行政院所屬各機關出國報告

(出國類別: 會議)

出席 **2011** 年世界行動通訊論壇部長級會議出國報告

服務機關：國家通訊傳播委員會

姓名職稱：劉崇堅　　委員

　　梁伯州　　簡任技正

派赴國家：西班牙

出國期間：100 年 2 月 12 日至 19 日

報告日期：100 年 5 月 4 日

出國報告摘要表

會議日期：100 年 2 月 14 日(星期一)至 100 年 2 月 17 日(星期四)

出國地點：西班牙巴塞隆納

內容摘要：

全球行動通訊系統協會(GSM Association, 簡稱 GSMA)成立於 1987 年，其成員包含全球 219 個國家約 800 個行動電話業者，目前該協會致力於創新、培養及開創新的機會來促進全球行動通訊傳播產業之發展。GSMA 近年來在西班牙巴塞隆納舉辦世界行動通訊論壇(Mobile World Congress, MWC)，作爲全球行動通訊產業交流的平台，今年已邁入第 8 年。GSMA 世界行動通訊論壇同時包括全世界最大的行動設備及應用展場、部長級會議(含高階領導人會議、政府行動論壇、區域研討會等)、全球行動獎及企業專業研討會等。

本會爲加強與國外通訊傳播主管機關之交流，汲取通信服務、技術及監理之新知及國際發展趨勢，本年特由劉崇堅委員代表本會出席 GSMA 部長級會議，該會議之主題爲「行動科技引領人類生活之轉變(Leading the Transformation)」，討論重點包括：通訊應用服務與產業生態(ecosystem)的改變及影響、行動寬頻頻譜的規劃重點、開放性行動網際網路(open mobile Internet)的建立及行動通訊引領民生及健康醫療進入新的時代、行動通訊基地台的規劃及健康議題等。

總計本次部長級會議共有 131 個國家及國際組織代表參與，包括 50 位部長級官員及 70 位監理單位的高階主管等，同時國際電信聯合會(ITU)秘書長 Dr. Hamadoun Toure 亦親臨致詞，顯現 GSMA 年度行動通訊大會及部長級會議業受到 ITU 及各國之高度重視。本會劉委員於會議期間

亦與各國官方與產業代表及主辦單位積極互動，包括與捷克電信辦公室(Czech Telecommunications Office)主席 Dr. Pavel Dvorak、新加坡資訊通信發展管理局(IDA)副局長、喬治亞經濟發展部通信暨資訊技術處處長、智利電信管理局(Undersecretariate of Telecommunications)國際事務處處長、賴比瑞亞電信管理局(Liberia Telecommunications Authority)主席、國際電子發展公司(E-Development International)總裁兼執行長、GSMA 政府及監理事務主任等人，就會議議題、產業趨勢、市場發展等事項進行廣泛交流。

本會藉由積極參與相關活動，確能加強國際人脈之建立，以及對全球通訊傳播發展現況及未來趨勢之掌握，故建議未來仍應積極參加。

關鍵詞：GSMA、世界行動通訊論壇部長級會議、行動通訊、寬頻服務

目錄

壹、 緣起

全球行動通訊系統協會(GSM Association, 簡稱 GSMA)成立於 1987 年，其成員包含全球 219 個國家約 800 個行動電話業者，目前該協會致力於創新、培養及開創新的機會來促進全球行動通訊傳播產業之發展。GSMA 近年來在西班牙巴塞隆納舉辦世界行動通訊論壇(Mobile World Congress, MWC)，作爲全球行動通訊產業交流的平台，今年已邁入第 8 年，GSMA 世界行動通訊論壇同時包括全世界最大的行動設備及應用展場、部長級會議(含高階領導人會議、政府行動論壇、區域研討會等)、全球行動獎及企業專業研討會等。

本年 GSMA 部長級會議之主題爲「行動科技引領人類生活之轉變 (Leading the Transformation)」，本會爲加強與國外通訊傳播主管機關之交流，汲取通信服務、技術及監理之新知及國際發展趨勢，特由劉崇堅委員代表本會出席相關活動。

貳、 會議議程

	上午	下午
2 月 14 日	高階領導人會議 (Leadership Summit) ● 開幕致詞 (Opening Addresses) ● 小組討論 (Panel Discussion) ■ 應用服務的世界 – 對產業生態的影響 (The World of Applications – Implications across the Ecosystem) ■ 行動通訊 – 引導健康的新時代 (Mobile – Enabling a New Era for Health and Wellness)	
2 月 15 日	政府行動論壇 (Government Mobile Forum) ● 專題演講 (Keynotes) ● 行動寬頻頻譜 (Spectrum for Mobile Broadband)	

	● 促進開放性行動網際網路 (Enabling an Open Mobile Internet) ● 行動電話及基地台之規劃及建康議題(Managing Health and Planning Issues for Mobile Phone and Base Station Technology)	
2 月 16 日	政府及監理者研討會 (Government and Regulator Workshop)	亞太區域研討會 (Asia-Pacific Regional Workshop)
2 月 17 日	參觀展場	

參、 會議情形

一、 高階領導人會議 (Leadership Summit)

日期：100 年 2 月 14 日(一)

(一) 開場 (Opening Addresses)

法國電信執行長 Stephane Richard 在致詞時表示，從服務提供者的角度來看，在高度競爭的市場中，必須保持創新，以整合方式提供高品質的內容及有用的服務，並確保以下面向：

- 開放性(Openness)：除可擴大應用面外，亦可驅動我們的願景。
- 互運性(Interoperability)：這是服務提供者最基本的服務原則。
- 安全性(Security)：這是服務提供者對客戶的承諾。

歐盟負責「歐洲數位議程(Digital Agenda)」委員 Neelie Kroes 致詞時表示，面對行動通訊的快速成長及重要性，吾人不應只循今日成功的步伐，但應思考明日的方向；目前歐盟有兩個重要的議題，包括頻譜的規劃，例如 800MHz 將於 2013 年完成整備，以及歐盟會員國間不合理的跨境行動漫遊費的處理，目前該費用仍達國內通信費用的 3 倍，故我們必須思考是否導因於競爭不足，而解決方案爲何？我們希望在 2015 年時，使兩項費用達到一致，另透過意見的徵詢所獲得的

意見，亦建議應對行動漫遊費應採取高度管制，以保障民眾的權益。

(二) 小組討論 (Panel Discussion)

小組討論(panel discussion)與談者(包括中國移動董事長王建宙、宏達電執行長周永明、RIM 共同執行長 Jim Balsillie，以及埃及通訊暨資訊科技部長 Dr.Tarek Kamel、Appollo Telemedicine Networking Foundation 主席 Dr. K. Ganapathy 等)所提意見大致可歸納如下：

1. 目前我們刻正目睹通訊服務產業生態(ecosystem)的巨大改變：

- 行動數據應用及智慧型手機的逐漸普及，已使無線寬頻需求真正浮現，頻譜資源有效運用及數位紅利成爲當前重要議題。
- 智慧型手機(smart phone)的銷售將於本年底超過傳統的功能手機(feature phone)。
- 這些改變將爲網路業者、應用服務提供業者及設備商帶來挑戰及機會。
- 確保消費者選擇權是這個改變過程中，不可忽略的要素。

2.未來的贏家將是掌握服務創新及市場導向的業者

- 整合服務的提供
- 高品質的內容
- 符合消費者需求的有用服務

3.爲了達成上述目的，必須確保網路的互連(interconnectivity)與服務的互通(interoperability)、安全(security)，建立可行的收費模型(billing)，並對網路及服務做有效率的管理。

4.隨著開發中國家整體人口及已開發國家高齡人口的增加，醫療保健業成爲當今各國政府的重要挑戰，預期至 2050 年時，OECD 會員國醫療保健支出之成長幅度，將超越其國民所得之成長，支出額度將達國內生產毛額的 15~25%。透過行動通訊服務，大致可從以下面向改善醫療保健服務的品質：

- 遠端監控及診斷
- 定時提醒用藥及自我檢測
- 遠端病患醫療數據蒐集，以利病患管理及醫療研發
- 實現居家醫療，改善病患生活品質

二、 政府行動論壇 (Government Mobile Forum)

日期：100 年 2 月 15 日(二)

(一) 專題演講 (Keynotes)

本議程首先安排 ITU 秘書長 Dr. Hamadoun Toure 進行專題演講，他提到我們刻正見證近十年來資通訊技術(ICT)的快速發展，特別是行動通訊的超凡進步；在 1990 年代末期，全球僅有 5 億行動通訊用戶，今日此數字已超過 50 億，即便在部分開發中國家的偏鄉，行動通訊的家戶普及率亦已超過 50%；故 ITU 推動全球民眾近用通信技術的目標，已然達成；而今日我們所面臨的挑戰，是如何針對網際網路，特別是寬頻通信，複製行動通訊的成功奇蹟。

Dr. Toure 提到，目前全球三分之二的人口仍無法上網，而開發中國家中僅有少部分的人可使用撥接方式上網，相較於數十億人關切飲水安全、食物價格大漲及醫療保健的缺乏，上網是否重要？ Dr. Toure 表示，上網很重要，因爲寬頻是最特殊的致能工具(enabler)，最終它將改變每個人的生活，尤其是擁有廣大偏遠地區的開發中國家，透過寬頻，可以提供更好的醫療保健、下一代可以不受地理藩籬的限制而獲得更佳的教育、可以確保環境的永續經營及減緩氣候變遷的問題。

爲了促進寬頻的近用，Dr. Toure 呼籲政府應重視兩個議題：(1)應將寬頻網路建設列爲優先事項，同時爲了促進各國政府高層的重視，併同本年將於日內瓦舉行的 ITU 世界電信研討會(ITU TELECOM) 40 週年活動，ITU 亦將於本年 10 月 24 日至 27 日舉辦「全球寬頻高峰會(Global Broadband Summit)」；(2)近用寬頻的費率應使更多人負擔得起，在 ITU「評量資訊化社會 2010 (Measuring Information Society 2010)」報告中，在全球近用寬頻費率最高的 28 個國家裏，寬頻月租費相當於當地一個月的平均所得，所幸行動寬頻的快速發展，已帶來正面的影響，今日大家在巴塞隆納齊聚一堂，共同討論相關議題，相

信吾人將可透過行動通訊的神奇力量，打造世界成爲更好的居所。

標檢集團(STC Group)執行長 Eng. Saud Al Daweesh 致詞表示，年復一年，電信產業不斷開創新的局面，在百年來全球經濟歷經三次的超級循環(super-cycles，分別爲 1880 年至 1910 年、1950 年到 1970 年、2000 年迄今)中，電信產業均扮演關鍵的科技驅動力；而今「連網的世代(Connected Generation)」促進了行動通訊的快速普及，社群網站、線上應用服務則提升了近用網際網路的意願，也促使連網價格快速下降、速率快速提升。

Daweesh 提到，當前經濟成長與各國是否能滿足人們上網需求，以及是否使公私部門寬頻投資具有獲利性，將有莫大的關聯；他認爲新興市場必須超越阻礙性的舊有管制措施，在其中市場主導者濫用其市場地位，另外已開發市場中所談論的「網路中立性(Net Neutrality)」，亦須考量是否影響寬頻網路業者的獲利性及投資意願。於此，機場及媒體產業開放予航空公司、廣告近用，並依使用時段收取不同費用的措施，應值得參考，奠基於此自由市場經濟上，將允許具獲利的基礎網路投資。

(二) 行動寬頻頻譜 (Spectrum for Mobile Broadband)

印度通信暨資訊技術部長 Mr. Shri. Sachin Pilot 以「印度行動寬頻之頻譜(Spectrum for Mobile Broadband in India)」爲題進行報告，他首先表示，近年來印度經濟快速成長，已成爲全球第四大經濟體，而電信是促進此經濟成長的主要貢獻力量，印度的電話普及率從 10 年前的 3%成長至今日的 62%就是最好的印證。藉由公私協力(Public-Private Partnership)方式，政府推動的改革與企業的努力，促使電信成爲一個自由化、創新及競爭的產業。

隨著寬頻的普及，爲偏遠地區民眾帶來許多利益，例如電子化政府、醫療、教育等，除了改善數位落差外，同時也將帶來長期的乘數效果(multiplier effect)；因此在偏遠地區提供可負擔的寬頻服務，也就成爲印度政府的優先政策措施。著眼於行動通訊的快速佈健及效率，印度政府將優先採用無線接取網路，並兼顧骨幹網路的建設，透過「國家寬頻計畫」，印度將鋪設光纖網路至擁有 500 位以上居民的所有區域；在此同時，頻譜的有效使用、長期規劃及可負擔的行動終端設備，

亦是印度政府努力的目標。

隨後進行的小組討論(panel discussion)，與談者(包括塞爾維亞電信及資訊社會部長 Jasna Matic、愛爾蘭通信監理委員會委員兼歐盟無線電頻譜政策小組主席 Mike Byrne、澳洲行動通訊協會執行長 Chris Althaus 等人)所提意見大致歸納如下：

- 頻譜規劃須及時，並兼顧透明、可預測性及穩定性。
- 政府應與產業等利害關係者(stakeholders)合作，以研議頻譜政策、瞭解需求、訂定可行的一套遊戲規則，引入競爭機制，俾提高頻譜使用的有效性及效率。
- 頻譜政策及頻譜規劃均須與國際充分接軌，俾確保頻譜之和諧使用、服務之跨國漫遊及終端設備製造之經濟規模(可使價格下降，提高消費者對終端設備的選擇性，進而加速普及)。

(三) 促進開放性行動網際網路 (Enabling an Open Mobile Internet)

RIM 共同執行長 Jim Balsillie 以「行動網際網路願景(A Vision for the Mobile Internet)」進行報告，指出通信、應用服務、B2B/G2C、金流、數位媒體的匯流爲監理政策帶來許多新的議題及機會，例如在阿根廷，透過智慧手機將二百萬平方公里內的農作物生產者作密切的整合，使得市場價格更新、訂單、農業氣象預報、穀物運送之貨車需求、物流追蹤、收付款的確認等整個供應鍊的管理，變得更有效率及可靠，也爲農業社群通信方式帶來革命性的改變。

此外 Balsillie 提到，英國南約克郡警方透過智慧手機，可以即時查詢確認目前所在地點，以及所遇見的人士、車輛，不僅改善打擊犯罪的成果，也節省每位員警每次執勤時間 30 分鐘，每年並爲當地警方減省 6 百萬英鎊。最後他則以頻譜需求每年成長 108%、供給每年成長 12%，作爲監理挑戰之結論。

小組討論與談者(包括歐盟國際 ICT 政策主任 Nigel Hickson、Telefonica 國際事務辦公室主任 Carlos Lopez Blanco、AT&T 國際事務資深副總經理兼 GSMA 監理事務小組主席 Len Cali 等人)所提意見大致歸納如下：

- 談開放性網路(open network)或網路中立性(network neutrality)時，須進一步探討是否只看網路層之開放使用，抑或也應看應用服務(applications)層？網路業者是否因此而無法對其網路及訊務流量(traffic)作合理的管理及收費？服務之互通性是否因此獲得確保？

- 談開放性網路，須進一步探討隱私(privacy)及安全(security)，因此國際合作或區域合作有其必要，但應避免因管制過當而扼殺應用服務之發展，但如只透過自律(self-regulation)是否足夠？另外，也須建立一套非歧視(non-discrimination)及簡單可行的收費原則。

- 網路業者(如我國的第一類電信事業)於基礎網路的巨額投資，在網路中立性政策的執行下，是否可獲得合理的回收？抑或上層應用服務提供者(如 Google)成爲 free rider，拿走極大部分的營收？如此，是否將降低業者投入基礎網路建設之動機？這些議題均須進一步探討。

(四) 行動電話及基地台之規劃及建康議題 (Managing Health and Planning Issues for Mobile Phone and Base Station Technology)

