

The Wireless Network Infrastructure Bible: 2014 – 2020 - Macrocell RAN, Small Cells, RRH, DAS, Cloud RAN, Carrier WiFi, Mobile Core & Backhaul

<https://marketpublishers.com/r/W4F5FC73847EN.html>

Date: December 2013

Pages: 391

Price: US\$ 2,500.00 (Single User License)

ID: W4F5FC73847EN

Abstracts

The term “Wireless Network Infrastructure” has conventionally been associated with macrocell Radio Access Network (RAN) and mobile core network infrastructure, which SNS Research estimates to account for nearly \$52 Billion in spending by the end of 2014.

However, the scope of the term is expanding as wireless carriers increase their investments in Heterogeneous Network or HetNet infrastructure encompassing WiFi, small cells, Distributed Antenna Systems (DAS), Remote Radio Heads (RRH) and the emerging Cloud RAN concept. Driven by the promise of added capacity and coverage with minimum investment in additional spectrum, HetNet infrastructure is expected to account for nearly \$17 Billion in spending by the end of 2014.

While macrocell RAN spending is forecast to decline at a CAGR of 3% over the next 6 years, SNS Research estimates that the overall wireless network infrastructure market encompassing macrocell RAN, HetNet, mobile core and backhaul infrastructure will witness tremendous growth over the coming years. Growing at a CAGR of over 5%, the market will account for over \$104 Billion in annual spending by the end of 2020.

Complimenting this growth would be over \$1 Billion worth of annual R&D investments on 5G mobile technology by wireless carriers, vendors and vertical market players alike, in a bid to further enhance the capacity, speed and performance of future mobile networks.

The “Wireless Network Infrastructure Bible: 2014 – 2020 - Macrocell RAN, Small Cells, RRH, DAS, Cloud RAN, Carrier WiFi, Mobile Core & Backhaul” report presents an in-

depth assessment of 9 individual submarkets of the wireless network infrastructure opportunity. Besides analyzing the key market drivers, challenges, operator revenue potential, regional CapEx commitments, expert interviews and vendor strategies, the report also presents revenue and unit shipment forecasts for the market from 2014 to 2020 at a regional as well as a global scale. Historical figures are also provided for 2010, 2011 and 2013.

The report comes with an associated Excel datasheet suite covering quantitative data from over 400 numeric forecasts presented in the report.

Contents

1 CHAPTER 1: INTRODUCTION

- 1.1 Executive Summary
- 1.2 Topics Covered
- 1.3 Historical Revenue & Forecast Segmentation
- 1.4 Key Questions Answered
- 1.5 Key Findings
- 1.6 Methodology
- 1.7 Target Audience
- 1.8 Companies & Organizations Mentioned

2 CHAPTER 2: AN OVERVIEW OF WIRELESS NETWORK INFRASTRUCTURE

- 2.1 What is the Wireless Network Infrastructure Market?
- 2.2 2G: GSM & CDMA
 - 2.2.1 2G Trends & Developments
 - 2.2.2 2G Market Summary
- 2.3 3G: W-CDMA, TD-SCDMA & CDMA2000
 - 2.3.1 3G Trends & Developments
 - 2.3.2 3G Market Summary
- 2.4 4G: LTE, LTE-A & WiMAX
 - 2.4.1 4G Trends & Developments
 - 2.4.2 4G Market Summary
- 2.5 Macrocell RAN Market for 2G/3G/4G
 - 2.5.1 Macrocell RAN Trends & Developments
- 2.6 HetNet RAN Market for 2G/3G/4G
 - 2.6.1 HetNet RAN Trends & Developments
 - 2.6.2 Small Cells
 - 2.6.3 DAS
 - 2.6.4 Cloud RAN
 - 2.6.5 Carrier WiFi
- 2.7 Mobile Core
 - 2.7.1 Mobile Core Trends & Developments
- 2.8 Mobile Backhaul
 - 2.8.1 Mobile Backhaul Trends & Developments

3 CHAPTER 3: MARKET DRIVERS, BARRIERS & RISKS

3.1 Market Drivers

3.1.1 Mobile Subscriptions Growth

3.1.1.1 Asia Pacific

3.1.1.2 Eastern Europe

3.1.1.3 Latin & Central America

3.1.1.4 Middle East & Africa

3.1.1.5 North America

3.1.1.6 Western Europe

3.1.2 Smartphone & Tablet Proliferation

3.1.3 Growing Penetration of Mobile Broadband

3.1.4 Mobile Data Traffic Growth

3.1.5 Interest from Vertical Markets

3.1.6 Reducing the Total Cost of Ownership (TCO)

3.1.7 Replacement of TDM with Ethernet: Continued Growth in Backhaul

3.1.8 Advances in Spectrum Flexibility & Carrier Aggregation: Driving HetNet

Deployments

3.1.9 Strategic Choice for CDMA & WiMAX Operators: Join Mainstream Ecosystem

3.1.10 Address 2G/3G Network Congestion

3.1.11 Bringing Broadband to the Masses

3.1.12 Trend Summary: Which Segments of the Wireless Infrastructure Market Will

Witness Growth?

