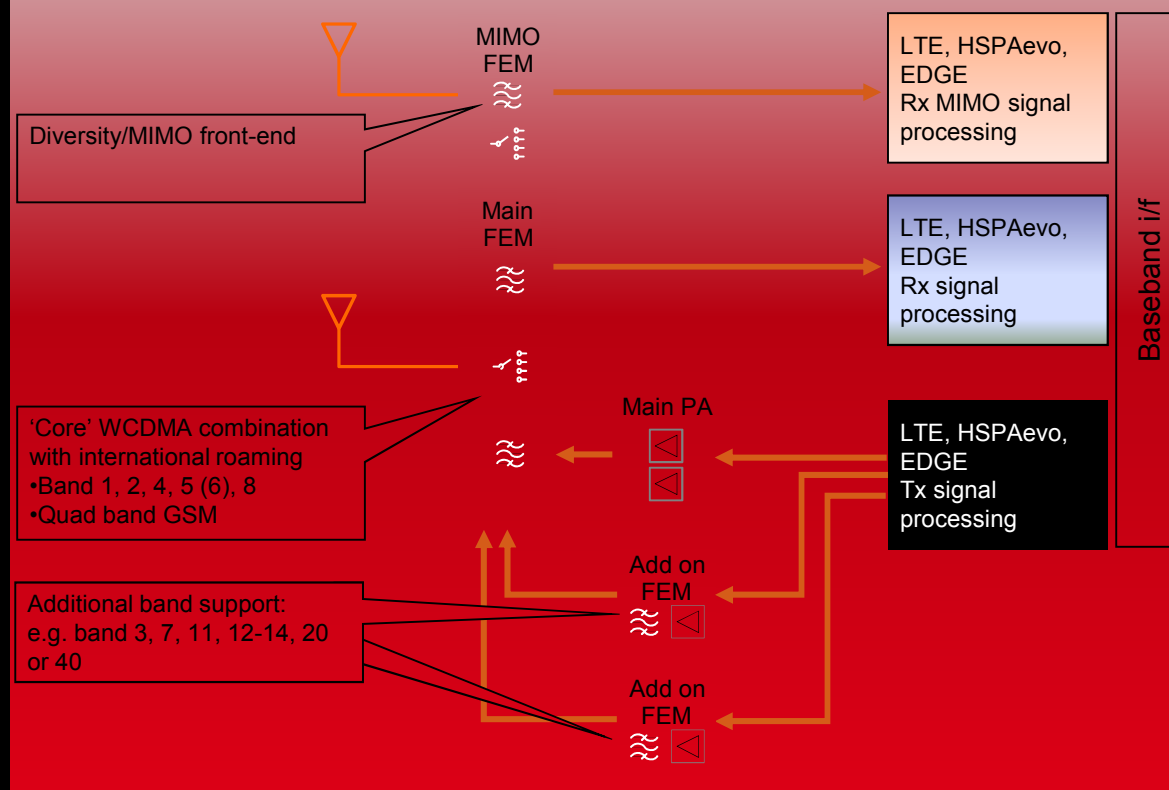
Source: LECG analysis of data from Strategy Analytics and Yankee Group.

Why international harmonisation matters



- Because of the need for analogue components in the RF chain, effectively means a new RF front end module per frequency band. But this is complex and can impact on RF performance (as well as costs).

Radio Multiband Architecture Example



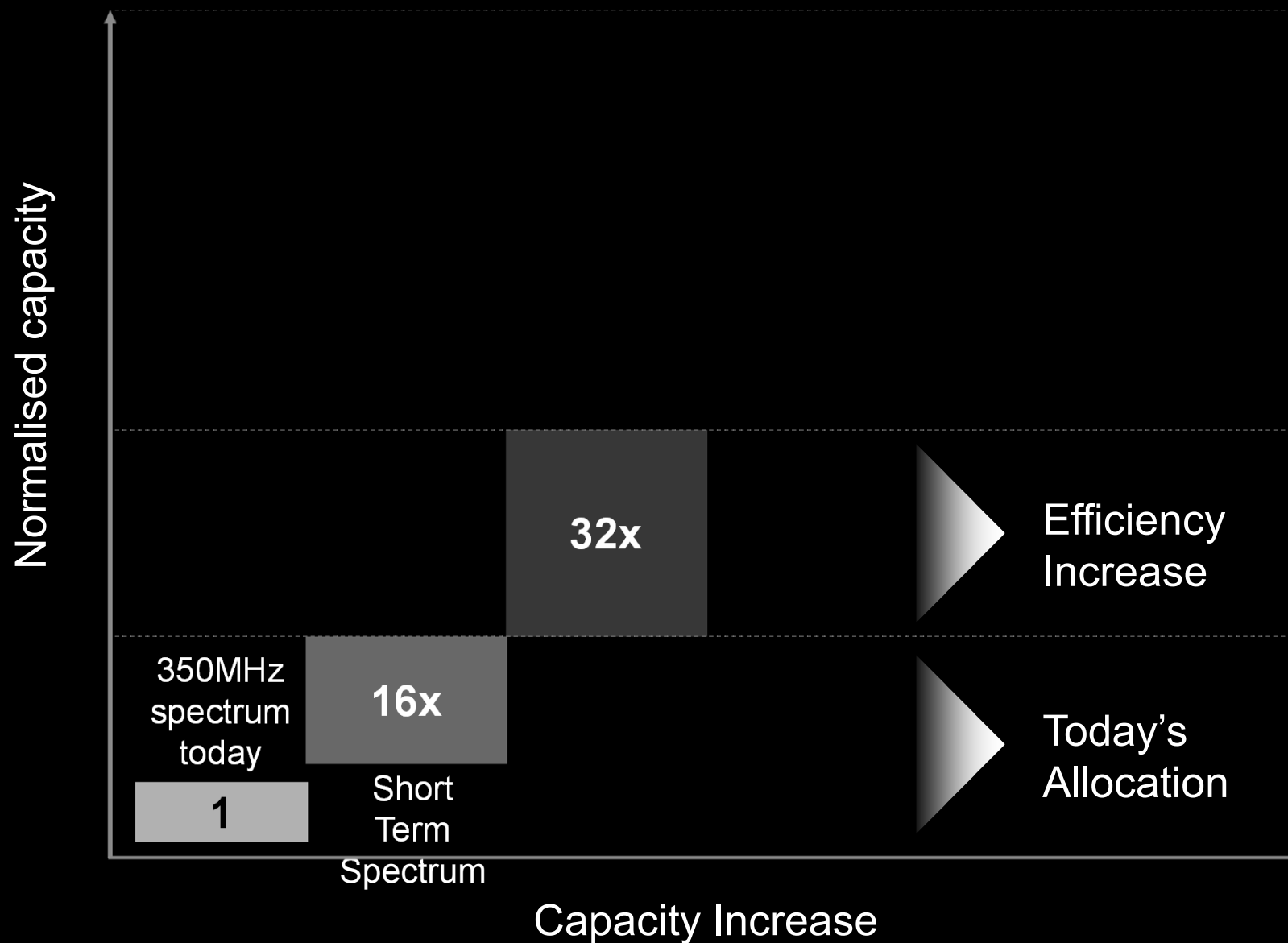
Number of bands a handset can support is limited.

As the number of bands goes up the RF efficiency goes down.

Every new FEM adds to complexity

Meeting the capacity shortfall

Forecasted 2025 Capacity Need



What can be done to drive efficiency

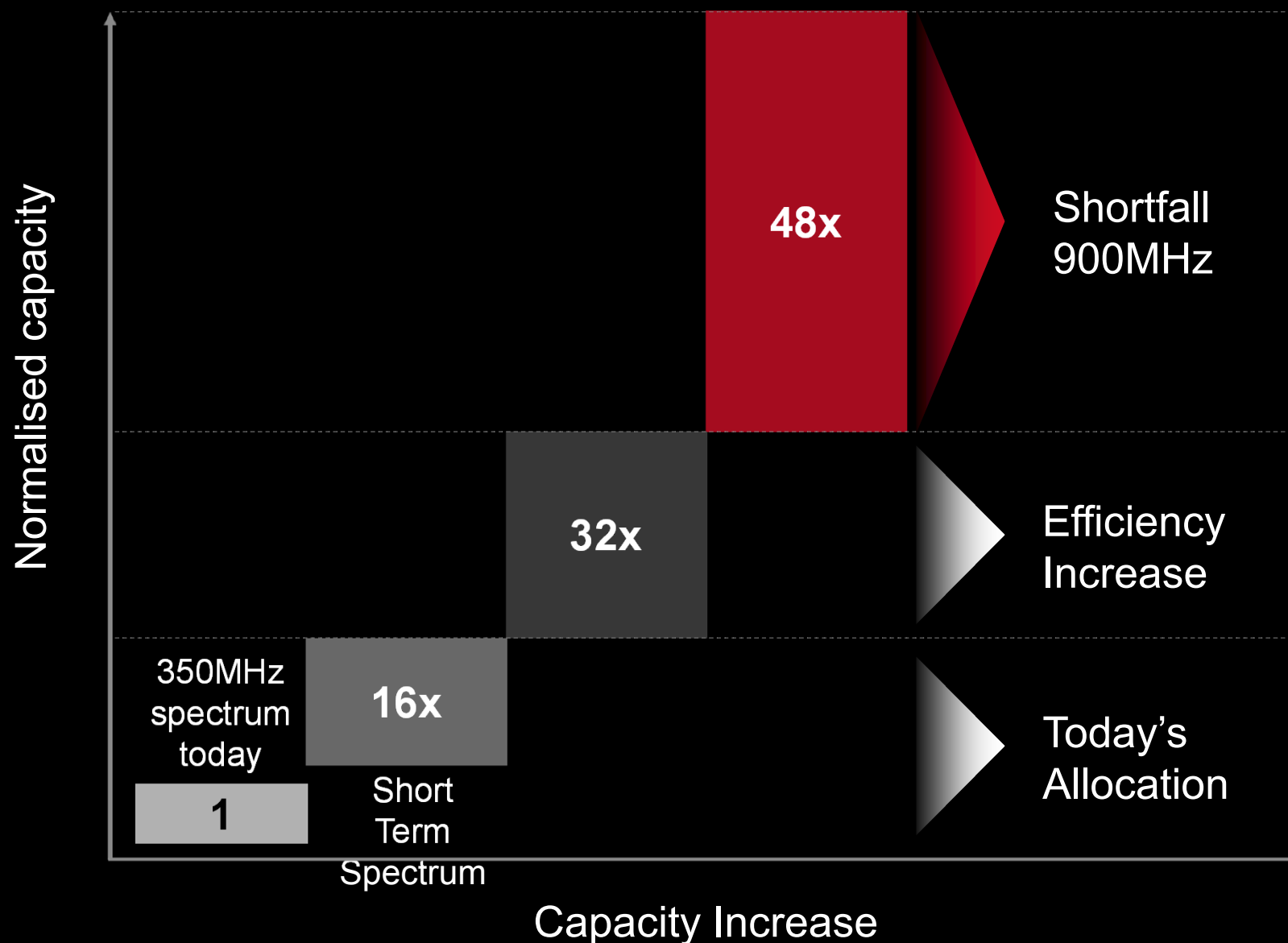
- Spectrum Efficiency.
 - LTE advanced is significantly more efficient than GSM (18x)
- Network Offload
 - Ranges of figures and a variety of approaches but could allow operators to focus on high value / high mobility traffic
- Harmonisation
 - Fragmentation impacts receiver sensitivity and battery life (not just economies of scale)
- Cell Splitting
 - Could be as much as a 10fold increase in capacity IF you can get planning consent and appropriate sites
- Unpaired spectrum
 - Could be useful for A-symmetric traffic management

And what helps (but doesn't fix it)

- Spectrum Sharing
 - Could be up to 30% efficiency gain if moved to a wholesale model (but this is unlikely to be supported by regulators or industry)
- Spot Markets / Cognitive Radio
 - So far unproven and although useful where there is available spectrum – in urban centres (where we need most spectrum) there are few white spaces
- Improved compression techniques
 - Use of more efficient video codec could reduce bit rates by 50% but... We anticipate consumers will demand higher quality . HD video quality
- Femto Cells
 - Complexity of engineering the Femto into the network topography will not provide significant more capacity in Urban areas. May be useful but not for capacity
- Mesh technology
 - May be useful for coverage but not for capacity

Meeting the capacity shortfall

Forecasted 2025 Capacity Need



Spectrum is a national sovereign asset

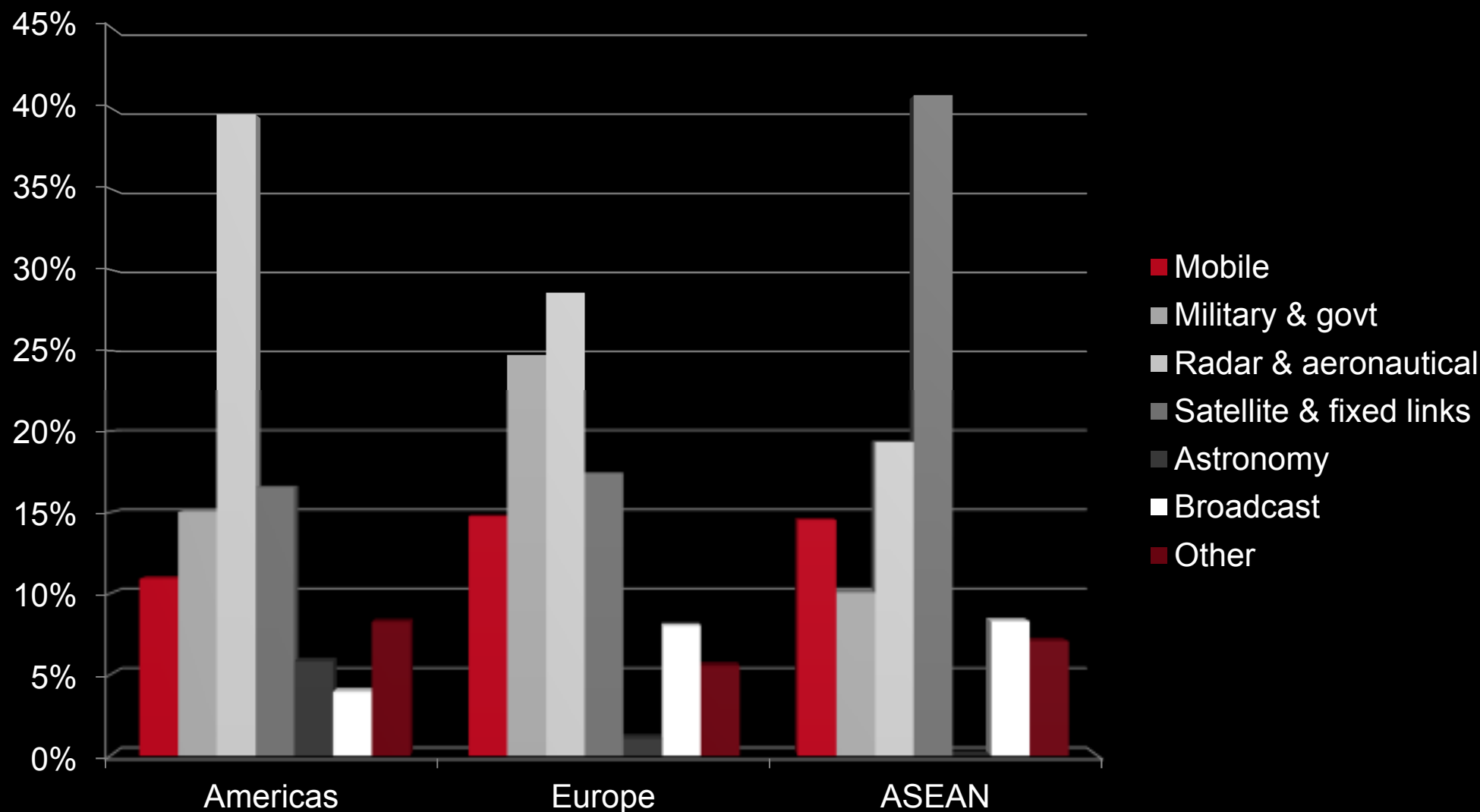
A low-angle photograph looking up at numerous flagpoles against a clear blue sky. The flagpoles are arranged in a grid-like pattern, creating a sense of height and scale. Various national flags are flying from the poles, including the flag of Israel on the right side.

**At WRC 12 support to add
an agenda item to consider
IMT an agenda item to
consider IMT spectrum
requirements
spectrum requirements and
ITU-R study and ITU-R study**

Moving incumbents will be a significant challenge



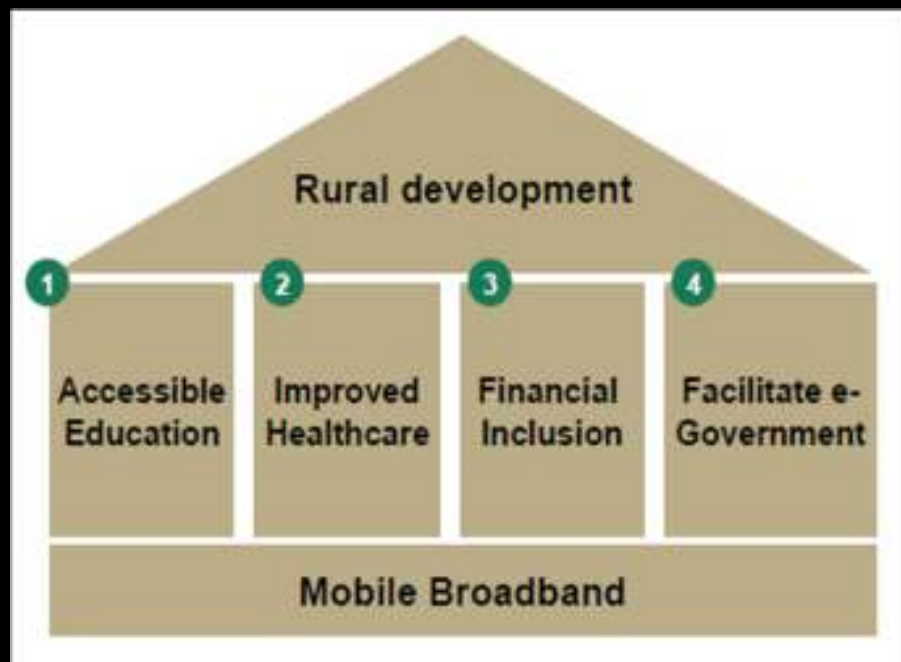
Percentage Spectrum Allocations: 400MHz - 5GHz



Social inclusion and development

- Allocating 700 MHz band to mobile broadband in APAC
 - Can increase rural Internet subscriptions by 14-23% by 2020
 - Overall number of Internet subscriptions expected to increase 2-8%
 - 1.1M new business activities could be created by 2020
 - Could contribute additional US\$ 103B to government revenues for 2014-2020

Mobile broadband is a powerful tool for facilitating rural development



Accessible education to rural areas lacking adequate facilities, resources and teachers

Improved healthcare services for rural and under-privileged groups

Provide much-needed financial intermediation to unbanked poor and rural areas

Reduce bureaucracy and improve government interfaces towards businesses and consumers

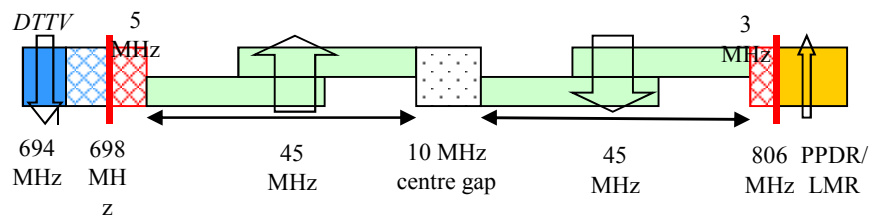
Source: 
 THE BOSTON CONSULTING GROUP

Allocation of sufficient and harmonized spectrum has been assumed in the analysis of socio-economic benefits

Sufficient bandwidth needs to be allocated to mobile

2 x 45 MHz needed to provide sufficient bandwidth for effective rollout

- APT harmonized UHF bandplan for IMT within the 698-806 MHz band
- Lower guard-band between 698-703 MHz and an upper guard-band between 803-806 MHz



Adequate bandwidth will facilitate competition between operators, enhancing efficiency and consumer choice and price benefits

Harmonization of spectrum across region necessary to reap full benefits

Non-harmonization will drive up cost of hand-sets and make them unaffordable to lower-income consumers

- Lack of frequency harmonization can drive up terminal costs, as providers will not be able to enjoy economies of scale
- Small un-harmonized markets risk being marginalized by equipment manufacturers
- Harmonization will reduce cross-border interference and facilitate improved usage quality

A selection of socio-economic analysis

- **World Bank Information and Communication for Development Report (IC4D 2009):**
<http://www.infodev.org/en/Article.384.html>
- **Boston Consulting Group analysis of socio-economic impact of allocating 700 band to mobile in APAC:**
<http://www.gsmamobilebroadband.com/upload/resources/files/277967-00-Impact%20of%20700-22Oct10-EG-SIN.pdf>
- **Analysys Mason Assessment of Economic Impact of Wireless Broadband in India:**
http://www.gsmamobilebroadband.com/upload/resources/files/AM_India_Exec_Summary_Final.pdf
- **McKinsey&Company Mobile Broadband for the masses:**
<http://www.gsmamobilebroadband.com/upload/resources/files/MBBforMasses.pdf>
- **Boston Consulting Group Towards A Connected World, Socio-Economic Impact of Internet in Emerging Economies:**
http://www.telenor.com/en/resources/images/Towards%20a%20Connected%20World_tcm28-50426.pdf
- **Analysys Mason / DotEcon / Hogan&Hartson Report for the European Commission 'Exploiting the Digital Dividend' – a European approach:**
http://www.analysismason.com/EC_digital_dividend_study

In conclusion...

- President *Barack Obama* – 16.03.10

“Just as past generations met the great infrastructure challenges of the day, such as building the railroads and the Interstate highways, so too must we harness the potential of the Internet. Expanding broadband across the nation will build a foundation of sustained economic growth and the widely shared prosperity we all seek.”

- ITU Secretary General, Dr Hamadoun Toure, 15.02.2011

“governments need to raise broadband to the top of the development agenda, so that rollout is accelerated and the benefits are brought to as many people as possible”

Thank You

Questions?



GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



Coffee/tea break with
networking

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



ERICSSON



MOBILE BROADBAND – THE NEXT STEP

Mr. Stephen Coffey, Strategic
Product Manager, Mobile
Broadband ,Ericsson



MOBILE BROADBAND-THE NEXT STEP

STEPHEN COFFEY
MOBILE BROADBAND
ERICSSON AB

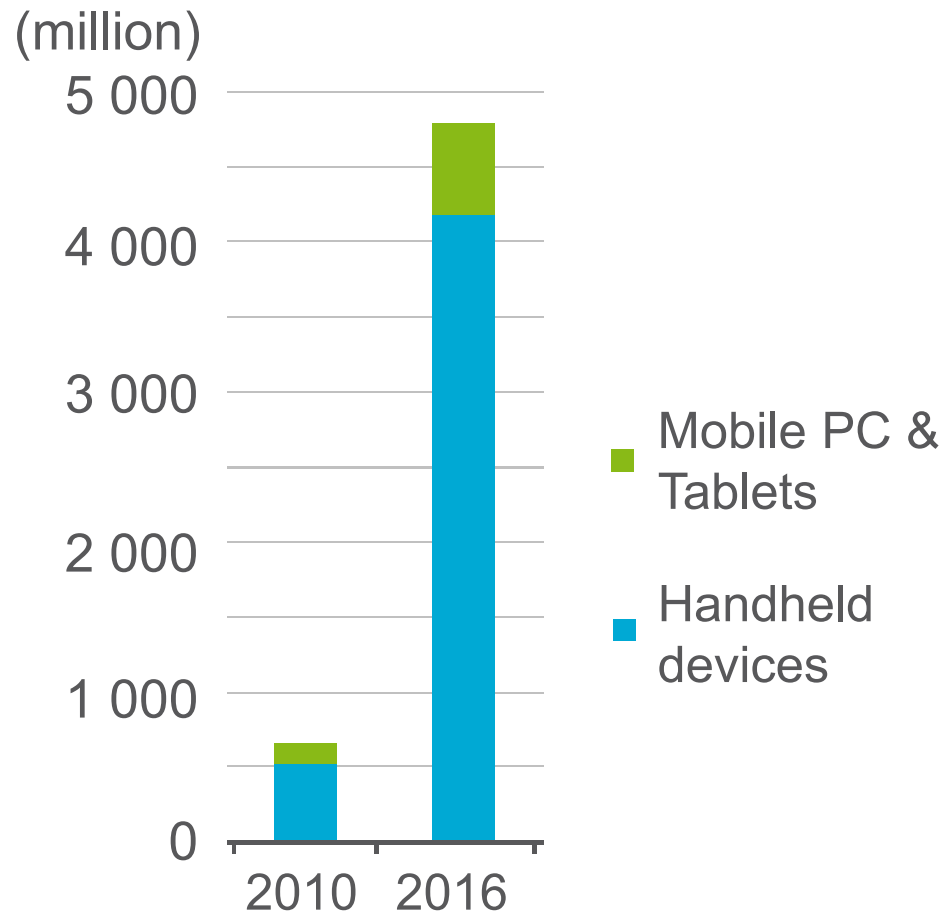
THE NETWORKED SOCIETY - USER EXPERIENCE IS KEY



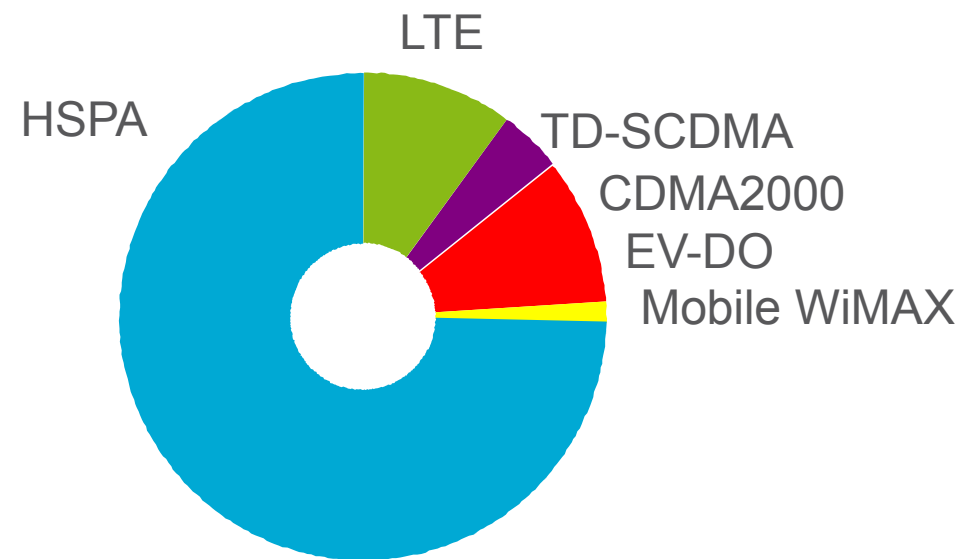
[Anywhere internet 24/7, please]

SMARTPHONES EVERYWHERE

MBB Subscriptions



Technology share 2016



[85% of subscriptions on HSPA and LTE in 2016]

WINNING MBB STRATEGY

HIGH END & MASS MARKET DEVICES



SERVICE DIFFERENTIATION



Price

Demand-based pricing / QoS



Subs





NETWORK IS THE DIFFERENTIATOR



S/N



NETWORK IS THE DIFFERENTIATOR

NETZTEST 2010				Switzerland			Austria	
LAND	Schweiz			Österreich				
Anbieter	Swisscom	Sunrise	Orange	A1 Telekom Austria	Orange	T-Mobile	Hutchison 3G	
BREITBAND DOWNLOAD (STADT)								
Anteil > 1Mbit/s (%)	93,1%	82,6%	46,1%	97,1%	95,1%	77,3%	62,2%	
Datentransferate (kbit/s)	3926	1824	1458	3802	2365	2384	1683	
connect URTEIL max. 500	454 sehr gut	386 gut	279 ausreichend	465 sehr gut	393 gut	388 gut	386 gut	
								
								



BEST SMARTPHONE NETWORK



Always on

[Smartphone optimized]



Speed and
low latency

[Perceived speed –
Clear differentiator]



Coverage

[Lack of coverage –
Main cause of churn]



Capacity

[Traffic x2 per year]