小組討論與談者(包括 WHO 電磁場計畫主任 Dr. Emilie van Deventer、GSMA 研究暨永續辦公室主任 Dr. Jack Rowley、德國 Karlsruhe 技術研究所資深研究員 Dr. Peter Wiedemann 等人)所提意見大致歸納如下：

- 行動電話基地台的處理因地而異，非屬單純的技術議題。

- 中央政府、地方政府及業者的責任應釐清。

- 政府應提供充分、及時的資訊(如 WHO 所發布的消息)予民眾，爭取民眾對政府的信任，另應透過對業者的督導或合作，加強與民眾溝通，以瞭解民眾疑慮及意見，另應確保相關設備符合國際標準，並訂定基地台建設之標準作業流程及檢核事項清單。

三、 政府及監理者研討會 (Government and Regulator Workshop)

日期：100 年 2 月 16 日(三)上午

本研討會係由易利信公司(Ericsson)舉辦，主要報告該公司就全球市場與技術趨勢之觀察，基本上重點趨勢如下：

- 行動寬頻成長強勁
- 可用終端設備賡續上市
- 數據訊務流量(data traffic)快速成長
- 數據訊務營收逐漸下滑
- 雲端運算的應用逐漸出現
- 2020 年前，所有可以從網路連接獲得效益的事物，均將連結網路，所需基礎包括移動性、寬頻及雲端。

針對上述重點趨勢，該公司評估將對產業造成以下影響及衝擊：

- 依易利信統計資料顯示，行動寬頻訊務流量以每年兩倍的速度成長，故預測未來 5 年將成長 30 倍，10 年將成長 1000 倍。依此預測，如頻譜資源未及時規劃，恐難因應市場快速成長的需求。
- 而隨著無線寬頻的快速成長，後端線路(backhaul connection)連接至核心網路(core network)的頻寬亦須配合成長；再者，由於行動寬頻的使用仍以室內(indoor)爲主(部分設備商預估約達 7 成)，行動業者爲減輕其行動寬頻接取網路之負載，可能採取在室內佈建 WiFi、Femtocell 等方式，將訊務流量(traffic)改由固定網路(如數位用戶迴路 DSL)傳送至核心網路；在這些情況下，若固定網路之頻寬不足，將有可能成爲未來寬頻通訊之瓶頸所在。
- 在網路佈建方面，行動業者由既有網路升級至寬頻網路的過程中，可能採逐步汰換、異質(heterogeneous)網路並存的方式處理，或者係爲因應某特定小範圍地區對行動寬頻的高度需求，此時行動業者均可能在既有微型細胞(micro cell)基地台的服務涵蓋範圍中，再佈建新的超微型細胞(pico cell)基地台，以提供消費者所需的寬頻服務，此時基地台的數量將呈倍數成長。

四、 亞太區域研討會(Asia-Pacific Regional Workshop)

日期：100 年 2 月 16 日(三)下午

GSMA 報告規劃 700MHz 頻段供行動通訊服務使用的重要性，強調透過建立相關設備生產之經濟規模，可使終端設備價格快速下降、服務快速普及，且有利於跨國漫遊，最終並建議採行亞太電信社群(APT)無線論壇(Wireless Forum) 2010 年 9 月通過的 700MHz 頻段計畫(band plan)，規劃 698-806MHz 供行動通訊服務(指 FDD)使用。

波士頓顧問公司(Boston Consulting Group)就其所完成之"The Socio-economic Impact of Allocating the 700MHz Band to Mobile in Asia Pacific"報告進行簡報，該報告係針對將 700MHz 頻段核配予行動寬頻服務而非數位廣播電視服務所獲致之效益進行分析，其結論認爲，借由核配 700MHz 供建置及提供行動寬頻服務，將可改善民眾近用教育、醫療、金融等服務之社會效益，提升企業生產效能、增加就業率等經濟效益，最終於 2020 年前使亞太國家總 GDP 增加 7,290 億美元、偏遠地區網際網路用戶增加 14~23%，達成縮小數位落差目標。

五、 參觀展場

日期：100 年 2 月 17 日(四)

本次行動設備及應用展場共吸引約 1,400 家公司參展，展場面積達 5.8 萬平方公尺。本會出國代表因時間關係，主要安排赴易利信(Ericsson)、阿爾卡特朗訊(Alcatel-Lucent)、宏達電(HTC)及三星(Samsung)等設備商之展場參觀，整體展出的重點包括：

- 行動終端設備：包括智慧型手機、LTE Dongle 及整合 LTE 晶片組之平版電腦、筆記型電腦等，相關技術趨勢包括 Android 3.0、雙核心技術、3D 立體影像呈現，並強調可提供語音通話之 LTE 手機即將商用化。
- 基地台：包括 LTE 超微型細胞(pico cell)基地台、室內家用基地台等，均強調體積小，天線與基站整合(從外觀看不到如過去 2G、3G 的天線)，可相容提供 GSM、WCDMA、HSPA 通訊功能等。

- 應用程式介面(Application Programming Interface, API)：強調提供電信業者或第三方(third party)應用服務開發者便利的軟體開發介面。
- 未來行動寬頻應用概念：強調因物聯網(Internet of Things)、視訊(包括視訊電話、視訊會議、電影、電視等)、線上遊戲、適地性服務(location-based service)等應用，行動通訊的頻寬需求將呈指數成長。

肆、 心得與建議

一、 本年部長級會議有 130 餘國家及國際組織代表參與，包括 50 位部長級官員及 70 位監理單位的高階主管等，ITU 秘書長亦親臨致詞，顯現 GSMA 年度行動通訊大會及部長級會議業受到 ITU 及各國高度重視。本會劉委員於會議期間亦與各國官方與產業代表及主辦單位積極互動，包括與捷克電信辦公室(Czech Telecommunications Office)主席 Dr. Pavel Dvorak、新加坡資訊通信發展管理局(IDA)副局長、喬治亞經濟發展部通信暨資訊技術處處長、智利電信管理局(Undersecretariate of Telecommunications)國際事務處處長、賴比瑞亞電信管理局(Liberia Telecommunications Authority)主席、國際電子發展公司(E-Development International)總裁兼執行長、GSMA 政府及監理事務主任等人，就會議議題、產業趨勢、市場發展等事項進行廣泛交流。整體而言，藉由積極參與相關會議活動，對於加強本會國際人脈之建立，以及對全球通訊傳播發展現況及未來趨勢之掌握，誠有相當助益，故建議未來仍應積極參加。

二、 由於行動寬頻的快速成長，頻譜資源的管理及規劃，誠爲本次會議討論的重點之一；惟後端線路(backhaul connection)連接至核心網路(core network)的頻寬亦須配合成長，方可使無線寬頻接取技術及服務的效益發揮至極致，故其重要性亦不可偏廢。

三、 中興、華爲公司大規模參展，展現極大的企圖心，會場中相當受到矚目。另欣見我國宏達電公司亦設有大型展場，同時該公司執行長周永明先生亦受邀在多場研討會(包括高階領導人會議)中做專題演講，顯示其品牌實力已獲國際高度肯定，期盼未來我國能有更多類似的成功案例可以在國際上發光。

四、 由展場所呈現之行動終端技術趨勢，如開放作業系統 Android 3.0、雙核心技術、3D 立體影像螢幕等，預期將爲行動通訊使用者注入嶄新的使用經驗，或許也將引領另一波新的應用服務熱潮，值得各界保持密切的注意。

MOBILE WORLD CONGRESS

10.30, TUESDAY 15 FEBRUARY 2011
BARCELONA, SPAIN

GOVERNMENT MOBILE FORUM

DR HAMADOUN TOURÉ

SECRETARY-GENERAL,
INTERNATIONAL TELECOMMUNICATION UNION

Distinguished colleagues,
Ladies and gentlemen,

- We have seen the most extraordinary progress in ICT development in the past decade, especially in mobile communications.
- I hardly need to remind anyone here at the Mobile World Congress that at the end of the 1990s there were fewer than 500 million mobile cellular subscriptions globally. Or that today, there are well over five billion.
- Even in rural areas of some developing countries, we are now seeing household mobile penetration rates of over 50%.
- So we at the ITU – and across the broader ICT sector – have achieved our primary aim, of bringing all the world's people within reach of communications technology.
- The challenge now is how to replicate the mobile miracle for the Internet, and especially for broadband.
- I think here in the rich West, we have a tendency to forget how important the Internet has become in our daily lives – or indeed how difficult it would be for any of us to live and work without it.
- We did see, however, the quick and crippling effect that switching off the Internet had on Egypt's economy over the past few weeks.
- For most of the world's people, it is not a question of switching off the Internet, however, but a question of how to get access for the very first time.

- Two thirds of the global population is still offline, and only a tiny fraction of people in the developing world have anything other than a dial-up connection.
- Does this matter, when billions of people might arguably be more concerned by the daily lack of safe drinking water, rising food prices, and a chronic shortage of healthcare?
- It does matter.
- Because broadband is the most extraordinary enabler. And, over time, it will transform the lives of everybody.
- This is especially true in the developing world. And it is especially true in countries with large rural and remote populations.
- Let me give you just a few examples:
    - With broadband networks, health services can be delivered far more effectively, and especially to ageing or isolated populations.
    - With broadband networks, we can better educate the next generations of children, wherever they live.
    - With broadband networks, traffic networks can be streamlined, government services can be delivered more efficiently, and water and energy supplies can be properly monitored, managed and conserved.
    - With broadband networks, we can create the right environment for applications like mobile banking, which are already in the process of improving the lives of millions of people around the world.
    - With broadband networks we can help to ensure environmental sustainability, and help to manage and mitigate climate change.
    - And with broadband networks, progress can be rapidly accelerated towards meeting the Millennium Development Goals.
- What can we do, *ladies and gentlemen*, to bring broadband to all the world's people?
- Two things need to happen.
- ***Firstly***, 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.

- This is why ITU, in conjunction with UNESCO, launched the Broadband Commission for Digital Development last year. To encourage governments around the world to implement national broadband plans and increase access to broadband applications and services.

- The Commission is co-chaired by President Paul Kagame of Rwanda and Carlos Slim, Honorary Lifetime Chairman of Grupo Carso. We also have over 50 Commissioners from the highest walks of life across the public and private sectors – and many of them are here in Barcelona for the Mobile World Congress this week.

- In the first months of the Commission's existence we successfully raised broadband as a vital issue of global concern at the highest political levels.

- We did this most notably at the 2010 MDG Summit, which was held in New York last September, and I am pleased to see that the Broadband Commission was specifically mentioned in one of the General Assembly's Resolutions.

- There will be a Global Broadband Summit in Geneva in October, which will be held in conjunction with the ITU Telecom 40th anniversary edition – so please mark 24 to 27 October in your diaries if you haven't done so already.

- ITU Telecom World 2011 will bring together world leaders at the highest level, along with top executives from many of the world's most powerful players in the ICT sector – including many of the people here in Barcelona this week, of course.

- I will very much look forward to continuing the present discussions and debates when we meet again in October.

- The ***second*** thing that needs to happen is that Internet access – and especially broadband access – needs to become very much more affordable than it is today.

- There are quite extraordinary disparities today between the affordability of broadband access in different countries around the world.

- It is a terrible irony that all around the world, the people who can least afford broadband access continue to be asked to pay the most, relative to their income.

- In the most expensive 28 countries listed in ITU's 'Measuring the Information Society 2010' report, a monthly broadband subscription costs over 100% of average monthly income.

- Compare that to the world's rich and developed countries, where broadband access on the whole costs from 1 to 3% of average monthly income.

- There are clear grounds for optimism, however.

- Firstly, generally speaking, broadband access is getting more affordable, everywhere, year-on-year. Ongoing increases in capacity, more competitive market places, and effective policy and regulatory frameworks, are doing much to drive prices down.

- And secondly, of course, we have the ongoing explosion in mobile broadband, which is changing the world in front of our eyes.

- In early 2011, we have over a billion mobile broadband subscriptions globally, and that number is forecast to continue to grow very rapidly indeed over the coming years.

Ladies and gentlemen,

- I personally believe that this will be the decade when the Internet becomes truly pervasive and truly ubiquitous – going far beyond the two billion people who already have access today, and reaching the unconnected billions worldwide.

- I believe that we will see the Internet spread everywhere this decade – not just connecting people, but connecting objects, machines, cars, households, factories and governments, in hitherto unimagined ways.

- This will very largely be brought about by the rapid proliferation of advanced mobile technologies.

- Here in Barcelona, this is something we can all celebrate.

- We are fortunate not just to be working in a sector that is right at the heart of everything that happens in the modern world, but in a sector that has the potential to make real and lasting improvements to the lives of all the world's people.

- I challenge you, therefore, to put all this connectivity, all these amazing mobile devices and incredible mobile technologies, to good use.

- What are *you* going to do to ensure that mobile plays a real part in improving global health? Global education? Global entrepreneurship?

- What are *you* going to do to in terms of getting the right content onto the right devices in the hands of the right people? Wherever they live, and whatever their circumstances?

- Together, I know that we can harness the incredible power of mobile to make the world a better place for all.

Thank you.

1,200 words

Engr. Saud AL Daweesh, Group CEO, STC

Your Excellencies, Ladies and Gentlemen

It gives me great pleasure to be among you today, in this important forum that brings the shapers of our industry together to discuss the most important topics that shape our industry.

Year on year, the telecom industry continues to open new frontiers. Never before has the pace of development been so dramatic in an industry affecting everyday life and playing a key role in the economy, influencing its cycles for over 100 years.

The world economy has enjoyed three time periods of economic growth known as super-cycles; (1880 to 1910), (1950 to 1970) and (2000 to present). These economic cycles are usually driven by increasing trade, high rates of investment, urbanization and technological innovation, characterized by the emergence of large, new economies, first seen in high catch-up growth rates across the emerging world.

We, at STC, believe that innovation in the telecom industry was a major technological driver to these cycles:

- The invention of the electrical telegraph
- The invention of the telephone in 1876
- The development of long distance data networks in the forties

- And the commercialization of the internet coupled with the first GSM networks in Europe in the nineties

The “Connected” Generation, or Generation-C was a major contributor to the fast development and spread of mobile communication, and more recently, mobile and wireless data. Social networks and online applications have significantly increased interest in connectivity at increasingly higher speed, capacity and reach.

Your Excellencies, our economic growth is linked to our ability to serve the needs of this generation and enable public and private sectors to profitably invest in appropriate broadband infrastructure in an accelerated pace, in order to satisfy the demand that has been building up over a decade.

In order to do so successfully, emerging markets have to transcend their traditional slow developing regulations that are still in many cases restrictive where, for instance, we still see the unimaginable practice of incumbents being allowed to price on-net mobile voice traffic below interconnect price levels. While we see in some developed markets the other extreme where the topic of “Net Neutrality” has taken a social dimension that is democratizing telecom network access beyond any other comparable industry, impacting the ability of infrastructure builders to profitably build the future mobile and fixed superhighways at the required pace. There are lessons to be learned from other industries.

Airports, roads, media among others all have their similar forms of access neutrality. While open air policy, for example, gives access to any airline, the airport still sells the best time slot at a premium… and While media has to open indiscriminately its airwaves to all advertisers, the spots are allocated to time slots based on the nature of the content.

Such rules are basic building blocks of free market economies, that, when applied, will allow profitable investment in appropriate infrastructure upon which economies are built.

Your Excellencies, ladies and gentlemen, I wish you a very successful debate over the next few days, that will help our industry capture the value of the fast technology evolution of today to build sustainable economies in the future.

Thank you for listening.