3.2 Barriers & Risks

3.2.1 CapEx Commitments

3.2.2 Spectrum Scarcity

3.2.3 RAN Sharing: A Concept Embraced by Operators

3.2.4 Operators Are Finding Innovative Ways to Address Capacity Issues

3.2.5 Social, Political, Economic and Environmental Threats

3.2.6 Country Specific Risks

3.3 Key Strategic Options for Operators

3.4 Business Case for Investments in New and Existing Technologies

3.4.1 Gain Operational Efficiencies Through Strategic Investments

3.4.2 Invest in Capacity for Increased Revenue Opportunities

3.4.3 Deliver Best User Experience

3.4.4 Reduce Competitive Threats

3.4.5 Reserve Network Capacity the M2M Opportunities

3.4.6 Increase Customer Satisfaction

3.4.7 Capitalize on Differentiation Strategies

3.4.8 Evolve towards the Next Generation

4 CHAPTER 4: MOBILE NETWORK CAPEX REVIEW

- 4.1 Global Mobile Network CapEx
- 4.2 Regional Split
- 4.3 Top 10 Operators
 - 4.3.1 China Mobile
 - 4.3.2 China Unicom
 - 4.3.3 AT&T Mobility
 - 4.3.4 Verizon Wireless
 - 4.3.5 NTT DoCoMo
 - 4.3.6 SoftBank
 - 4.3.7 Sprint
 - 4.3.8 KDDI
 - 4.3.9 T-Mobile USA
 - 4.3.10 SK Telecom
- 4.4 Asia Pacific Mobile Network CapEx
- 4.5 Eastern Europe Mobile Network CapEx
- 4.6 Latin & Central America Mobile Network CapEx
- 4.7 Middle East & Africa Mobile Network CapEx
- 4.8 North America Mobile Network CapEx
- 4.9 Western Europe Mobile Network CapEx

5 CHAPTER 5: MOBILE NETWORK SUBSCRIPTIONS & SERVICE REVENUE REVIEW

- 5.1 Global Mobile Network Subscriptions
- 5.2 Global Mobile Network Service Revenue
- 5.3 Segmentation by Technology
 - 5.3.1 Mobile Network Subscriptions by Technology
 - 5.3.2 Mobile Network Service Revenue by Technology
- 5.4 GSM Subscriptions & Service Revenue
- 5.5 iDEN Subscriptions & Service Revenue
- 5.6 CDMA Subscriptions & Service Revenue
- 5.7 W-CDMA/HSPA Subscriptions & Service Revenue
- 5.8 TD-SCDMA Subscriptions & Service Revenue
- 5.9 FDD LTE Subscriptions & Service Revenue
- 5.1 TD-LTE Subscriptions & Service Revenue
- 5.11 WiMAX Subscriptions & Service Revenue

5.12 Regional Split

5.12.1 Mobile Network Subscriptions by Region

5.12.2 Mobile Network Service Revenue by Region

5.13 Service Split

5.13.1 Mobile Network Service Revenue by Service Type

5.13.2 Voice Service Revenue

5.13.3 SMS/MMS Service Revenue

5.13.4 Mobile Broadband Service Revenue

5.14 Asia Pacific Mobile Network Subscriptions & Service Revenue

5.15 Eastern Europe Mobile Network Subscriptions & Service Revenue

5.16 Latin & Central America Mobile Network Subscriptions & Service Revenue

5.17 Middle East & Africa Mobile Network Subscriptions & Service Revenue

5.18 North America Mobile Network Subscriptions & Service Revenue

5.19 Western Europe Mobile Network Subscriptions & Service Revenue

6 CHAPTER 6: INDUSTRY ROADMAP & VALUE CHAIN

6.1 Industry Roadmap

6.1.1 Initial LTE FDD Rollouts: 2010 - 2011

6.1.2 Rise of the HetNet Ecosystem: 2012 - 2013

6.1.3 A Wave of TD-LTE Deployments: 2014 - 2016

6.1.4 Moving Towards “Software Centric” Networking: 2017 - 2019

6.1.5 Start of the 5G Era: 2020 & Beyond

6.2 Value Chain

6.3 Embedded Technology Ecosystem

6.3.1 Chipset Developers

6.3.2 Embedded Component/Software Providers

6.4 RAN Ecosystem

6.4.1 Macrocell RAN OEMs

6.4.2 ‘Pure-Play’ and Specialist Small Cell OEMs

6.4.3 WiFi Access Point OEMs

6.4.4 DAS & Repeater Solution Providers

6.4.5 Cloud RAN Solution Providers

6.4.6 Other Technology & Network Component Providers/Enablers

6.5 Mobile Backhaul Ecosystem

6.5.1 Backhaul Solution Providers

6.6 Mobile Core Ecosystem

6.6.1 Core Network Infrastructure & Software Providers

6.7 Connectivity Ecosystem

- 6.7.1 2G, 3G & 4G Wireless Carriers
- 6.7.2 WiFi Connectivity Providers
- 6.7.3 Small Cells as a Service (SCaaS) Providers
- 6.8 SON Ecosystem
 - 6.8.1 SON Solution Providers
- 6.9 SDN & NFV Ecosystem
 - 6.9.1 SDN & NFV Providers

7 CHAPTER 7: EXPERT OPINION – INTERVIEW TRANSCRIPTS

- 7.1 Ericsson
- 7.2 Nokia Solutions & Networks (NSN)

8 CHAPTER 8: VENDOR LANDSCAPE

- 8.1 Alcatel-Lucent
 - 8.1.1 Portfolio
 - 8.1.2 Strategy
 - 8.1.3 Market Momentum
- 8.2 Cisco
 - 8.2.1 Portfolio
 - 8.2.2 Strategy
 - 8.2.3 Market Momentum
- 8.3 Ericsson
 - 8.3.1 Portfolio
 - 8.3.2 Strategy
 - 8.3.3 Market Momentum
- 8.4 Huawei
 - 8.4.1 Portfolio
 - 8.4.2 Strategy
 - 8.4.3 Market Momentum
- 8.5 Nokia Solutions & Networks (NSN)
 - 8.5.1 Portfolio
 - 8.5.2 Strategy
 - 8.5.3 Market Momentum
- 8.6 Samsung
 - 8.6.1 Portfolio
 - 8.6.2 Strategy
 - 8.6.3 Market Momentum