ALWAYS ON

SMARTPHONE OPTIMIZED

User experience



Network efficiency

Battery life time

Response time

Signaling capacity

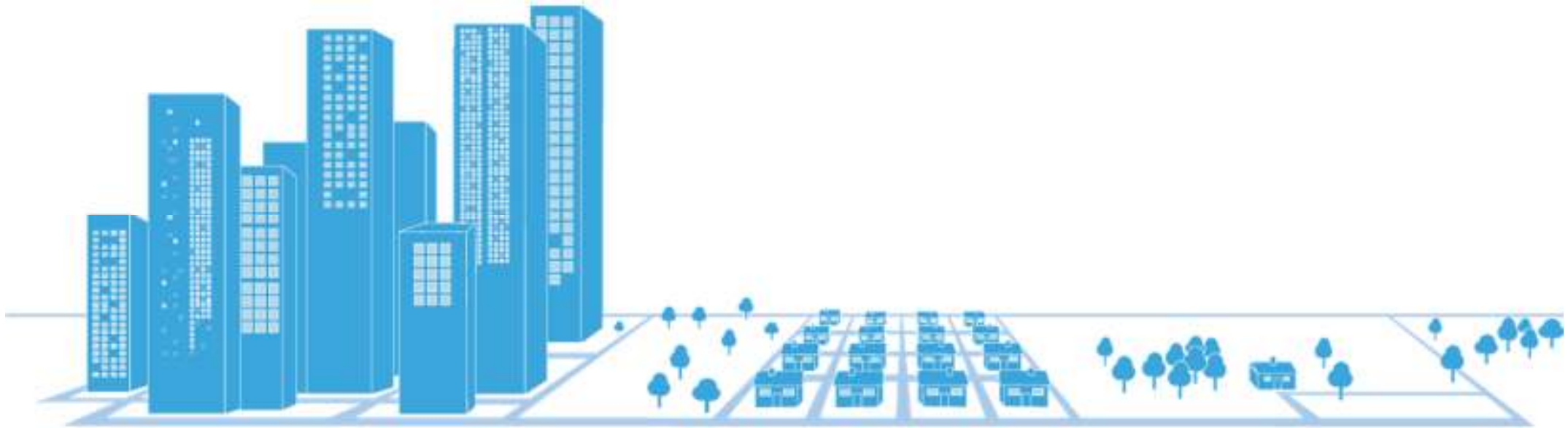


ANYWHERE COVERAGE

Urban

Suburban

Rural



LTE

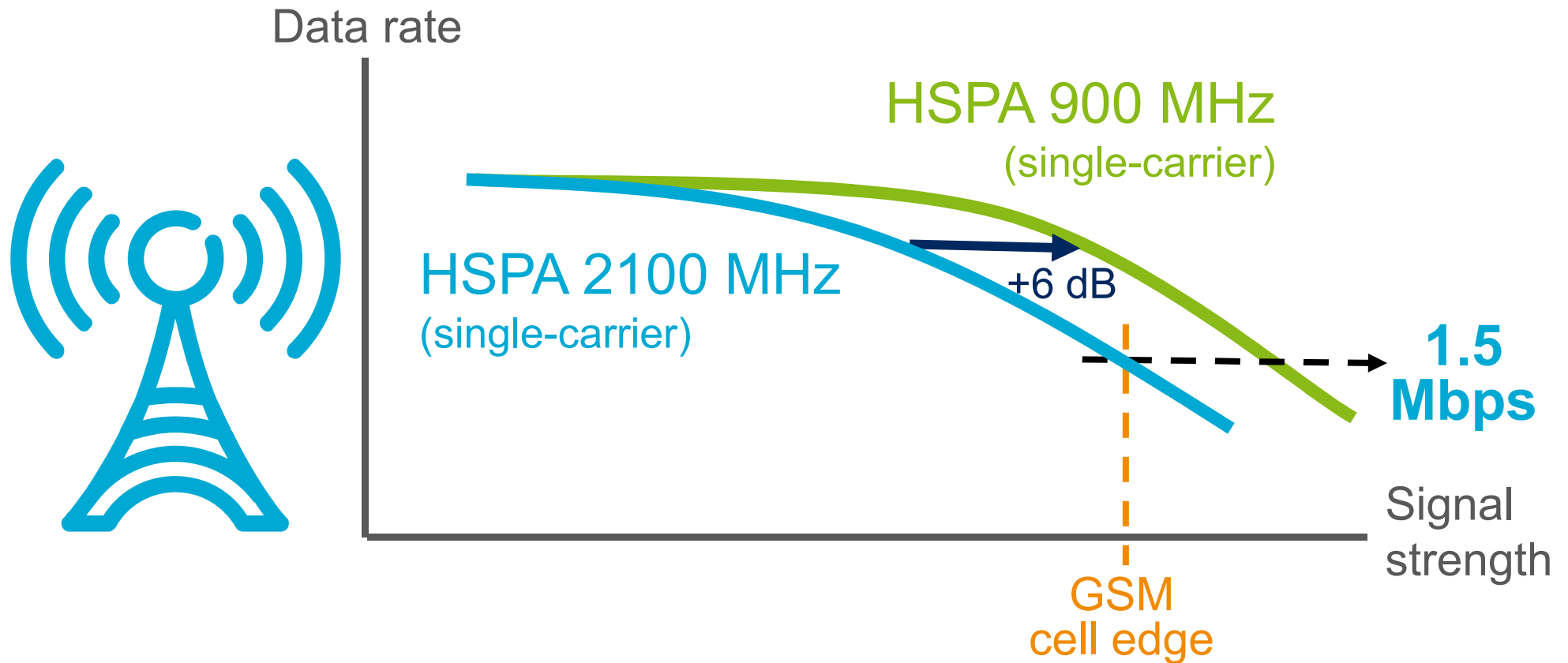
Low bands

HSPA / HSPA Evolution

EDGE / EDGE Evolution

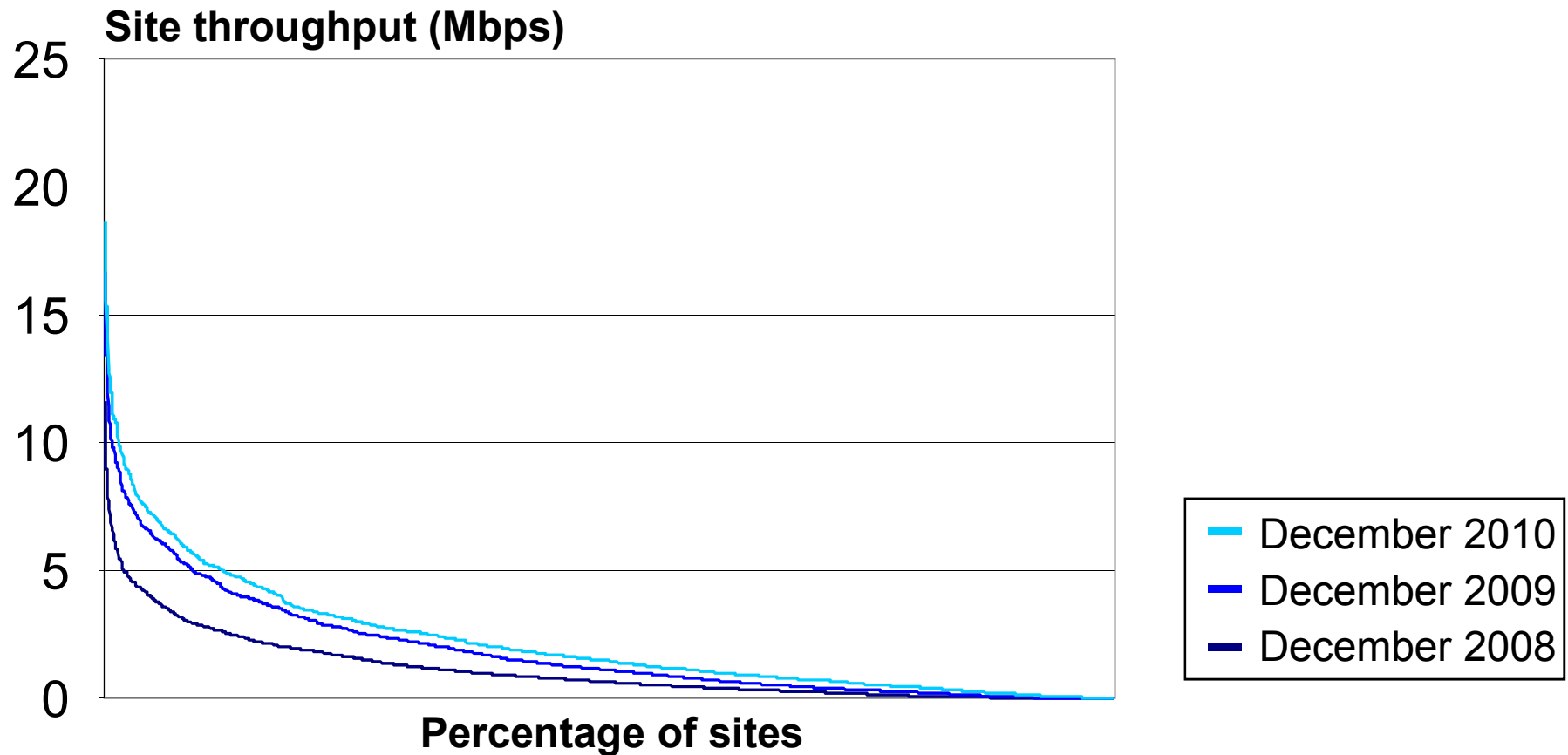
Smartphones demand coverage everywhere

COVERAGE



[HSPA on every GSM site]
Low band / High band

MANAGEABLE CAPACITY GROWTH

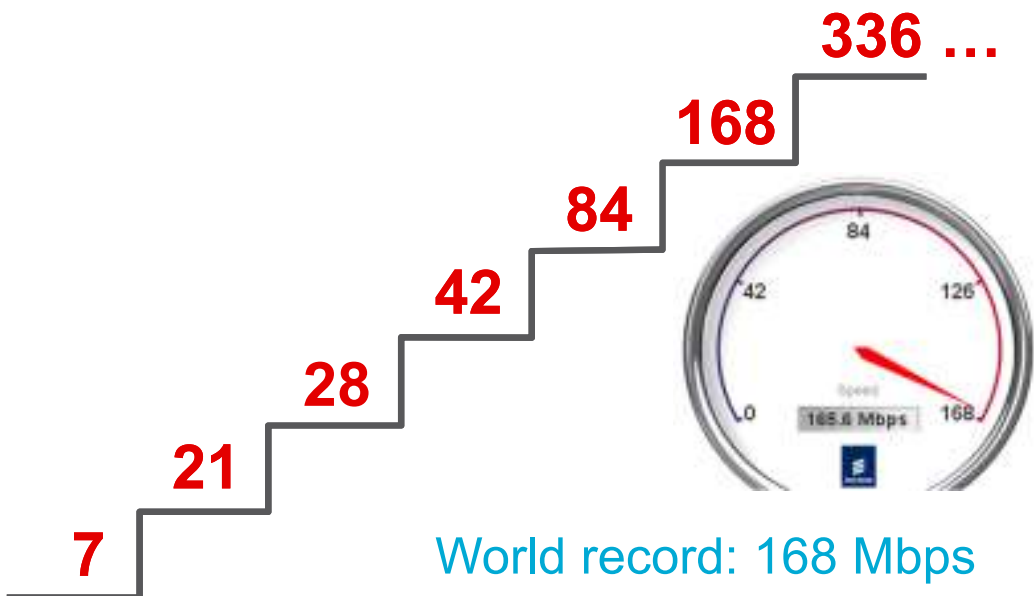


Source: MBB operator with high Smartphone and notebook penetration

**[3x traffic volume in 2 years
High capacity potential]**

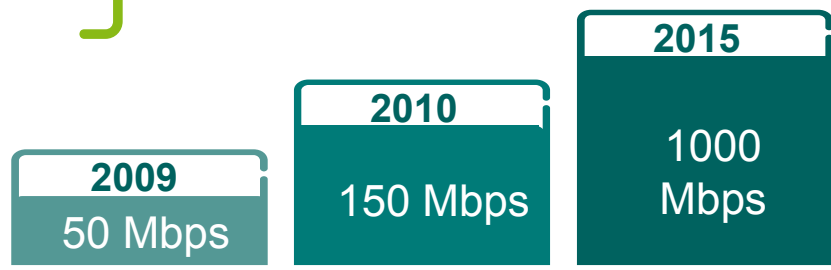
NEED FOR SPEED AND LOW LATENCY

HSPA EVOLUTION



LTE

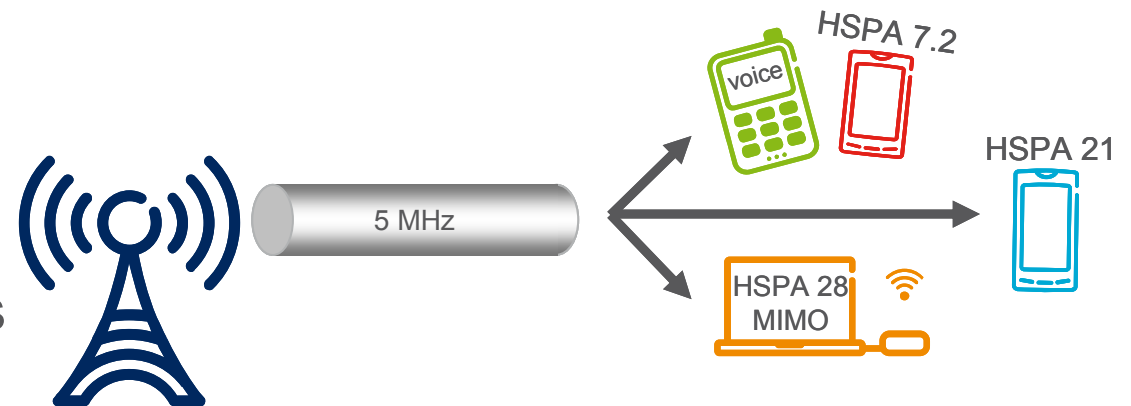
[150 million people covered today]



HIGH NETWORK EFFICIENCY

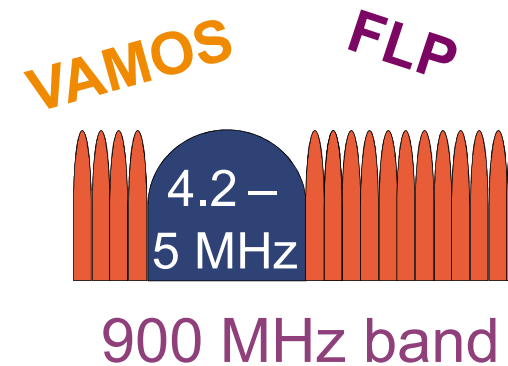
› HSPA carrier efficiency

- All device types on all carriers



› Tight GSM spectrum usage

- Allows re-farming for HSPA / LTE



› High-performing base stations

- Multi-standard (GSM / HSPA / LTE)

AIR:
Antenna
Integrated
Radio



THE BEST MOBILE BROADBAND



Always on



Coverage

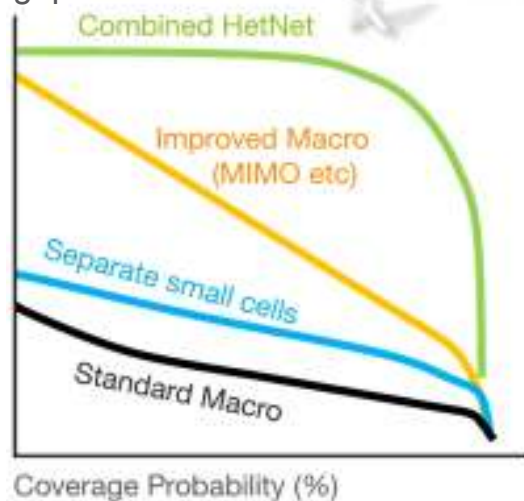


Speed and
low latency



Capacity

User
throughput



The networked society -
User experience is key



ERICSSON

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



3G + LTE – THE KEY TO MOBILE BROADBAND IN INDIA

Dr. Lakshminath Reddy Dondeti,
Director, Engineering - Technical
Standards, Qualcomm



QUALCOMM



3G + LTE – THE KEY TO MOBILE BROADBAND IN INDIA

May 2011



The Biggest Platform in the History of Mankind



>5 BILLION WIRELESS SUBSCRIBERS

>1B

3G SUBSCRIPTIONS
NOW

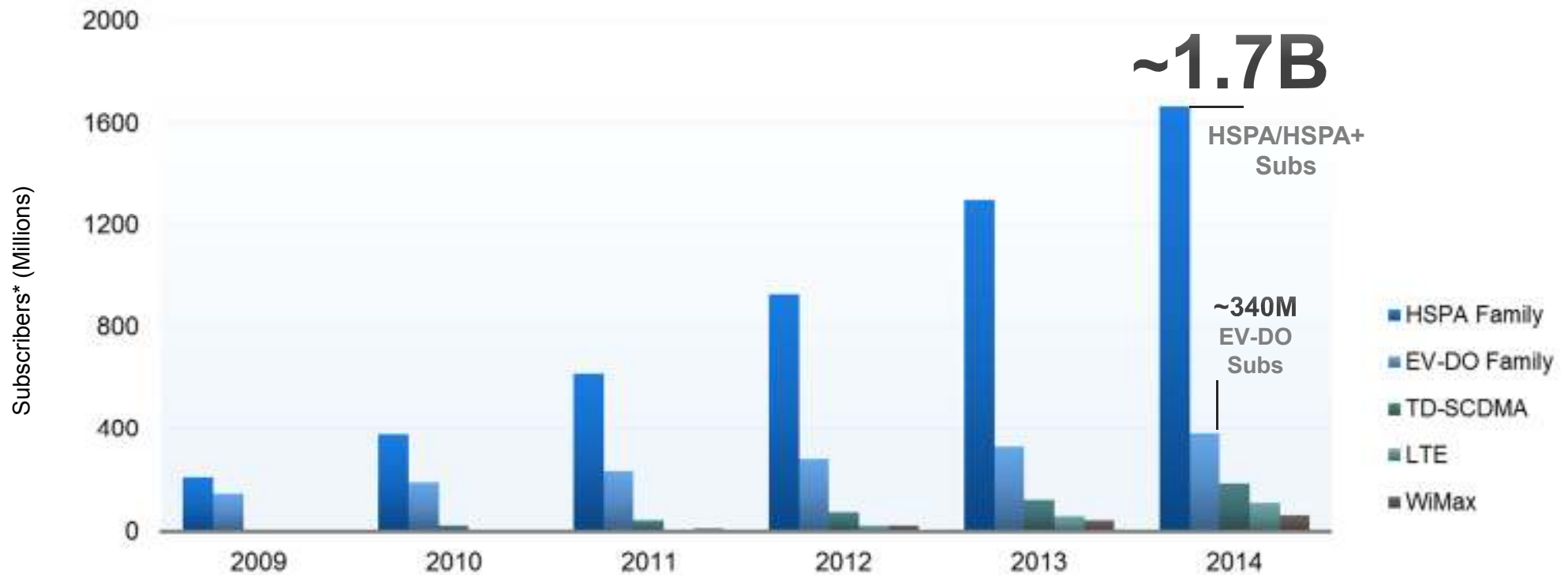
~2.8B

3G SUBSCRIPTIONS
BY 2014

Note : 3G includes CDMA2000, WCDMA and TD-SCDMA

Source: Wireless Intelligence estimates as of Nov.2 , 2010 for the quarter ending Sep 30, 2010; *number of unique wireless connections

HSPA+ is The Mobile Broadband Leader



Total 3G* mobile broadband subscribers expected to be ~2.2B by 2014 (of total 2.8B 3G)

HSPA+ is The New Baseline

HSPA+ IS THE NEW BASELINE

123

LAUNCHES

173

NETWORK COMMITMENTS

OPERATORS QUICKLY MOVING TO Dual-Carrier

23

LAUNCHES

Aug 2010

FIRST LAUNCH

HSPA+ DEVICES ACROSS ALL SEGMENTS

92

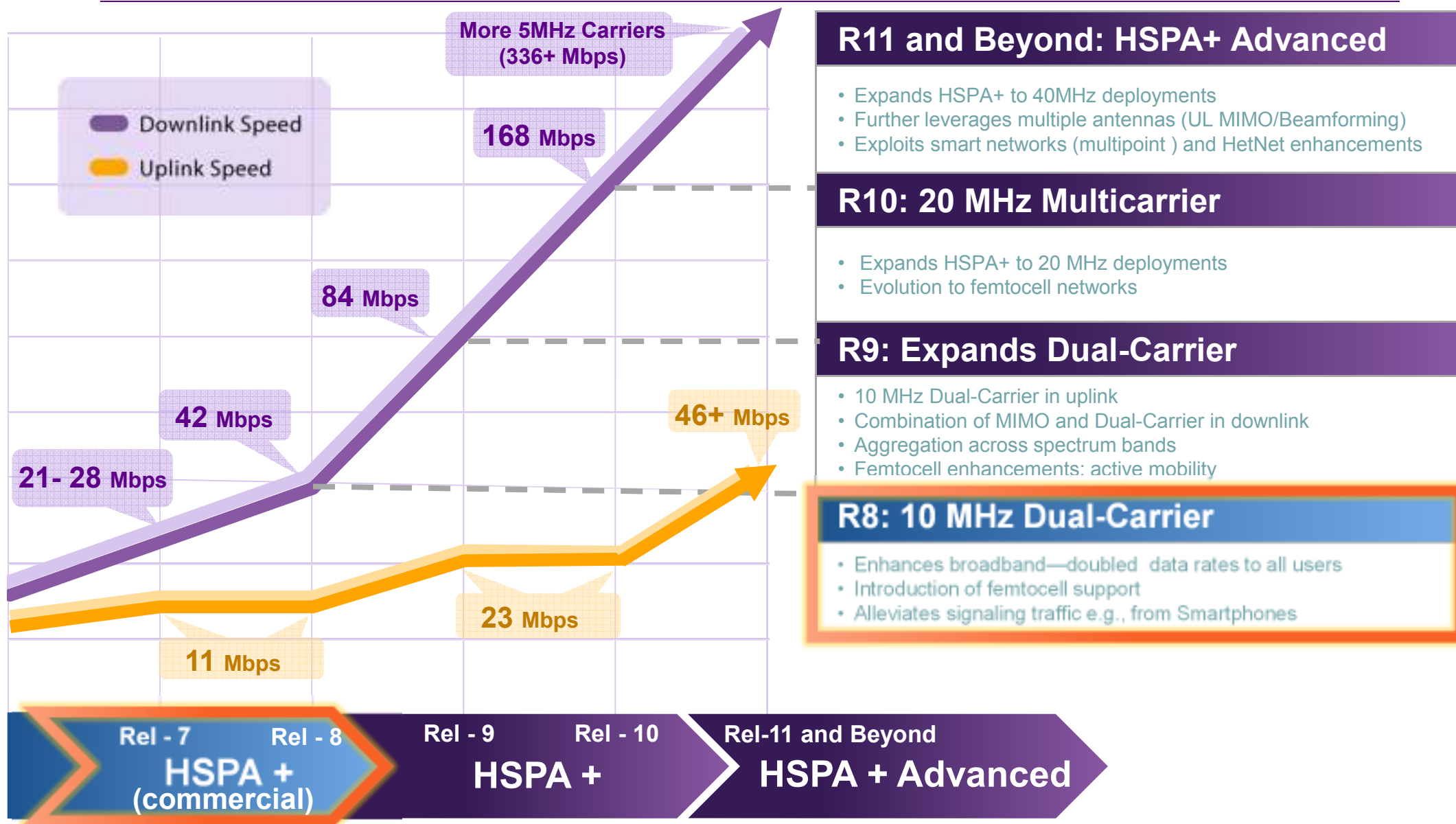
DEVICES

20

VENDORS

All Indian 3G Operators Have Already Deployed HSPA+ Networks

HSPA+ Has A Strong Evolution Path



Created 01/21/11

Notes: R8 reaches 42 Mbps by combining 2x2 MIMO and HOM (64QAM) in 5 MHz, or by utilizing HOM (64QAM) and multicarrier in 10 MHz. R9 combines multicarrier and MIMO in 10 MHz to reach 84 Mbps peak rates. Uplink multicarrier doubles the uplink peak data rate to 23 Mbps in 10 MHz in R9. R10 expands multicarrier to 20 MHz to reach 168 Mbps. R11 expands multicarrier to 40MHz to reach

HSPA+ Enhances User Experience



- More responsive user experience
 - 50% reduction in call setup¹
 - 50% reduction in transitions time between inactive and connected states²
- Better 'always-on' experience
 - User can stay longer in connected state without compromising battery life (CPC)³
- Higher peak and user data rates
- More Enhancements in R8 and beyond
 - Further alleviates signaling load and extends battery life

¹Paging messages sent over HSDPA channels in CELL_PCH state. ²Up to 50% reduced time over the air (from PCH to CELL_FACH/DCH state) compared to R6 with Enhanced CELL_FACH/PCH. ³Users can stay in connected state longer without compromising battery life and experience faster state transitions thanks to CPC (DTX and DRX).



QUALCOMM



3G And LTE



LTE Has Strong Commitments

LTE MULTIMODE LAUNCHED

17

LAUNCHES

208

NETWORK COMMITMENTS

LTE TDD GAINING MOMENTUM

>15

TRIALS

NOV 2010

QUALCOMM MOBILITY FIELD TRIAL

GROWING DEVICE ECOSYSTEM

>98

DEVICES

>12+

VENDORS

LTE TDD: The Global Solution for Unpaired Spectrum

L
T
E

Complements 3G to Boost Data Capacity

3G provides ubiquitous data, voice and global roaming

T
D
D

Seamless 3G Interoperability from Day One

Leverages LTE FDD and Huge 3G Ecosystem

Common TDD/FDD standard and design ensures economy of scale

Qualcomm: Common FDD/TDD chipset platform

Multimode chipsets supports LTE FDD & TDD with 3G and its evolution

3G and LTE: Working Hand in Hand



Industry's first LTE multimode solutions

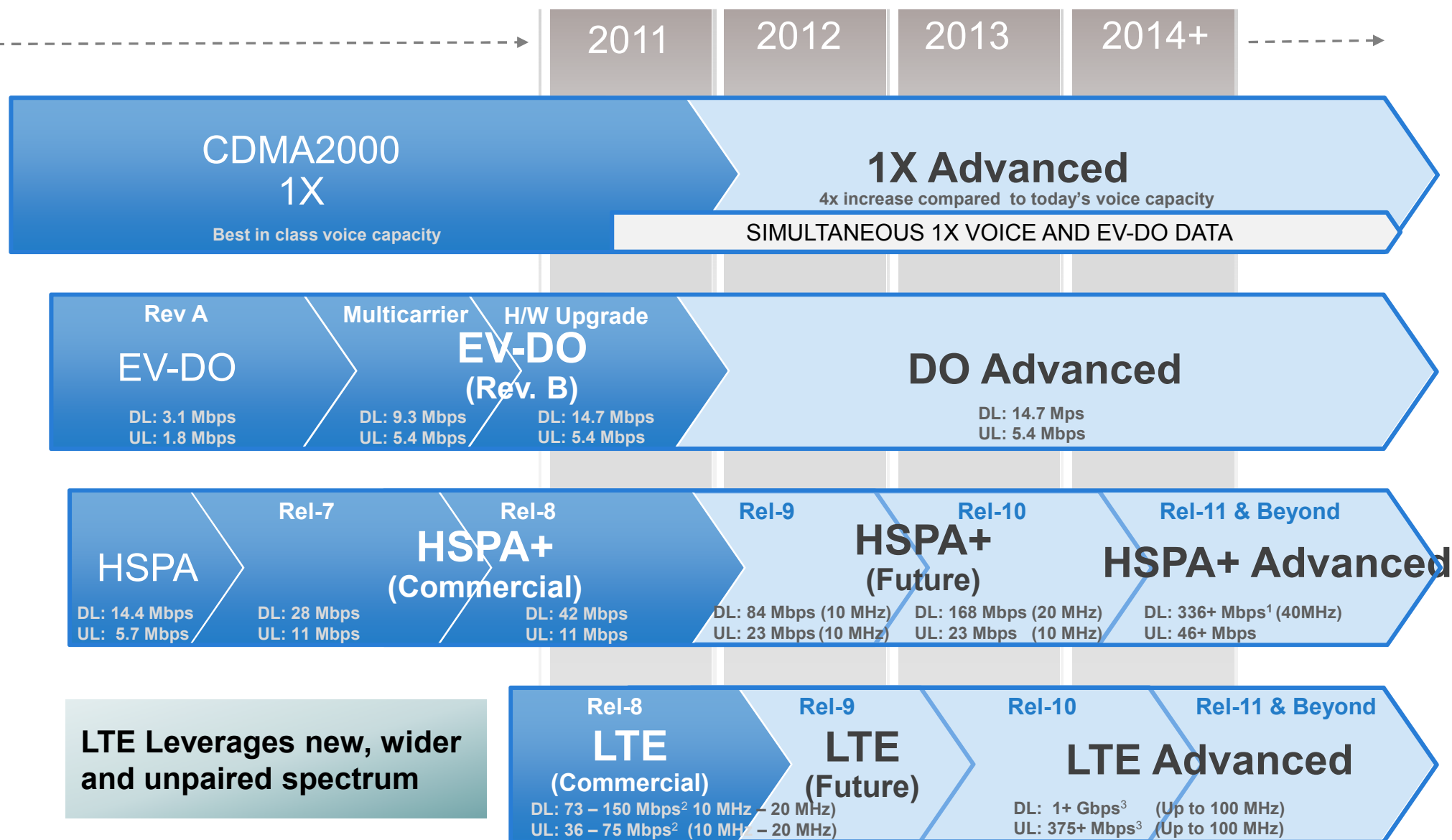
- LTE leverages new, wider spectrum to boost data capacity
- WCDMA/HSPA+ provides ubiquitous data and voice
 - Provides global broadband experience in global bands (900/2100 + 850/1900)
 - LTE deployed across a fragmented set of bands and in a fragmented set of scenarios.
- Seamless service continuity from day one with multimode devices

LTE (*FDD or TDD*)

HSPA+ Coverage

HSPA+ ensures similar user experience outside the LTE coverage

Qualcomm is a Leader in 3G and 4G



■ Commercial

Note: Estimated commercial dates.

¹R11 expands multicarrier to 40 MHz to reach up to 336 Mbps, ²Peak rates for 10 and 20 MHz FDD using 2x2 MIMO, standard supports 4x4 MIMO enabling peak rates of 300 Mbps. Peak data rates takes overhead into account, per standards 172 Mbps is achievable in 20 Mhz. ³Peak rates can exceed 300 Mbps by aggregating multiple 20 MHz carriers planned for LTE Advanced (LTE Rel-10). Peak data rate can exceed 1 Gbps using 4x4

Created 02/08/2011

Standardized, Seamless 3G Interoperability Supported from Day One



- LTE FDD/TDD Standardized in 2009¹
- Optimized 3G Interoperability
 - Both with WCDMA/HSPA+ and CDMA2000 1X/EV-DO
- Seamless voice support—3G fallback
 - Circuit Switched FallBack (CSFB) to WCDMA, 1X or GSM to support voice and emergency services

- Leverages same core network as LTE FDD
 - Shares most of FDD design and standard
 - Inherent seamless interoperability with LTE FDD
 - UMTS core network components may be upgradeable to support EPC functionality
- LTE continues on 3G's strong track record of mobility, interoperability and high spectral efficiency

**Common LTE
Core Network
(EPC)**

**Combined
FDD/TDD LTE
(and 3G)**

LTE FDD

LTE TDD

¹The LTE air interface 3GPP publication was 12/2007, but the core network (EPC) was published mid 2008. LTE R8 ASN.1 was frozen in March 2009 (A stable ASN.1 code is required for commercial implementation of the standard).