INPUTS FOR SPEECH

FOR

SHRI. SACHIN PILOT
HON'BLE MINISTER OF STATE FOR COMMUNICATIONS & IT

ON
"*SPECTRUM FOR MOBILE BROADBAND IN INDIA*"

AT

THE 3GSM WORLD CONGRESS BARCELONA

ON

-- February, 2011

Distinguished Delegates,

Members of the Media,

Ladies and Gentlemen,

It is indeed a pleasure to be here before this distinguished gathering and represent India, which is making an indelible mark around the world in all spheres. Mr. Barack Obama, U.S. President, during his visit to the country last year stated, “For in Asia and around the world, India is not simply emerging; India has already emerged.” I absolutely agree with this statement, as the Indian economy is poised to meet a GDP growth rate of 8.5 percent in 2010-11, amongst the highest growth rates in the world. India is the world’s fourth largest economy behind US, China and Japan in terms of purchasing power parity.

I have great pride in stating that I am a part of the one of the most dynamic sectors of the country, which is the prime contributor tp economic growth of the country. Yes, the Indian telecommunications sector has been scaling newer heights year on year. This is exemplified by the achievement of over 730 million mobile subscribers now, representing a teledensity of over 62% from only 3% a scant 10 years ago! We are today the fastest growing telecom market in the world, with the addition of over 15 million subscribers every month.

I believe that the excellent progress made by the Telecom sector, especially the mobile industry is the result of a strong spirit of cooperation and commitment that has been building up over the last few years between the Government and the industry. The strength of the Indian telecom industry lies in its form of working in the PPP (Public-Private Partnership) mode. The Government on its part has maintained a strong focus on ongoing telecom reforms which coupled with aggressive efforts of the industry have catapulted the sector to the cutting edge of liberalization, innovation and competition.

I am also confident that the exceptional progress that the Indian mobile industry has made will continue to be the engine that drives broadband services in the country. Broadband connectivity is increasingly seen as an integral driver of improved socio-economic performance. We believe that all citizens of India should have access to broadband and the transformative opportunities it offers. Broadband services allow individuals to access new career and educational opportunities, they help businesses reach new markets and improve efficiency and they enhance the Government's capacity to deliver critical services to all of its citizens.

For urban India, broadband will offer the convenience of mobility with rich multimedia services, with streaming audio and video, high data transfer rates, faster video/data downloads, new services like video telephony, video on demand, mobile TV & other entertainment related services and personalized services, where content can be pushed to users.

Substantial additional benefits of broadband will come for the rural subscribers. Their requirements are much more. In fact, in some cases, more than in the case of the urban subscribers. Services like health care, education, e-governance, etc., which the urban subscribers take for granted, are of greater importance to them than to their urban counterparts. These can be delivered to them through Mobile Broadband services. Another important service that would be delivered to them with ease would be M-banking. This will bring a sea change in the lives of the rural and un-banked population of our country.

Provision of Broadband in rural and remote areas will also help in bridging the so-called “digital divide” and the widespread adoption of broadband in rural areas will have a multiplier effect over the long-term. It will help improve productivity in rural areas, help overcome the constraints of an inadequate transport infrastructure and overall improve the quality of life in rural areas. Given the significant economic and social benefits, expanding affordable access to broadband will become a high priority for the Government.

The Indian demographics with a large rural population suggests that the development of a robust broadband ecosystem will be the key to meet Government’s objectives. It is a known fact that wireless is the quickest and most efficient medium to provide broadband services in the access network. World over, wireless broadband technologies have been identified as the via media to overcome the hurdles faced by wireline. We therefore believe

that the future growth of broadband in developing countries, especially India, will see wider deployment with greater emphasis on wireless networks.

However, there is an absolute necessity to have an equally competent backbone network. To cater to the higher speeds and the applications available on broadband, it is critical to have a strong backhaul system, which supports this. The Government has almost finalized the 'National Broadband Plan', which envisages reaching out to all the corners of the country including the rural and remote areas. The plan would broadly delineate the utilisation of the existing network , new infrastructure required to be built ,desirable technologies, expected outcomes, timeframe and financing.

The Government, under the National Broadband Plan, will build the OFC network, which will be an open access optical fibre network connecting all habitation with population of 500 and above. This Network will be established in two phases. The first phase covering all cities, urban areas and Gram Panchayats will be completed by the year 2012. Phase II will see the extension of the network to all the habitations having a population more than 500, to be completed by the year 2013.

To cater to the access network, last year, we had conducted a very successful auction of the 3G & BWA spectrum. The operators have started rolling out the wireless broadband networks in the country and very soon the services will be available in the entire country.

The availability of various applications on the move will attract more users by increasing the value of broadband. Various stakeholders like service providers/ vendors have started investing heavily for the creation of application stores which allows users to browse and download applications with no or minimum costs, thereby increasing the accessibility and adoptability of broadband.

At present the 3G spectrum allocation made to the operators is only 5MHz, which I believe will be able to support limited number of subscribers. The confluence of the Internet and mobile/wireless computing, along with geo-spatial integration will accelerate the consumption of spectrum. With data applications able to consume far more bandwidth than voice and with an expected increasing number of mobile users engaging in ever more bandwidth intensive applications, it is only a matter of time before current commercial mobile radio spectrum will be exhausted.

The capacity of a wireless network (and therefore the network's ability to support wireless broadband services and applications) in any given location depends on spectral efficiency, as well as the amount of spectrum the operator has. Mobile network operators have implemented or are considering various mechanisms to maximize capacity by managing bandwidth consumption in the absence of access to more licensed spectrum. While engineering greater spectral efficiency and building more cell sites have increased some capacity, taken

alone, they are unlikely to address the expected magnitude of the demand for spectum. Long term, more spectrum is needed to enable mobile operators to keep pace with consumer demand for more and faster mobile broadband.

However, we do not want that the lack of spectrum should become a major hurdle to realizing the potential of broadband and deny subscribers the benefits/ applications of broadband. Thus, we are exploring other spectrum bands for wireless broadband usages. The Government is in the process of framing a policy, which includes identification of such bands, co-ordination from existing users and allocation for future use.

There is a lot of opportunity in the rural areas in India, as the teledensity in rural areas at present is only ~30%. To increase penetration in these areas and also to provide the benefits of mobile/ broadband services to these people, the Government is developing suitable subsidy schemes and programs in consultation with the stakeholders for penetration of broadband services. We hope to finalize the National Broadband Plan along with all the required subsidy schemes to meet the Government objectives very shortly.

The Government also recognizes that the cost of the subscriber terminal equipment is also a key to providing affordable services to the subscribers. the Government is providing fiscal incentives on telecom manufacturing and is also focusing on encouraging domestic manufacturing to meet the affordability targets.

I am sure that the next year when India is represented at this particular forum, we will have a lot to talk about the broadband achievements that the country will be setting in this coming year.

We have a tremendous opportunity in front of us. I, on behalf of the Government of India, invite all our foreign friends to participate in this tremendous opportunity and effort. I assure you that it would be mutually beneficial. The challenge of connecting a vast and vibrant country and a billion people onto the unlimited opportunities of the broadband seems momentous. My Government and I are committed to make the vision of a broadband connected nation a true success, and look forward to working with all of you to make this happen!

Thank You.

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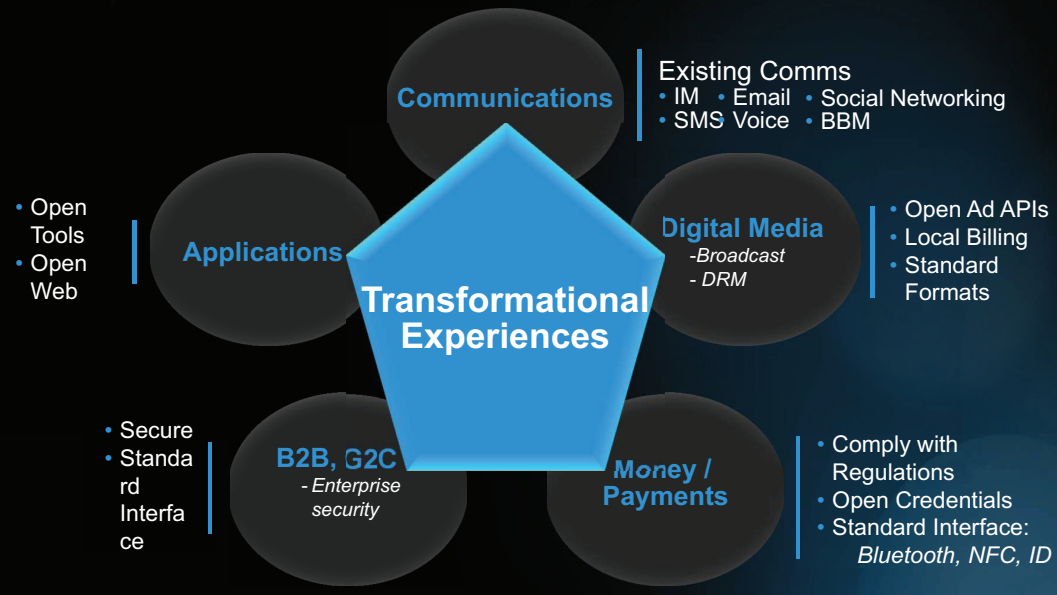
A Vision for the Mobile Internet

Jim Balsillie, Co-Chief Executive Officer
Research In Motion

A Vision for the Mobile Internet

The convergence of five formerly independent categories is creating regulatory public policy issues and opportunities



E-Government and Economic Development

Agriculture - Compania Argentina de Granos
Argentina

Solution Deployed

- Connects 4,000 agriproducers over 2+ million square km to CAGSA's Oracle ERP on BlackBerry smartphones
- Enables commodity market price updates, supply orders, agricultural weather forecasts, truck requests for grain pickups, delivery tracking, and accounts payable and receivable

Results

- Improved efficiency and reliability of supply chain
- Faster decision making and new information services
- Revolutionized communication within agricultural community
- Competitive advantage and higher loyalty for CAGSA

"This BlackBerry wireless solution streamlined the way to do business with our 12,000+ agriproducer community."
Gastón Kauer, COO, CAGSA

E-Government and Economic Development

Education - Gauteng Department of Education
South Africa

Solution Deployed

- Provides 2,200 school principals with BlackBerry devices to improve communication and reporting with district offices
- Employs customized application developed locally by Afrigis

Applications

- Gathering and sharing intelligence regarding issues experienced in the schools
- Reporting and sending photos of incidents that occur at schools
- Monitoring supplies and attendance in the schools
- Improving collaboration in a cost effective manner with BlackBerry Messenger

"We have 150 school support clerks we use to communicate with principals. With these [smart]phones we will communicate directly with principals. We need a 21st century way to communicate."
Barbara Creecy, Gauteng MEC for Education

E-Government and Economic Development

Public Safety – South Yorkshire Police
United Kingdom

Solution Deployed

- Equipped 1,000 police officers with BlackBerry smartphones, loaded with an Airpoint application, providing them with immediate access to police records
- Enabled South Yorkshire police officers to instantly and easily identify a person, vehicle or location when on patrol and input their 'Stop and Search' forms without having to go back to the station

South Yorkshire POLICE

Results

- Improved crime fighting
- Increased police presence in communities

Estimated Future Results*

- Savings of 30 minutes per shift per officer
- £6,037,475 efficiency savings per year

"Deploying the BlackBerry solution at South Yorkshire Police has demonstrated the value that mobile technology can provide police forces."
Sergeant Simon Davies, Project Manager, South Yorkshire Police

*Due to anticipated deployment of 2,500 additional smartphones to officers by February 2011

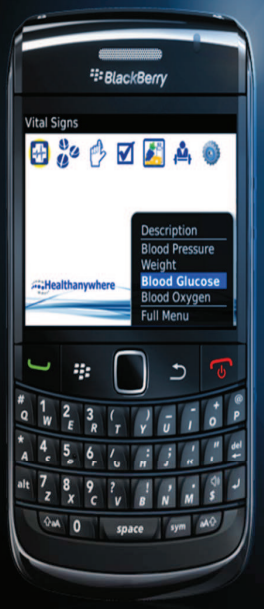
E-Government and Economic Development

Healthcare - We Care Home Health Services
Canada

Solution Deployed

- Utilizes Bluetooth-enabled monitors to send data to a web portal in order to track patient blood pressure readings automatically with the Health On The Go solution from HealthAnywhere

wecare™ Home Health Services



Results

- Streamlined administration and better reporting
- Empowered patients and reduced burden on healthcare system
- Meets privacy requirements for medical information
- More connected, happier staff with improved company loyalty

"Our monitoring application on the BlackBerry smartphone keeps patients safely at home while simultaneously managing their vital signs – the gains to individuals and to the healthcare system are enormous."
John Schram, CEO, We Care Home Health Services

BlackBerry has >1m users in the US Government

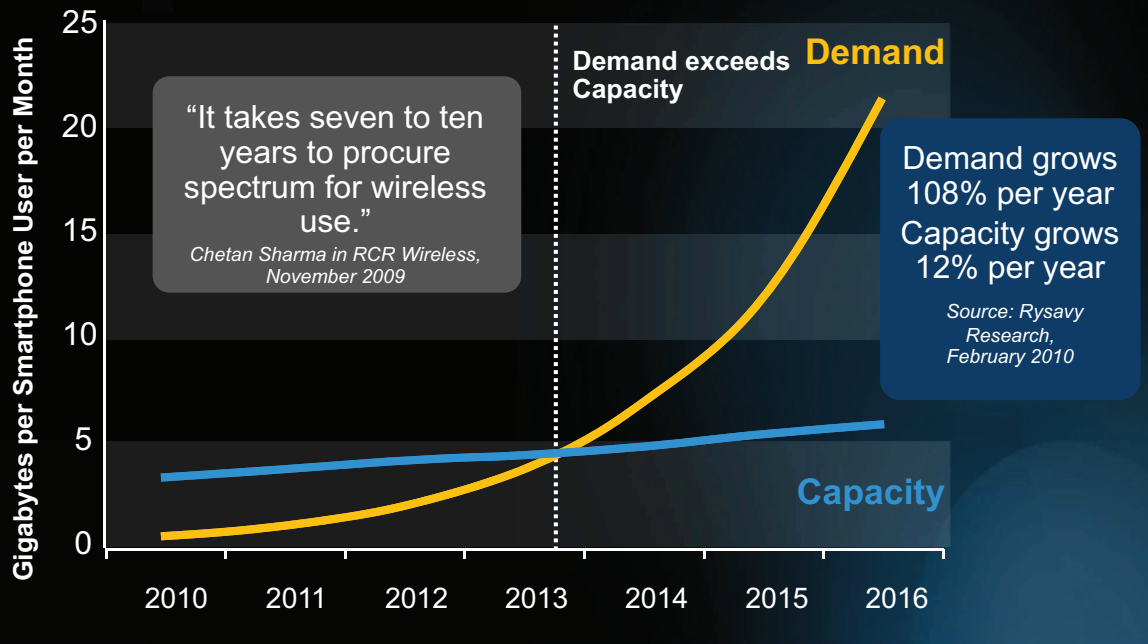
US Federal agencies among the earliest of adopters of BlackBerry

- Air National Guard (ANG)
- Central Intelligence Agency (CIA)
- Defense Department (DOD)
- Department of Air Force
- Department of Army
- Department of Commerce
- Department of Navy
- Department of State (DOS)
- Department of Transportation (DOT)
- Department of the Treasury
- Energy Department (DOE)
- Fannie Mae
- FDIC
- Federal Aviation Administration (FAA)
- Federal Bureau of Investigation (FBI)
- Federal Bureau of Prisons
- Food and Drug Administration (FDA)
- Federal Reserve Bank of New York
- GSA
- Department of Homeland Security (DHS)
- House of Representatives
- Department of the Interior
- Internal Revenue Service (IRS)
- Joint Chiefs of Staff
- Justice Department
- Department of Labor (DOL)
- Library of Congress
- National Aeronautics and Space Administration (NASA)
- National Institutes of Health (NIH)
- National Oceanic and Atmospheric Administration (NOAA)
- National Security Agency
- Office of the Inspector General (OIG)
- Secret Service
- Securities and Exchange Commission (SEC)
- Senate
- Small Business Administration (SBA)
- Social Security Administration
- State Department
- Transportation Security Administration
- Treasury Department
- U.S. Courts
- U.S. Customs and Border Protection
- U.S. Postal Service
- Veterans Affairs Department (VA)
- Veterans Health Administration
- White House