8.7 ZTE

8.7.1 Portfolio

8.7.2 Strategy

8.7.3 Market Momentum

8.8 Vendor Outlook

8.8.1 Pricing

8.8.2 Portfolio Diversification

8.9 Vendor Ranking

8.9.1 Macrocell RAN & Mobile Core

8.9.2 Small Cell RAN

8.9.3 Carrier WiFi

8.9.4 Mobile Backhaul

9 CHAPTER 9: GLOBAL MARKET ANALYSIS & FORECASTS

9.1 Market Definition

9.2 Decomposing the Global Wireless Network Infrastructure Market

9.3 Macrocell RAN & Mobile Core

9.3.1 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue

9.3.2 Macrocell RAN & Mobile Core Revenue by Region

9.4 Macrocell RAN Submarket

9.4.1 Macrocell RAN Revenue

9.4.2 Macrocell RAN Base Station Shipments

9.4.3 Segmentation by Infrastructure Component

9.4.4 Segmentation by Region

9.4.5 Segmentation by Technology

9.4.6 Base Station Segmentation by Region

9.4.7 Base Station Segmentation by Technology

9.4.8 GSM Base Station Shipments & Revenue

9.4.9 CDMA2000/EV-DO Base Station Shipments & Revenue

9.4.10 TD-SCDMA Base Station Shipments & Revenue

9.4.11 W-CDMA/HSPA Base Station Shipments & Revenue

9.4.12 LTE FDD Base Station Shipments & Revenue

9.4.13 TD-LTE Base Station Shipments & Revenue

9.4.14 WiMAX Base Station Shipments & Revenue

9.4.15 Base Station Controller Segmentation by Region

9.4.16 Base Station Controller Segmentation by Technology

9.4.17 GSM Base Station Controller Revenue

9.4.18 CDMA2000 Base Station Controller Revenue

- 9.4.19 TD-SCDMA Base Station Controller Revenue
- 9.4.20 W-CDMA Base Station Controller Revenue
- 9.5 Mobile Core Submarket
 - 9.5.1 Segmentation by Region
 - 9.5.2 Segmentation by Technology
 - 9.5.3 3G Packet Core Submarket
 - 9.5.4 WiMAX ASN & CSN Submarket
 - 9.5.5 EPC Submarket
- 9.6 Home Location Register (HLR) Submarket
 - 9.6.1 Segmentation by Region
- 9.7 Mobile Switching Subsystem (MSS) Submarket
 - 9.7.1 Segmentation by Region
 - 9.7.2 Segmentation by Submarket
 - 9.7.3 Mobile Switching Center
 - 9.7.4 Mobile Soft Switch
- 9.8 Small Cell RAN Submarket
 - 9.8.1 Small Cell Revenue
 - 9.8.2 Small Cell Unit Shipments
 - 9.8.3 Segmentation by Region
 - 9.8.4 Segmentation by Air Interface Technology
 - 9.8.5 GSM/W-CDMA/HSPA Small Cell Unit Shipments & Revenue
 - 9.8.6 CDMA2000/EV-DO Small Cell Unit Shipments & Revenue
 - 9.8.7 LTE FDD Small Cell Unit Shipments & Revenue
 - 9.8.8 TD-LTE Small Cell Unit Shipments & Revenue
 - 9.8.9 WiMAX Small Cell Unit Shipments & Revenue
 - 9.8.10 Segmentation by Cell Size
 - 9.8.11 Microcell Unit Shipments & Revenue
 - 9.8.12 Picocell Unit Shipments & Revenue
 - 9.8.13 Femtocell Unit Shipments & Revenue
- 9.9 Carrier WiFi Submarket
 - 9.9.1 Carrier WiFi Revenue
 - 9.9.2 Carrier WiFi Unit Shipments
 - 9.9.3 Segmentation by Region
 - 9.9.4 Segmentation by Equipment Type
 - 9.9.5 Carrier WiFi Access Point Unit Shipments & Revenue
 - 9.9.6 Carrier WiFi Access Point Controller Unit Shipments & Revenue
 - 9.9.7 Segmentation by Integration Approach
 - 9.9.8 Managed WiFi Offload Access Point Unit Shipments & Revenue
 - 9.9.9 Unmanaged 'Open Access' WiFi Access Point Unit Shipments & Revenue