3G Operators Committed to Combined 3G and LTE Strategy

3G adds ~ 3 million approximately every 4 days¹

Mobile WiMAX is approaching 13 million subscribers globally since its existence²

160

3G Operators

200
Million

3G Subs

2005

665

3G Operators

>1
Billion

3G Subs

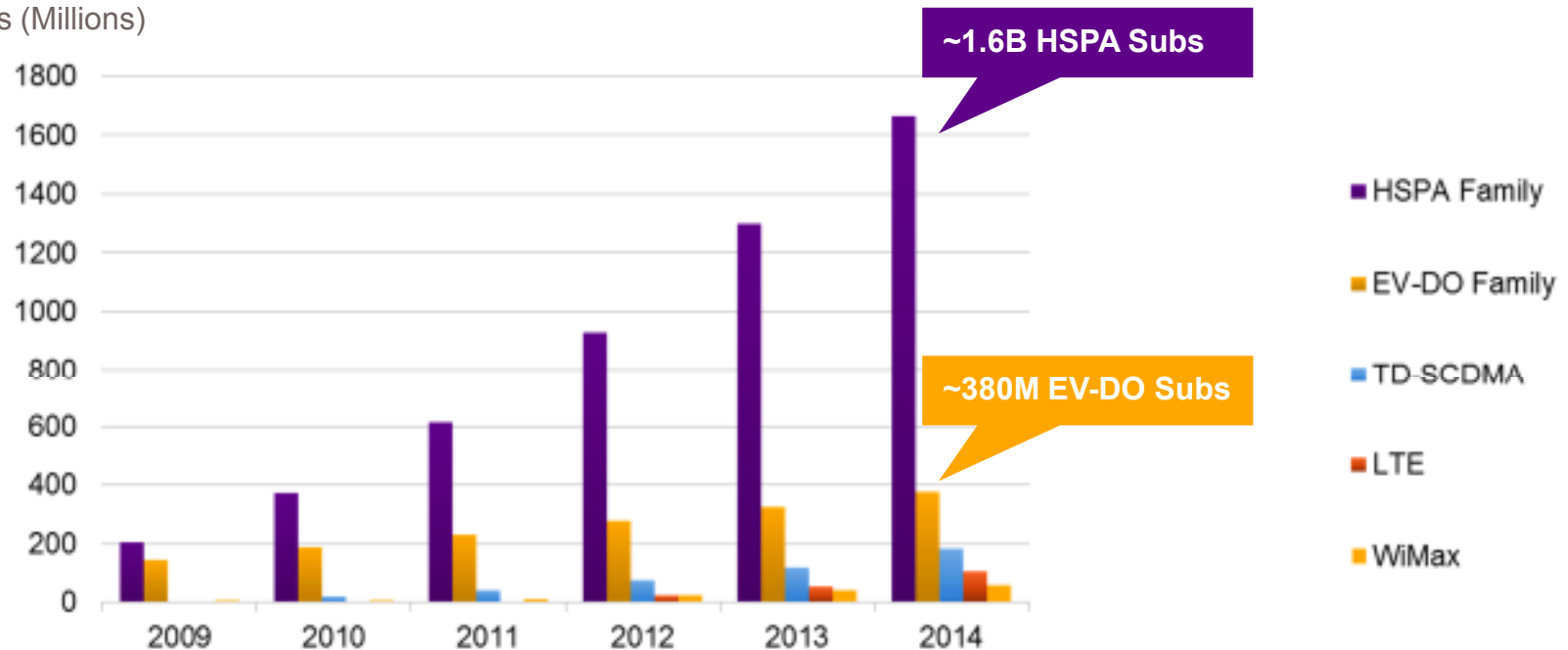
2010³

Sources: ¹3G - Wireless Intelligence, as of Q2 '10. ²3G WiMAX - Maravedis, as of Q1 '11 ³Wireless Intelligence estimates as of Jul 19 for the quarter ending Jun 30, 2010, GSMA and CDG, Jul 2010 ⁴Global Mobile Suppliers Association (GSA) Aug 26, 2010

LTE Leverages Huge 3G Ecosystem

- The 3G ecosystem is committed to LTE and multimode devices
 - 3G Operators committed to combined 3G and LTE Strategy
- LTE leverages 3G's scale to provide similar access to devices
 - More than 4900 3G devices by ~235 vendors (Source: CDG and GSA as of July 2010)
 - ~840 HSPA devices launched in past 9 months—48% growth (Source: GSA July 2010)

Subscribers (Millions)



Source: 3G subs – Wireless Intelligence (Jul-10), LTE – Avg. of ABI (Jun-10) and Yankee (Mar-10) and WiMax – Avg. of ABI (Mar-10) and Informa (Jun-10)

Note: * 3G includes EV-DO family, HSPA family and TD-SCDMA

LTE TDD Excellent for Hot-Spot Expansions

- Existing networks can leverage LTE TDD for targeted capacity expansions
 - TDD spectrum typical available at higher frequency bands optimal for capacity expansion¹
 - Excellent indoor complement for small nodes—does not interfere with FDD network
- New LTE TDD networks—plan for small nodes from day one
 - Mix of LTE TDD hot spots (picocells, femtocells) with LTE TDD macro coverage

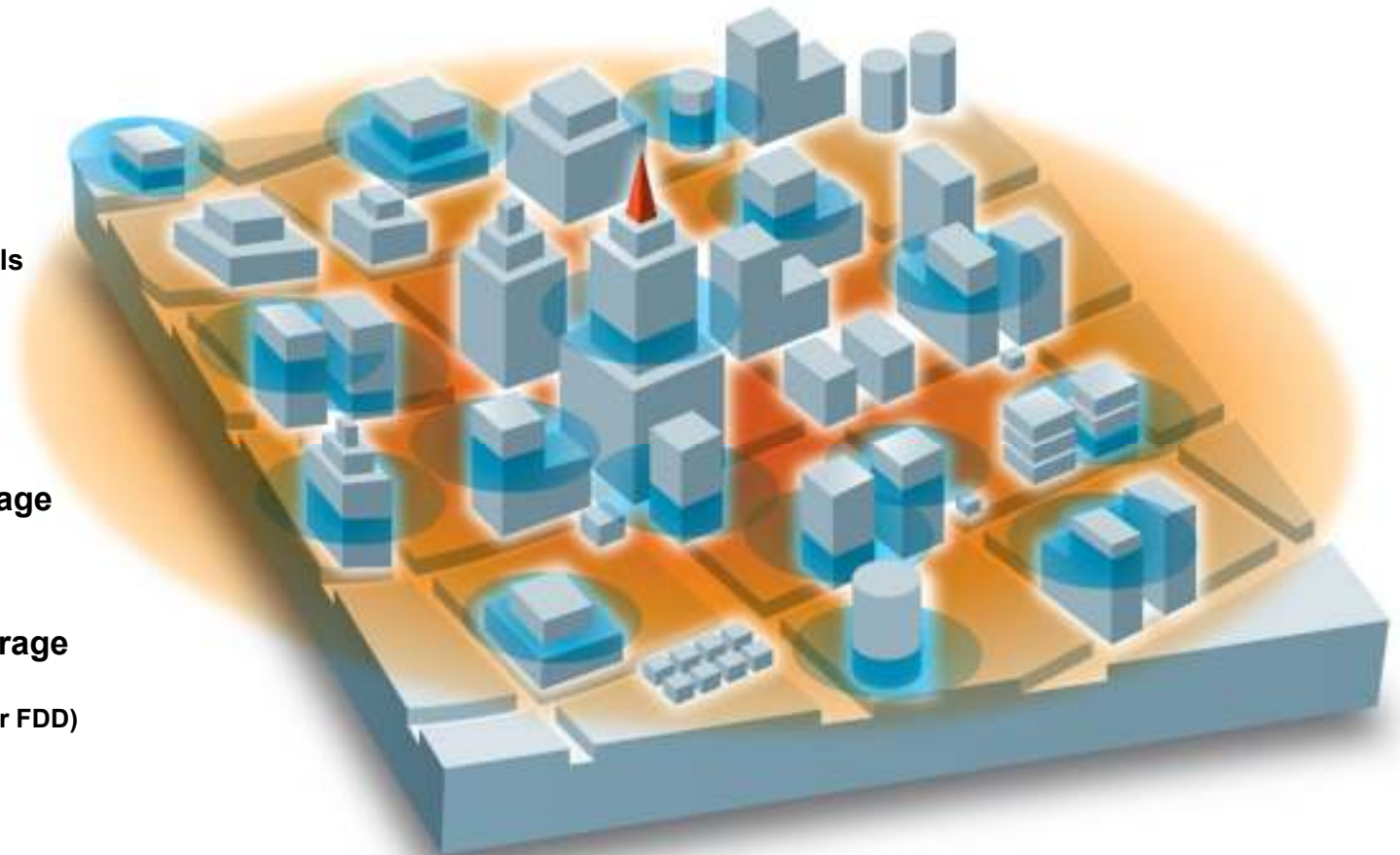
Capacity boost

LTE TDD Hot-spots
E.g. Micro, Pico and Femtocells
(2.3 GHz and 2.5/2.6 GHz)

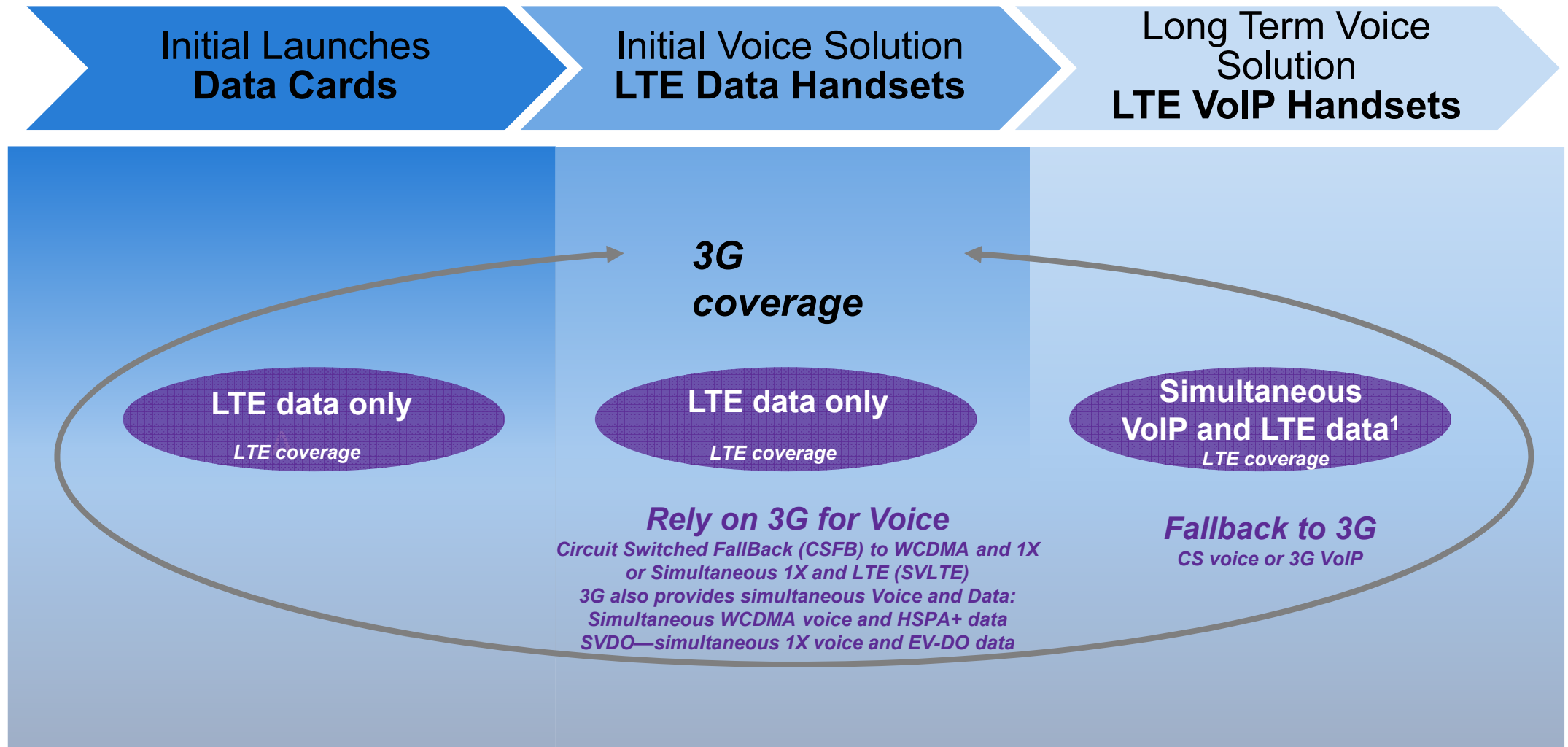
Wide Area Coverage

3G FDD Wide Area Coverage
HSPA+ and EV-DO Rev. B
(e.g. 800/900 MHz and 2.1 GHz)

LTE FDD Wide Area Coverage
(Or LTE TDD)
(e.g. digital dividend spectrum for FDD)

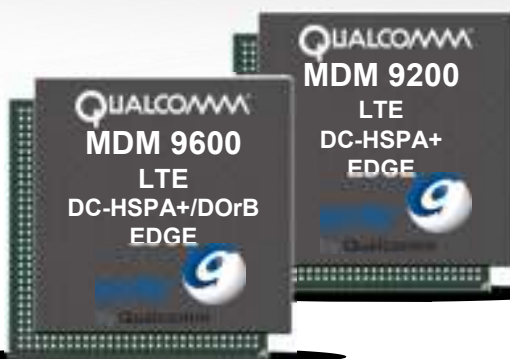


LTE Voice Through Fallback to 3G



Common LTE FDD & TDD Chipset Platform

Modems & Data Cards



- 50+ designs by 25+ OEMs
- Commercial 4Q 2010
- 100 Mbps DL/50 Mbps UL

Smartphones & Tablets



- Dual-Core CPU (28nm)
- Superior graphics & multimedia
- Integrated connectivity (WLAN, GPS, Bluetooth, FM)
- MSM8960 launches in 2012
- Handset & tablet launches in 2011 based on (MDM9x00+MSM)

Industry's First LTE/3G Multimode Chipsets

Worldwide LTE TDD Trials in 2010

Worldwide LTE TDD trials

- India BWA 2.3 GHz spectrum for LTE TDD
 - Qualcomm and Ericsson demonstrates LTE TDD mobility in India November 30th 2010
 - Reliance committed to LTE TDD
 - Qualcomm won one 20 MHz slot in key telecom circles for LTE TDD
- China Mobile showcased large-scale LTE TDD trial at the World Expo in 2010
 - China Mobile to establish three separate trial networks in 2010
 - China Mobile is also partnering to establish trial networks overseas, including Taiwan
- Clearwire (USA) conducted LTE trials in 2010 (FDD and TDD)
- Softbank Mobile in Japan is reported to consider LTE TDD
- LTE TDD testing in Ireland
 - With the authorization of regulator ComReg under its trial and test license program

Growing LTE TDD Eco-System

- All major Infrastructure vendors support LTE TDD
 - Examples are Alcatel-Lucent, Alvarion, Ericsson, Huawei, Motorola, Nokia Siemens Networks and ZTE
 - Typically common LTE FDD and TDD Infrastructure products
- Chipset vendors committed to LTE TDD chipsets in 2.3/2.5 GHz
 - Qualcomm, Altair, Sequans, Innofidei, Wavesat, Beceem, Runcom LG, Huawei, Samsung, ST-Ericsson (Source: GSA, Signals Research Group, August 2010)

Summary: LTE TDD is The Global Solution for Unpaired Spectrum

L
T
E

T
D
D

Complements 3G to Boost Data Capacity

3G provides ubiquitous data coverage, voice services and global roaming

Seamless 3G Interoperability from Day One

LTE continues on 3G's strong track record of mobility and interoperability

Leverages LTE FDD and Huge 3G Ecosystem

Common TDD/FDD standard and design ensures economy of scale

Qualcomm: Common FDD/TDD chipset platform

Multimode chipsets supports LTE FDD & TDD with 3G and its evolution



> Thank You

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



**WHOLESALE
APPLICATIONS
COMMUNITY**

Pang Chiang, Director,
Business Development, WAC



**Operator outreach
May 2011**

WAC

wholesale applications community

Who is WAC?

WAC is a not-for-profit organisation representing 73 members including 27 operators worldwide

WAC provides platform to access more than **3 billion** potential customers

Operators

Americas



Europe, Middle East & Africa



Asia Pacific



Selected technology and OEM members

Technology and OEM members



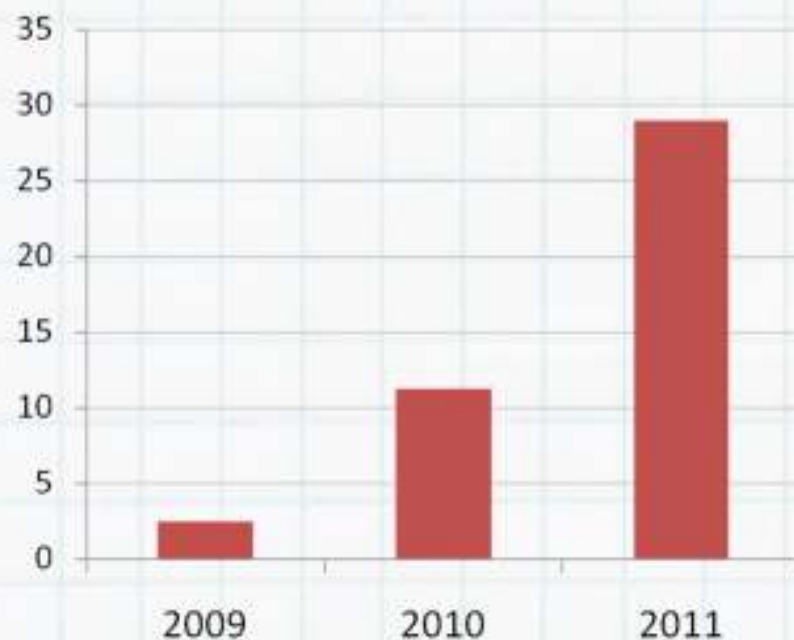
WAC

Why do we bother about apps?

Apps are growing exponentially surpassing 10bn downloads and \$5Bn revenue in 2010

Cumulative apps download expected to reach around 30bn by end of this year

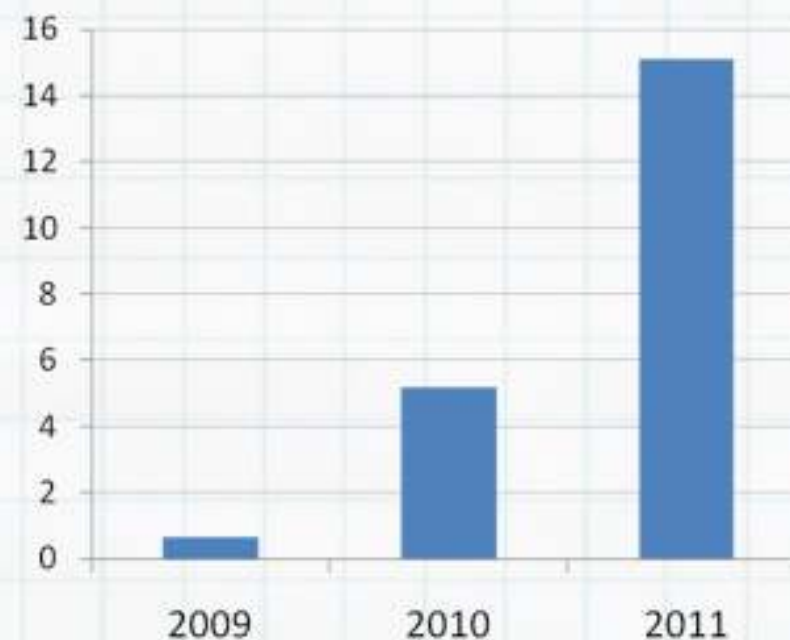
Cumulative number of apps download bn, 2009-11



Source: Gartner, Ovum

Significant multi-billion dollars revenues are expected from apps

Cumulative revenue from app store \$bn, 2009-11



Source: Gartner, Ovum

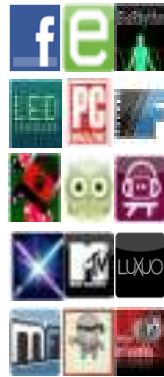
WAC enables app developers and app stores to interact through a single point for distribution and settlement

1

Distribution of apps

- To get apps to **huge marketplace – multiple app stores**
- Opportunity to write an application once which runs on **many different devices and OSes**
- Simplify operator engagement
 - Make it easy to join and submit apps
 - Single interface

Content developer



WAC

Single distribution interface for both developers and app stores

Multiple app stores



Customers with different devices and OS



2

Settlement

- Fast and efficient at **settling payments – single point for many app stores**
- **Consolidated reporting across multiple app stores**

Content developer



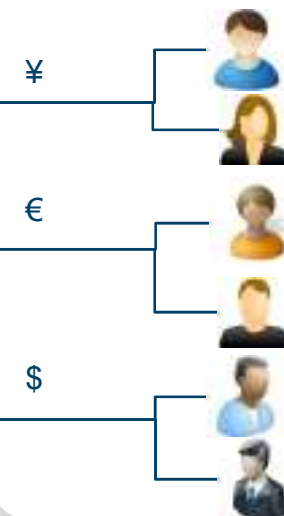
WAC

Single settlement interface for both developers and app stores

Multiple app stores



Global customers



WAC

WAC benefits developers and application stores

• For developers

- Opportunity to write an application which runs on many different devices
- To get apps to huge marketplace
- Simplify operator engagement
 - Make it easy to join and submit apps
 - Fast and efficient at settling payments – single point for many app stores
- Provide open, helpful and transparent environment

• For retail application stores

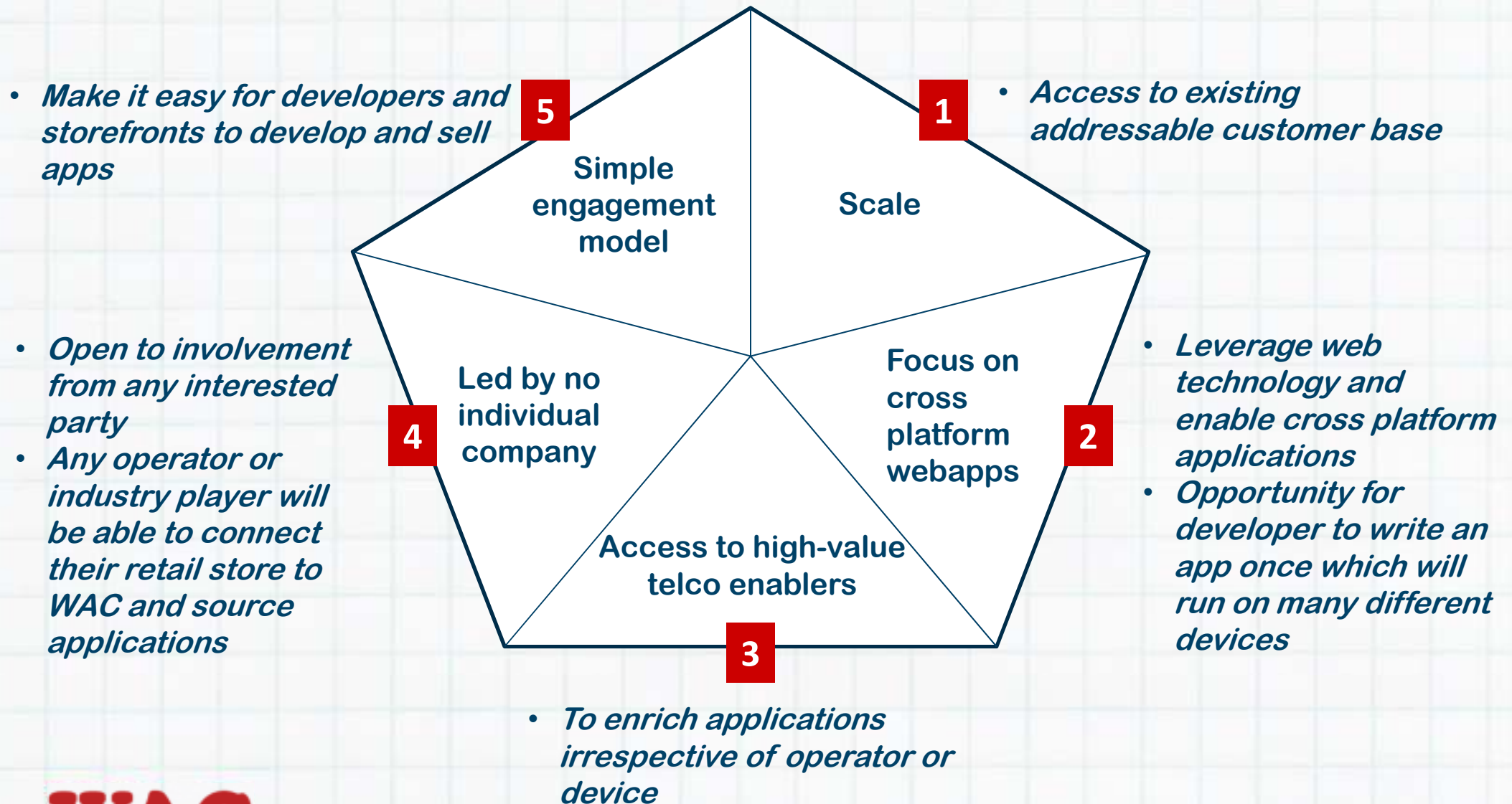
- Cost savings in bringing apps to market
- Provide access to the widest range of apps
- Stimulating more and better apps
- Driving the usage of apps across devices
- Efficient processes for integration and operations

WAC Business Model

- WAC is a not for profit organisation
- Revenue share set by retail application store
- Developer sets applications price and defines target operators

WAC

WAC unique selling points



Clear financial benefits from WAC membership

Direct Application Revenue

- Sell more apps in application stores
- Generate more 3rd party commissions and advertising from increased applications sales
- Monetise network APIs
- Create new business from enabling WAC on devices

Indirect revenue

- Attract and retain customers with a wider range of compelling apps
- Knowledge creation surrounding WAC technology
- Sell more data bundles/packages

Cost savings

- Share in the scale of WAC
- Share implementation costs amongst WAC membership – doing it alone costs much more
- Save on product development, integration, support...
- Save on device testing

WAC announced launch of devices and commercial stores at MWC 2011



WAC is hitting its committed timescales and demonstrating that cross-operator initiative can be successful!

WAC has connected with 8 operators, gained support from 5 device OEMs and made thousands of apps available

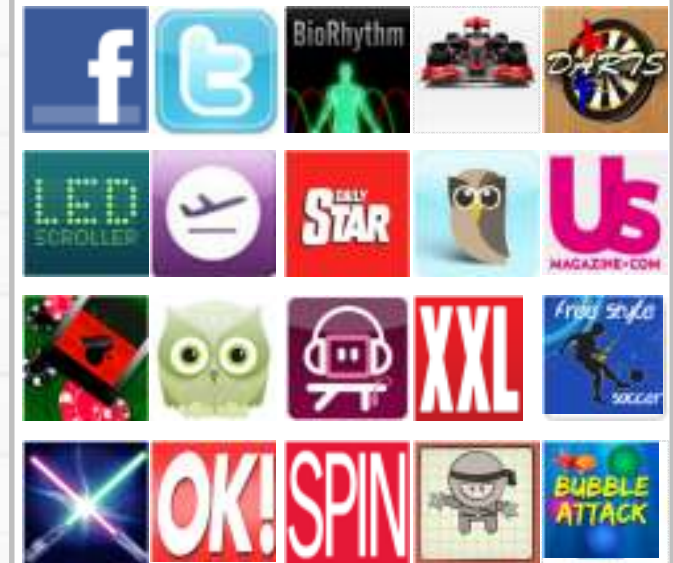
8 Operators Connected to WAC Platform



5 Supporting Device OEMs



Thousands of Applications



A further 8 operators are expected to launch during 2011

WAC plans to expose network APIs to enable more compelling apps later this year

1

WAC will expose unified network enablers through a single interface, for the benefit of both developers and customers

2

Leverage existing work including the GSMA OneAPI



3

- Priority network enablers:
 - **In-application billing:** allows the application to sell digital and virtual goods and charge to the customers mobile phone bill
 - **Identity / authentication:** enables simple user authentication from the consumers mobile phone profile

- Capabilities demonstrated in collaboration with FOX TV, producers of the hit TV series "Glee"
- Application will feature video content, music content and social networking capabilities



Why join WAC now?

Have control of apps that your customers will continually and increasingly use

Customers want to have more services

TV

Cameras/Photo

Music

Astrology

Bollywood

Cricket

...

How do customers access apps?

Pre-loaded

Download

What is the impact to mobile operators?

Do you have control over the choices presented to your customers?

Can you easily promote your preferred apps to your customers?

Can you determine the look and feel and user experience of your customers?

Do you control the up-sell and cross-sell through APIs?