U.S. AIR FORCE

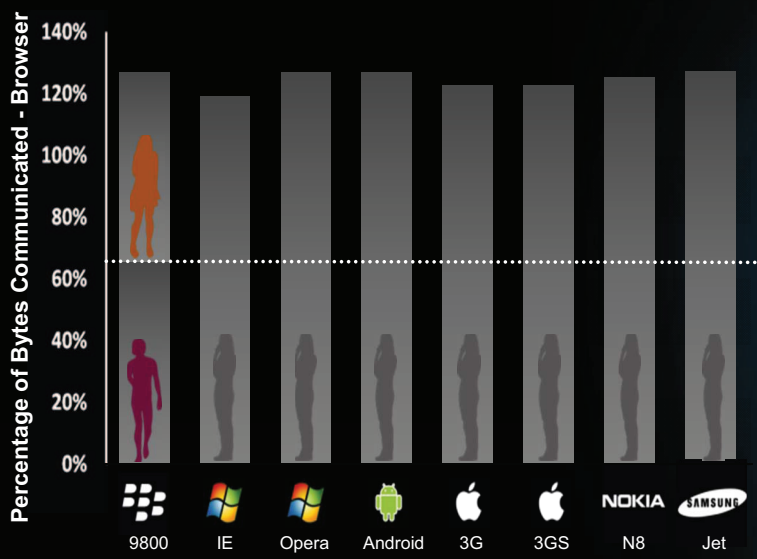
Regulatory Challenges and Opportunities

Sustainability of wireless



Regulatory Challenges and Opportunities

BlackBerry DataSmart drives greater spectrum efficiency



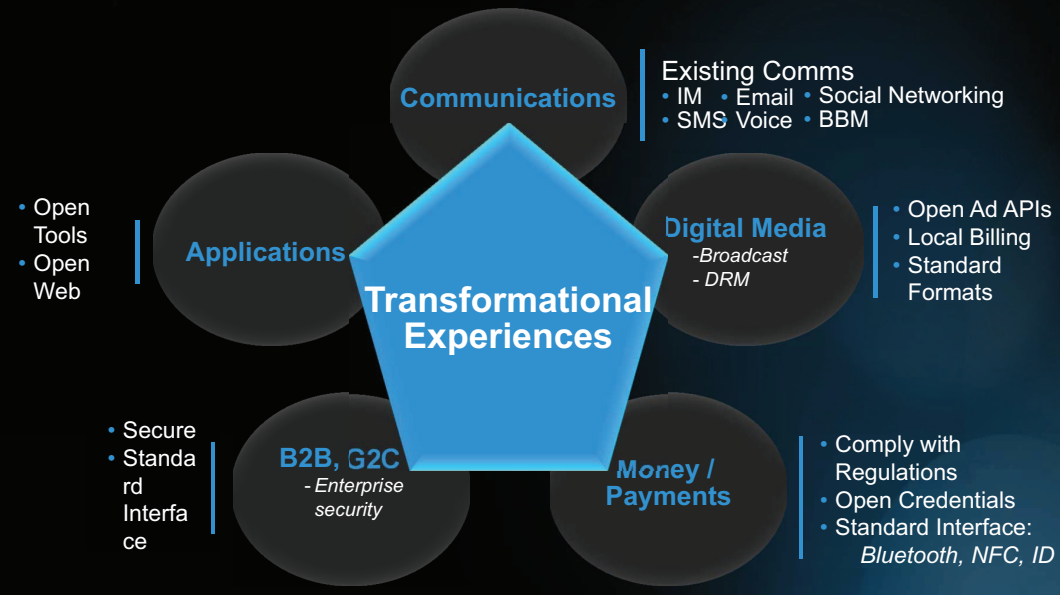
"Up to two BlackBerry users for every one other smartphone."
Source: Rysavy Research

2X more users on same infrastructure = ~1/2 carbon footprint

Annual carbon footprint from mobile > 30Mt
= 60TWh
= 25 million households
Source: Juniper Research & NSN, 2009

A Vision for the Mobile Internet

The convergence of five formerly independent categories is creating regulatory public policy issues and opportunities



BlackBerry Partners Fund

NEW at MWC 2011 – announcing geographic expansion of Partners Fund

- BlackBerry Partners Fund provides seed funding and venture capital to the entrepreneurial firms that will be tomorrow's leaders in the wireless space
- It is the leading independent venture capital
  firm focused exclusively on mobile computing
- Fund is available to partners focused on:

BlackBerry
BlackBerry Partners Fund

Commerce | Payments | Productivity | Social Networking & Gaming | Enterprise | Media | Infrastructure

PRESENTATION BY HON. HARUNA IDDRISU, MINISTER OF COMMUNICATIONS, GHANA ON: MANAGING HEALTH AND PLANNING ISSUES FOR MOBILE PHONE AND BASE STATION TECHNOLOGY

Mr. Chairman,

Distinguished Participants,

Ladies and Gentlemen,

I bring you greetings from the Government and people of Ghana. For the benefit of the audience, Ghana is a country of 24 million people, situated on the west coast of Africa and bordered on the east by the Republic of Togo, on the west by La Cote d'Ivoire and in the north by Burkina Faso.

Significantly, the Greenwich Meridian passes right through the country, and you would be right if you consider Ghana to be the centre of the earth because the Meridian intersections with the Equator just south of the capital, Accra.

The economy of Ghana is largely built on the production and export of primary products. These are cocoa (second in world production and export), Gold, manganese, bauxite, and lately oil.

The performance of the economy in 2010 reveals a GDP growth of 5.9% (compared to sub-Saharan growth of 2.0%); inflation at 9.38% in October 2010; and Gross international reserves of USD 3,973 at the end of October 2010.

The Sectoral performance of the economy has revealed for the first time that growth in the Services sector has displaced the Agriculture sector as the highest contributor to GDP. It

grew by 6.1% as against 4.8% by Agriculture. This strong performance of the services sector is attributed largely to the development of the Telecommunications Sector.

The telecommunications sector has consistently grown by 23% over the years and presently total mobile subscription stands at 17,436,949 and conservatively, 75% tele-density.

This figure is accounted for by MTN – 50%; Millicom (TIGO) – 22.6%; Vodafone – 15.4%; Airtel – 10%; Expresso – 1.35%.

While the expansion of telecommunications infrastructure and services, has brought improvement to the socio-economic conditions of the citizens, it has also invited worrying cries from members of the public.

The public that was yearning for delivery of telecommunications service and improvement in the quality of services, begun raising 'red flags' over the siting of base stations. The Civil Society even got involved especially when some Towers sited in residential areas collapsed causing injury and deaths.

The main issues relate to health, aesthetics and safety, even though some of the concerns particularly, with regard to health are not supported by existing scientific findings.

This notwithstanding, the Ministry of Communications embarked on public education and public awareness campaigns. Evidence was provided by the Standardisation Bureau of the ITU to respond to the fears of the public and resource persons from the ITU were presented on national television to allay the fears of the public.

To give assurance to the public and also support the telecommunications service providers in their expansion programmes, a national policy needed to be developed and Government adopted the proposal of the Ministry to establish an all-encompassing technical committee involving the stakeholders to examine the concerns and develop a set of guidelines to solve the problem once and for all.

Accordingly, an Inter-Ministerial Committee (IMC) was inaugurated to champion the development and implementation of a solution framework.

The IMC instituted an Industry Technical Committee (ITC) headed by the National Communications Authority (NCA) to collaborate with industry and the other stakeholders:

- Environmental Protection Agency (EPA),
- Ghana Civil Aviation Authority (GCAA),
- Ghana Atomic Energy Commission (GAEC), and
- Metropolitan, Municipal and District Assemblies (MMDAs)

to develop a set of guidelines for the institution of a one-stop-shop permitting scheme for the deployment of communication towers.

The Terms of Reference for the ITC are as follows:

a. Provide clear standards and procedures for the installation of towers and also address the issues of environmental sanity.
b. Formulate a cost-effective and efficient mechanism to address administrative and bureaucratic bottlenecks faced by Operators.
c. Design a fair and open cost-based fee policy/structure which would ensure that all Operators are charged fairly by the relevant permitting authorities.

d. Facilitate the development of infrastructure to enhance the delivery of quality service and also promote the provision of competitive and affordable services nationwide.

The ITC in fashioning these Guidelines, reviewed all relevant bodies of laws and regulations of the institutions responsible for permitting and recommended the following:

1. Institutionalise a one-stop-shop mechanism with defined:
    a. application and approval procedures;
    b. appellate process;
    c. Harmonised fees structure;
    d. Monitoring and enforcement.
2. Promotion of public awareness and education; and
3. Encourage co-location to reduce the proliferation of towers.

The guidelines developed by the Committee covered:

CONSTRUCTION OF TOWERS where, a person who intends to construct a tower must demonstrate that all reasonable steps have been taken to investigate tower sharing opportunities before applying to the permitting agencies to construct a new tower within a specified radius of 400m of the proposed site.

PRE-APPLICATION REQUIREMENTS FOR A NEW SITE which must indicate the Location and Proximity to Power Lines.

APPLICATION PROCESS simplified so that the applicant shall be required to obtain all necessary approvals, permits and Licenses from relevant Government Agencies and Local Authorities before commencement of construction work. This is done through a single submission to the respective Metropolitan, Municipal and District Assemblies (MMDAs) after obtaining Ghana Civil Aviation Authority (GCAA) and Radiation Protection Institute (RPI) approvals.

The process for obtaining a permit shall not exceed ninety (90) calendar days from the date of submission of all relevant documents to the MMDAs. Where an application is refused, the applicant may appeal the decision of the MMDAs, within fourteen (14) days from the date of receipt of the decision, to the Inter-Ministerial Committee, which shall comprise of the following Ministries:

- The Ministry of Communications;
- The Ministry of Environment, Science and Technology; and
- The Ministry of Local Government and Rural Development.

The Inter-Ministerial Committee shall within thirty (30) days after receiving a petition, decide on the petition and shall inform the MMDAs and the applicant concerned of its decision within seven (7) days of making the decision.

An applicant dissatisfied with the decision of the Inter-Ministerial Committee may within thirty (30) days of being informed of that decision, appeal to the High Court for judicial review of the decision.

REQUIREMENTS OF THE VARIOUS PERMITTING AGENCIES

GHANA CIVIL AVIATION AUTHORITY (GCAA) to certify that the proposed construction will not constitute a hazard to air navigation.

RADIATION PROTECTION INSTITUTE (RPI) to ensure that the public, workers and the environment are protected from any harmful effect of radiation.

ENVIRONMENTAL PROTECTION AGENCY (EPA) to ensure that the activity may not have a detrimental effect on the environment and as such an environmental impact assessment shall be conducted.

METROPOLITAN, MUNICIPAL AND DISTRICT ASSEMBLIES (MMDAs), ensuring conformance to the Planning Scheme for the selected area.

Requirements on Radiation Emission

Authorisation holders must ensure that specific exposure limits are in conformity with those of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which are recommended by the World Health Organization (WHO), to protect workers and the general public against excessive exposure to RF fields.

Measurement/modelling may be carried out in accordance with the measurement standards recommended by any of the following organisations:

- International Electrotechnical Commission (IEC);
- International Telecommunication Union (ITU);
- Institute of Electrical and Electronics Engineers (IEEE);
- European Committee for Electrotechnical Standardization (CENELEC); and
- World Health Organisation (WHO).

STRUCTURAL REQUIREMENT have also been developed determined by the Landscape
A structure shall be designed to withstand forceful wind speeds that occur on the average of once every 30 to 50 years, considering that wind speed escalates with height.

A base station may have a generator, as a secondary source of power, which must be:
sited three (3) meters away from all demised properties excluding the fence, and should be sound proof and complying with all permissible sound levels prescribed by EPA.

I am happy to report that with the development of the guidelines, there is understanding and cooperation by all the stakeholders and the processing of applications is proceeding smoothly. It has made possible for nearly 400 permits to be processed for GLO Mobile Communications to build its base stations expecting to launch its operations as the newest entrant into the market.

Thank you.

Socio-economic impact of allocating 700 MHz band to mobile in Asia Pacific

Presentation at GSMA World Congress

THE BOSTON CONSULTING GROUP

Overview of the project

We were tasked to assess the social and economic benefits of allocating the 700 MHz band to mobile, relative to alternative uses

Study focused on four countries ...

- India
- Indonesia
- Malaysia
- South Korea

... and the results were extrapolated for the Asia-Pacific region

Goal was to produce conservative estimates of the incremental benefits of mobile, relative to broadcasting

Four countries studied and extrapolated to AP

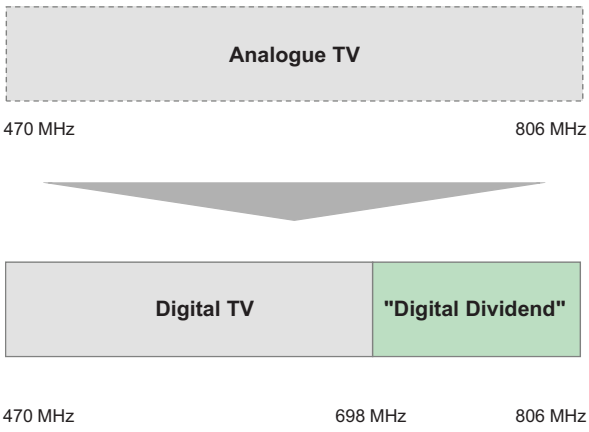
Individual country reports for 4 countries

- India
- Indonesia
- Malaysia
- South Korea

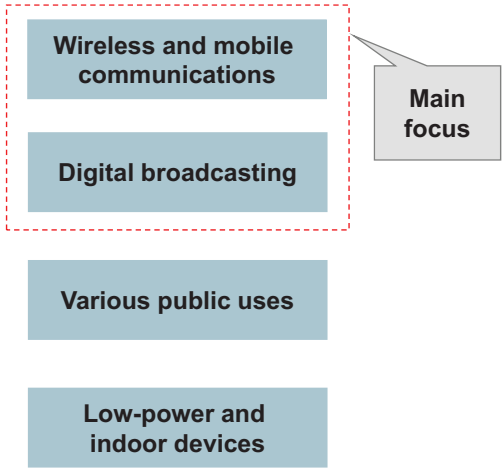
Synthesis report covering whole Asia-Pacific region

Unique opportunity to reallocate spectrum

With digitalization, a large portion of the lower UHF band can be freed up...