9.10 Distributed Antenna Systems (DAS) Submarket

9.10.1 Segmentation by Region

9.11 Remote Radio Head (RRH) Submarket

9.11.1 Remote Radio Head (RRH) Revenue

9.11.2 Remote Radio Head (RRH) Unit Shipments

9.11.3 Segmentation by Region

9.12 Macrocell Backhaul Submarket

9.12.1 Segmentation by Region

9.12.2 Segmentation by Technology

9.12.3 ATM

9.12.4 Coaxial Cable

9.12.5 DSL

9.12.6 Ethernet over Copper

9.12.7 Ethernet over Fiber

9.12.8 Microwave Radio

9.12.9 PDH

9.12.10 PON

9.12.11 Satellite

9.12.12 SONET, SDH & WDM

9.12.13 WiMAX

9.13 Small Cell Backhaul Submarket

9.13.1 Segmentation by Region

9.13.2 Segmentation by Technology

9.13.3 Ethernet over Copper

9.13.4 Ethernet over Fiber

9.13.5 DSL

9.13.6 NLOS Microwave (Below 6 GHz)

9.13.7 PTP Microwave (6-60 GHz)

9.13.8 PTMP Microwave (6-60 GHz)

9.13.9 Millimeter Wave (unlicensed 60 GHz)

9.13.10 Millimeter Wave (licensed 71-76, 81-86 GHz)

9.13.11 Satellite

10 CHAPTER 10: REGIONAL MARKET ANALYSIS & FORECASTS

10.1 Asia Pacific

10.1.1 Macrocell RAN and Mobile Core

10.1.2 Macrocell RAN

10.1.3 Macrocell RAN Base Stations

- 10.1.4 GSM Base Stations
- 10.1.5 CDMA2000/EV-DO Base Stations
- 10.1.6 TD-SCDMA Base Stations
- 10.1.7 W-CDMA/HSPA Base Stations
- 10.1.8 LTE FDD Base Stations
- 10.1.9 TD-LTE Base Stations
- 10.1.10 WiMAX Base Stations
- 10.1.11 Base Station Controller
- 10.1.12 GSM Base Station Controller
- 10.1.13 CDMA2000 Base Station Controller
- 10.1.14 TD-SCDMA Base Station Controller Revenue
- 10.1.15 W-CDMA Base Station Controller Revenue
- 10.1.16 Mobile Core
- 10.1.17 3G Packet Core
- 10.1.18 WiMAX ASN & CSN
- 10.1.19 EPC
- 10.1.20 Home Location Register (HLR)
- 10.1.21 Mobile Switching Subsystem (MSS)
- 10.1.22 Small Cell RAN
- 10.1.23 Carrier WiFi
- 10.1.24 Distributed Antenna Systems (DAS)
- 10.1.25 Remote Radio Head (RRH)
- 10.1.26 Macrocell Backhaul
- 10.1.27 Small Cell Backhaul
- 10.2 Eastern Europe
 - 10.2.1 Macrocell RAN and Mobile Core
 - 10.2.2 Macrocell RAN
 - 10.2.3 Macrocell RAN Base Stations
 - 10.2.4 GSM Base Stations
 - 10.2.5 CDMA2000/EV-DO Base Stations
 - 10.2.6 W-CDMA/HSPA Base Stations
 - 10.2.7 LTE FDD Base Stations
 - 10.2.8 TD-LTE Base Stations
 - 10.2.9 WiMAX Base Stations
 - 10.2.10 Base Station Controller
 - 10.2.11 GSM Base Station Controller
 - 10.2.12 CDMA2000 Base Station Controller
 - 10.2.13 W-CDMA Base Station Controller Revenue
 - 10.2.14 Mobile Core

- 10.2.15 3G Packet Core
- 10.2.16 WiMAX ASN & CSN
- 10.2.17 EPC
- 10.2.18 Home Location Register (HLR)
- 10.2.19 Mobile Switching Subsystem (MSS)
- 10.2.20 Small Cell RAN
- 10.2.21 Carrier WiFi
- 10.2.22 Distributed Antenna Systems (DAS)
- 10.2.23 Remote Radio Head (RRH)
- 10.2.24 Macrocell Backhaul
- 10.2.25 Small Cell Backhaul
- 10.3 Latin & Central America
 - 10.3.1 Macrocell RAN and Mobile Core
 - 10.3.2 Macrocell RAN
 - 10.3.3 Macrocell RAN Base Stations
 - 10.3.4 GSM Base Stations
 - 10.3.5 CDMA2000/EV-DO Base Stations
 - 10.3.6 W-CDMA/HSPA Base Stations
 - 10.3.7 LTE FDD Base Stations
 - 10.3.8 TD-LTE Base Stations
 - 10.3.9 WiMAX Base Stations
 - 10.3.10 Base Station Controller
 - 10.3.11 GSM Base Station Controller
 - 10.3.12 CDMA2000 Base Station Controller
 - 10.3.13 W-CDMA Base Station Controller Revenue
 - 10.3.14 Mobile Core
 - 10.3.15 3G Packet Core
 - 10.3.16 WiMAX ASN & CSN
 - 10.3.17 EPC
 - 10.3.18 Home Location Register (HLR)
 - 10.3.19 Mobile Switching Subsystem (MSS)
 - 10.3.20 Small Cell RAN
 - 10.3.21 Carrier WiFi
 - 10.3.22 Distributed Antenna Systems (DAS)
 - 10.3.23 Remote Radio Head (RRH)
 - 10.3.24 Macrocell Backhaul
 - 10.3.25 Small Cell Backhaul
- 10.4 Middle East & Africa
 - 10.4.1 Macrocell RAN and Mobile Core

- 10.4.2 Macrocell RAN
- 10.4.3 Macrocell RAN Base Stations
- 10.4.4 GSM Base Stations
- 10.4.5 CDMA2000/EV-DO Base Stations
- 10.4.6 W-CDMA/HSPA Base Stations
- 10.4.7 LTE FDD Base Stations
- 10.4.8 TD-LTE Base Stations
- 10.4.9 WiMAX Base Stations
- 10.4.10 Base Station Controller
- 10.4.11 GSM Base Station Controller
- 10.4.12 CDMA2000 Base Station Controller
- 10.4.13 W-CDMA Base Station Controller Revenue
- 10.4.14 Mobile Core
- 10.4.15 3G Packet Core
- 10.4.16 WiMAX ASN & CSN
- 10.4.17 EPC
- 10.4.18 Home Location Register (HLR)
- 10.4.19 Mobile Switching Subsystem (MSS)
- 10.4.20 Small Cell RAN
- 10.4.21 Carrier WiFi
- 10.4.22 Distributed Antenna Systems (DAS)
- 10.4.23 Remote Radio Head (RRH)
- 10.4.24 Macrocell Backhaul
- 10.4.25 Small Cell Backhaul
- 10.5 North America
 - 10.5.1 Macrocell RAN and Mobile Core
 - 10.5.2 Macrocell RAN
 - 10.5.3 Macrocell RAN Base Stations
 - 10.5.4 GSM Base Stations
 - 10.5.5 CDMA2000/EV-DO Base Stations
 - 10.5.6 W-CDMA/HSPA Base Stations
 - 10.5.7 LTE FDD Base Stations
 - 10.5.8 TD-LTE Base Stations
 - 10.5.9 WiMAX Base Stations
 - 10.5.10 Base Station Controller
 - 10.5.11 GSM Base Station Controller
 - 10.5.12 CDMA2000 Base Station Controller
 - 10.5.13 W-CDMA Base Station Controller Revenue
 - 10.5.14 Mobile Core