WAC

Membership is open to all industry players

Governance and levels of membership

1 Board of Directors (*Operator positions now filled*)

2 Member (Operators)

- Operators are invited to join WAC as Members
- Entitled to fully participate in WAC working groups
- Members could launch WAC-enabled retail store
- Members annual fee: €150k

3 Sponsor (Non-Operators)

4 Associate (Non-Operators)

What next?

Joining is simple

- **Complete the WAC application form**
- **Sign and return to:**
WAC Ltd.
5th Floor
14-16 Westbourne Grove
W2 5RH
United Kingdom
- **For more information, please visit www.wacapps.net or**
- **Please do not hesitate to contact us:**
Pang Chiang
Director Business Development
Mobile: +44 7739 325461
Email: pang.chiang@wacapps.net



GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



Lunch and
networking

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



Deloitte.

PROMOTING THE UPTAKE OF DATA APPLICATIONS AND SERVICES

Hemant Joshi, Telecom Leader,
India

Addicted to connectivity
Perspectives on the
Indian mobile consumer,
2011

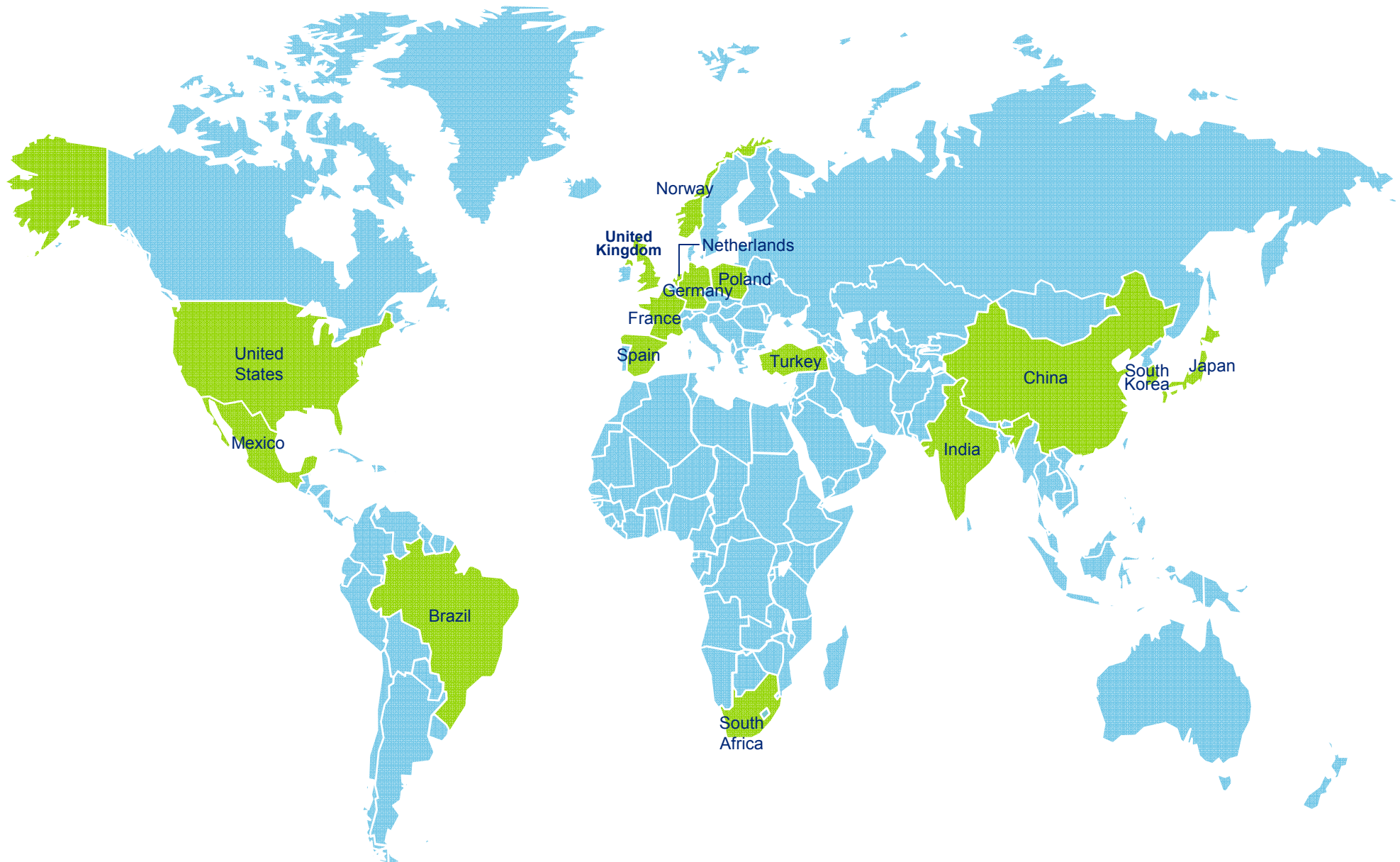
Hemant Joshi, Telecom Leader, India

May 23, 2011

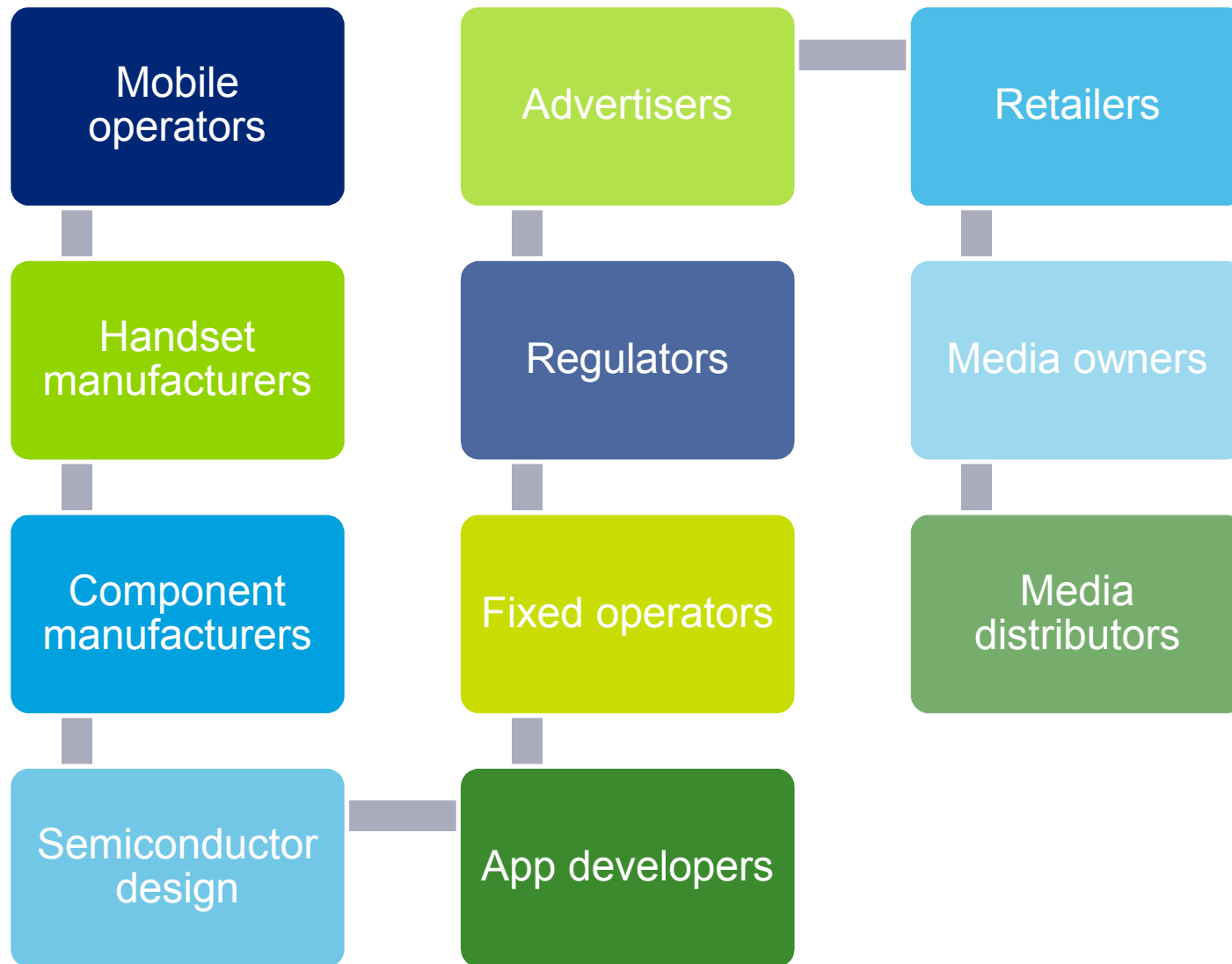


Deloitte's Global Mobile Consumer Survey, 2011

34,000 responses, 17 countries, 5 continents



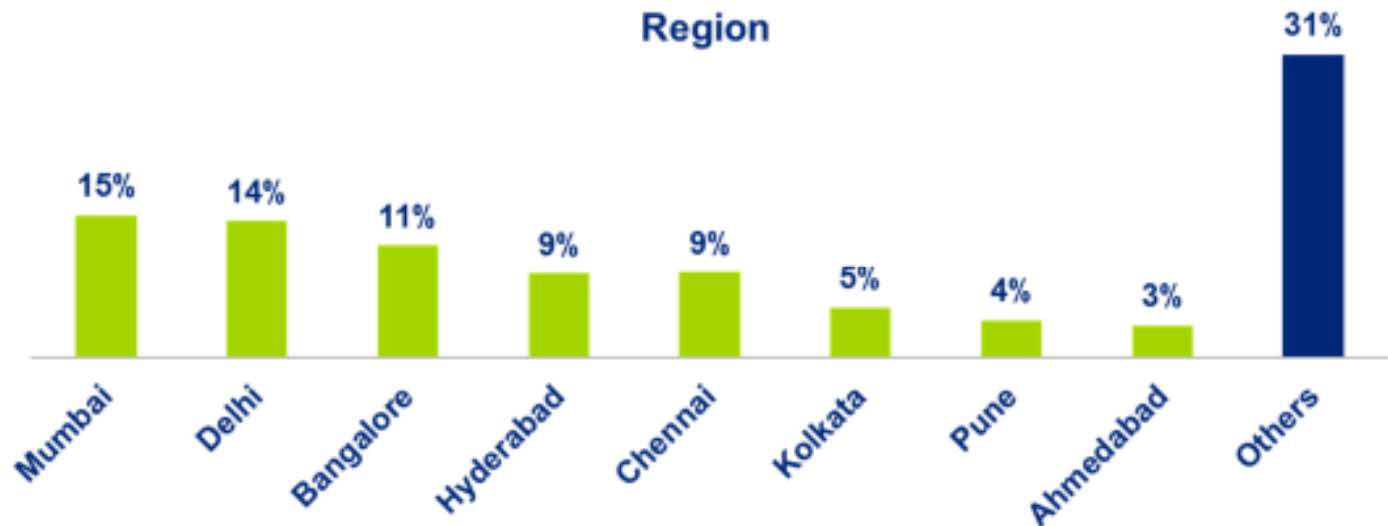
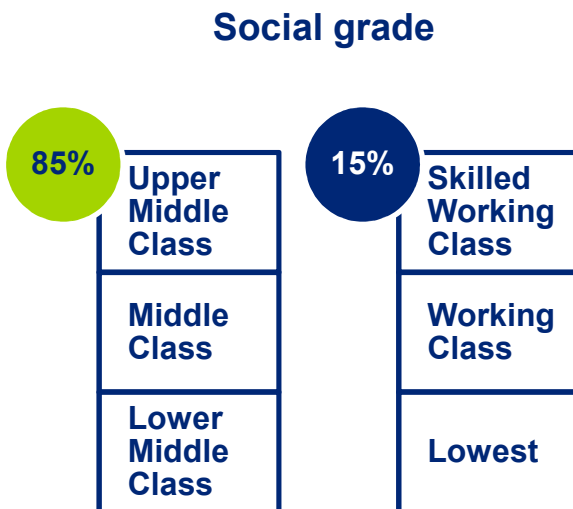
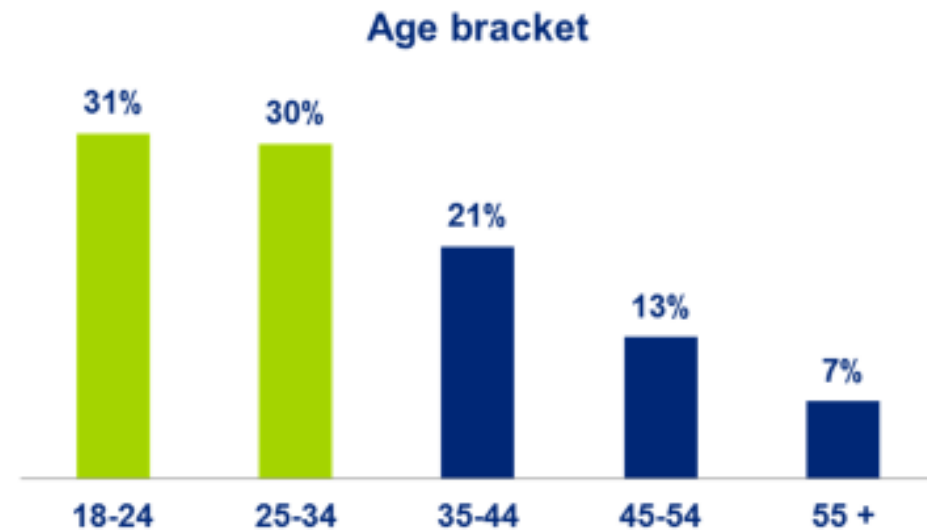
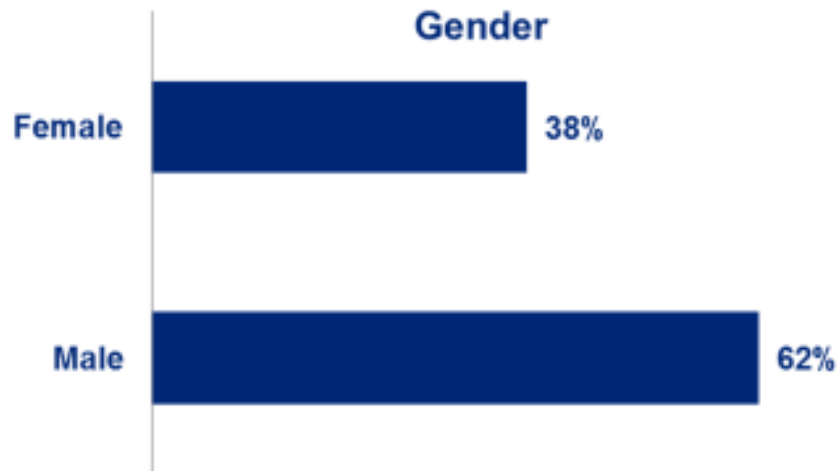
Deloitte's Global Mobile Consumer Survey, 2011: target audience



Deloitte's Global Mobile Consumer Survey, 2011: methodology

- Field work took place in January and February 2011.
- All research has been undertaken via online research, which results in a high concentration of urban professionals.
- The questions for this survey were written by Deloitte.
- The online research program was managed by Deloitte.
- In all, 2028 responses from India were included in the study.
- The question set for this survey was standard, except where information about the local market was specifically requested. In India, additional questions about characteristics specific to this market were asked, for example the adoption of dual SIM handsets.
- Questions pertaining to spend were all asked in local currency. Currency ranges were tailored to local purchasing power where appropriate.
- The scope of survey ranges from quantifying ownership of multiple mobile-enabled devices to a ranking of the most popular mobile internet applications.

Respondents profile



Unique features of telecom sector in India

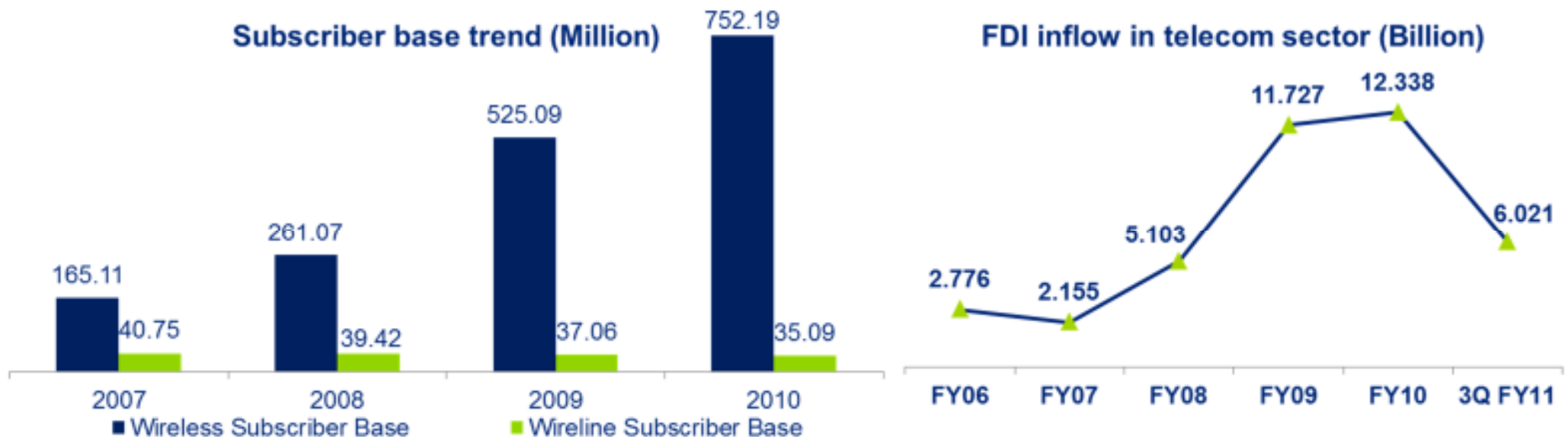
- Indian market is dominated by **prepaid users** with 96.6% share of total subscriber base.
- Prepaid ARPU declined to ` 88 in December 2010 while Postpaid ARPU increased to ` 572.
- **Multiple SIM card** phones, the fastest growing segment, is growing at nearly 100%.
- 6-7 new Indian handset manufacturers have captured about 12% market share in just a year.
- Telecom space faces intense competition among **15 operators** in 22 circles of India and hence is seeking consolidation.

 All India	All India (except Punjab, Gujarat, Rajasthan) 	  Together all India
AP, Bihar, Delhi, Haryana, Karnataka, Kerala, Kolkata, Maharashtra, Mumbai, Rajasthan, Tamil Nadu, West Bengal 	Bihar, HP, Orissa 	Mumbai 
AP, Bihar, Gujarat, Karnataka, Kerala, Kolkata, Maharashtra, Mumbai, Orissa, Tamil Nadu, UP, West Bengal 	Gujarat, Haryana, Kerala, Tamil Nadu & Mumbai 	Punjab 

Etisalat only soft launch

Length & breadth of telecom sector in India

- With 811 million wireless subscribers as on March 2011, Indian telecom industry has the highest growth rate in the world.
- The wireline subscriber base is continuously declining every quarter by about 4%.
- Teledensity of 157% in the urban markets vis-à-vis 33% in rural markets at the end of March 2011.
- The diversity in languages in India creates a large potential market for regional content.
- The cumulative flow of FDI in the sector during April 2000 and October 2010 was \$9,993 million.



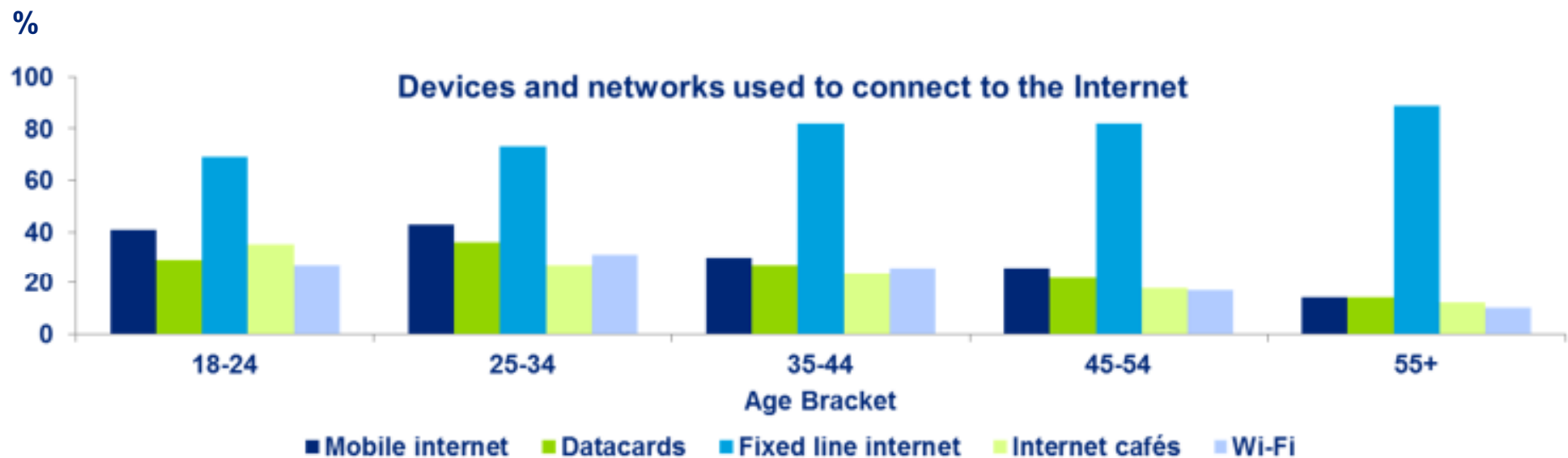
Source: TRAI

For few years now it is common place for an individual to have two mobile phones in cities: this is the principal factor for urban teledensity reaching in excess of 100%.

Mobile operators need to be more versatile and pragmatic when it comes to addressing mobile consumers' connectivity needs

In the face of convergence, people today use broad range of wireless and fixed line technologies to always stay connected.

Mobile internet and data cards are more popular among younger generation who constitute about 50% of the Indian population today.



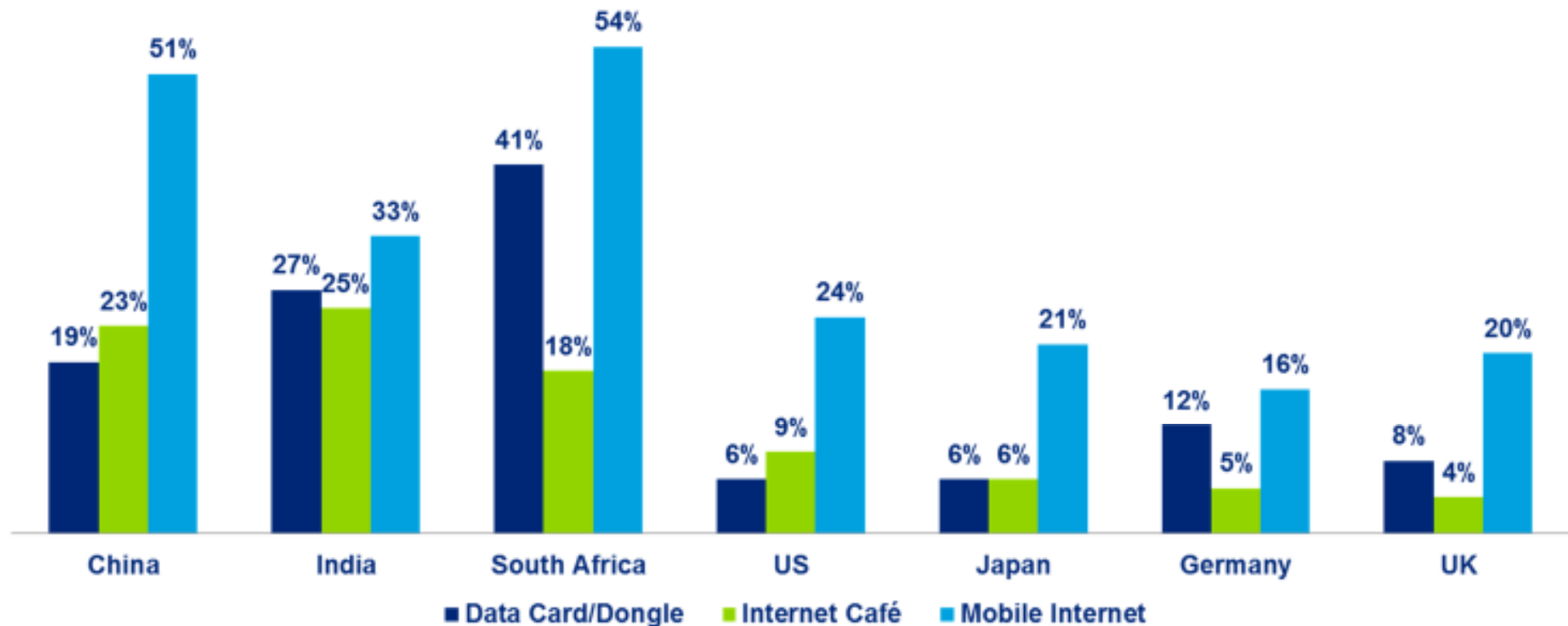
Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All respondents (2028)

While the computer and internet empowered urban India, it is the mobile which is bridging the digital divide and making it the perfect medium for delivering a variety of services and content to the common man through MVAS.

Diversity of devices driving internet connectivity

Difference in basic characteristics such as price, usability, power supply and operating conditions of the devices lead to different ways to access internet in the advanced (US, Japan, UK) and the emerging economies (India, China, SA).



Source: Deloitte Global Mobile Consumer Survey, 2011

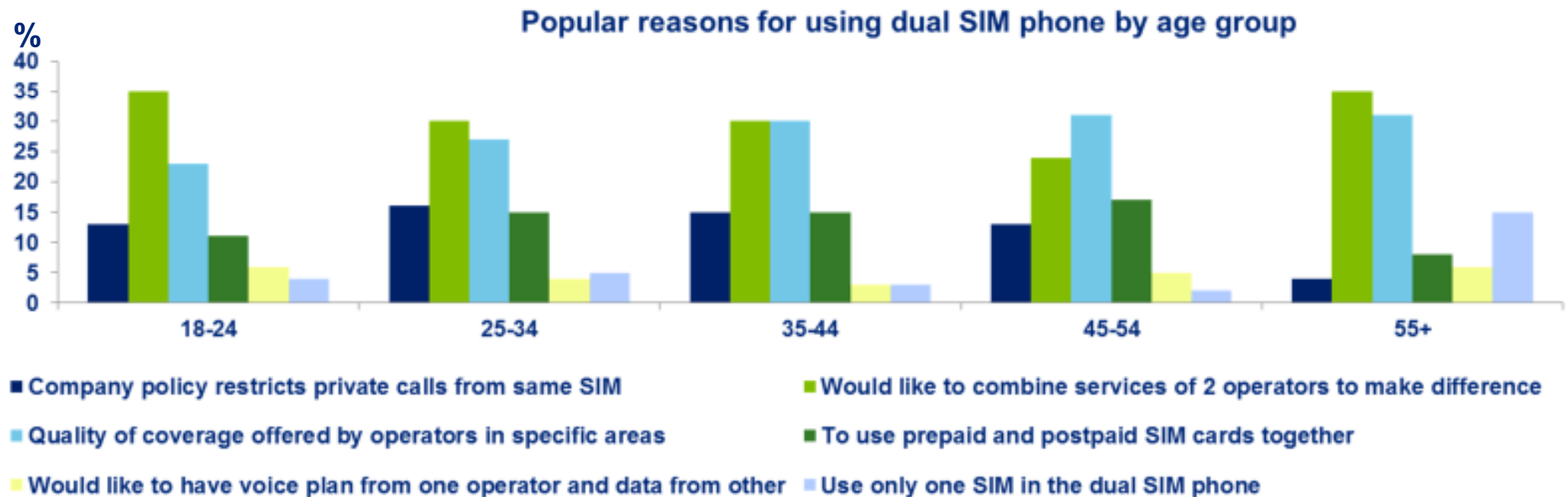
Base: All respondents in respective countries

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Focusing on ARPU means little in a market if the definition of a “user” is often in reality a subscription, rather than a consumer with multiple SIMs and numerous mobile devices.

Dual SIM: catering to people's multiple needs

Most of the respondents want two or more service providers in order to have different services from different operators.