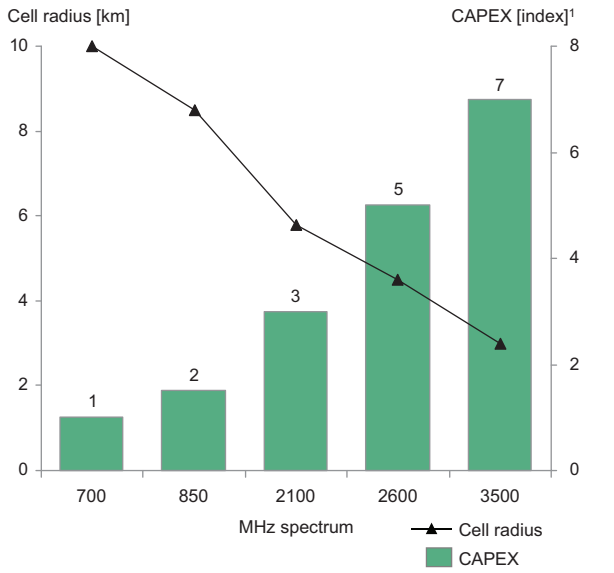
...creating a "Digital Dividend" of alternative uses in the 698-806 MHz band[1]



1. Referred to as 700 MHz band
Source: Association for International Broadcasting; GSMA

'Digital Dividend' band ideal for rural roll-out

700 MHz band provides optimal combination of range and data capacity



Potential to create significant benefits if allocated to mobile broadband

Greater coverage and lower service costs improve customer accessibility

Substantial economic impact from increased productivity and new businesses

Significant social benefits, especially in rural and less developed areas

1. E.g. using the 2100 MHz band will require 3 times as many base stations
Source: SCF Associates; GSMA; Expert interviews; BCG analysis

700 MHz band helps overcome adoption barriers

Infrastructure availability	**More rapid roll-out, with significantly larger rural footprint**
Affordability	**Cost of service will be reduced, improving affordability for the poor**
Perceived value of relevant content	**Availability of local content and services will improved over time**
Literacy/ IT literacy	**Usage capabilities and trust in services will to be built up over time**

Long-term

Clear benefits from allocating 700 MHz band to mobile in Asia Pacific, relative to broadcasting

Cumulative GDP increase 2014-2020

US$ 502B

in net present value

New business activities by 2020[1]

1.1M

new business activities

Cumulative government revenues 2014-2020

US$ 76B

in net present value

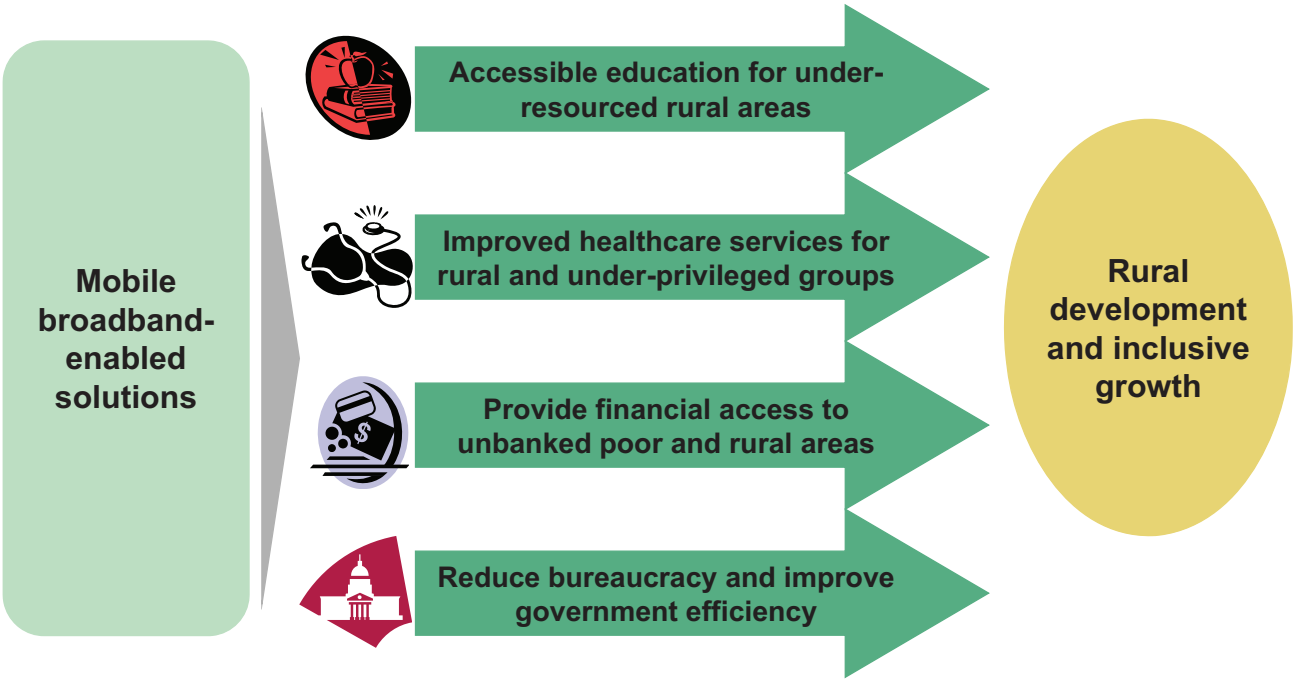
Additional jobs created by 2020

2.2M

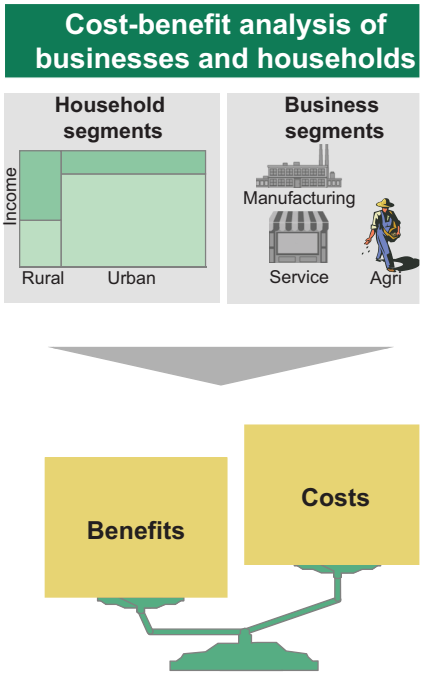
new jobs

1. Incl. new independent businesses as well as new departments/units/business areas within existing firms
Note: NPV discounted by study country government security rates for each cluster; 1.5% for Korea, 2.8% for Malaysia, 4.0% for Indonesia and 5.0% for India
Source: Datamonitor; EIU; OECD; World Bank; National statistics units; BCG analysis

Mobile broadband addresses key social issues



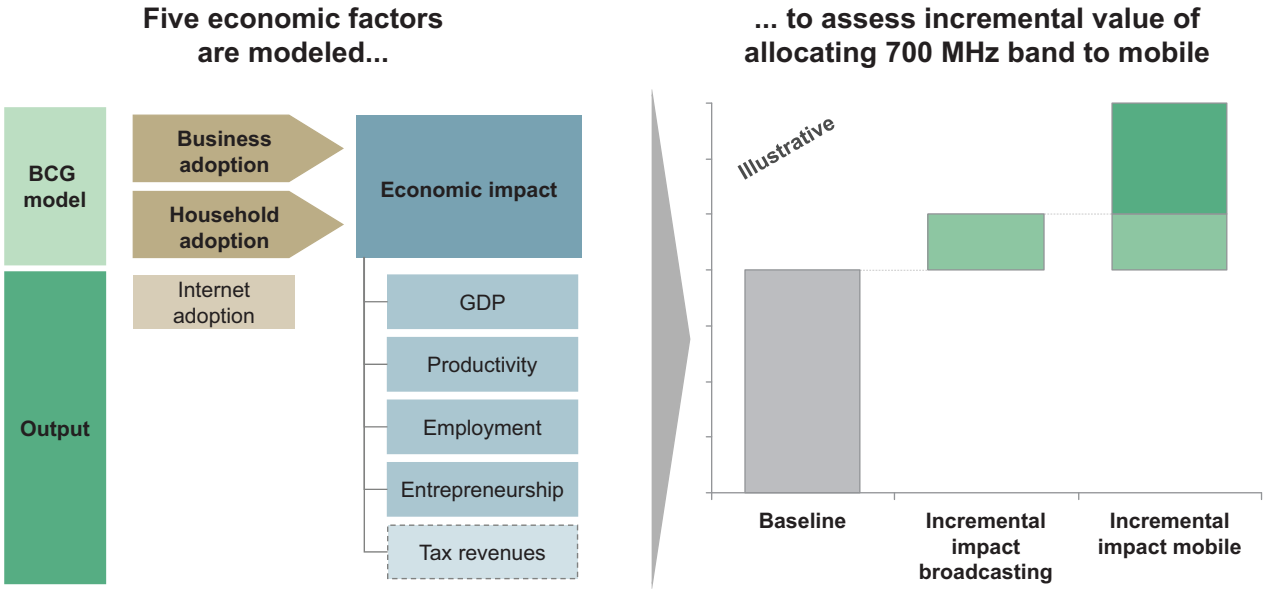
Study uses rigorous cost-benefit analysis



Note: Figures are illustrative

Adoption is translated into five economic factors

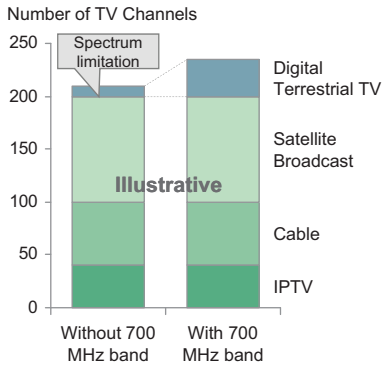
Impact assessed relative to alternative use: broadcasting



Note: Graphs are illustrative

Best-case broadcast impact estimated

700 MHz band allows more TV channels...



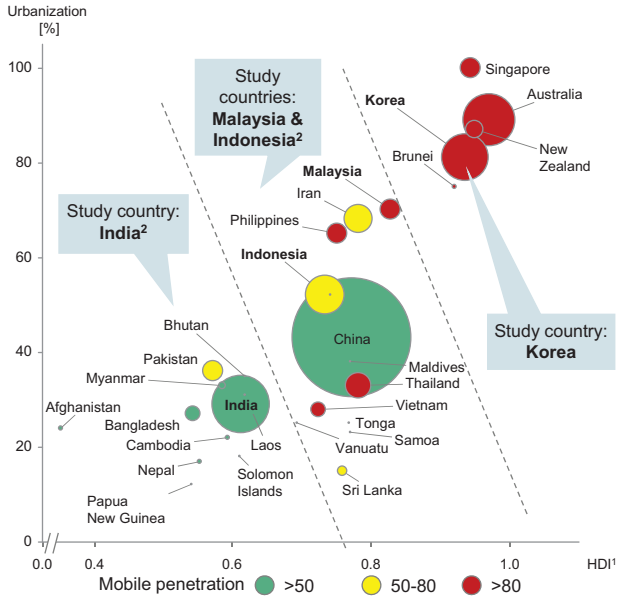
Generous assumptions on additional channels

Analysis of four countries extrapolated to region

Countries clustered based on HDI[1], urbanization and mobile penetration...

- **Current human development level**
- **Rural-urban split**
- **Mobile penetration**

... and representative countries modeled to aggregate socio-economic impact



1. Human Development Index 2. Two countries chosen to reflect diversity of cluster
Note: Size of bubble denotes GDP at constant prices (2009) , Kiribati, Marshall Islands, Micronesia, Tuvalu and North Korea omitted as HDI is not reported. Japan excluded.
Source: IMF; UNDP; CIA World Factbook; ITU; BCG Analysis

Methodology stress-tested with experts

	Economic methodology	Technological implications	Country-specific analyses
Selected academic and official references	• Studies from EU, World Bank, OECD, etc. • Economic research from leading academics	• Technical analyses from industry experts	• Government statistical bodies • National plans
Selected experts consulted	• Economics researchers • Development economists • BCG economic modelling experts	• Technology and network experts in equipment vendors • Technology and network experts in mobile operators	• Academics focusing on specific countries • Interviews with regulators and policy makers • BCG local experts

Allocation of spectrum will determine benefits

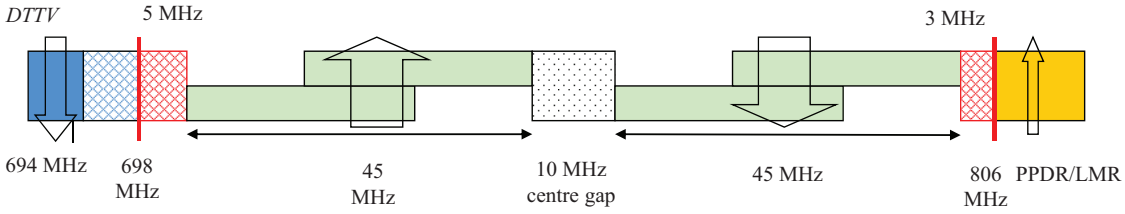
Sufficient bandwidth needs to be allocated to mobile

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

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

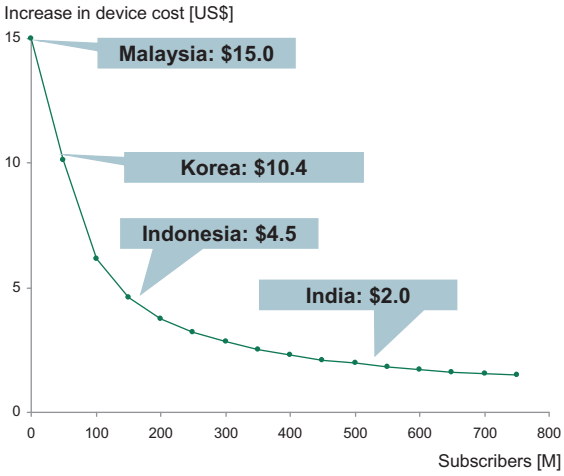
Non-harmonization will drive up cost of hand-sets and make them less affordable, delaying adoption



Source: 9th Meeting of the APT Wireless Forum (AWF-9); GSMA

Failure to harmonize spectrum reduces benefits

Non-harmonized spectrum could increase cost of handset US$2-15 ...

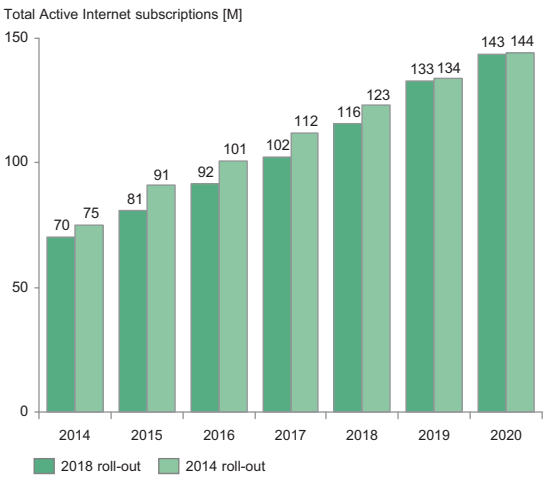


... reducing taxes impact by 19% and new job creation by 16%

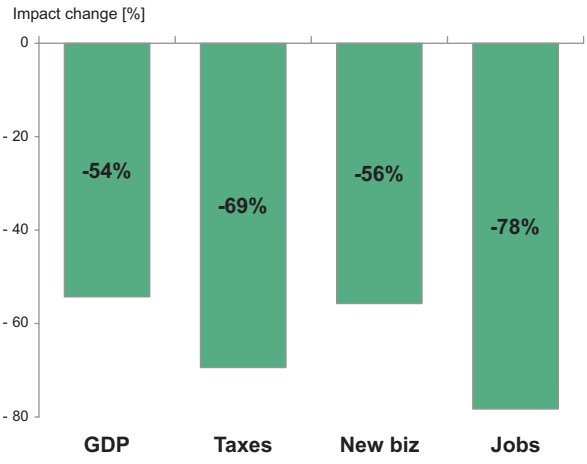
Note: Based on interpolation of analysis results by RTT, which assumes a market like China with 80M handsets sold per year will increase prices US$ 1.5, up to US$ 15 for markets with 8M handsets
Source: RTT; GSMA

Postponing digital switch-over would also have significant impact, e.g., Indonesia

Postponing roll out of mobile broadband from 2014 to 2018 could...