- 10.5.15 3G Packet Core
- 10.5.16 WiMAX ASN & CSN
- 10.5.17 EPC
- 10.5.18 Home Location Register (HLR)
- 10.5.19 Mobile Switching Subsystem (MSS)
- 10.5.20 Small Cell RAN
- 10.5.21 Carrier WiFi
- 10.5.22 Distributed Antenna Systems (DAS)
- 10.5.23 Remote Radio Head (RRH)
- 10.5.24 Macrocell Backhaul
- 10.5.25 Small Cell Backhaul
- 10.6 Western Europe
 - 10.6.1 Macrocell RAN and Mobile Core
 - 10.6.2 Macrocell RAN
 - 10.6.3 Macrocell RAN Base Stations
 - 10.6.4 GSM Base Stations
 - 10.6.5 CDMA2000/EV-DO Base Stations
 - 10.6.6 W-CDMA/HSPA Base Stations
 - 10.6.7 LTE FDD Base Stations
 - 10.6.8 TD-LTE Base Stations
 - 10.6.9 WiMAX Base Stations
 - 10.6.10 Base Station Controller
 - 10.6.11 GSM Base Station Controller
 - 10.6.12 CDMA2000 Base Station Controller
 - 10.6.13 W-CDMA Base Station Controller Revenue
 - 10.6.14 Mobile Core
 - 10.6.15 3G Packet Core
 - 10.6.16 WiMAX ASN & CSN
 - 10.6.17 EPC
 - 10.6.18 Home Location Register (HLR)
 - 10.6.19 Mobile Switching Subsystem (MSS)
 - 10.6.20 Small Cell RAN
 - 10.6.21 Carrier WiFi
 - 10.6.22 Distributed Antenna Systems (DAS)
 - 10.6.23 Remote Radio Head (RRH)
 - 10.6.24 Macrocell Backhaul
 - 10.6.25 Small Cell Backhaul