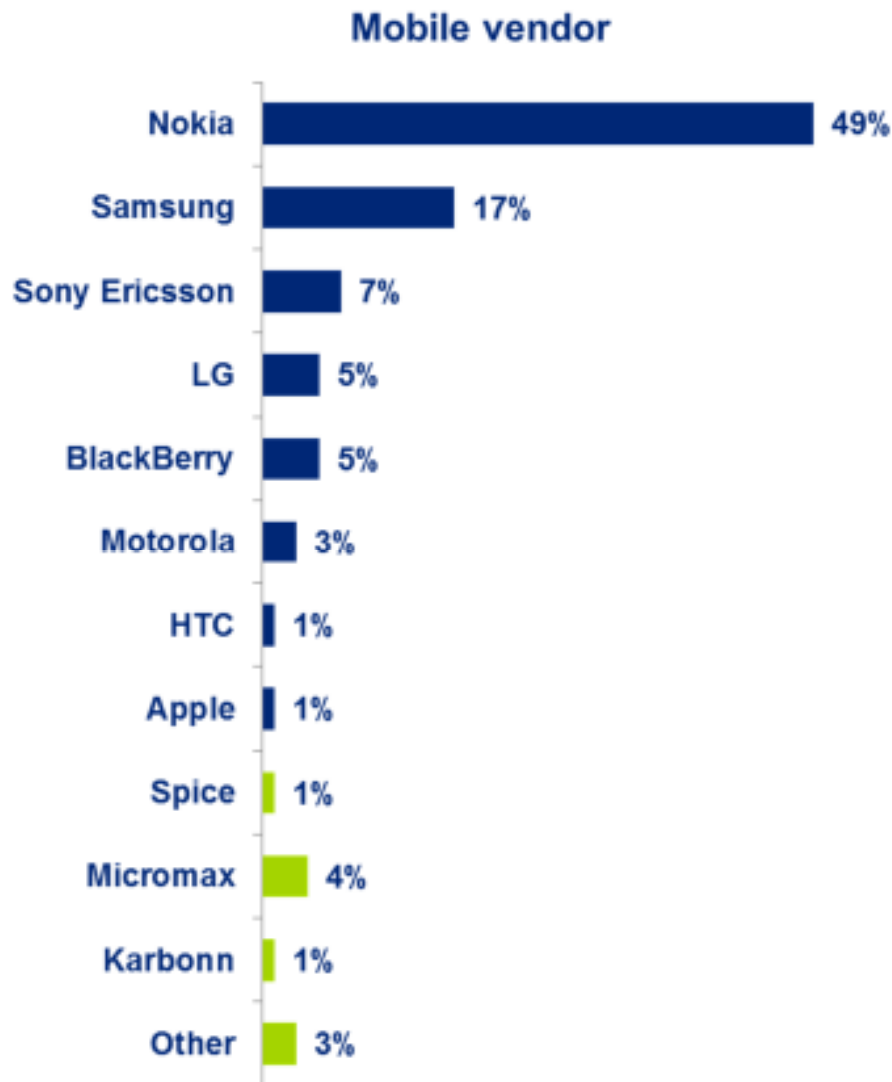
Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All respondents that have a dual SIM phone (1024)

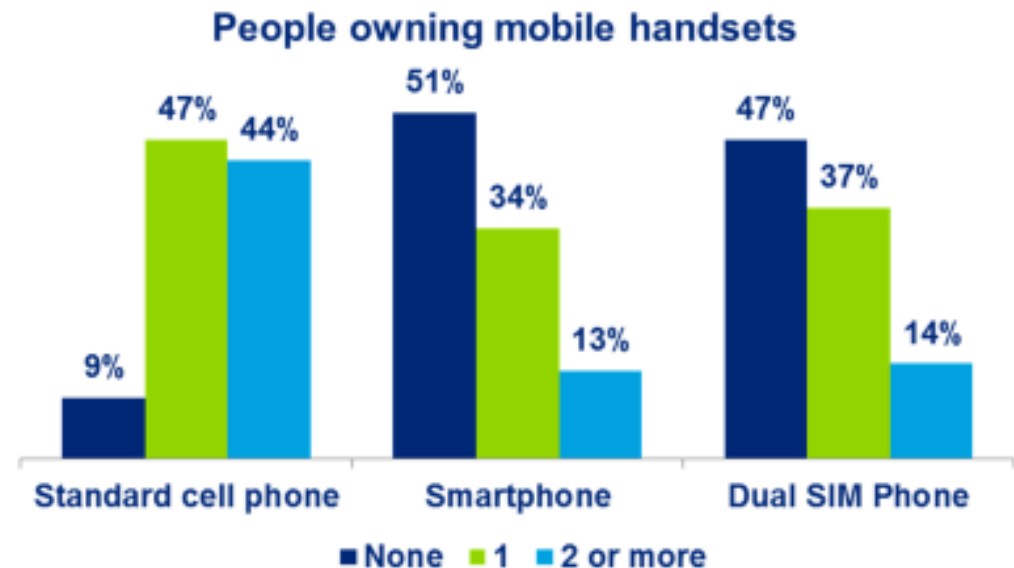
In rural India, benefits of using mobile range from mobility and convenience to easy access to customized content. Use of mobiles has created new opportunities to make a living, to be more productive and hence earn more, for migrants from rural areas to the cities.

Indian mobile phone vendors are welcome if mobile is reliable and of good quality

Falling prices of handsets and increasing competition from local vendors are forcing the global mobile phone manufacturers to differentiate through services like application stores.



Millions of living rooms now boast more phones than cushions



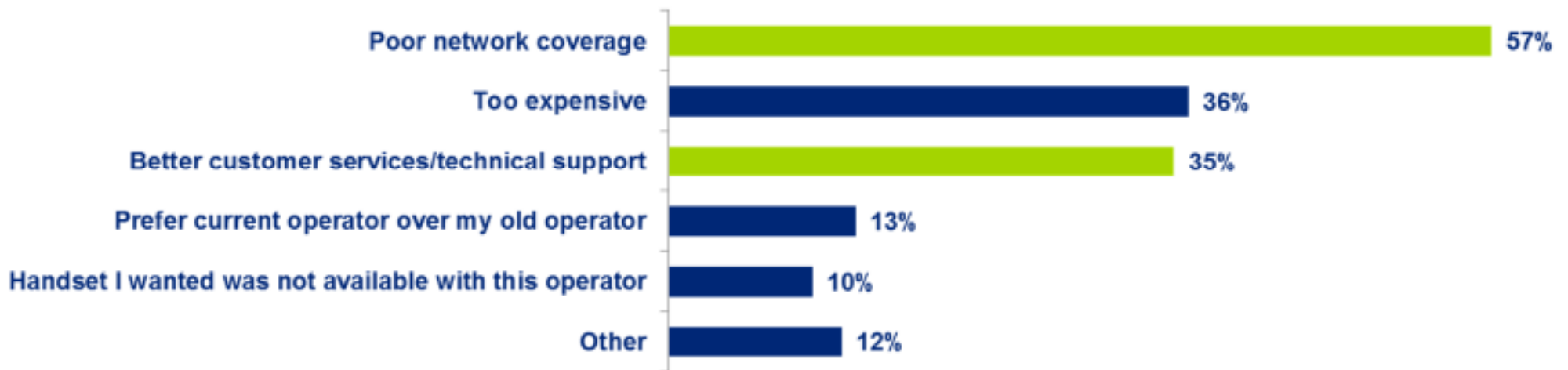
Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All that have a handset

Earlier mobile operators were judged mostly on their engineering prowess; today they need to tick that box, direct or via a third party, and also be a leading edge retailer

Increasing disposable incomes have boosted willingness to spend on services that bring value among the upwardly mobile citizens today, but network coverage and customer service are the uncompromising needs to stay always connected.

Common reasons for changing network operator



Source: Deloitte Global Mobile Consumer Survey, 2011

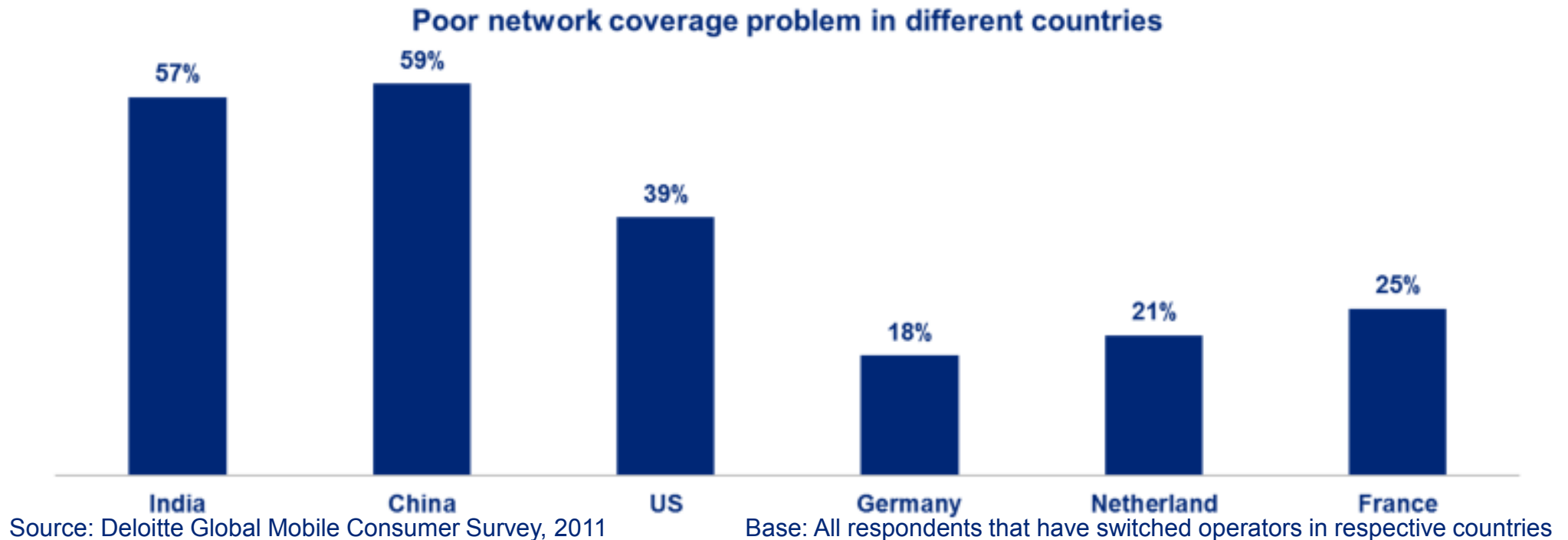
Base: All that have switched operators (1394)

Operators need support of industry players such as banks, educational institutions, healthcare providers, etc. to expand their services to semi-urban and rural areas.

Large countries struggling to have the last mile coverage

Network coverage problems are not limited to rural and isolated areas with some city-dwellers struggling to get good connections, but are also faced in the most developed of countries like US, the survey suggests.

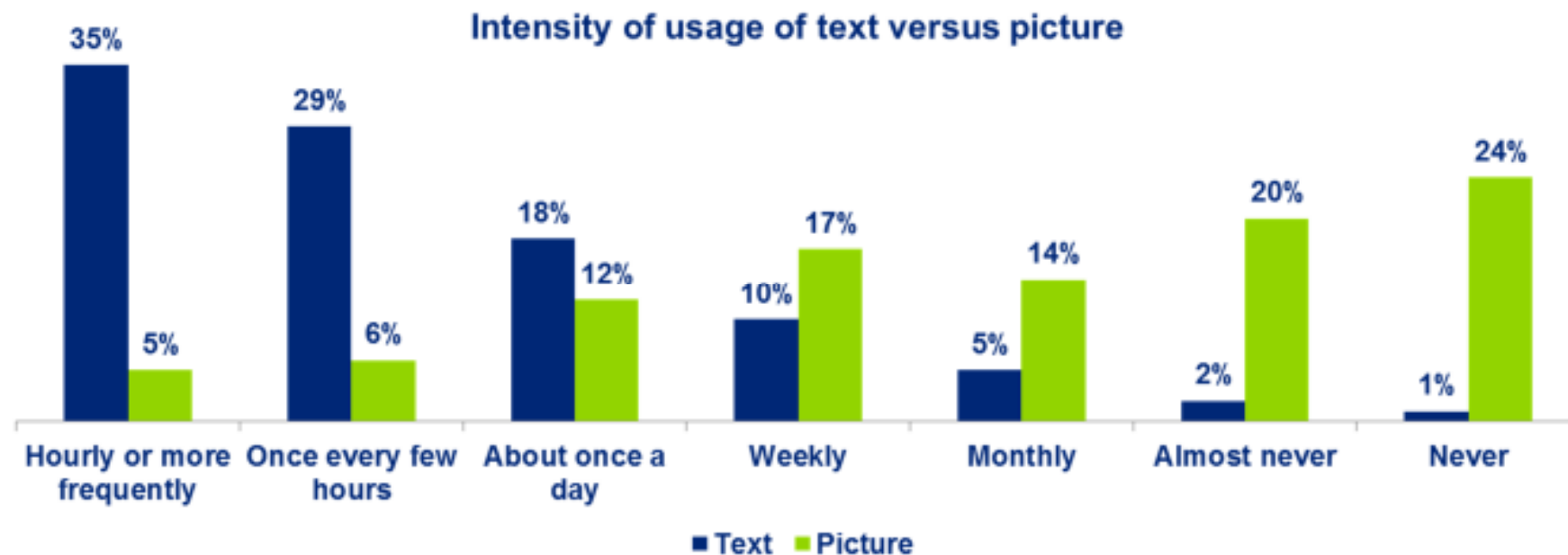
Network problems in different countries could be explained based on diverse factors such as geography, size, teledensity, telecom infrastructure, technology, frequency band...



SMS may serve as an entry point for other mobile data services

The frequency of usage of text messages remains high. The most enthusiastic users are the 18-24 year olds: a half claim they text every hour.

Text messaging is also relatively popular among those using their phone in roaming.



Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All that have a handset

Special handsets/software that supports SMS in Indian languages will be a breakthrough for rural subscribers.

SMS: An innovative content delivery mechanism

- SMS can be used as a tool to access the most important byte-sized information. e.g. short cricket clip, movie trailer, news clip, etc
- SMS can encourage to access additional video and audio information at reasonable price
- Operators can give access to customized and local regional content through SMS
- Location based services could be accessed by sending SMS
- Mobile data services can be used to assign new jobs to an employee on the move or to provide a service technician with detailed information on a customer's problem
- Integration of the mobile device into the supply chain
- Access to financial information in banks, insurance companies, etc is possible through SMS

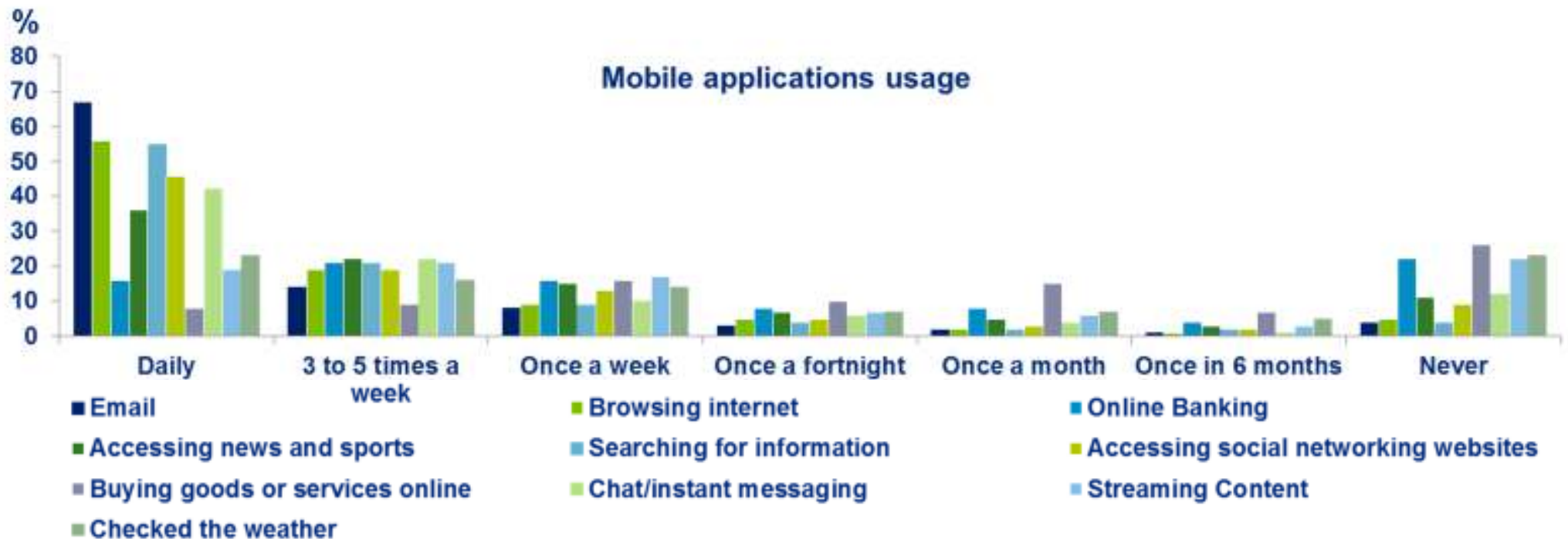


The first thing to check for in the morning is not whether they have received any SMS, but rather to check on updates to their social network.

Consumers will be inclined to choose a connectivity provider which best meet their evolving requirements, regardless of the underlying technology

87% respondents having smartphone access internet through their smartphone.

Mobiles have surpassed their primary role of voice communications and have become more of an infotainment device for mobile users.



Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All that have a smartphone or PDA and use the internet (617)

Some key non-entertainment services for the rural and urban segments will be in the areas of governance, commerce, health and education, with a need for customization according to the demographic segment.

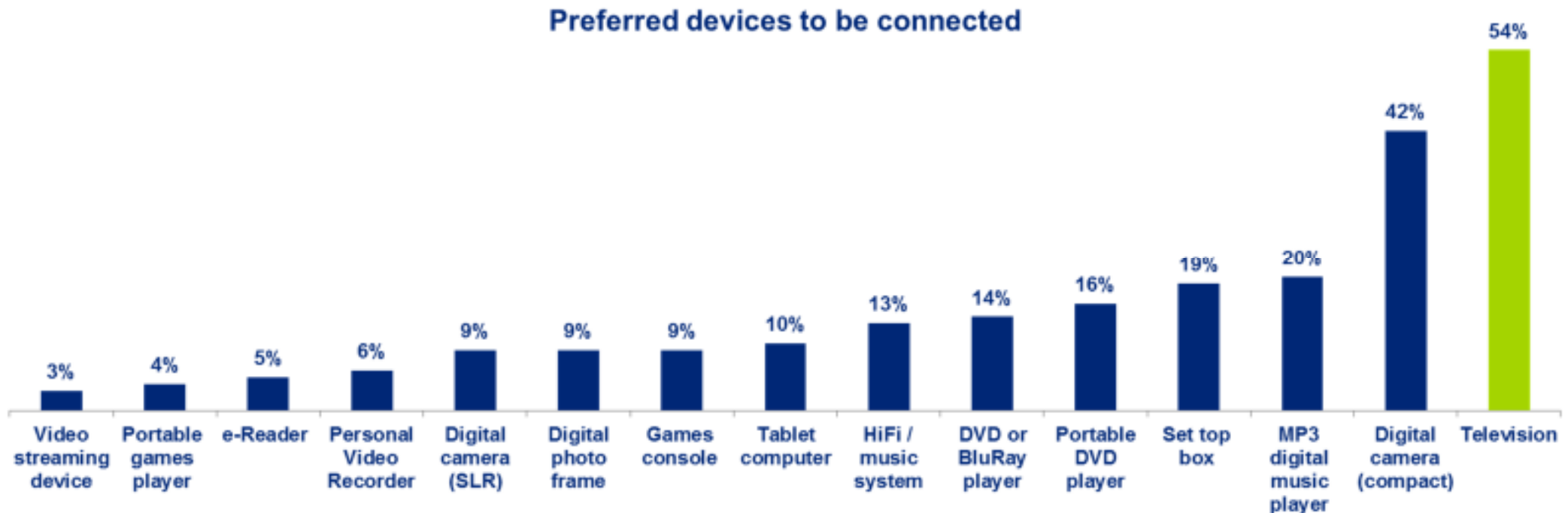
As devices become more specialised, operators' technical support may need to evolve to address diversifying needs.

Operators should consider at what point support becomes a premium service rather than a standard, inclusive element of a standard package.

Mobile industry: from niche B2B to most ubiquitous consumer technology

62% respondents are ready to pay a premium for connecting devices.

Urban India wishes to combine TV, which dominated their lives for longest period, with internet that empowered them.



Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All respondents that have devices (1996)

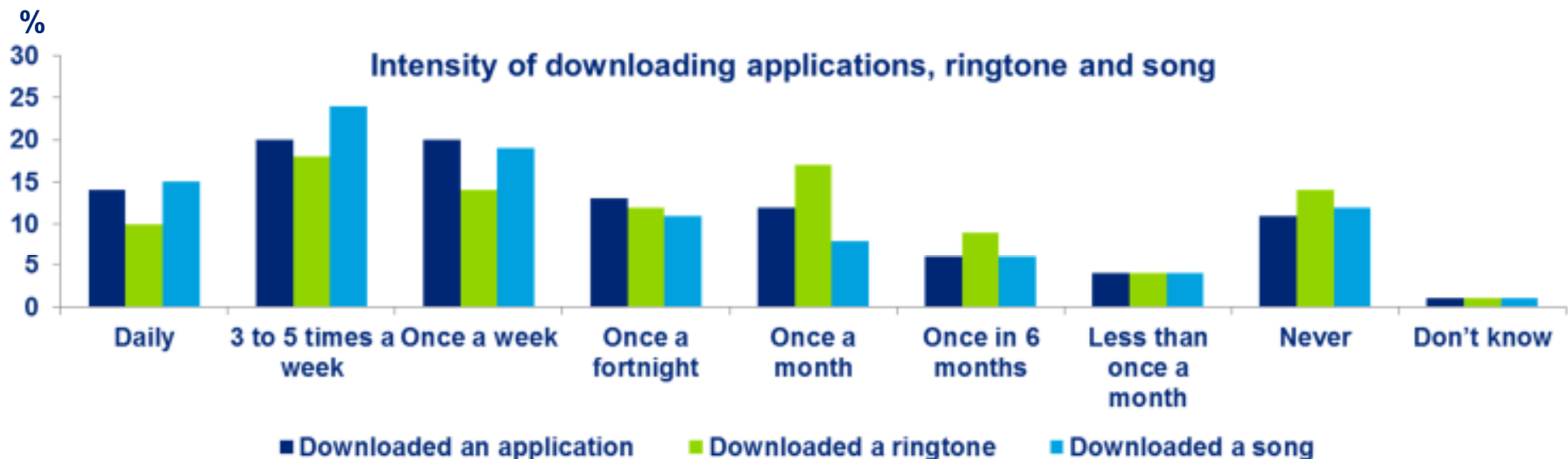
Heavily subsidized services to the rural segments could ensure mass reach and adoption.

Operators need to consider which networks are best placed, from technical and economic perspectives, to support each type of connected device.

MVAS: rejuvenating the highly competitive and pressurized telecom market

There is adequate consumer demand for MVAS, but operators need to understand the unique needs of Indian consumer and innovate and promote adoption.

The top four to five products such as game based applications, music or ringtone download continue to form close to 80% of VAS revenues, and have become easily replicable.



Source: Deloitte Global Mobile Consumer Survey, 2011

Base: All that have a smartphone or PDA and use the internet (617)

Operators should provide access to business-critical information in atleast 10 languages in rural areas which directly results in supporting the livelihood of the farmers, fishermen, etc.

3G preferred for connectivity over Wired and Wi-Fi

67% people would like to use 3G on prepaid plan.

The “must have” factors in 3G connection: faster speed and better network coverage

74% people would change operator if their current operator didn't provide 3G access

Most popular services people look from 3G access are:

- Watch live TV
- Access the high speed internet
- Receive/Send emails
- Download music tracks
- Downloadable video of entertainment, news, current affairs and sport content
- Make video call

Consumers are also looking for diverse vernacular content at affordable prices. This would enable proliferation of 3G services across the country especially rural India.

The seemingly unstoppable rise of smartphone is allowing the mobile adverts to become ever more visually compelling

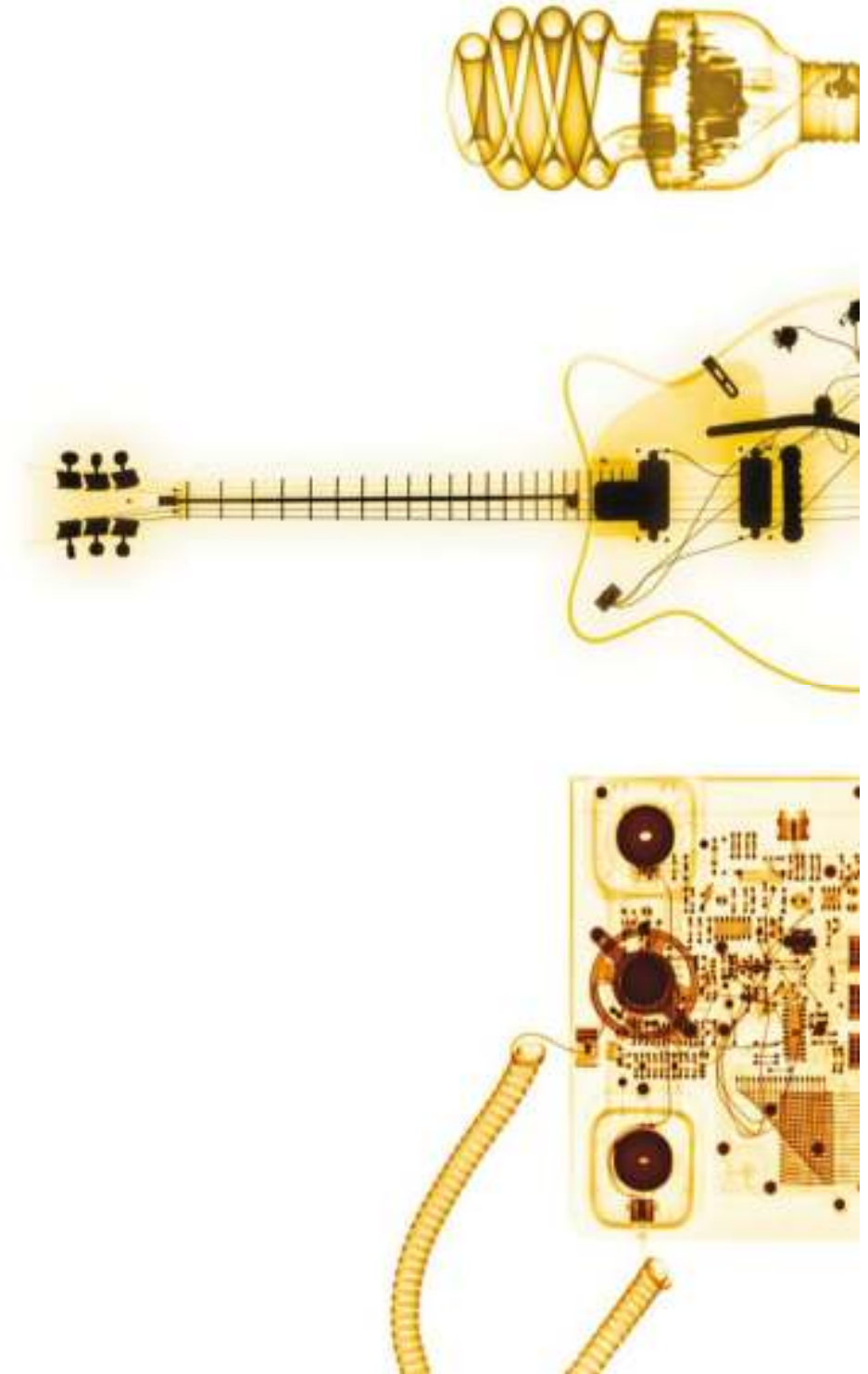
80% respondents received mobile adverts of which only 36% took action about advertisement received.

Mobile will give advertisers a platform to target consumers in a specific geographical area and demographic segment instead of mass message broadcasting.



Factors that will drive greater acceptance of mobile advertising among users

Telecommunications Predictions 2011 India Perspective



India: Interplay of industry to drive rural upliftment in 2011

- Telecom will move higher up the value chain and be a carrier of many services offered by various industries and will become a major facilitator in interplay of industries.
- The challenge of connecting a certain seller of services to a potential buyer (end user) directly is also the biggest opportunity for telecom and interplay between industries is the way forward.
- Although telecom enabled sub-industries will try to tap the rural segment, it will be the urban market that will see mass usage of various services such as entertainment, mobile gaming, mobile retailing and many other high end services in 2011.



3G in India: enabler for decongestion of network and improved VAS

- 3G spectrum would initially decongest the voice network; gradually provide revenue streams for high ARPU data services like mobile broadband, video calling, etc
- Operators are likely to use the 3G spectrum to future proof voice services and offer targeted high priced VAS services.
- Fierce price wars for 3G services are unlikely since all players have paid huge amount (Rs. 1040 billion) for 3G and BWA spectrum.
- Data roaming could provide good revenue stream and ensure reduction in CAPEX and OPEX cost as mobile data consumption is expected to double in this year.



Mobile broadband could catalyze integration of rural & urban India



- In 2011 the volume of data uploaded or downloaded from portable devices will grow at a much faster rate using mobile broadband networks.
- Just as wireless voice ultimately grew the voice market, mobile broadband is likely to grow the broadband market.
- In the face of convergence, mobile providers must think more broadly about the range of wireless and wireline technologies that people want to use, and then help their customers tap into the right mix.
- Post 3G launch mobile providers could benefit the most if mobile broadband users start to focus on applications that actually take advantage of its unique strengths – wide-area coverage, mobility and integrated security.

Wi-Fi complements cellular broadband for “data on the move”

Deloitte bottom line

Mobile providers:

- Should view Wi-Fi and cellular broadband as complementary,
- Should build out blended networks, or partner with Wi-Fi providers,
- Could benefit the most if cellular broadband use starts to focus on applications that take advantage of its unique strengths,
- Must think more broadly about the range of wireless and wireline technologies that people want to use, and help them tap into the right mix.

IT managers:

- Can help their companies keep costs in check by making it as easy as possible for users to log into Wi-Fi networks when available.

Wi-Fi network providers:

- Need to be aware of Wi-Fi's limitations, connection quality needs to be continually monitored to avoid network degradation.
- Must create networks with sufficient capacity so they are not overwhelmed by the increasing volume of users and data traffic.

Conclusion

- The primary reason to use multiple SIM handset is that most of the respondents want two or more service providers in order to have different services from different operators.
- Falling prices of handsets and increasing competition from local vendors are forcing the global vendors to differentiate through other services.
- Network coverage and superior customer service are the basic needs from the operators.
- The frequency of usage of SMS remains high. SMS may serve as an entry point for other mobile data services.
- Some key non-entertainment services for the rural and urban segments will be in the areas of governance, commerce, health and education, with a need for customization according to the demographic segment.
- Urban India wishes to combine TV with internet.
- There is adequate consumer demand for MVAS, but operators need to understand the unique needs of Indian consumer and innovate and promote adoption.
- Consumers are ready to pay premium price for 3G services if they get faster speeds and better network coverage.