... reduce incremental governmental revenues 69% and job creation 78%[1]



1. GDP and taxes 2010-2020 NPV, new business and job creation 2014-2020 cumulative
Source: BCG analysis

Call to action

Digital switchover is a once-in-a-lifetime opportunity to allocate spectrum to its most productive use

Mobile broadband will generate significantly more economic and social benefits than alternative uses like broadcasting

International harmonization is critical to reap the full benefits of the 'Digital Dividend'

Prompt action is needed to maximize the benefits

GLOBAL MARKET & TECHNOLOGY TRENDS

THE ERICSSON SEMINAR FOR GOVERNMENTS & REGULATORS

WEDNESDAY 16 FEBRUARY 2011

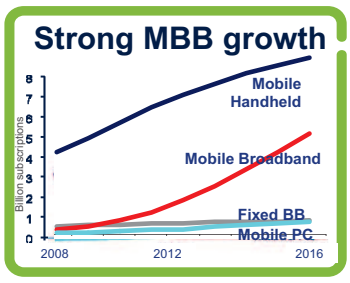
AGENDA

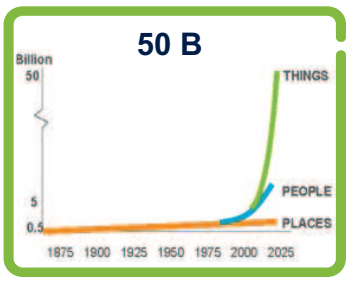
09.15	Morning coffee
09.45	Welcome. Ulf Pehrsson, VP Government & Industry Relations
	• **Market trends** Douglas Gilstrap, Senior VP Group Strategy
	• **Technology trends** Erik Ekudden, VP Group Technology Strategies
	• **Demonstrations:** – PC as a service – The evolving LTE eco-system
12.00	Lunch – directly outside this room
13.30	End

DOUGLAS GILSTRAP

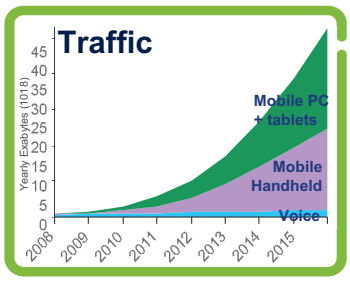
SVP GROUP STRATEGY

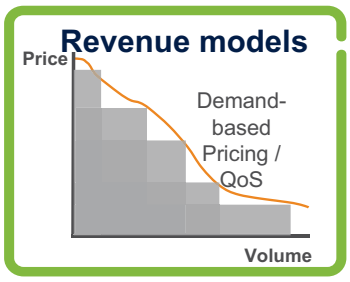
MAIN MARKET TRENDS 1(2)



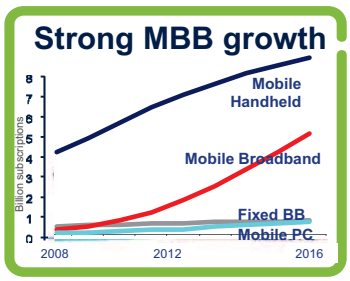


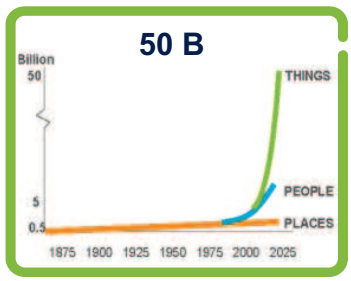
MAIN MARKET TRENDS 2(2)

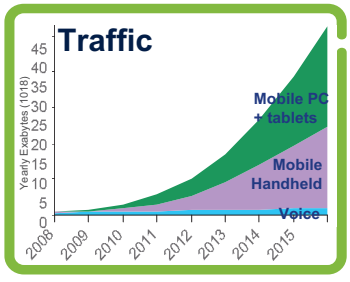


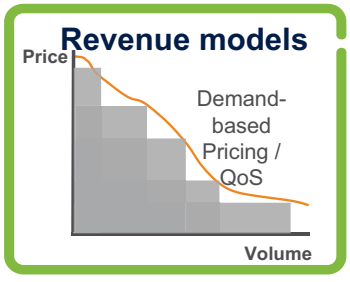


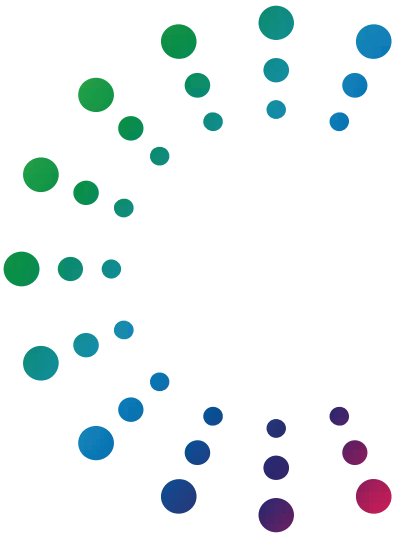
MAIN MARKET TRENDS











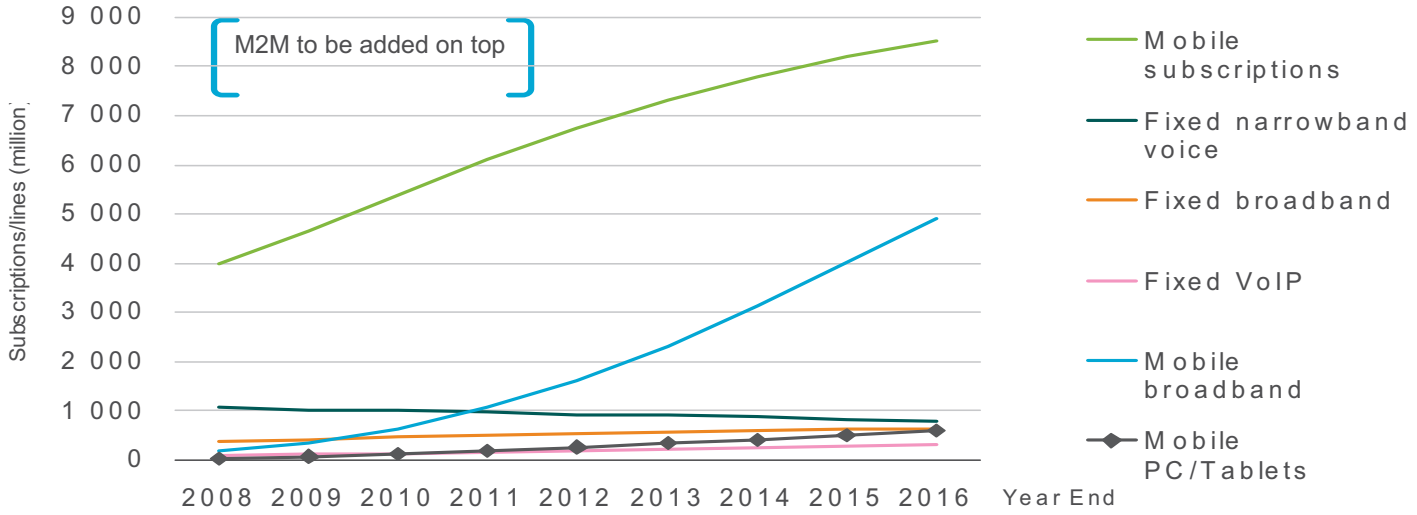
TECHNOLOGY TRENDS

ERIK EKUDDEN
VICE PRESIDENT
HEAD OF TECHNOLOGY STRATEGIES

MOVING TO THE NETWORKED SOCIETY

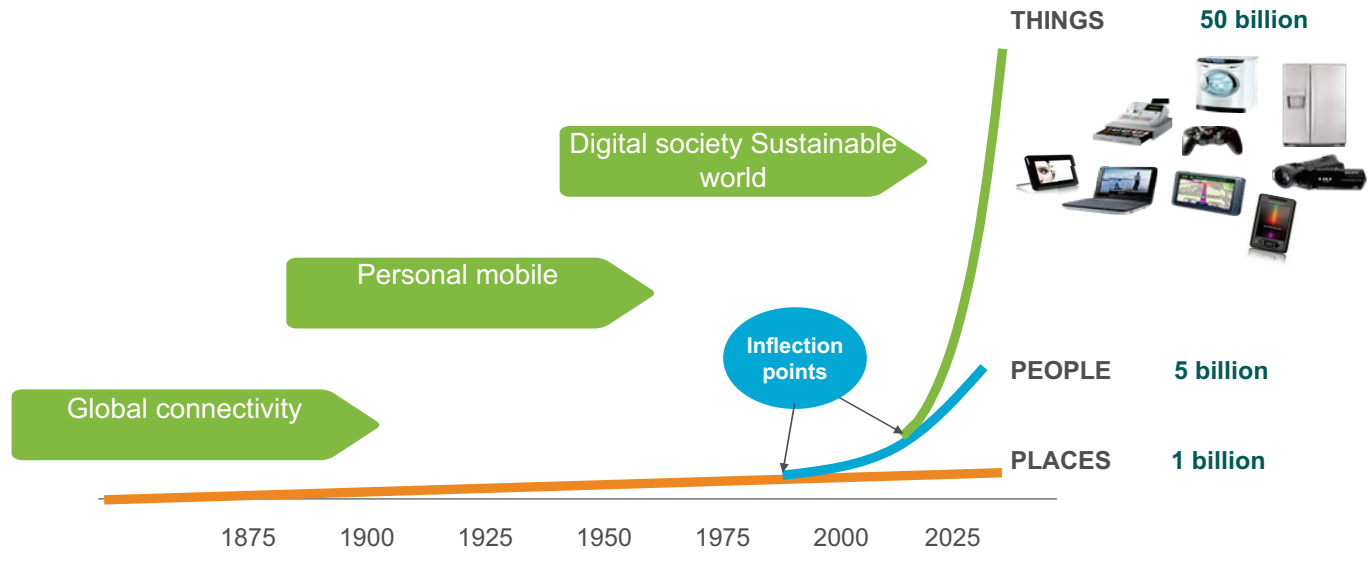
By 2020, everything that benefits from a network connection will be connected. Foundation is Mobility, Broadband and Cloud