11 CHAPTER 11: PROSPECTS OF THE 5G MARKET

11.1 5G Standardization and Research Initiatives

11.1.1 METIS

11.1.2 5GPP

11.1.3 Korea's 5G Forum

11.1.4 Japan's ARIB 2020 and Beyond AdHoc

11.1.5 China's IMT 2020

11.2 How much is being Invested in 5G R&D?

11.3 5G Requirements

11.4 Vertical Industries to Play a Key Role

11.5 SDN Capabilities Considered Inherent for 5G

11.6 Spectrum Aggregation is a Necessity

11.7 Authorized Shared Access (ASA)

11.8 Will 5G be a New Air Interface?

11.9 5G Demonstrations

11.9.1 Samsung

11.9.2 NSN

11.9.3 Huawei

12 CHAPTER 12: CONCLUSION & STRATEGIC RECOMMENDATIONS

12.1 Enterprise RAN Deployments Gain Traction

12.2 Is Mobile Network Virtualization a Threat to the Wireless Network Infrastructure Market?

12.3 Wireless Incumbents Could Face Cloud Rivals: Thanks to SDN & NFV

12.4 Spectrum: Driving Continued Acquisitions by Incumbent Operators

12.5 LTE-A: Upgrades for Capacity & Coverage Boosts

12.6 China's TDD Spectrum Allocation: Starting an Era of Large-Scale TD-LTE Deployments

12.7 Smart Cities: Wireless Infrastructure Vendors to Lead the Way

12.8 Standardization Driving RAN & WiFi Integration

12.9 Vendors Bringing LTE-Broadcast into Focus

12.10 Vendor Specific HetNet Offerings: Disrupting Traditional Network Architectures

12.11 Operators Will Strive for Agility

12.12 SWOT Analysis

12.13 Strategic Recommendations

12.13.1 Recommendations for Operators

12.13.2 Recommendations for Infrastructure Vendors

List Of Figures

LIST OF FIGURES

- Figure 1: Subsegments of the Wireless Network Infrastructure Market
- Figure 2: Global GSM Networks: 1991 - 2014
- Figure 3: Global GSM Subscriptions: 2010 – 2020 (Millions)
- Figure 4: Global W-CDMA & HSPA Subscriptions: 2010 – 2020 (Millions)
- Figure 5: Global W-CDMA & HSPA Subscriptions (%): 2014
- Figure 6: Global LTE Commercial Network Launches: 2009 - 2014
- Figure 7: Macrocell RAN Component Segmentation by Technology
- Figure 8: HetNet RAN Component Segmentation by Technology
- Figure 9: Global Voice over LTE (VoLTE) User Forecast: 2013 – 2020 (Millions)
- Figure 10: Mobile Backhaul Segmentation by Technology
- Figure 11: Global Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 12: LTE Penetration by Region: 2010 – 2020 (%)
- Figure 13: LTE Penetration in Asia Pacific: 2010 – 2020 (%)
- Figure 14: LTE Penetration in Eastern Europe: 2010 – 2020 (%)
- Figure 15: LTE Penetration in Latin & Central America: 2010 – 2020 (%)
- Figure 16: LTE Penetration in Middle East & Africa: 2010 – 2020 (%)
- Figure 17: LTE Penetration in North America: 2010 – 2020 (%)
- Figure 18: LTE Penetration in Western Europe: 2010 – 2020 (%)
- Figure 19: Global Smartphone & Tablet Shipments: 2010 – 2020 (Millions of Units)
- Figure 20: Global Smartphone vs. Feature & Basic Phone Shipments: 2010 – 2020 (Millions of Units)
- Figure 21: Global Mobile Broadband & Voice Service Revenue Compared: 2010 – 2020 (\$ Billion)
- Figure 22: Annual Global Throughput of Mobile Network Data Traffic by Region: 2010 – 2020 (Exabytes)
- Figure 23: Annual Global Throughput of Mobile Network Data Traffic by Access Network Type: 2010 – 2020 (Exabytes)
- Figure 24: Private Public Safety LTE Infrastructure Spending: 2010 – 2020 (\$ Billion)
- Figure 25: Average Annual Traffic & Revenue Growth Compared for a Tier 1 Operator: 2010 – 2014 (%)
- Figure 26: TCO Comparison for 2G, 3G, LTE and HetNet Deployments (\$ per GB)
- Figure 27: Strategic Options for Operators
- Figure 28: Global Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 29: Mobile Network CapEx by Region: 2010 – 2020 (\$ Billion)
- Figure 30: Mobile Network CapEx for Top 10 Operators (\$ Billion)

- Figure 31: China Mobile CapEx Commitments (\$ Billion)
- Figure 32: China Unicom CapEx Commitments (\$ Billion)
- Figure 33: AT&T Mobility CapEx Commitments (\$ Billion)
- Figure 34: Verizon Wireless CapEx Commitments (\$ Billion)
- Figure 35: NTT DoCoMo CapEx Commitments (\$ Billion)
- Figure 36: SoftBank CapEx Commitments (\$ Billion)
- Figure 37: Sprint CapEx Commitments (\$ Billion)
- Figure 38: KDDI CapEx Commitments (\$ Billion)
- Figure 39: T-Mobile USA CapEx Commitments (\$ Billion)
- Figure 40: SK Telecom CapEx Commitments (\$ Billion)
- Figure 41: Asia Pacific Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 42: Eastern Europe Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 43: Latin & Central America Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 44: Middle East & Africa Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 45: North America Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 46: Western Europe Mobile Network CapEx: 2010 – 2020 (\$ Billion)
- Figure 47: Global Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 48: Global Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 49: Global Mobile Network Subscriptions by Technology: 2010 – 2020 (Millions)
- Figure 50: Global Mobile Network Service Revenue by Technology: 2010 – 2020 (\$ Billion)
- Figure 51: GSM Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 52: GSM Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 53: iDEN Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 54: iDEN Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 55: CDMA Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 56: CDMA Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 57: W-CDMA/HSPA Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 58: W-CDMA/HSPA Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 59: TD-SCDMA Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 60: TD-SCDMA Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 61: FDD LTE Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 62: FDD LTE Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 63: TD-LTE Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 64: TD-LTE Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 65: WiMAX Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 66: WiMAX Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 67: Mobile Network Subscriptions by Region: 2010 – 2020 (Millions)
- Figure 68: Mobile Network Service Revenue by Region: 2010 – 2020 (\$ Billion)

- Figure 69: Mobile Network Subscriptions by Service Type: 2010 – 2020 (Millions)
- Figure 70: Mobile Network Voice Service Revenue: 2010 – 2020 (Millions)
- Figure 71: Mobile Network SMS/MMS Service Revenue: 2010 – 2020 (Millions)
- Figure 72: Mobile Network Broadband Service Revenue: 2010 – 2020 (Millions)
- Figure 73: Asia Pacific Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 74: Asia Pacific Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 75: Eastern Europe Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 76: Eastern Europe Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 77: Latin & Central America Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 78: Latin & Central America Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 79: Middle East & Africa Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 80: Middle East & Africa Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 81: North America Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 82: North America Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 83: Western Europe Mobile Network Subscriptions: 2010 – 2020 (Millions)
- Figure 84: Western Europe Mobile Network Service Revenue: 2010 – 2020 (\$ Billion)
- Figure 85: The Wireless Network Infrastructure Industry Roadmap: 2014 - 2020
- Figure 86: The Wireless Network Infrastructure Value Chain
- Figure 87: Embedded Technology Ecosystem Players
- Figure 88: Macrocell RAN Ecosystem Players
- Figure 89: Specialist Small Cell RAN Ecosystem Players
- Figure 90: Carrier WiFi Ecosystem Players
- Figure 91: DAS & Repeater Ecosystem Players
- Figure 92: Cloud RAN Ecosystem Players
- Figure 93: Mobile Backhaul Ecosystem Players
- Figure 94: Mobile Core Ecosystem Players
- Figure 95: List of LTE Trials & Deployments
- Figure 96: SON Ecosystem Players
- Figure 97: SDN & NFV Ecosystem Players
- Figure 98: Macrocell RAN Infrastructure Vendor Share: 2013 (%)
- Figure 99: Mobile Core Infrastructure Vendor Share: 2013 (%)
- Figure 100: LTE Infrastructure Vendor Share: 2013 (%)
- Figure 101: WiMAX Infrastructure Vendor Share: 2013 (%)
- Figure 102: 2G & 3G Infrastructure Vendor Share: 2013 (%)
- Figure 103: Small Cell RAN Infrastructure Vendor Share: 2013 (%)
- Figure 104: Carrier WiFi Infrastructure Vendor Share: 2013 (%)