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GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



MARKET DEVICE LANDSCAPE

Paul Pullan,
Project Marketing Manager
GSMA

Device Landscape: India

Enabling Growth in Data Revenues

Prepared for



by

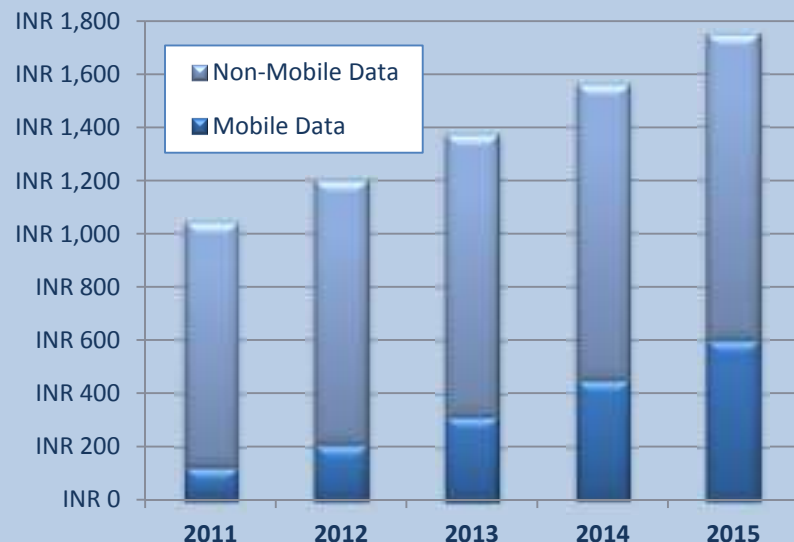
generator



MAY 2011

Mobile Data is Key to Growth

Indian Mobile Operator Service Revenues
(INR, Billions)



Mobile Data will account for 34% of Mobile Operator service revenues in 2015, up from 12% in 2011.

Mobile Data will grow at 48% (CAGR).

Non-Mobile Data (Voice & Messaging) will grow at just 5.6% (CAGR).

Overall, Mobile Operator Service Revenues will grow at 13.7% (CAGR).

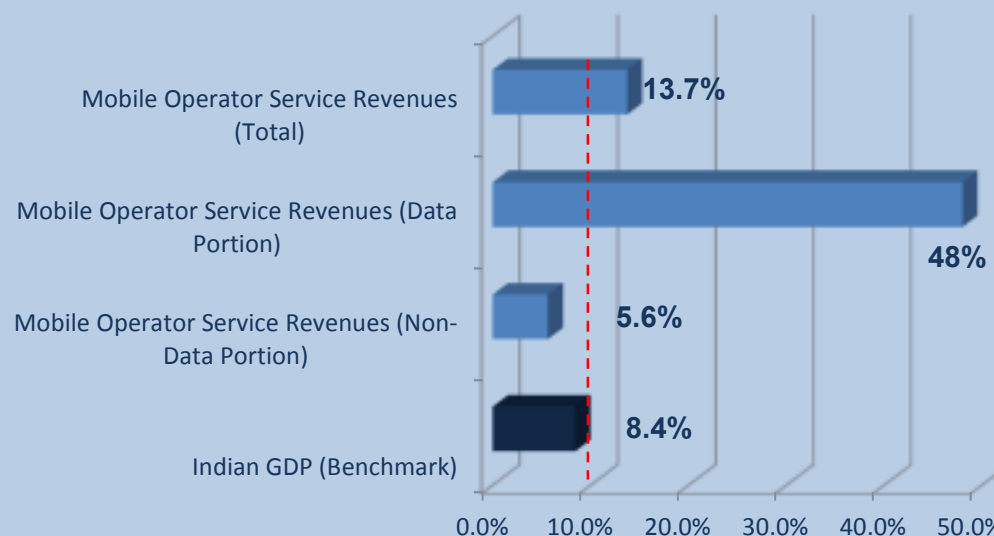
Although only accounting for 34% of revenues in 2015, Mobile Data is a vital element of the growth story.

Without Mobile Data, total operator service revenues will only grow at 5.6% (below GDP growth rate at 8.4%)

...and subscriber numbers will only grow at 4.2% , which is no longer enough to drive strong growth.

But success in growing Mobile Data Revenues is not a 'sure thing': Enabling devices, compelling services, favourable pricing and effective marketing are all vital.

Comparison in Growth Rates (CAGR): 2011 to 2015



Enabling Devices

How Devices Enable Revenue Growth

Enabling Device	Stage of Market	CAGR from 2011 to 2015 (Installed Base)	Market Size in 2011		Market Size in 2015	
			Users (Millions)	Mobile Data Revenues (INR, Billions)	Users (Millions)	Mobile Data Revenues (INR, Billions)
Media Tablet	Emerging	171%	0.1	INR 0.4	5.4	INR 18.2
Portable PC	High Growth	40%	5.5	INR 55.9	21.3	INR 313.4
Desktop PC	High Growth	43%	1.3	INR 13.1	5.4	INR 80.1
Smartphone	High Growth	36%	19.7	INR 11.9	67.5	INR 66.4
Featurephone	Lower Growth	18%	274.2	INR 47.6	534.3	INR 126.1
			300.8	INR 129.0	633.9	INR 604.2

Four reasons why devices enable Revenue Growth:

1. **Demanded by the Top-end of the Market:** The highly-lucrative top end of the user base is attracted to new, branded devices. These users are less price sensitive and more inclined to use mobile data services.
2. **Aspirational for lower Tiers of the Market:** Many users aspire to own an advanced device and use the services that those devices enable. As India's GDP rises, more and more users are finding that they can afford, wireless-enabled devices. Therefore, a user that once had a Featurephone, may upgrade to a Smartphone, and then buy a Portable PC, and then a Media Tablet. All this behaviour increases expenditure on mobile data services.
3. **Feature Roll-down:** Advanced features quickly filter down the device hierarchy, which means that tomorrow's Featurephones will look similar to today's Smartphones, This has the effect of increasing penetration and increasing device usage among the lower tiers in the market.
4. **Competitive Rivalry:** Competitive pressures mean that content providers, electronics retailers, mobile operators and services providers (the whole value chain) are attracted to the latest products, which are less commoditised and maintain consumer interest.

Devices Across the User Base

All Mobile Data Users Segmented by Device Type

Millions	2011	2012	2013	2014	2015
Featurephone Users	274.2	352.7	417.6	480.7	534.3
Smartphone Users	19.7	29.2	40.2	53.8	67.5
Portable PC Users	5.5	8.8	12.8	16.1	21.3
Desktop PC Users	1.3	1.7	2.3	4.6	5.4
Media Tablet Users	0.1	0.4	1.1	2.6	5.4
Total Mobile Data Users:	300.8	392.8	474.0	557.8	633.9

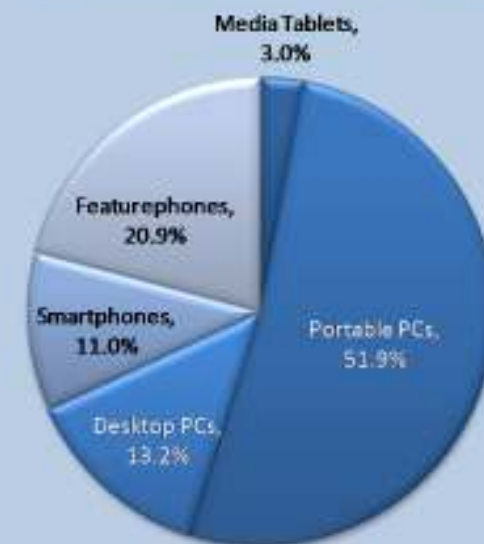
Featurephones will vastly outnumber other device types in terms of the installed base, accounting for 84% of all Mobile Data users in 2015.

However, Smartphones, Portable & Desktop PCs and Media Tablets are still extremely important growth segments, because of their higher ARPU.

For example, although accounting for only 4.2% of the installed base of Mobile Data users in 2015, Portable and Desktop PCs will account for 65% of Mobile Operator Data Revenues, and 22% of mobile operator's Total Service Revenues.

Meanwhile, Media Tablets – while only contributing 1% to Total Operator Service Revenues in 2015 (but 3% to mobile Data Revenues) – cannot be ignored because many Media Tablet users will also have a Smartphone and a Portable PC, implying very high *combined* user ARPU.

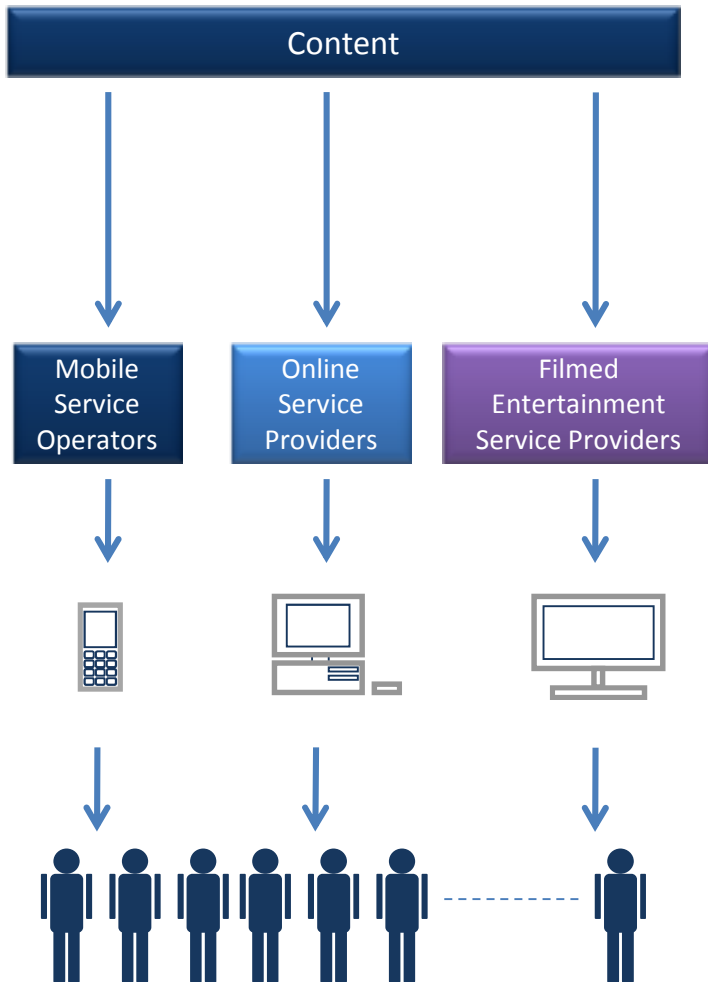
Total Mobile Data Revenues Segmented by Device Type: 2015



Integrated Platforms

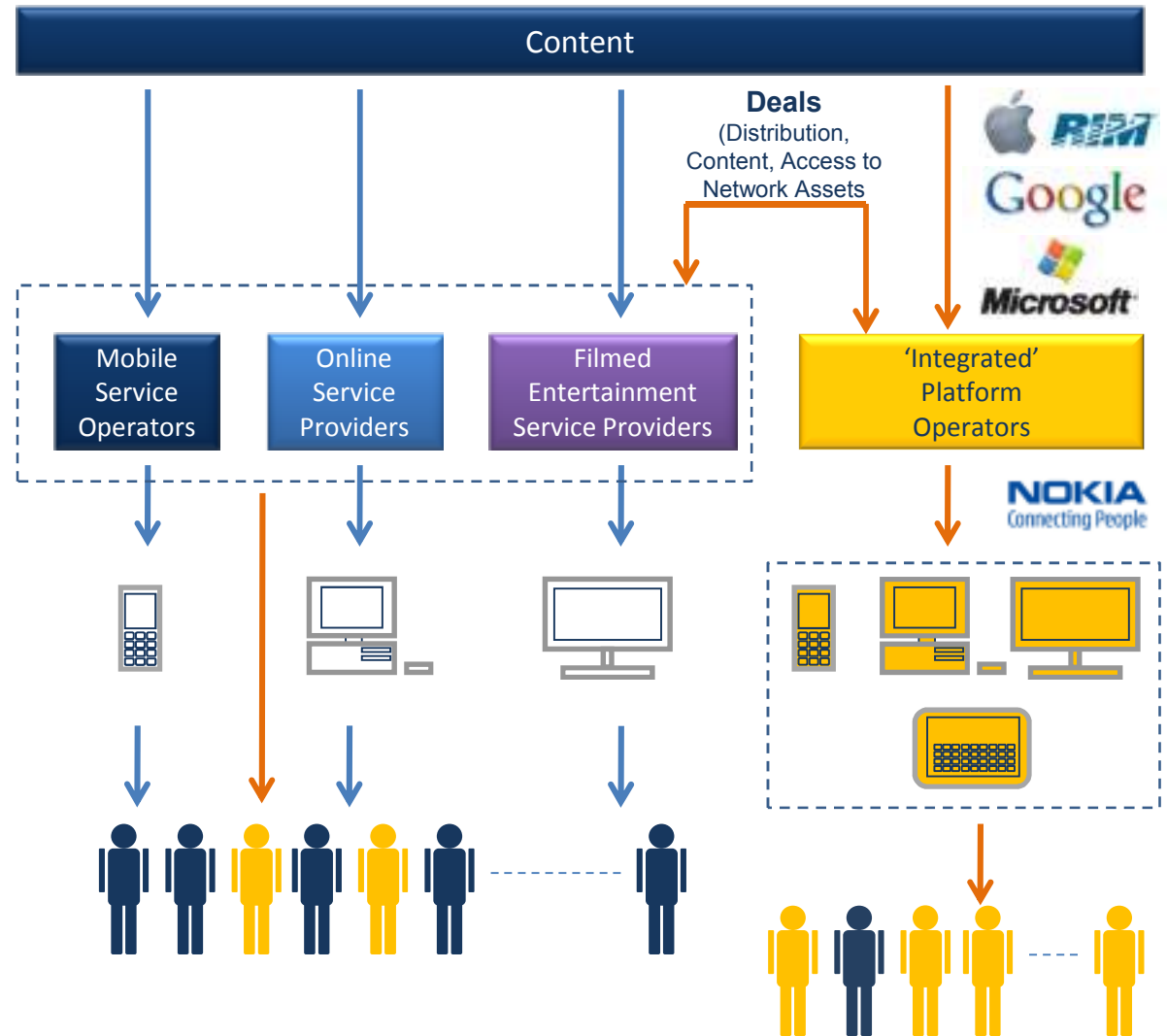
New Landscape: Devices

Up to 2003: Discrete Service Elements



Vertical, fragmented silos dominated. As devices, networks and internet software matured, the lack of vertical and horizontal integration started to limit the rate of growth of the overall market.

From 2004: Integrated Platforms



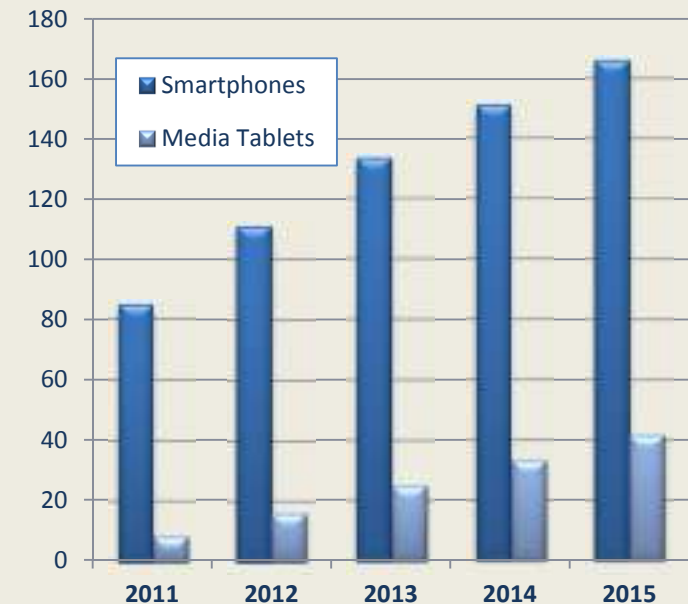
New entrants using a 'integrated' strategy is resulting in improved devices, new devices, better integration between devices, new service propositions and more content.

The result is an expanded market with more customers + more revenue

Key Integrated Platforms



Smartphone and Media Tablets
Asia Pacific: Unit Shipments (Millions)



Market is becoming concentrated around just four 'integrated platforms' which brands, content owners and service providers use to reach consumers.

In 2010, the combined revenues of Nokia (devices), Apple, Google & RIM represented 13% of India's GDP.

These new platforms are sources of long-term value: similar to access networks but less susceptible to commoditisation:

- **Telco World:** Value is in 'Access Networks'
- **Digital Content World:** Value is in 'Integrated Platforms'

Enabling Services

Operator Mobile Data Services

Mobile Broadband



Mobile Broadband: India

	2011	2012	2013	2014	2015
Users					
Installed Base (Mn)	6.8	10.6	15.4	21.2	27.6
Annual Change		55.0%	45.0%	38.0%	30.0%
Service Revenues (INR, Bn)					
Mobile Data	INR 69	INR 120	INR 192	INR 289	INR 406
Non-Mobile Data	INR -	INR -	INR -	INR -	INR -
Total:	INR 69	INR 120	INR 192	INR 289	INR 406
ARPU per Month (INR)					
Mobile Data	INR 845	INR 947	INR 1,041	INR 1,135	INR 1,226
Non-Mobile Data	INR -	INR -	INR -	INR -	INR -
All Usage:	INR 845	INR 947	INR 1,041	INR 1,135	INR 1,226

- Users increase by 16% PA
- Service Revenues increase by 15% PA
- Non-Mobile Data ARPU *falls* by 2% PA
- Mobile Data ARPU increases by 10% PA

Mobile Internet



Mobile Internet: India

	2011	2012	2013	2014	2015
Users					
Installed Base (Mn)	294	382	459	537	606
Annual Change	n/a	30.0%	20.0%	17.0%	13.0%
Service Revenues (INR, Bn)					
Mobile Data	INR 59	INR 93	INR 128	INR 164	INR 199
Non-Mobile Data	INR 457	INR 565	INR 657	INR 754	INR 835
Total:	INR 517	INR 657	INR 785	INR 918	INR 1,033
ARPU per Month (INR)					
Mobile Data	INR 17	INR 20	INR 23	INR 26	INR 27
Non-Mobile Data	INR 130	INR 123	INR 119	INR 117	INR 115
All Usage:	INR 146	INR 143	INR 143	INR 143	INR 142

- Users increase by 32% PA
- Service Revenues increase by 42% PA
- Mobile Data ARPU increases by 8%% PA

Mobile Broadband: The Opportunity

PC Users					
Millions	2011	2012	2013	2014	2015
Desktop PCs	38.8	43.4	46.5	48.0	48.1
Portable PCs	18.3	24.5	31.6	39.5	48.2
Total:	57.1	67.9	78.1	87.5	96.3
<i>Annual Change:</i>	19.0%	15.0%	12.0%	10.0%	

Source: Generator Research

Aggressive price-based competition between PC vendors, who are keen to address the Indian market, along with rising incomes in India has made PCs more affordable.

Government policy-makers are keen to see more Indian homes go online, with broadband internet connections. A connected nation is an important part of India's economic progression.

By the end of 2011, over 25% of Indian households will have a PC. This will rise to over 40% by 2015.

But there is a problem...

In 2011, only 60% of PC Households will have an internet connection in 2011 (and only 38% will have a broadband internet connection).

Based on existing trends, this gap will grow leaving most Indian PC Households without broadband Internet...

Fixed broadband connections (e.g. DSL) are not going to close the gap: fixed line penetration in India is just 3.5% and no longer growing. Also, not all of the existing local access lines is good enough to support DSL.

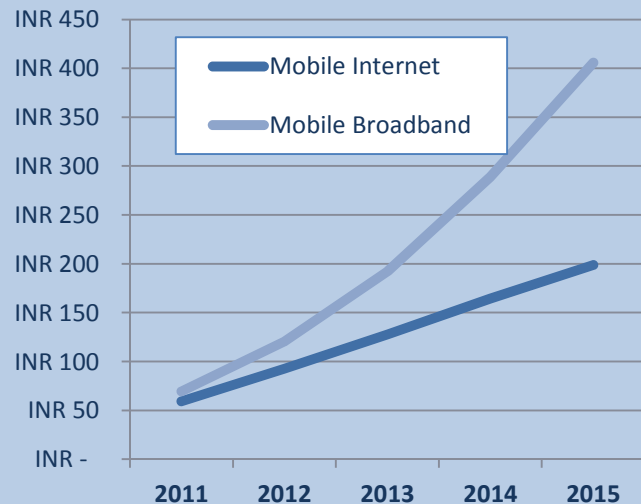
This creates an opportunity for wireless-based broadband internet connections (USB Stick/PCMCIA Card): **Mobile Broadband**.

Fixed Internet Users					
Fixed Internet Subscribers (Millions)	Sep-09	Dec-09	Mar-10	Jun-10	Sep-10
Broadband (≥ 256 kbit/s)	7.2	7.8	8.8	9.5	10.3
Narrowband (≤ 256 kbit/s)	7.4	7.4	7.4	7.3	7.6
Total:	14.6	15.2	16.2	16.7	17.9
<i>Quarterly Change:</i>	4.2%	6.2%	3.3%	7.1%	

Source: TRAI

Mobile Broadband: Revenues & Users generator

Operator Mobile Data Revenues
Segmented into 'Mobile Internet' and
'Mobile Broadband' (INR, Billions)



Mobile Broadband is a high growth, profitable and sustainable market.

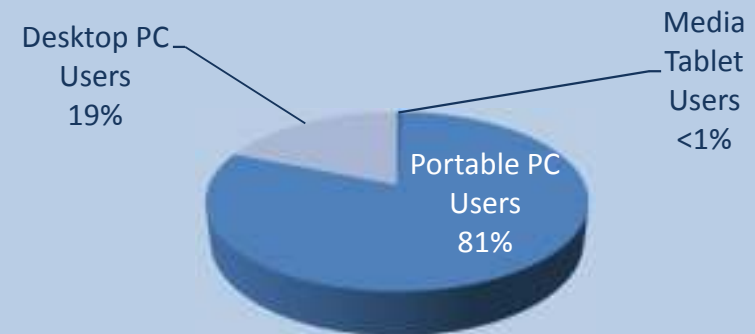
In 2015, Mobile Broadband will become the most important Mobile Data Service for Indian mobile operators accounting for:

- 67% of Mobile Operator Data Revenues
- 23% of Total Mobile Operator Service Revenues
- The highest ARPU (over INR 1,200 per month)

In 2015, Mobile Broadband subscribers will represent just 2.9% of the total subscriber base and just 4.2% of Mobile Data Subscribers, underlining the very high value of these customers.

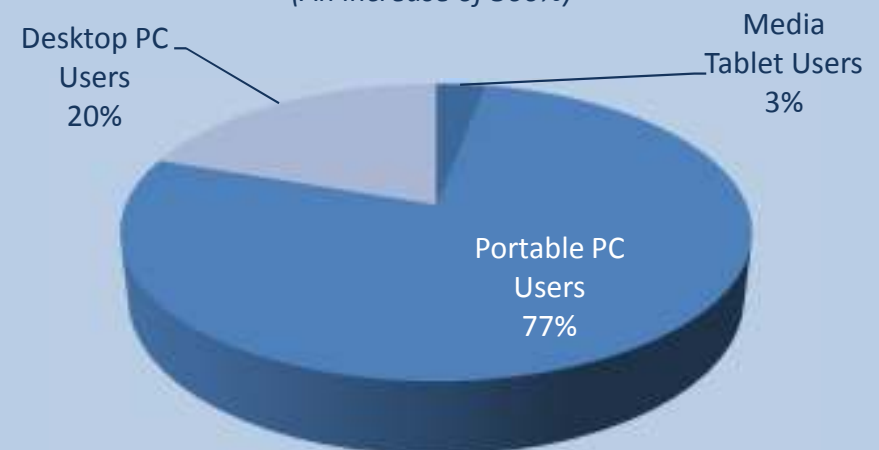
2011

6.8 million Mobile Broadband Users



2015

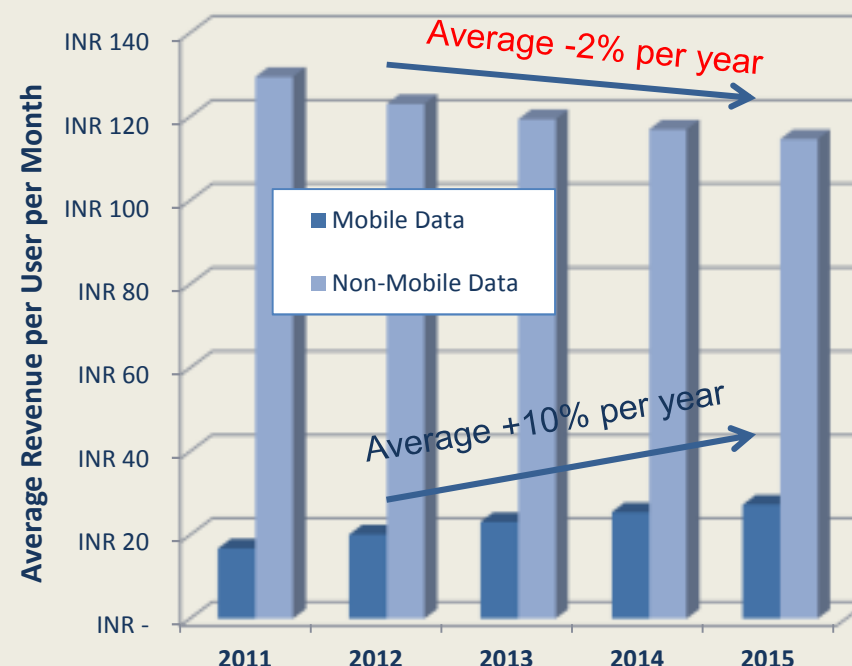
27.6 million Mobile Broadband Users
(An increase of 300%)



Mobile Internet: The Opportunity

- Intense competition (16 new telecom licenses were issued in early 2008) has forced the Indian operators to cut their voice price plans to the extent of offering almost '**free voice**':
 - Airtel, Reliance, Vodafone and BSNL are now offering as low as **1 paisa per second** plans.
 - Videocon Mobile Services has very recently launched a '**zero tariff plan**' which offers Videocon mobile handsets with free local voice calling for an year
- On average , Indian operators earn 60 paise (1.6 cents) per minute for local voice calls compared to Chinese operators, who earn on average 130 paise (3.3 cents) for the same;
- Overall market expansion (new subscribers) will keep TOTAL non-data revenues growing, but non-data ARPUs are falling...

Mobile Internet Users
ARPU Trends



- If left unchecked, this trend will cause a reduction in total service revenues as the market matures.
- Therefore, in order to compensate, it is vital for operators to encourage uptake of Mobile Internet.

Mobile Internet: The Opportunity



Ultimately, consumer behaviour is driven by the availability of compelling services.

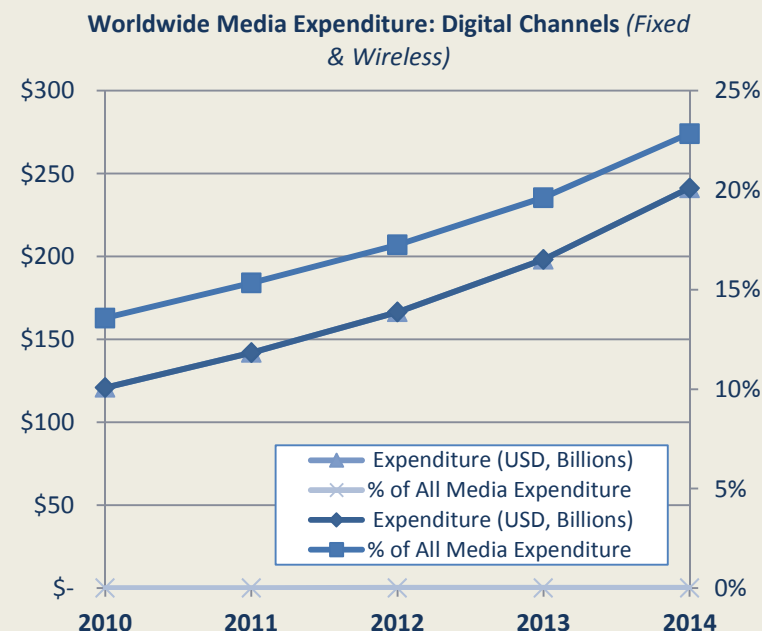
The comparatively recent maturation of advanced devices, broadband access networks and online digital content services & platforms means that a tipping point has been reached.

Worldwide expenditure on digital content services will account for 25% of media spend by 2015, with substantial long-term growth potential beyond.

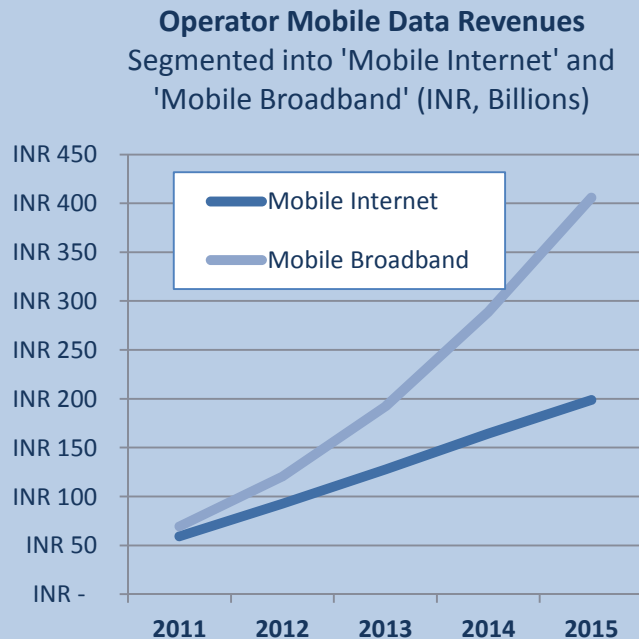
We are seeing the emergence of generic propositions for digital content: internet television, internet video, streaming music, e-books, social networking.