FIXED & MOBILE SUBSCRIPTIONS



Mobile broadband: The dominant broadband

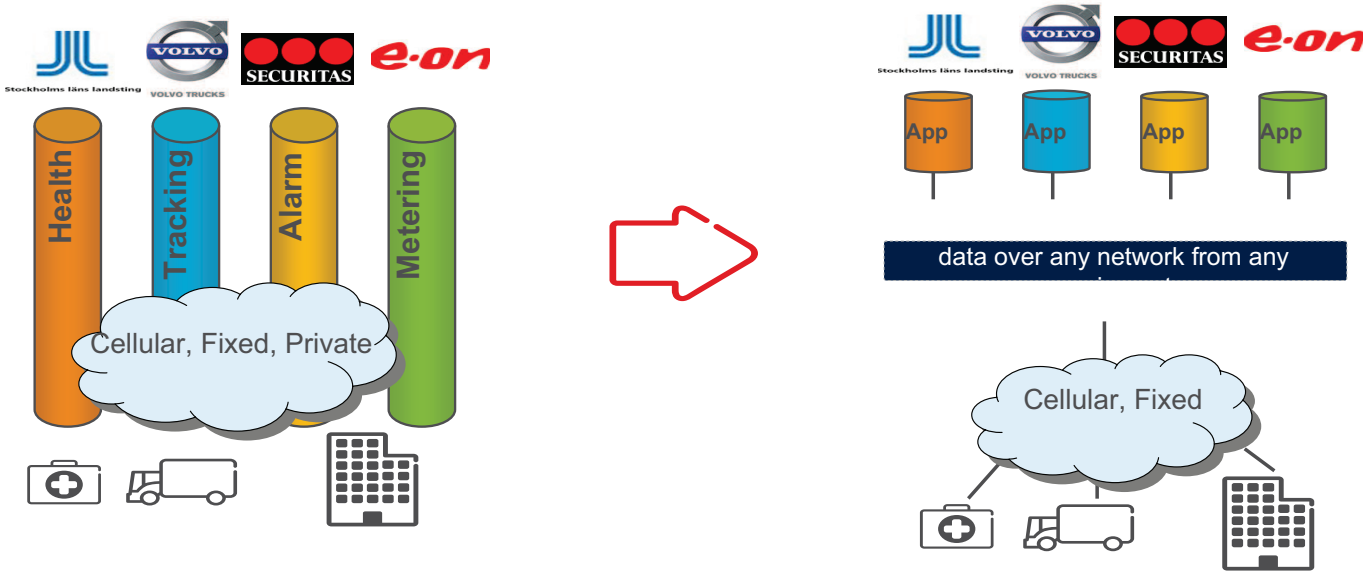
INFLECTION POINTS DRIVING OUR BUSINESS



Source: Ericsson

VERTICALS IN THE 50B VISION

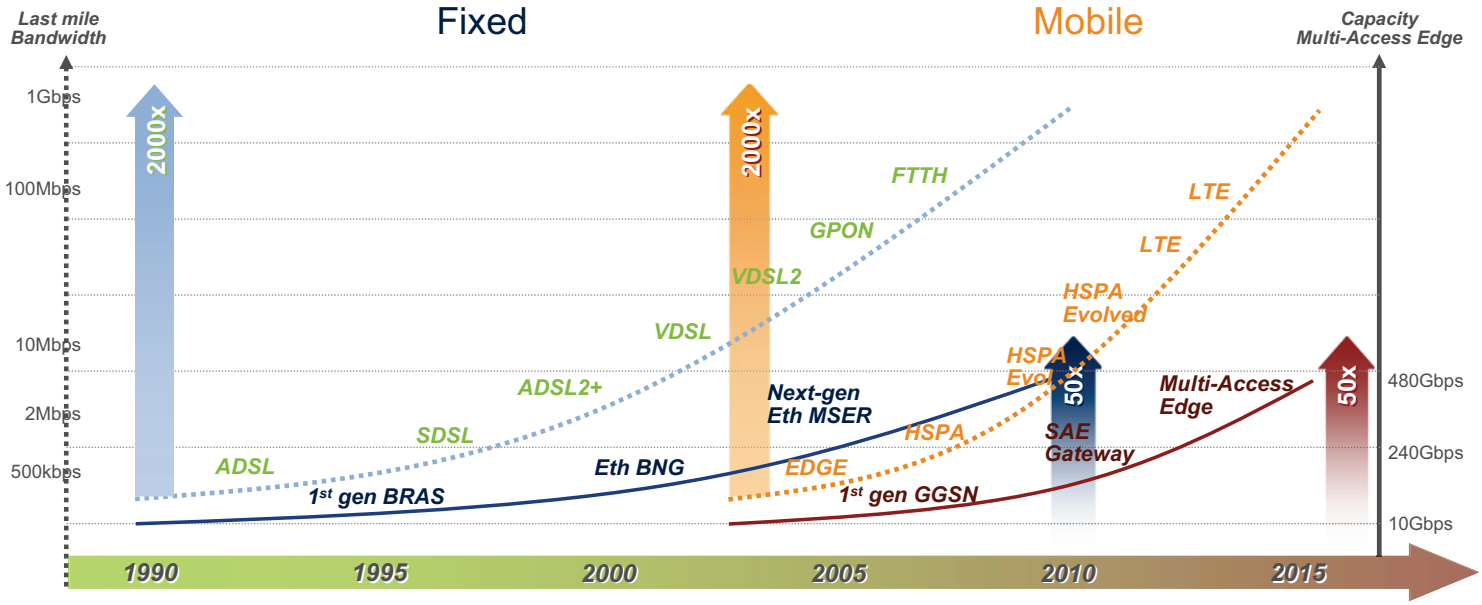
INNOVATION BASED ON HORIZONTAL LAYERS



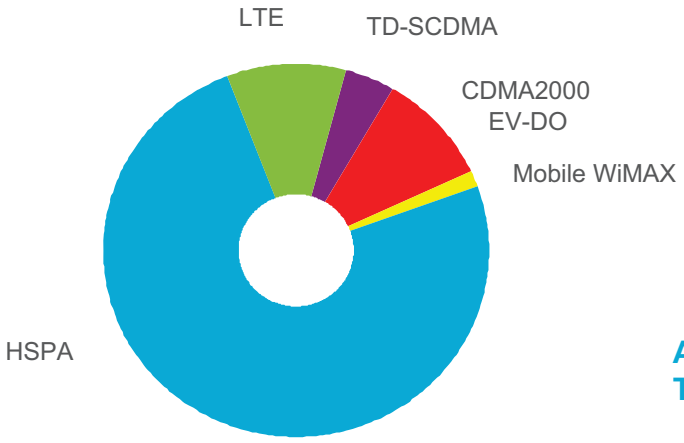
BUILDING ON STANDARDIZED TECHNOLOGY TO ACHIEVE ECONOMY OF SCALE

TECHNOLOGY EVOLUTION

BROADBAND CAPACITY



MOBILE BROADBAND SUBSCRIPTIONS 2016

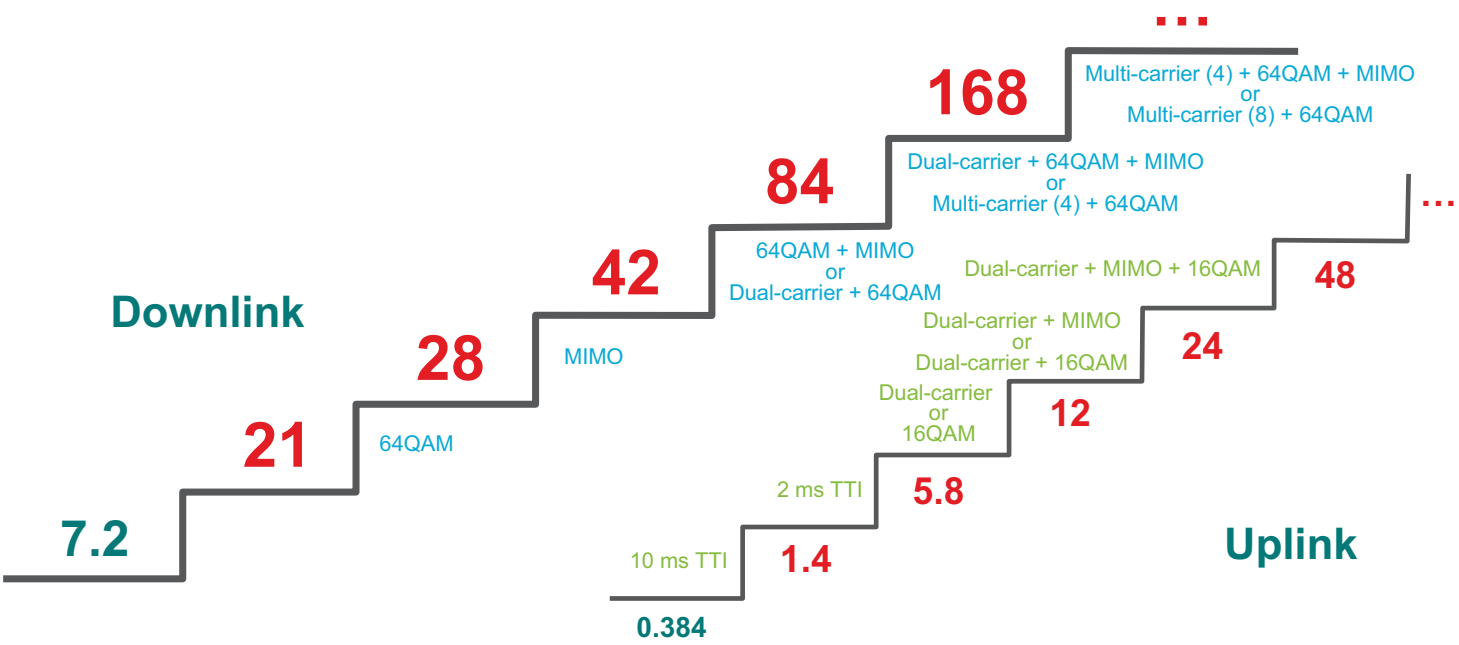


M2M connections not included

ALMOST 5 BILLION IN TOTAL BY 2016

Source: Internal Ericsson
Mobile broadband defined as: CDMA2000 EV-DO, HSPA, LTE, Mobile WiMAX and TD-SCDMA.
Note that mobile broadband here refers to handsets, USD dongles, embedded modules etc. The vast majority is handsets. Tablets/M2M are not included.
This slide contains forward looking statements

HSPA EVOLUTION



CONNECTIVITY RULES

The network is the **differentiator.** Connectivity must be **application aware** and applications must be **connectivity aware**

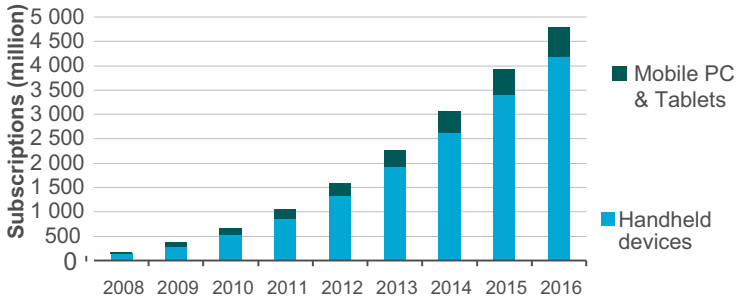
CAPACITY DEMAND

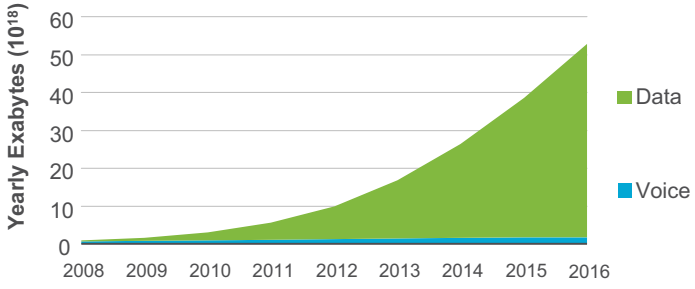
Mobile voice
10 kbps
10-50 MB/month
1

Smartphone
100-1,000 kbps
100-500 MB/month
10

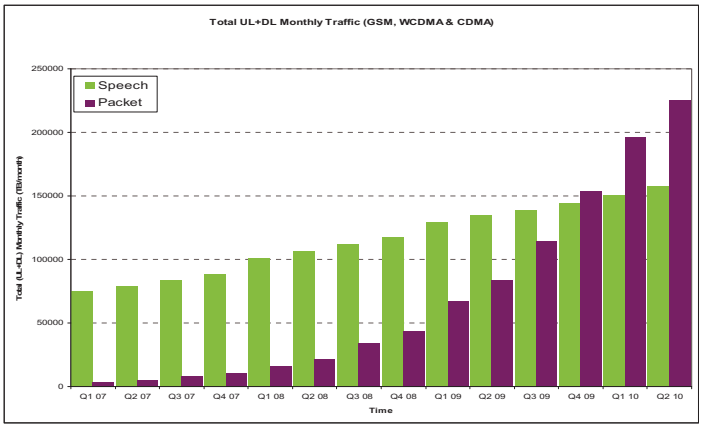
Mobile PC
>1 Mbps
1-5 GB/month
100

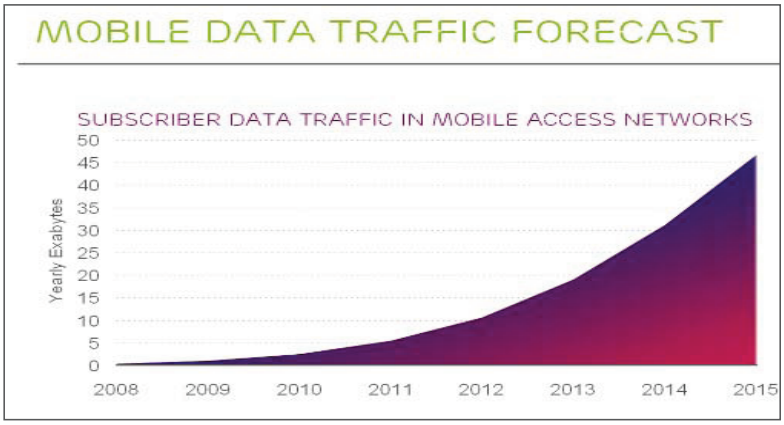
Traffic = users x volume per user





MEASURED VOICE AND DATA TRAFFIC GLOBAL TOTAL





A data traffic doubling every year would mean 30x in 5 years, 1000x in 10 years

Source: Ericsson Measurements in Global Networks
(DVB-H, Mobile WiMax, M2M and WiFi traffic not included)

This slide contains forward looking statements

CAN WE HANDLE IT?

› Question: Where do we find a capacity increase of a factor 1000?

› Answer: HSPA and LTE vs. WCDMA gives a factor **10**

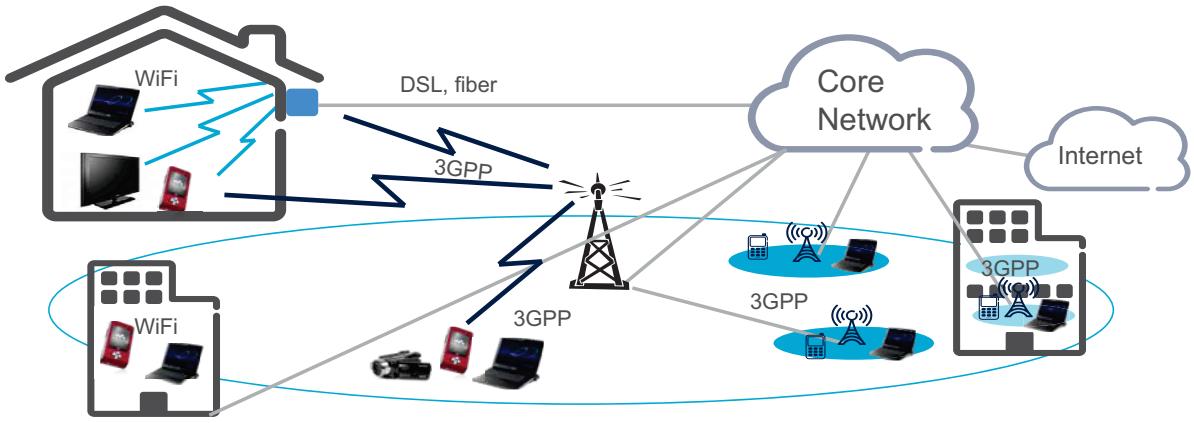
Spectral efficiency improvements from 1bps/Hz to 2 bps/Hz gives a factor **2**

More allocated spectrum gives a factor **5**

~3 times smaller cell radius gives a factor **10**

In total 10*5*2*10 = 1000

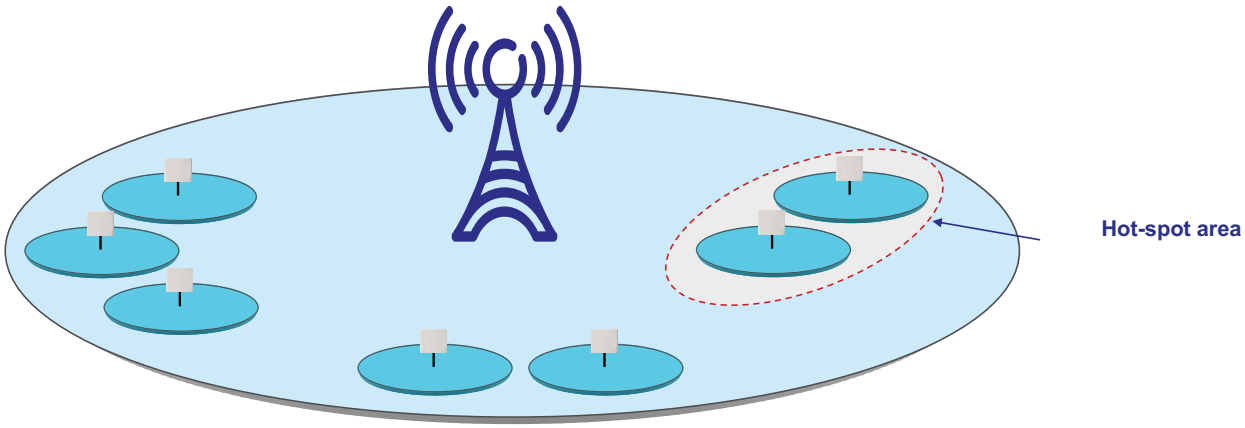
ONE NETWORK – MANY PIPES



Personalized services in an Always Best Connected environment

MORE DENSE INFRASTRUCTURE

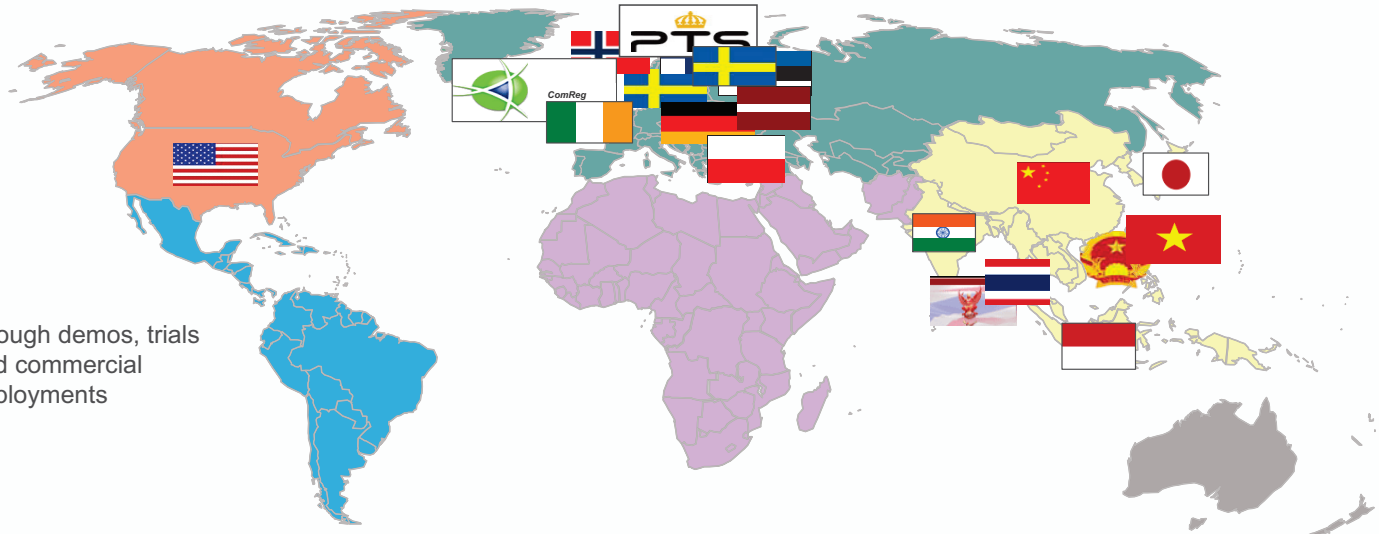
HETEROGENEOUS NETWORKS



CO-ORDINATED MACRO BASE STATIONS AND SMALL CELLS IN A HETNET

LTE GLOBALLY ESTABLISHED

LTE FDD & TD-LTE



through demos, trials and commercial deployments

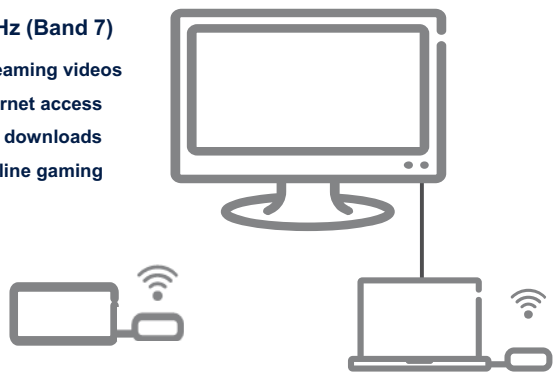
LTE FDD GLOBALLY ESTABLISHED. TD-LTE MOMENTUM STRONG IN ASIA AND GROWING IN NORTH AMERICA AND EUROPE