Figure 105: Mobile Backhaul Infrastructure Vendor Share: 2013 (%)

Figure 106: Global Wireless Network Infrastructure Revenue by Submarket: 2010 – 2020 (\$ Million)

Figure 107: Global Wireless Network Infrastructure Market Share by Submarket: 2014 (%)

Figure 108: Global Wireless Network Infrastructure Market Share by Submarket: 2020 (%)

Figure 109: Global Macrocell RAN & Mobile Core Revenue: 2010 – 2020 (\$ Million)

Figure 110: Global 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 111: Macrocell RAN & Mobile Core Revenue by Region: 2010 – 2020 (\$ Million)

Figure 112: Global Macrocell RAN Revenue: 2010 – 2020 (\$ Million)

Figure 113: Global Macrocell RAN Base Station Shipments: 2010 – 2020

Figure 114: Global Macrocell RAN Revenue by Infrastructure Component: 2010 - 2020 (\$ Million)

Figure 115: Macrocell RAN Revenue by Region: 2010 - 2020 (\$ Million)

Figure 116: Global Macrocell RAN Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 117: Macrocell RAN Base Station Shipments by Region: 2010 - 2020

Figure 118: Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 119: Global Macrocell RAN Base Station Shipments by Technology: 2010 - 2020

Figure 120: Global Macrocell RAN Base Station Shipment Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 121: GSM Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 122: GSM Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 123: CDMA2000/EV-DO Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 124: CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 125: TD-SCDMA Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 126: TD-SCDMA Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 127: W-CDMA/HSPA Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 128: W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 129: LTE FDD Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 130: LTE FDD Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 131: TD-LTE Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 132: TD-LTE Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 133: WiMAX Macrocell Base Station Shipments by Region: 2010 - 2020

Figure 134: WiMAX Macrocell RAN Base Station Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 135: Macrocell Base Station Controller Revenue by Region: 2010 - 2020 (\$ Million)

Figure 136: Global Macrocell Base Station Controller Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 137: GSM Base Station Controller Revenue by Region: 2010 - 2020 (\$ Million)

Figure 138: CDMA2000 Base Station Controller Revenue by Region: 2010 - 2020 (\$ Million)

Figure 139: TD-SCDMA Base Station Controller Revenue by Region: 2010 - 2020 (\$ Million)

Figure 140: W-CDMA Base Station Controller Revenue by Region: 2010 - 2020 (\$ Million)

Figure 141: Global Mobile Core Revenue: 2010 – 2020 (\$ Million)

Figure 142: Mobile Core Revenue by Region: 2010 - 2020 (\$ Million)

Figure 143: Global Mobile Core Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 144: Global 3G Packet Core Revenue by Submarket: 2010 - 2020 (\$ Million)

Figure 145: 3G Packet Core Revenue by Region: 2010 - 2020 (\$ Million)

Figure 146: Global WiMAX ASN & CSN Revenue by Submarket: 2010 - 2020 (\$ Million)

Figure 147: WiMAX ASN & CSN Revenue by Region: 2010 - 2020 (\$ Million)

Figure 148: EPC Revenue by Region: 2010 - 2020 (\$ Million)

Figure 149: Global Home Location Register (HLR) Revenue: 2010 – 2020 (\$ Million)

Figure 150: Home Location Register (HLR) Revenue by Region: 2010 - 2020 (\$ Million)

Figure 151: Global Mobile Switching Subsystem (MSS) Revenue: 2010 – 2020 (\$ Million)

Figure 152: Mobile Switching Subsystem Revenue by Region: 2010 - 2020 (\$ Million)

Figure 153: Global Mobile Switching Subsystem Revenue by Submarket: 2010 - 2020 (\$ Million)

Figure 154: Global Mobile Switching Center Revenue: 2010 - 2020 (\$ Million)

Figure 155: Global Mobile Soft Switch Revenue: 2010 - 2020 (\$ Million)

Figure 156: Global Small Cell Unit Shipment Revenue: 2010 – 2020 (\$ Million)

Figure 157: Global Small Cell Unit Shipments: 2010 – 2020 (Thousands of Units)

Figure 158: Small Cell Unit Shipments by Region: 2010 - 2020 (Thousands of Units)

Figure 159: Small Cell Unit Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 160: Global Small Cell Unit Shipments by Air Interface Technology: 2010 - 2020

(Thousands of Units)

Figure 161: Global Small Cell Unit Shipment Revenue by Air Interface Technology: 2010 - 2020 (\$ Million)

Figure 162: Global GSM/W-CDMA/HSPA Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 163: Global GSM/W-CDMA/HSPA Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 164: Global CDMA2000/EV-DO Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 165: Global CDMA2000/EV-DO Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 166: Global LTE FDD Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 167: Global LTE FDD Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 168: Global TD-LTE Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 169: Global TD-LTE Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 170: Global WiMAX Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 171: Global WiMAX Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 172: Global Small Cell Unit Shipments by Cell Size: 2010 - 2020 (Thousands of Units)

Figure 173: Global Small Cell Unit Shipment Revenue by Cell Size: 2010 - 2020 (\$ Million)

Figure 174: Global Microcell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 175: Global Microcell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 176: Global Picocell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 177: Global Picocell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 178: Global Femtocell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 179: Global Femtocell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 180: Global Carrier WiFi Unit Shipment Revenue: 2010 – 2020 (\$ Million)

Figure 181: Global Carrier WiFi Unit Shipments: 2010 – 2020 (Thousands of Units)

Figure 182: Carrier WiFi Unit Shipments by Region: 2010 - 2020 (Thousands of Units)