These are being deployed globally (with localisation) or replicated/copied in local markets.

Worldwide Media Expenditure: All Channels					
USD (Billions)	2010	2011	2012	2013	2014
Music	\$ 37	\$ 35	\$ 34	\$ 35	\$ 36
Gaming	\$ 35	\$ 38	\$ 41	\$ 44	\$ 48
Film	\$ 71	\$ 74	\$ 78	\$ 83	\$ 88
Television	\$ 155	\$ 159	\$ 163	\$ 168	\$ 172
Newspapers	\$ 23	\$ 24	\$ 24	\$ 25	\$ 25
Magazines	\$ 12	\$ 13	\$ 13	\$ 13	\$ 14
Books	\$ 56	\$ 57	\$ 58	\$ 59	\$ 60
Advertising	\$ 502	\$ 527	\$ 554	\$ 583	\$ 613
Total:	\$ 891	\$ 926	\$ 965	\$ 1,010	\$ 1,056



Mobile Internet: Revenues & Users

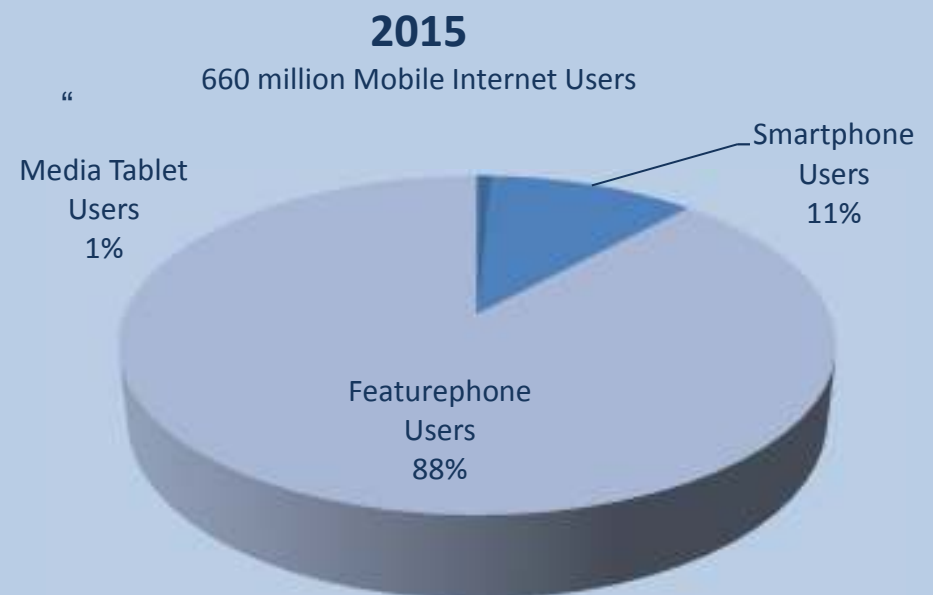
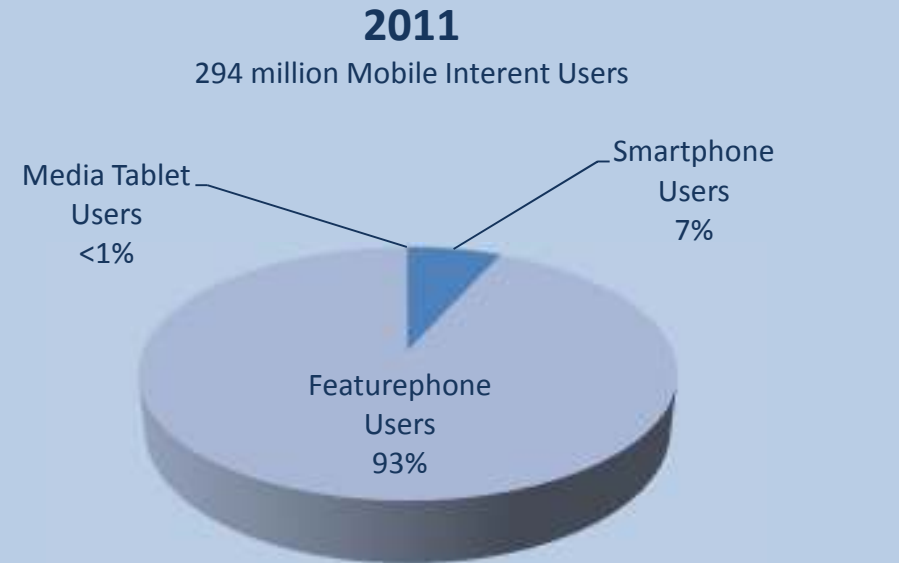


The entry of new players (16 new telecom licenses were issued in early 2008) and increasing price pressure has forced the Indian operators to cut their voice price plans to the extent of offering almost 'free voice':

Airtel, Reliance, Vodafone and BSNL are now offering as low as 1 paisa per second plans (USD 0.016 per minute)

Indian operator earns 60 paisa (1.6 cents) per minute for local voice calls as compared to a Chinese operator, which earns 130 paisa (3.3 cents) for the same.

Hence, it is vital to encourage subscribers to use their featurephones and smartphones for data:



Conclusion

Data is the key to maintaining growth in Mobile Service Revenues.

But Data is only interesting to users if the underlying Digital Content Services are in place.

A very important category of Digital Content Services is being enabled by four emerging 'Integrated Platforms' (e.g. Apple, Android, RIM, Windows Phone).

Integrated Platforms represent sources of long-term value because they will allow brands, advertisers, content owners and service providers to reach a new generation of users in new ways, when compared with traditional channels.

Integrated Platforms can be regarded as the 'access networks' of the digital content world.

The mobile device market has changed radically over the last 7 years: devices were once developed and promoted independently of services and software.

But the emergence of Integrated Platforms mean that devices now incorporate built-in content services, which compete with services offered by mobile operators.

This trend has started at the top end of the device market, but it will become more



May 2011

Mobile Broadband – business and pricing strategies for Mobile Broadband

Sandra Gilligan, Project Marketing Director, Mobile Broadband
GSMA

Mobile data demand.....



iPhone = Android

Smartphone 50x traffic
of a feature phone



Laptop user
25x traffic of
a Smartphone



By 2015, networks will need to
support over 700% more traffic
than they do today

Market drivers and barriers

Drivers

- Latent Internet demand
- Limited fixed network
- Bridging digital divide

Barriers

- Spectrum
- Government
- International connectivity
- Low APRU
- Coverage
- Devices

Strategic options

Strategy	Strategic drivers	Target customers	Marketing messages
3G data bonus	3G needed for voice capacity not data Minimal competition	Apex Enterprise Public sector	Exclusivity Innovation
Measured deployment	Demand for data Limited competition Profitability crucial	More emphasis on enterprise Apex Public sector Resellers	First mover advantage Innovation
Land grab	Measured deployment proven Voice saturation Established competition	Mass urban market Enterprise Public sector Resellers Apex	Corporate brand values Price Coverage Reliability
Fixed substitution	Limited fixed infrastructure Mobile-only player Text	Apex Enterprise Resellers Mass urban market Lower urban & rural	Web access where none existed previously
Integration	Integrated player Fixed & mobile network available	Apex Enterprise	Complementary Bundles

Operational issues

- Cost-effective deployment and management
- Traffic control
 - Fair and simple usage policies
- Network optimisation tools
- Customer support
- Measuring impact
- Dynamic and network intelligent pricing

Current situation



- Current methods to improve capacity:
 - Reduce costs
 - Move to LTE
 - Caching
 - Storing content on the networks edge
 - Reducing OPEX through network outsourcing and tower sharing
- What about looking at growing revenues
- Huge need now to look at business models and innovative pricing models (differentiation and segmentation) and the operator role in the new content-driven eco-system



What's on the menu?

- Flat rate pricing
 - By the hour, day or month
 - By the time of day / week
 - Time based packages
 - Bundling
 - Concealed package pricing



What's on the new menu?

- Pricing mechanisms with network intelligence
 - QoS prioritisation
 - Application based QoS
 - Device-based QoS
 - Dynamic discounts
 - Dynamic data pricing through femto cells
 - Speed-based pricing
 - On-demand QoS



By the hour/day/month

■ What

- allowing prepaid customers to buy access to the network for a specified time

■ Offers

- Hourly
- Daily – Movistar Argentina allowing 1GB in a day for ARS40
- monthly
- Capped – Claro Chile offering 250MB but allowance to be used within 7 day period



■ Pros/Cons

- Good where prepaid is dominant access
- Good where price sensitive and so used to budget for access via small top ups

Time of day / week plans

■ What

- Offering the customer access to the network during certain times of the day, helping to stimulate usage in periods of low traffic to reduce network costs. Designed to shape traffic /increase ARPU

■ Offers

- Orange France – unlimited data usage on weekends and school holidays for an additional €3/month
- Indosat – Broom Kalang is a night-only package offering 5GB data for IDR88,120/month between 0000 and 0600 with download speeds of 1MB/s
- Optus – different pricing for peak (0700 to 2359) and off peak (0000 to 0659)



■ Pros / Cons

- Focuses on cost reduction of network costs (peak hour usage determines operators network costs)
- Seen more as a reshaping of traffic usage rather than incremental

revenue

Time-based packages

■ What

- Based on buying time to access the network – different bundles of time with or without use-by dates

■ Offers

■ TIM



Telecom Italia Mobile's time-based tariffs

Tariff	Hours included	Tariff (€ per month)
Internet	40 hours per month	40
Internet 100	100 hours per month	19
Charging Internet 40	40 hours per month for 12 months	69
Internet Pack 40	40 hours per month for 12 months plus USB modem	99
Internet Pack 100	100 hours per month for 12 months plus USB modem	159

■ Pros / cons

- Popular in Italy and South / Central America
- Penalises users if networks underperform

Bundling packages

■ What

- Offering fixed and mobile services in a package up to quad and quint play (mobile voice, mobile data, fixed voice, fixed data and TV). Some offer big screen and small screen bundles whilst others incorporate WiFi as part of the package too

■ Offers

- Telefonica Spain, France Telecom, Telenor, 3 Australia (don't get stuck with a fixed connection)

■ Pros / Cons

- Great at acquiring new additions but incremental revenue is not assured and at reduced profitability (potential new relationships need to be established)

Table 5: Basic bundled offerings around the world

Market	Operator	Bundle	Broadband speed (Mbps)	Subscription price (\$ per month)	Mobile broadband usage limit
France	SFR	Broadband, IPTV, mobile broadband, fixed voice	Fixed: 20 Mobile: 7.2	139.40 24-month contract	1GB
France	Orange	Broadband, IPTV, mobile data/voice, fixed voice	Fixed: 20 Mobile: n/a	139.60 24-month contract	1GB
France	Bouygues	Broadband, IPTV, mobile data/voice, fixed voice	Fixed: 20 Mobile: n/a	126.70 24-month contract	2GB
UK	Virgin Media	Broadband, TV, mobile voice, fixed voice	Fixed: 10	65.90 12-month contract	n/a
Sweden	TeliaSonera	Broadband, IPTV, mobile voice, fixed voice	Fixed: 1.5–24	70.20	n/a
Sweden	Telenor	Broadband, IPTV, mobile broadband, fixed voice	Fixed: 12–24 Mobile: 6	83.60 12-month contract	Unlimited
Hong Kong	PCCW	Broadband, IPTV, big- and small-screen mobile broadband	Fixed: 30 Mobile: 7.2	32.80 24-month contract	Mobile broadband limited to five days per month
Singapore	SingTel	Broadband, IPTV, mobile broadband, fixed voice	Fixed: 15 Mobile: 1.5	66.90 24-month contract	30GB

Source: Ovum

OVUM

'Don't get stuck with a fixed connection'



Combo Caps.

Save with a Mobile Broadband Combo Cap!

Go for it with 3's new amazing value \$29, \$49 or \$69 Combo Cap. Don't get stuck with a fixed connection! Now you can get the best of both worlds with a Cap that combines your mobile phone with a free Internet Key modem, giving you the freedom to take the Internet with you.

Offers

Caps

Mobile Broadband

Terms & Conditions

\$29
Combo Cap

Total min cost \$696 over 24 months¹

NEW \$29 Combo Cap¹ gives you:

- Unlimited Free Talk to anyone on 3.
- \$180 of standard national & international calls, SMS and more every month²
- Heaps of unlimited news & info or sport³
- 1GB of Mobile Broadband every month over 24 months.⁴
- 200MB of data for mobile internet⁵

\$49
Combo Cap

Total min cost \$1176 over 24 months¹

NEW \$49 Combo Cap¹ gives you:

- Unlimited Free Talk to anyone on 3.
- \$500 of standard national & international calls, SMS and more every month²
- Heaps of unlimited news & info or sport³
- 2GB of Mobile Broadband every month over 24 months.⁴
- 1.5GB of data for mobile internet⁵

\$69
Combo Cap

Total min cost \$1656 over 24 months¹

NEW \$69 Combo Cap¹ gives you:

- Unlimited Free Talk to anyone on 3.
- \$700 of standard national & international calls, SMS and more every month²
- Heaps of unlimited news & info or sport³
- 3GB of Mobile Broadband every month over 24 months.⁴
- 2GB of data for mobile internet⁵

Wholesale Model

■ What

- Where the connection cost is hidden from the consumer as service can be offered through a wholesaler

■ Offers

- Most common to date is Kindle from AT&T and Amazon. Model can be based on revenue per device share or share of content download

■ Pros / Cons

- Can lose the identity of the operator brand
- Need to understand and set the upfront cost for a set volume of data



Qos Prioritisation

■ What

- Prioritise traffic from a customer who has paid a premium

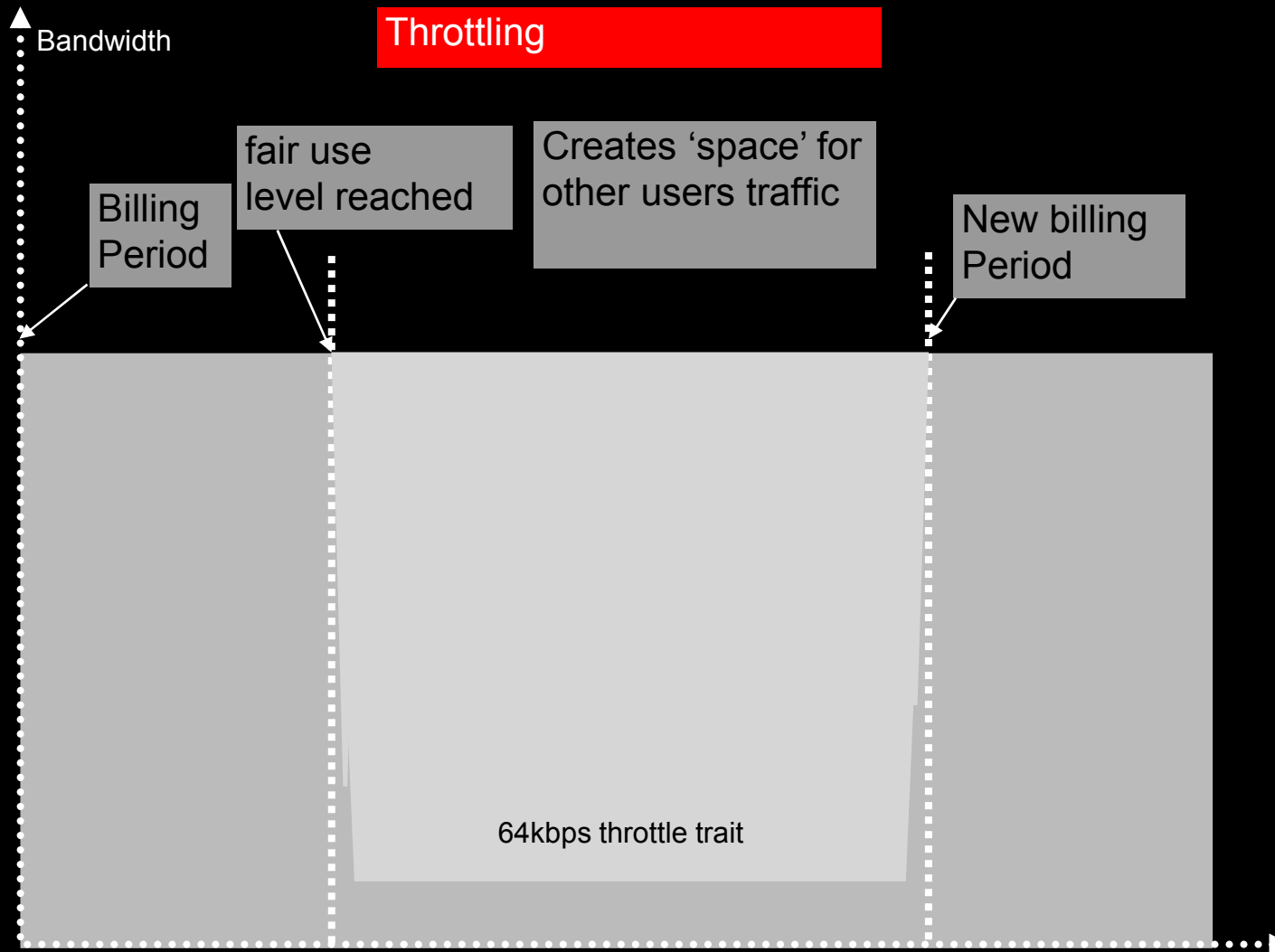
■ Offer

- Elisa Finland for an additional €10 / month (on a €30/month plan) receive priority access to operators network
- Vodafone Spain flat rate unlimited plan of 39/month which will maintain customer connection speed even after they have exceeded their usage limit (standard package sees customers speeds throttled back)
- Telekom Indonesia – sold to prevent small % of high-usage users choking the network

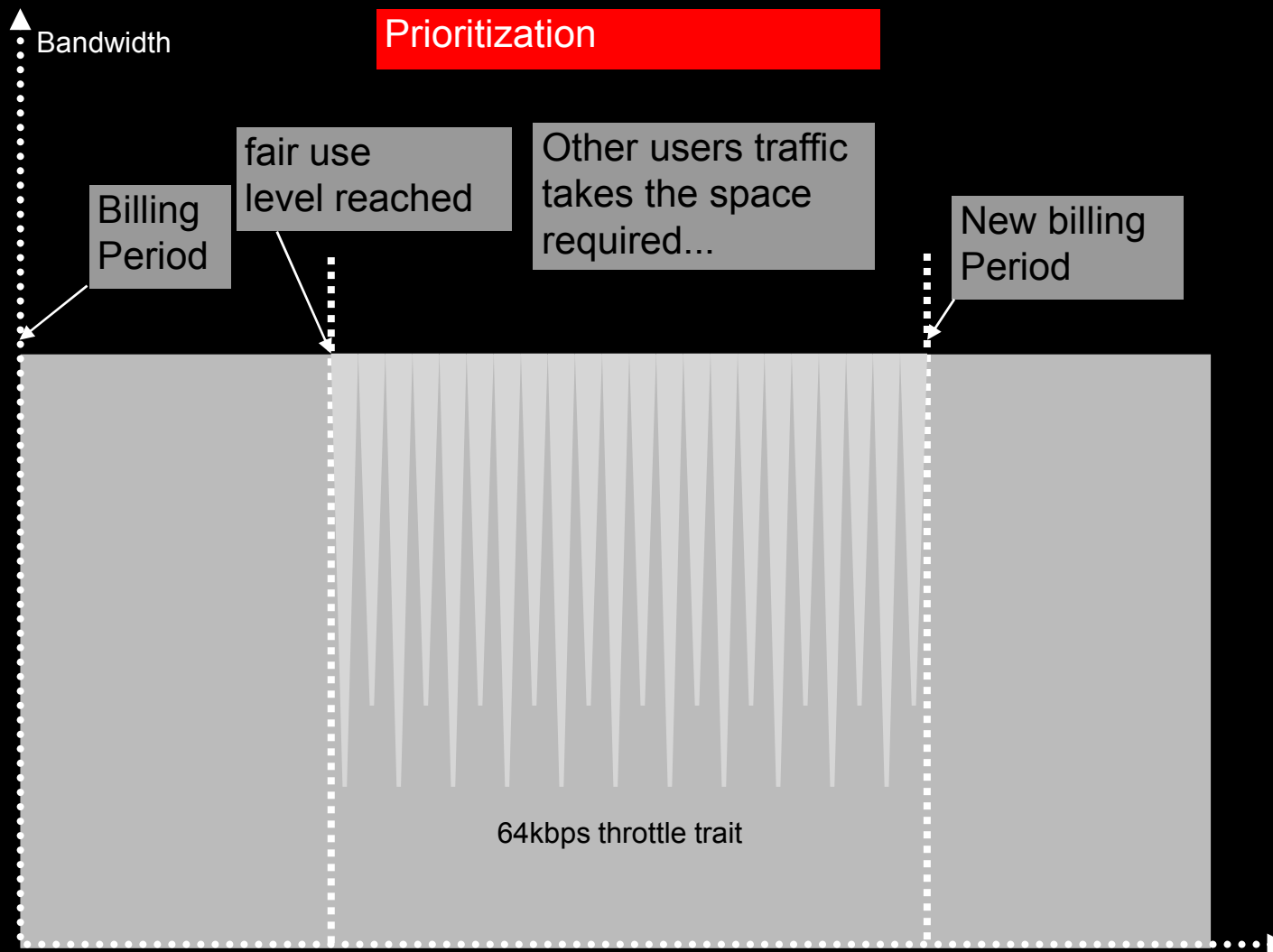
■ Pros / Cons

- Difficult to determine is user is getting faster speeds / prioritisation over other users
- Operators need to develop real time performance tracking tools for users to monitor performance of service (along with sophisticated traffic management and policy control)

Throttling versus Prioritization



Throttling versus Prioritization



Application-based QoS (future strategy)

■ What

- Operators charging content owners to prioritise their content or users pay content owners for priority delivery (revenue share)

■ Offers

- Likely to be for real time gaming / gambling, video streaming or for corporate users

■ Pros / Cons

- Will still need to prove to users they are indeed getting a premium service
- Net neutrality issues in some countries will limit offerings Operators can make



Device-based QoS

■ What

- Prioritising service to certain devices such as smartphones due to their high data usage / higher ARPU

■ Offers

- Unknown European operator who prioritises data to iPhone users over other users

■ Pros / Cons

- Alienating other low to mid-ARPU users who may go to competitors
- Compromise on network quality – leading to 2 tier data service

Dynamic discounts

■ What

- Discounts are delivered to a certain cell site based on network traffic conditions (not necessarily on geography)

■ Offers

- Popular in India, Africa, South and Central America where subscribers (both post and prepay) time limited / location specific discounts
- MTN South Africa – Zone service. 46% of all MTN subscribers have opted in

■ (Dynamic data pricing through femtocells)

- Seen as more of data offload than QoS
- China Unicom trialling for data service
- Starhub and Sprint offers unlimited calls with femtocells
- Other option – working with 3rd party offering free unlimited access for a specific location (say a shopping mall)

Speed-based

- What:
 - price based on the download data speed offered
- Offer
 - CSL HK – unlimited on all plans but charged based on access speed desired
 - HK\$208/month for 3.6Mb/s
 - HK\$348/month for 7.2Mb/s
 - HK\$498/month for 21Mb/s
 - Indosat
 - ISAT medium IDR300 for 1Mb/s
 - ISAT heavy IDR 500 for 3.6Mb/s
 - ISAT super IDR 1500 for 7.2Mb/s
- Pros / Cons
 - Consumer familiar with concept, allows for easier segmentation
 - Careful how to market – the speeds should be based on average or typical speed rather than peak

On-demand QoS

- What
 - Using speed to position value-added bolt-ons

- Offer
 - Indosat offers Turbo Speed – releases speed limitation on its unlimited plans for a period of time or amount of data

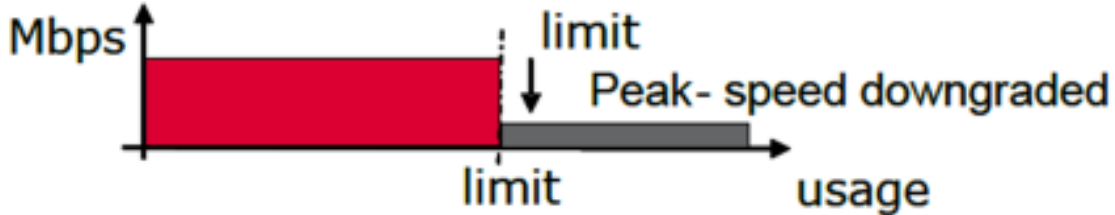

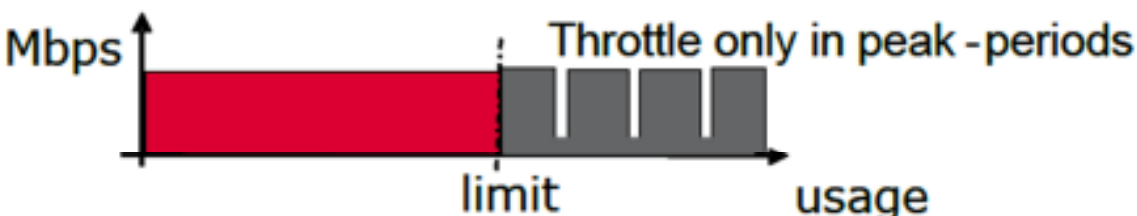
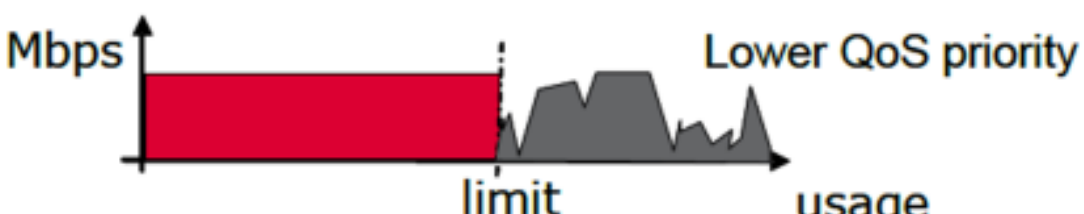
Buckets of data

- Growth of mobile broadband connections forecast to be yy billion by 2015
- More importantly, customers own more than 1 device with percentage growing that own 2 – 3 devices
- When embedded devices become more prevalent, this will increase even more
- Offers
 - Telenor – 2 SIMs that share same data allowance
 - Sprint – Everything Data family: unlimited data, message and voice calls to any mobile on its network for \$42.50
 - NTT DOCOMO – 3G family plan – allows unused monthly data allowances to be carried over for 2 months or shared with other family members
- NEXT – data bucket plans to be used across multiple devices means not just managing a SIM but an account

Fair usage policies

- Pareto rule applies
 - Around 5% of customers consumer 80% of capacity hence low volume users are subsidizing high-usage customers
- Unfair?
- Fair usage policies
 - There to enforce limits and are part of an operators toolkit to allow them to control alongside throttling or cancelling accounts

Policy control

Option 1: Nothing	
Option 2: Throttling	
Option 3: Additional charging	
Option 4: Throttling with policy control	
Option 5: Lower priority	

Summary

- Mobile broadband presented as a service, not as a technology or device
- Focus on areas where demand and limited fixed competition are greatest
- Work on governments to remove barriers to mobile broadband
- Customer segmentation is vital but plans/offers must be simple
- Small-screen and prepaid focus should increase down the pyramid
- Cost efficiency must be the key operational focus
- Measurement is critical to assess business impact



Sources:

- Operators strategies for mobile broadband in emerging markets
- Innovative tariff strategies for mobile broadband

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



RICH COMMUNICATIONS ECOSYSTEM

Sandra Gilligan, Project
Marketing Director
GSMA

Executive Summary

- The time is right for mobile operators to enrich their customers communications experiences and respond to OTT competition
- Five operators have committed to launch Rich Communications based on RCS-e specs in 2011/12
 - Deutsche Telekom, Orange, Telecom Italia, Telefonica, Vodafone
 - Spain and Germany likely to be first markets
- RCS-e spec designed to accelerate time to market and simplify customer proposition, leveraging customer and technical insights gained through trials and commercial services
- Future evolution of RCS-e will leverage appropriate specifications and feature roadmap of RCS R1-4

The **changing face** of person-to-person comms.

- Voice/SMS still majority of today's revenues...
- ...but trend is towards an integrated comms experience
- Many new entrants, from the very large to the very small
- Social networks/communities driving additional traffic
- New usage behaviours and consumer expectations for the "Internet Generation"
- Innovation & deployment cycles reduced from years to months



Who will provide service to tomorrow's customers?

A problem that can be fixed **NOW**



- **Pressure on ARPUs**
 - Highly competitive markets and regulatory constraints
- **Drift to replacement/alternative communication solutions**
 - Mobile access to Social Networking (SN) sites becoming the norm
 - ISPs providing free voice, messaging and data (file & picture)
 - Consumers losing emotional connection with the MNO
- **No action means... assuming the role of an access supplier/bit-pipe supplier**
 - No opportunities for value added selling
 - Losing the trusted and secure customer relationship
 - OTT SPs 'front-of-mind' supplier of comms services

GSMA Rich Communications: service **evolution**, not revolution

Voice > SMS > MMS > RCS



- **Leverages market familiarity with Internet communications**
- **Sharing the same building blocks**
 - Enhanced network address book
 - Conversational messaging
- **AND delivers added value to end-users**
 - Enriched voice – video/image share
 - Convergent service - multi-device/multi-network access
 - Location aware / sharing
 - Visibility of communication capabilities – enables easier and impulsive communications
 - Interoperability (everyone in your address book)

70% of Spanish RCS users would recommend it to friends, 65% wanted to keep the service at the end of the pilot

GSMA Rich Communications: a service offering leveraging **key operator assets and capabilities**



**growing business
potential
with a low investment
and low risk factor**

- Trusted customer relationship
- Quality, reliability, security
 - traffic shaping/control/policies
- Flexible business models
 - direct billing, bundling, cross selling, advertising...
- Open standards
 - device & platform diversity & choice
- Mobility and universality
- Addressing massive customer base
- Interoperability, interoperability, interoperability, ...