LTE ON SHOW IN MWC 2011

End-user experience

FDD
2.6GHz (Band 7)

- **Streaming videos**
- **Internet access**
- **File downloads**
- **On-line gaming**



Small form factor devices

FDD

1.8GHz	**(Band 2)**
AWS	**(Band 4)**
2.6GHz	**(Band 7)**
700MHz	**(Band 13)**
700MHz	**(Band 17)**

TDD

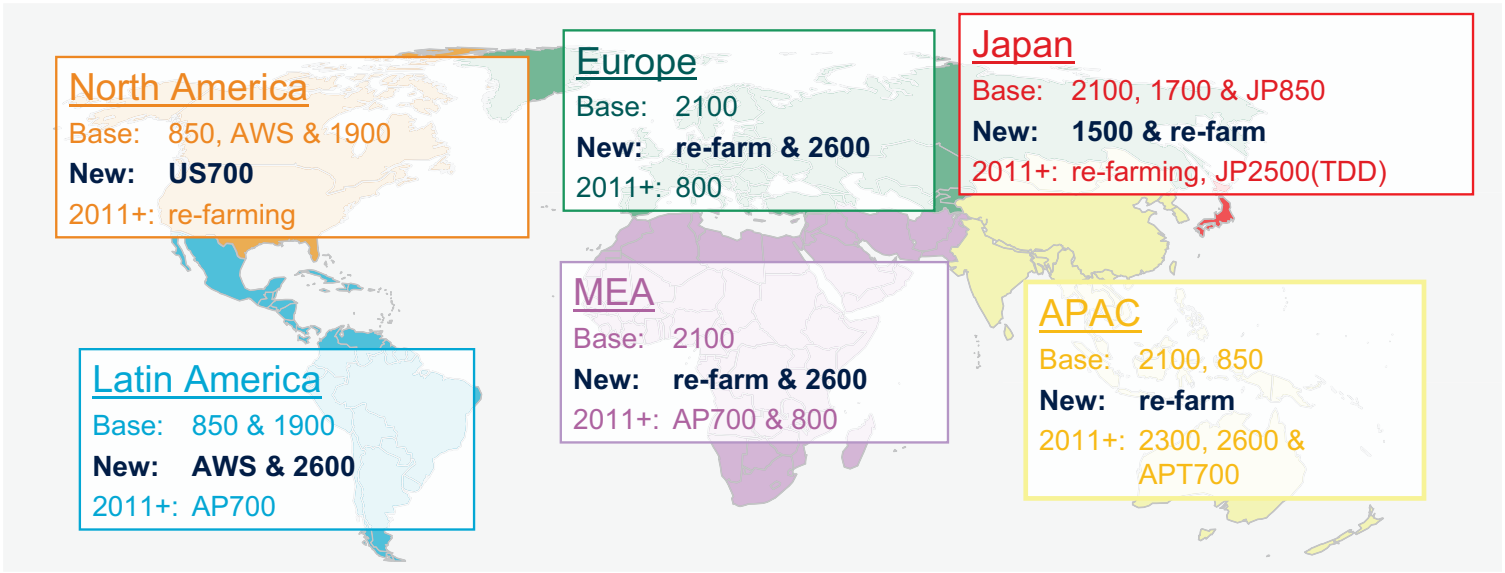
2.3GHz	**(Band 40)**

TD-LTE - GLOBAL MARKET

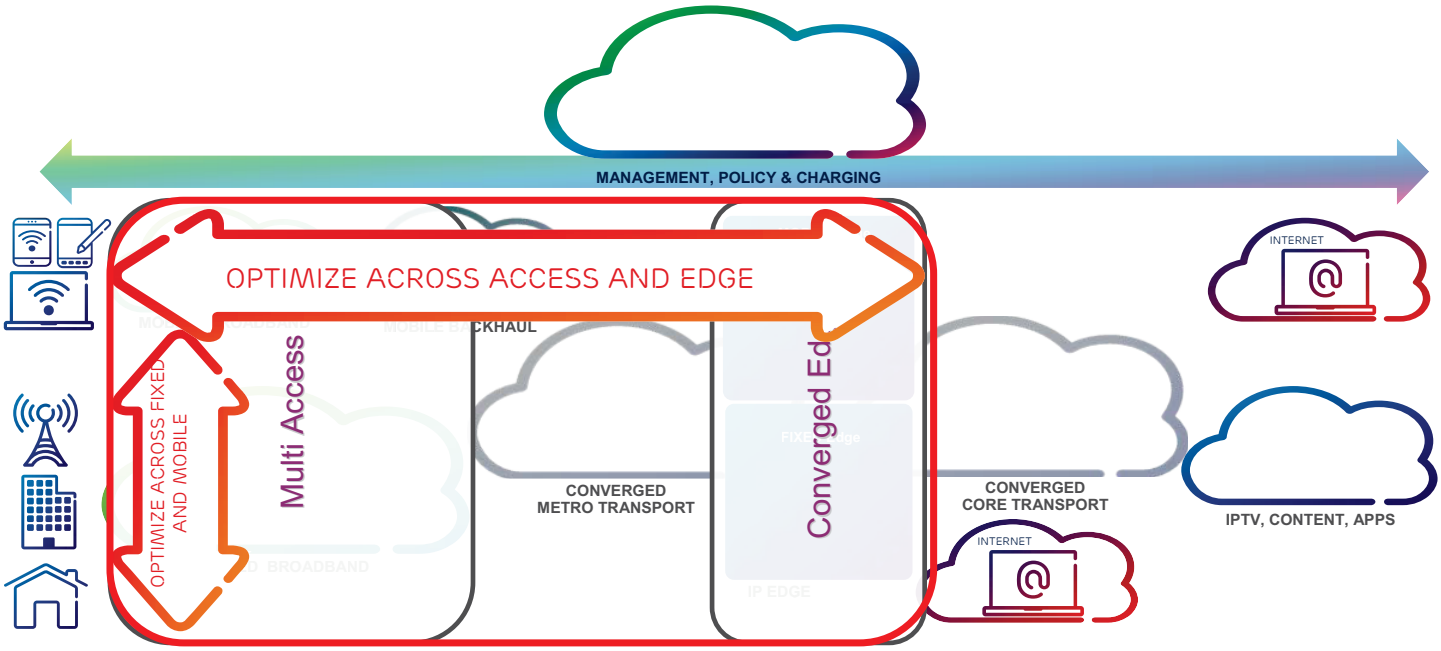
- Same LTE technology for FDD and TDD
  - Integrated chips/platforms
  - Optimized inter-working, handovers, and spectrum co-existence
- Economies of scale
  - Devices
  - Infrastructure
- Strong support from large operators
  - Global TD-LTE Initiative launched in MWC
- Spectrum available globally
  - China, India, US, and ROW

SPECTRUM FOR MOBILE BROADBAND

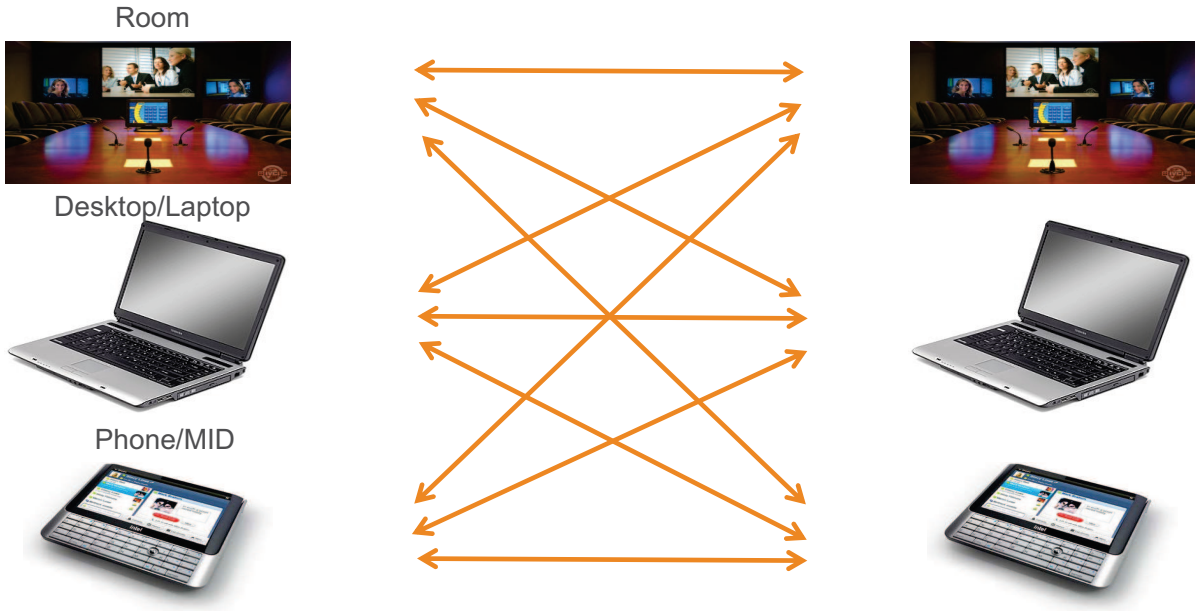
[MHz]



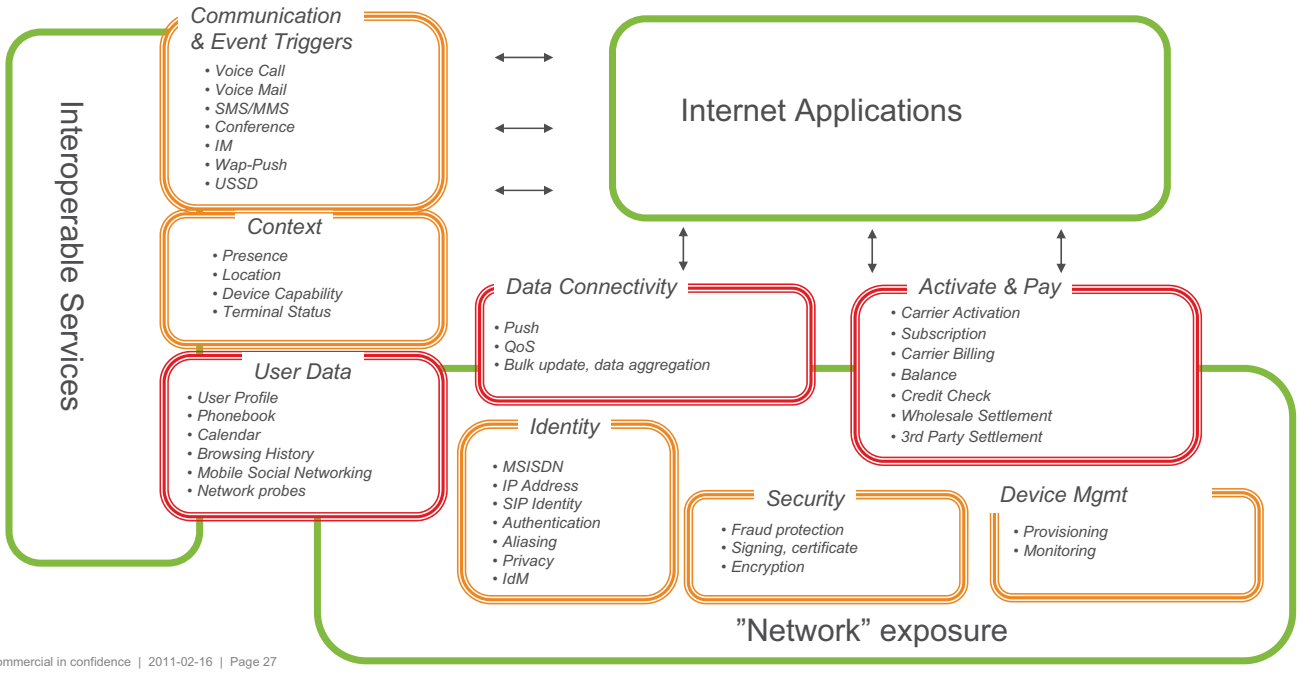
SMARTER PIPES
ENABLED BY IP & CONVERGENCE



INTEROPERABLE VIDEOCONFERENCING
VISUAL COMMUNICATION – ONE VIEW



WHAT CAPABILITIES CAN CARRIERS OFFER?



PC AS A SERVICE

INTERNET ACCESS
EMPOWERING PEOPLE

ENJOY

LEARN

GROW

WITHOUT INTERNET YOU WOULD BE LIKE A FISH IN A SMALL POND.

YOU WOULDN'T KNOW THE SAME INFORMATION AS PEOPLE IN THE OUTSIDE WORLD.

END-USER, INDONESIA

IMAGINE THIS
COMPUTING BUT NOT AS WE KNOW IT

BACK TO INDEX

- 5 seconds Start up
- No more Viruses
- Improved battery life
- Maintenance Free

A COMPLETE END TO END SOLUTION

SUPERIOR EXPERIENCE AT GREAT VALUE

BACK TO INDEX

- Low upfront cost
- Very reasonable prepaid or postpaid subscription
- Part of Broadband Bundle

SUPERIOR EXPERIENCE

AMAZINGLY SIMPLE FOR USERS TO LEARN, GROW AND ENJOY

PC AS A SERVICE
A PROVEN TELECOM PROPOSITION

BACK TO INDEX

40,000 Indians already subscribe for Broadband bundled with Novatium PC as a service

LTE DEMO
MOBILE WORLD CONGRESS
BARCELONA 2011

LTE ON SHOW

End-user experience

FDD
2.6GHz (Band 7)

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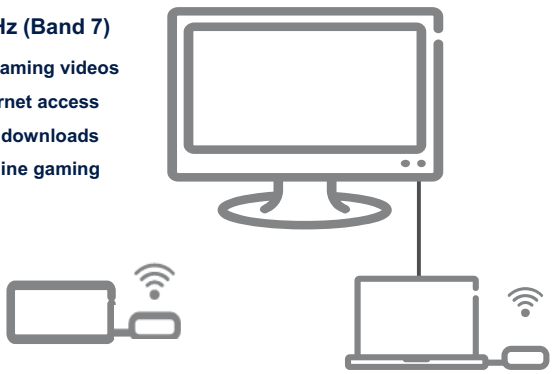

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TDD

2.3GHz	(Band 40)

ERICSSON LTE ECO SYSTEM DEMOS AT MWC2011

Data Devices


LGE VL600


Pantech


Sierra Wireless


Qualcomm


SAGEM


Samsung

Embedded PCs


MSI\Intel\GCT


Samsung


Toshiba


Lenovo

Tablets/Padlets


Quanta Tablet


Samsung Galaxy


Sony-Ericsson MID


Pegatron Tablet

Smartphone


Samsung

EU TELECOM REGULATIONS TUTORIAL

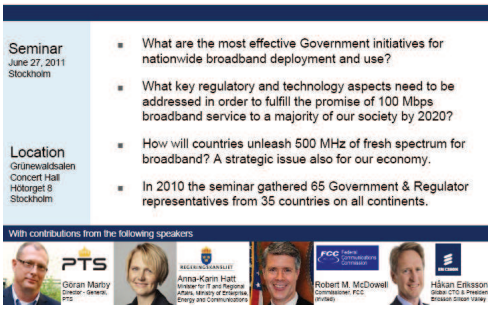
- Facts, processes and politics presented by Philippe Defraigne, Cullen International
- Two alternative sessions:
  - Wednesday 16 February 15-17, Ericsson Hall 6, room 224
  - Session 2: Thursday 17 February 10-12, Ericsson Hall 6, room 224
- A few remaining seats - Please register with the hostesses in this room

WELCOME TO STOCKHOLM JUNE 27-28, 2011

› Dedicated to - *Broadband for all*
- Seminar at the Stockholm Concert Hall
- Private meetings with Swedish regulator PTS
- Technology briefings with Ericsson experts

› Governments & Regulators only

› 2010 the seminar brought 65 delegates from 35 countries – all six continents represented



ERICSSON