Substantial industry commitment

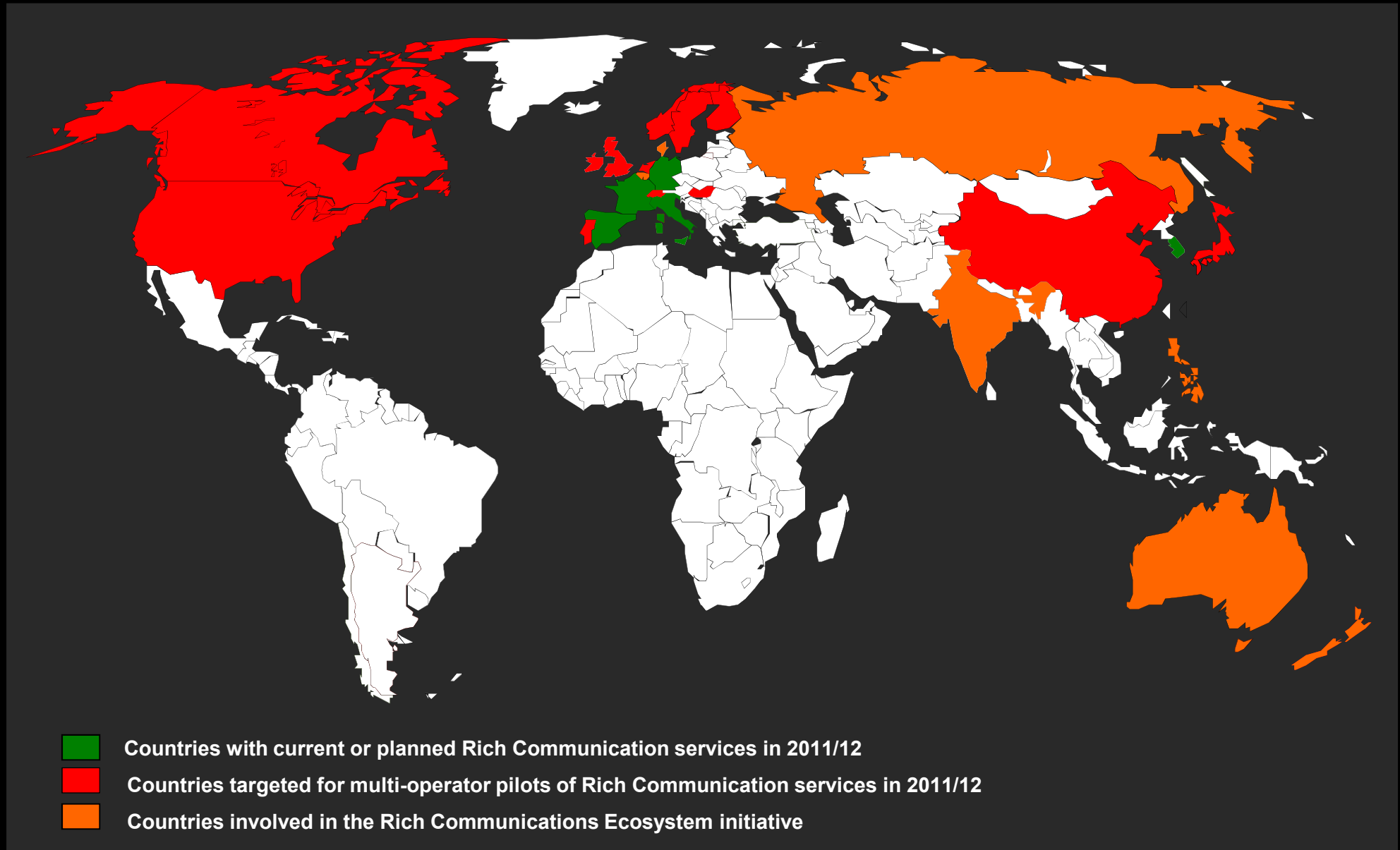


- 33 of the world's top operators
- 70+ leading vendors of
 - Handsets
 - Infrastructure
 - Applications
- Multi-operator trials
 - France
 - Spain
 - Japan
 - Italy
- > 20 single operator trials

**33 members are
operators representing
>2bn global connections**



A global initiative



Multi-operator Rich Communication pilots

- **France: Bouygues Telecom, Orange, SFR**
 - RCS Release 1 (mobile clients only)
 - Market pilot completed in July 2010
- **Spain: Orange, Telefonica**
 - RCS Release 2 (mobile and PC clients)
 - Market pilot completed in July 2010
- **Japan: eMobile, KDDI, NTT DoCoMo, NTT Corp, Softbank**
 - RCS Release 2 (mobile and PC clients)
 - Technical interop: 4Q2010, market pilot: TBC
- **Italy: Telecom Italia, Wind**
 - RCS Release 1 (mobile clients only)
 - Technical interop: 4Q2009, market pilot: TBC
- **Under discussion**
 - Canada, USA, Sweden, Portugal

Feb 2011: 5 major operators reveal new RCS-e specification and commit to launching in 2011/12



■ Deutsche Telekom

- Deutsche Telekom is committed to launch rich communication services based on the RCS-e specification. We are planning to start the rollout in Germany by 2012 and will include other territories in alignment with the interconnection opportunities with other participating Operators.

■ Orange-FT

- Orange FT is committed to launch RCS-e from 2012.

■ Telecom Italia

- TI is strongly committed to deploy on the market Rich Communication Suite services and has decided the following action plan:
 - 2011 soft launch on selected customers;
 - 2012: mass market launch (commercial push deployment will depend upon the feedback of soft launch)

■ Telefonica

- Telefonica commits to launch RCS-e services, starting in key European markets by end 2011 / beginning 2012.

■ Vodafone

- Vodafone shall launch RCS-e in key European markets starting in 2H 2011.

See Press Release at <http://www.gsmworld.com/newsroom/press-releases/2011/6047.htm>)

Handset vendor support for RCS-e expected to be strong

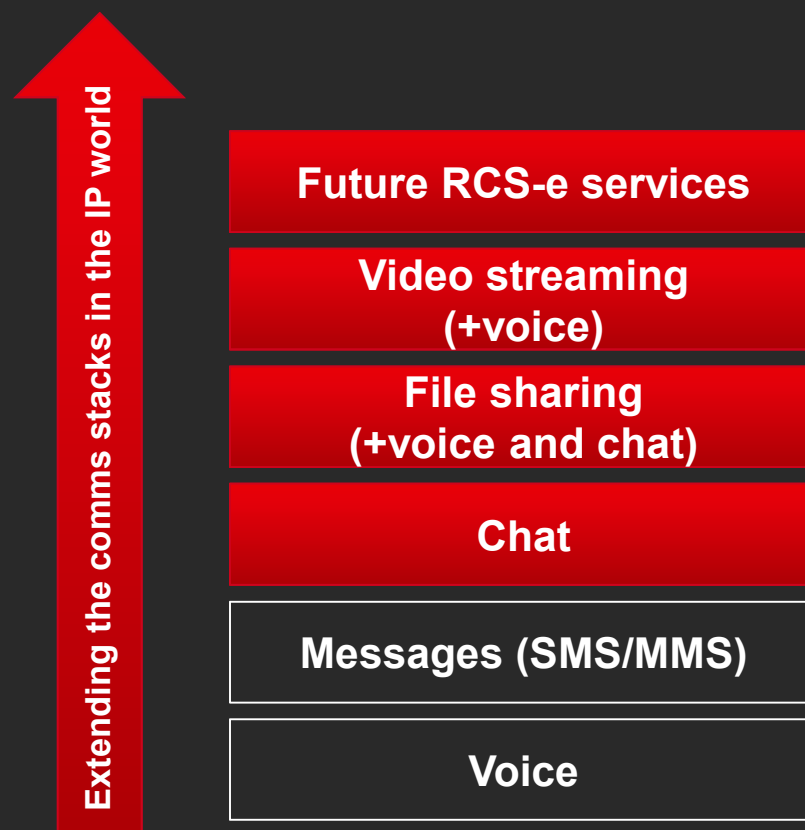


- RCS-e demos from Samsung and Nokia at Mobile World Congress
- Strong interest and engagement from major handset vendors during consultation on RCS-e
 - Samsung, Nokia, LGE, HTC, Sony Ericsson and RIM
- Launch commitments and handset (volume) requirements from major operators expected to lead to commercial availability of RCS-e devices in 1H 2012.
- RCS-e designed to encourage handset vendors to
 - integrate new rich communication services into the native user interface (as voice and SMS today)
 - be creative to deliver new and innovative services to customers and to differentiate operator and vendor services and products

The rationale behind developing RCS-e

- Operators behind the RCS-e specification share a mutual understanding on the strategic value to offer advanced communications services to their customers, under an interoperable telco based service approach
- To facilitate the service adoption by all operators, initial implementation hurdles have been lowered, e.g.
 - no obligation to deploy presence infrastructure
 - no mandatory implementation of Profile Sharing
- To ensure best customer experience, the instantaneous capability discovery mechanism has been introduced to ensure that only possible communications are offered by the device at any time

RCS-e industry proposition: “extending the comms stack”



RCS-e Customer Value

- It's relevant
 - selection of services which address customer demand
 - intuitively available on any handset
 - openness for 3rd party developments will induce constant innovation stream
- It's just there
 - all devices carry the features – no need to download
 - natively integrated – features are found where they are expected to be
 - independently of device source
- It just works
 - across handset makes and models
 - across operators and service providers
 - no need for set up or configuration

RCS-e key operator benefits

- Focus
 - advanced communications functions with minimal setup for the end consumer and interoperability across devices, infrastructure components and operators
- Lowering the entry barrier
 - capability check mechanism using SIP OPTIONS making it dynamic/instantaneous
 - no need to introduce a Presence Server keeps costs and timelines slim
 - can be deployed with or without RCS R2 profiles
- Universality
 - allow for implementation of Rich Communications in lower range devices
 - one common device specifications, driven by major European operators
 - considered as evolution of current RCS R2 standard (including profile sharing)

RCS-e is open for the industry



- Any operator is welcome to join
 - we actively invite other mobile network operators to join in launching services based on RCS-e
- Benefit from pioneer work of 5 operators
 - The 5 operators will support terminal and infrastructure vendors to deliver RCS-e – which any operator can benefit from
- One solution for many services
 - there are many options to use RCS-e as enabler for completely new services, supporting competition in the creative (products and services) space
- Open for 3rd party developers
 - we are committed to allow for 3rd party developers putting their services on top of the proposed functionality – details are still to be developed

GSMA/COAI Mobile Broadband Workshop

**Monetising Mobile
Broadband through
Services and
Applications**

26th May 2011



GSMA INITIATIVES

Paul Pullan,
Project Marketing Manager
GSMA



Embedded Mobile Programme

May 2011

Embedded Mobile - Goals and Objectives



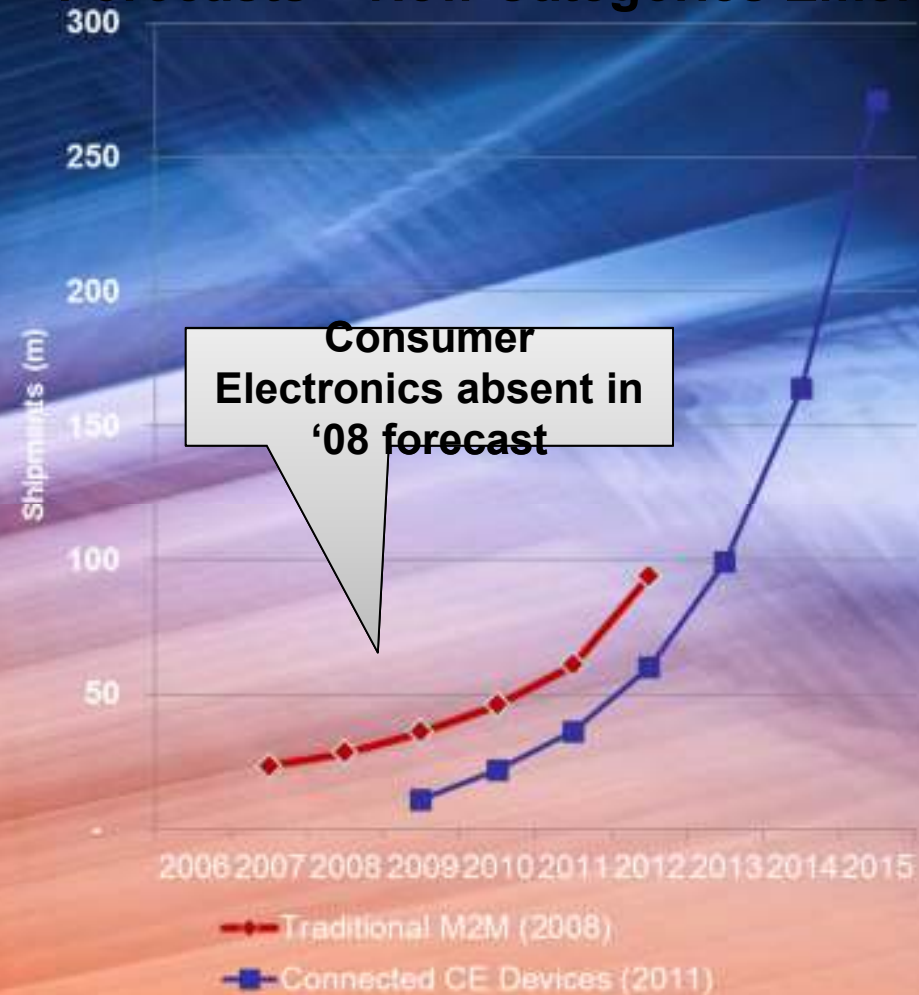
- GSMA Board initiated the Embedded Mobile programme in 2010 to **pursue new market opportunities outside the traditional handset business and drive the relationships with the adjacent ecosystems**
- Strategic goal was to **replicate GSM-like economies of scale for non-traditional devices**
- **Programme objectives to be achieved by 2013:**
 - Enable market expansion to reach 500 million connected devices
 - Stimulate the expansion and use of mobile in Consumer Electronics, Healthcare Transport and Utilities

Module shipment volumes starting to trend higher



- **Market has historically focused on industrial M2M applications**
- **Analyst firms are now broadening their scope of M2M**
 - Berg Insight data indicates new categories of CE devices with larger volume potential
 - mHealth not yet factored in forecasts
- **GSMA EM Programme aim is to bring industry change**
 - New opportunities beyond industrial M2M in connected consumer electronics, healthcare as well as smart transport and utilities sectors

2008 vs. 2011 Module Shipment Forecasts – New Categories Emerging



SOURCE: Berg Insight publications

Mission and Focus – 2011/12



The GSMA's programme has set out to **identify and accelerate new embedded revenue opportunities in adjacent industries that go beyond connectivity.**



mHealth Focus for 2011/12



Accelerate the acceptance of mobile solutions for Remote Monitoring of Chronic Conditions by aggregating and presenting compelling evidence to mHealth ecosystem players/payors

- **Use a common market trial framework**, to enable the production of replicable results from a global perspective.
- **Agreement and commitment to adopt the reference architecture and interoperability guidelines for mHealth devices and services** developed by the GSMA, as an enabler to accelerate the acceptance of mobile solutions



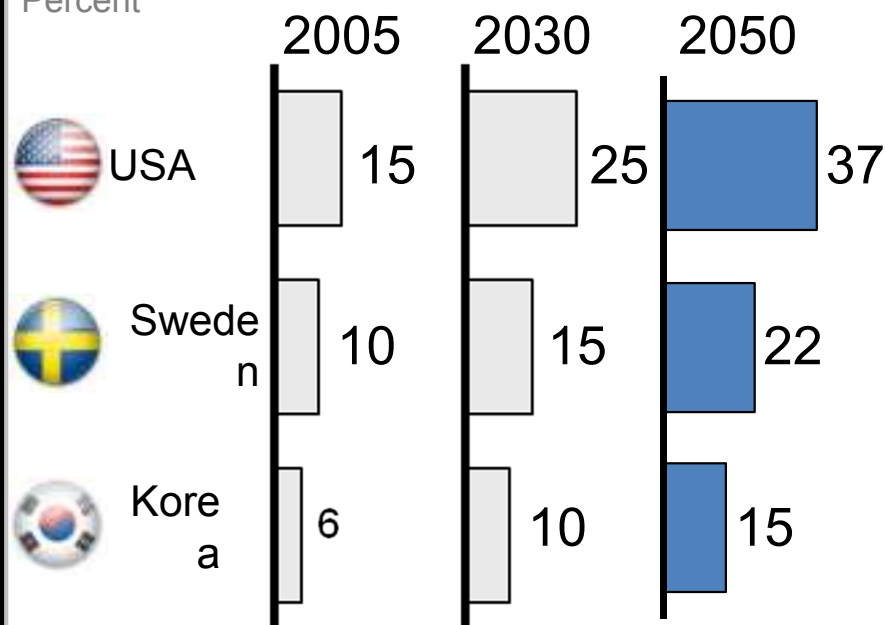
Healthcare - global need for innovation

DEVELOPED COUNTRIES

At current costs and speed, **healthcare spend is becoming unsustainable** in most countries

Projected healthcare as percentage of GDP

Percent

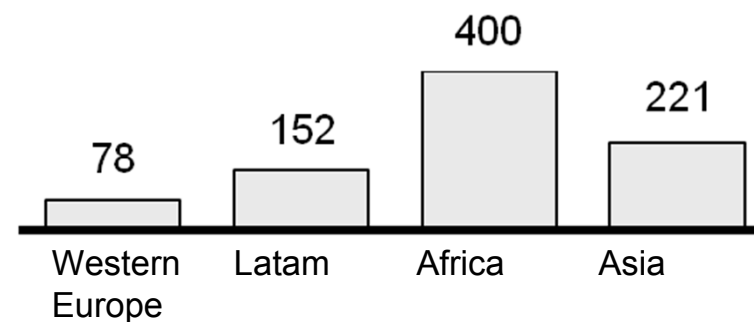


DEVELOPING COUNTRIES

Lack of access to healthcare services and infrastructure shortens life expectancy

Adult mortality rate

Number of deaths per 1,000 population²



GDP/capita
'000 USD

43.2³

7.7

1.3

4.1⁴

1 Assumes health care continues to grow at +2.0 above GDP

2 Excludes affluence countries like South Africa, Japan, Korea, Singapore, etc

3 EU 15

4 Includes Australasia

Automotive/Transport Focus for 2011/12



Develop the vision and technology roadmap for in-car mobile services to influence the next automotive development cycle

- **Common vision and roadmap for mobile in automotive**, including a technology roadmap and an outlook for ubiquitous connectivity.
- **Establish cross-sector communication with automotive OEMS** by creating a joint OEM-MNO forum to identify effective and efficient areas for cross-industry collaboration (e.g. open standards development) and identifying future areas of collective action and business opportunities

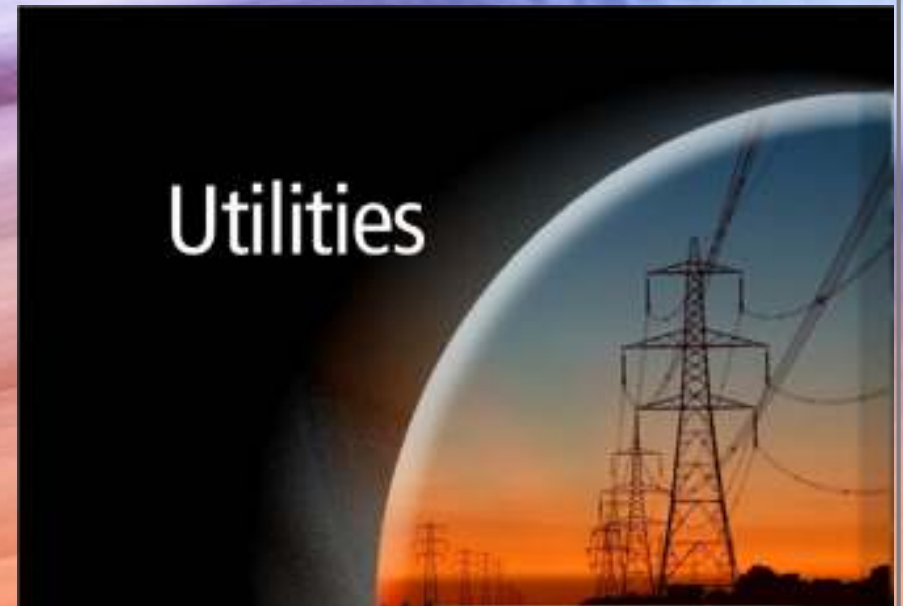


Smart Home/Utilities Focus for 2011/12



Promote the role of the mobile industry in the smart home and support a evolution of standards that encourages the development of mobile services beyond connectivity

- **Develop a common vision for the role of mobile in the future of the Smart Home** , in order to understand how GSMA needs to influence the evolution of standards to allow for the use of operator network assets beyond connectivity
- **Put together the requirements for Smart Home Gateways that materialise the common vision** agreed by the MNO Champion group



Consumer Electronics Focus for 2011/12



Innovate new mobile education services, by building on the usage of (mobile enabled) tablets for text books, classes, tests, assignments and social networking

- **Deliver and publish a global mEducation landscape study** and conduct in-country assessments (US, Japan, Spain, France, UK) to understand the educational ecosystem and business opportunities
- **Initiate market trials with a common value proposition for mEducation** developed by the GSMA jointly with the mobile operators



Connected Experiences Global Promotion Campaign



Promoting the role of mobile operators in delivering the “everything connected” world

- **Launch a promotional campaign on the role of the mobile industry in delivering the connected world experience**, demonstrating how the “next wave” of mobile devices, propositions and services will deliver new connected experiences
- **Highlight the opportunities for MNOs to provide additional services beyond connectivity**, focussing on specific key operator assets.

How to participate



- Participation is open for all members and associate members of the GSMA
- Non-members need to sign a non-member participation agreement
 - Duration of the agreement: 3 months

Contacts:

Programme Director – Ton Brand (tbrand@gsm.org)

mHealth – Richard Cockle (rcockle@gsm.org)

Smart Home/Utilities – Svetlana Grant (sgrant@gsm.org)

Automotive/Transport- Francesca Forestieri (fforestieri@gsm.org)

Consumer Electronics (mEducation) – Aruna Srinivasan (asrinivasan@gsm.org)

For more information

- Please visit:
- WWW.GSMAEMBEDDEDMOBILE.COM
- Or contact:
- embedded@gsm.org



The Mobile Broadband Service Mark

Supporting market growth to drive
Mobile Broadband volume



Why create a Mobile Broadband Service Mark?

- In 2007 research suggested a significant un-tapped market for Mobile Broadband devices; 79.5 million unit opportunity in 2008 – a US\$50 billion untapped market
(Source: Pyramid Research, commissioned by GSMA/Microsoft)
- Consumers were confused about what and how to buy; education and awareness-raising appear imperative as do service offerings that emphasis simplicity of choice and use
- The research provided clear insight for the role of a global identifier to help users easily identify 'ready to run' Mobile Broadband devices

A clear need and window of opportunity was established



Benefiting whole eco-system

User Benefits

- Global identifier provides confidence for new category of connectivity anywhere
- It is easy to get started
- Improved user experience

Operator Benefits

- Increase sales of data subscriptions/packages
- Grow/protect ARPU
- Enhances existing brand values as identifies with very latest technology

OEM/Vendor Benefits

- Strong demand for mobility means new markets for notebook PC OEMs
- Acceleration of modems market transition from a high-end niche device to lower-margin mass market means increased sales for vendors
- Driving earlier upgrades with new functionality

Acceleration of mass take-up of mobile
broadband services and products

Service Mark Creation



- Created by top global design agency, Landor
- Researched worldwide (US, Europe & Asia markets) with home and business users
- This identifier signals the arrival of a new category of 'ready-to-run' mobile broadband devices

What does the Service Mark convey?

**The Mobile Broadband service mark is used globally to help identify
'ready to run' Mobile Broadband devices**

By choosing a device with the service mark users can be assured that the devices they buy will always connect – wherever Mobile Broadband is available – and that they can expect a high standard of simplicity, mobility and ease of use. It supports the Mobile Broadband buying decision in a confusing market by providing:

Clarity

Instead of having to de-code multiple Mobile Broadband messages users only need to relate to one logo

Industry Quality Assurance

The service mark signifies that the device has met industry standards for Mobile Broadband devices

Recognition

Users don't have to understand a new logo every time there is a new Mobile Broadband technology, as the service mark will always track the technology evolution

We are striving to create additional value

- **A known ingredient brand can add value**

In consumer tests, garments displaying Woolmark are perceived as **17% higher in value**

- **It's a marketing asset**

In consumer tests, garments displaying Woolmark are **30% more likely to sell**



Service Mark already in action



Operator in action



- Online
- Europe

The screenshot shows the ZDNet Marken-Welt website, which is a marketplace for professional products. The header includes navigation links like Home, News, IT-Business, and a search bar. The main banner reads 'ZDNet Marken-Welt: Marktplatz des Fachhandels'. Below this, there are three laptop offers from HP and Acer, each with a 'Jetzt bestellen' button. On the right, there is a red 'Aktionenangebot' box indicating a 5-day offer, and a list of cities for local purchasing.

Unsere Topangebote im April: Sparen Sie beim Kauf eines Markennotebooks durch T-Mobile

HP Compaq Business Notebook 6530s
Batterieerweiterung
ab 699,00 EUR
mit T-Mobile Next Week Connect
Jetzt bestellen

Acer TravelMate 6730-642G20H
Batterieerweiterung
ab 799,00 EUR
mit T-Mobile Next Week Connect
Jetzt bestellen

HP Compaq Business Notebook 6730s
Batterieerweiterung
ab 799,00 EUR
mit T-Mobile Next Week Connect
Jetzt bestellen

Aktionenangebot
nur noch **5** Tage

Kaufen Sie in Ihrer Stadt

- im PLZ-Bereich 0...
- 06106 Halle
- im PLZ-Bereich 1...
- 17087 Alberskröpp
- im PLZ-Bereich 2...
- 20097 Hamburg
- im PLZ-Bereich 3...
- 31051 Alfeld (Lüneb.)
- 33034 Bielefeld
- 33038 Bielefeld
- 37574 Einbeck bei Göttingen
- 37603 Holzminden
- im PLZ-Bereich 4...
- 40789 Mönchengladbach
- 41747 Viersen
- 44145 Dortmund
- 47059 Duisburg
- 48149 Münster



OEM in action

TOSHIBA

- Online and collateral
- Europe



Online



Brochure



Technology Provider in action

- Events, online & social media and collateral
- EMEA, Asia, USA & South America



Signage



Brochure



Event transport



Online

Technology Provider in action



- Qualcomm.com chipsets section
- Qualcomm.com airlinks section



Technology Provider in action

- Brochure
- EMEA



UpTeq™ SIM in 3G laptop
Open up your services to the PC world, securely and simply

Current Context
3G laptops and mobile internet devices are the next big step up beyond mobile TV and television services.

The creation of a strong presence in operators to build their presence on end-user connected devices in order to generate new revenue through notebook, ultra portable and tablet PC... This opportunity is not without its challenges. Operators need to fight for customer ownership in order to keep control of their services in the Mobile Broadband world by deploying and managing their applications in the laptop.

This is where the GSM comes in - it makes it easy for operators to communicate their devices without providing the applications at manufacturing stage.

Is a market
The SIM embeds the complete set of software from the operator onto the 3G laptop, including the connection manager selected and adapted to the operator strategy. Deploying this card into a 3G laptop will function in like an operator locked environment by loading operator applications.

Once inserted in the PC, the SIM card is remotely managed via the Smart Device Management Center (SDMC) over The Internet (TIC). Gemalto operates this centralised data processing to activation, registration of the database of users and all administration tasks related to future updates of the embedded module.

What is the main objective of SIM in 3G laptop?

- Facilitating PC customization: The Gemalto SIM solution loads the operator lock & key and services, thus ensuring that the operator retains ownership of the PC environment.
- Managing applications life-cycle, and provide with end-user usage-tracking: The Gemalto

Does the Internet platform will play an important role in the life cycle management of the PC applications, building a long term revenue for Operators with services such as secure application updates, usage tracking and personal data synchronization.

Securing MVO Applications: Strong SIM based authentication and key generation to PC application. This access is done through a Secure channel (STSE). The secure channel protects exchanges between the SIM and applications, relying to PC open environment security standards. In other words, the SIM first checks the integrity of the application before executing it.

What is GSM Mobile Broadband?
Gemalto is involved with the GSM Mobile Broadband initiative which aims at creating a single event that quickly and easily enables PC notebooks and other portable devices as Mobile Broadband ready.

What are the main advantages?
Operators will be able to deploy to their end-user base, all applications & services targeting the laptop environment, as well as:

- Easy Embedded PC customization thanks to the SIM
- Get flexibility to move or enlarge its catalog of laptop devices
- Secure Services while Moving them to PC World
- SDMC:
 - Manage remotely all applications deployed
 - Provide with end-user usage-tracking

FINANCIAL SERVICES & RETAIL
ENTERPRISE
INTERNET CONTENT PROVIDERS
PUBLIC SECTOR
TELECOMMUNICATIONS & PRODUCT
TRANSPORT

*Some services advantages in the custom-embedded SIM will be needed to comply with regulations

www.gemalto.com

gemalto
security to be free

GSM



Summary and Thank you!

www.gsmamobilebroadband.com