Figure 183: Carrier WiFi Unit Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 184: Global Carrier WiFi Unit Shipments by Equipment Type: 2010 - 2020 (Thousands of Units)

Figure 185: Global Carrier WiFi Unit Shipment Revenue by Equipment Type: 2010 - 2020 (\$ Million)

Figure 186: Global Carrier WiFi Access Point Unit Shipments: 2010 - 2020 (Thousands

of Units)

Figure 187: Global Carrier WiFi Access Point Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 188: Global Carrier WiFi Access Point Controller Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 189: Global Carrier WiFi Access Point Controller Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 190: Global Carrier WiFi Access Point Unit Shipments by Integration Approach: 2010 - 2020 (Thousands of Units)

Figure 191: Global Carrier WiFi Access Point Unit Shipment Revenue by Integration Approach: 2010 - 2020 (\$ Million)

Figure 192: Global Managed WiFi Offload Access Point Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 193: Global Managed WiFi Offload Access Point Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 194: Global Unmanaged 'Open Access' WiFi Access Point Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 195: Global Unmanaged 'Open Access' WiFi Access Point Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 196: Global Distributed Antenna Systems (DAS) Revenue: 2010 – 2020 (\$ Million)

Figure 197: Distributed Antenna Systems (DAS) Revenue by Region: 2010 - 2020 (\$ Million)

Figure 198: Global Remote Radio Head (RRH) Unit Shipment Revenue: 2010 – 2020 (\$ Million)

Figure 199: Global Remote Radio Head (RRH) Unit Shipments: 2010 – 2020 (Thousands of Units)

Figure 200: Remote Radio Head (RRH) Unit Shipments by Region: 2010 - 2020 (Thousands of Units)

Figure 201: Remote Radio Head (RRH) Unit Shipment Revenue by Region: 2010 - 2020 (\$ Million)

Figure 202: Global Macrocell Backhaul Revenue: 2010 – 2020 (\$ Million)

Figure 203: Macrocell Backhaul Revenue by Region: 2010 - 2020 (\$ Million)

Figure 204: Global Macrocell Backhaul Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 205: Global ATM Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 206: Global Coaxial Cable Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 207: Global DSL Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 208: Global Ethernet over Copper Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 209: Global Ethernet over Fiber Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 210: Global Microwave Radio Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 211: Global PDH Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 212: Global PON Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 213: Global Satellite Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 214: Global SONET, SDH & WDM Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 215: Global WiMAX Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 216: Global Small Cell Backhaul Revenue: 2010 – 2020 (\$ Million)

Figure 217: Small Cell Backhaul Revenue by Region: 2010 - 2020 (\$ Million)

Figure 218: Global Small Cell Backhaul Revenue by Technology: 2010 - 2020 (\$ Million)

Figure 219: Global Ethernet over Copper Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 220: Global Ethernet over Fiber Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 221: Global DSL Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 222: Global NLOS Microwave (Below 6 GHz) Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 223: Global PTP Microwave (6-60 GHz) Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 224: Global PTMP Microwave (6-60 GHz) Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 225: Global Millimeter Wave (unlicensed 60 GHz) Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 226: Global Millimeter Wave (licensed 71-76, 81-86 GHz) Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 227: Global Satellite Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 228: Asia Pacific Macrocell RAN & Mobile Core Revenue: 2010 – 2020 (\$ Million)

Figure 229: Asia Pacific 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 230: Asia Pacific Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 231: Asia Pacific Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 232: Asia Pacific Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 233: Asia Pacific GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 234: Asia Pacific GSM Macrocell RAN Base Station Shipment Revenue: 2010 -

2020 (\$ Million)

Figure 235: Asia Pacific CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 236: Asia Pacific CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 237: Asia Pacific TD-SCDMA Macrocell Base Station Shipments: 2010 - 2020

Figure 238: Asia Pacific TD-SCDMA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 239: Asia Pacific W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 240: Asia Pacific W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 241: Asia Pacific LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 242: Asia Pacific LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 243: Asia Pacific TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 244: Asia Pacific TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 245: Asia Pacific WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 246: Asia Pacific WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 247: Asia Pacific Macrocell Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 248: Asia Pacific GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 249: Asia Pacific CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 250: Asia Pacific TD-SCDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 251: Asia Pacific W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 252: Asia Pacific Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 253: Asia Pacific 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 254: Asia Pacific WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 255: Asia Pacific EPC Revenue: 2010 - 2020 (\$ Million)

Figure 256: Asia Pacific Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 257: Asia Pacific Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 258: Asia Pacific Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 259: Asia Pacific Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 260: Asia Pacific Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 261: Asia Pacific Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 262: Asia Pacific Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 263: Asia Pacific Remote Radio Head (RRH) Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 264: Asia Pacific Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 265: Asia Pacific Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 266: Asia Pacific Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 267: Eastern Europe Macrocell RAN & Mobile Core Revenue: 2010 – 2020 (\$ Million)

Figure 268: Eastern Europe 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 269: Eastern Europe Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 270: Eastern Europe Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 271: Eastern Europe Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 272: Eastern Europe GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 273: Eastern Europe GSM Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 274: Eastern Europe CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 275: Eastern Europe CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 276: Eastern Europe W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 277: Eastern Europe W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 278: Eastern Europe LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 279: Eastern Europe LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 280: Eastern Europe TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 281: Eastern Europe TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 282: Eastern Europe WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 283: Eastern Europe WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 284: Eastern Europe Macrocell Base Station Controller Revenue: 2010 - 2020 (\$

Million)

Figure 285: Eastern Europe GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 286: Eastern Europe CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 287: Eastern Europe W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 288: Eastern Europe Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 289: Eastern Europe 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 290: Eastern Europe WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 291: Eastern Europe EPC Revenue: 2010 - 2020 (\$ Million)

Figure 292: Eastern Europe Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 293: Eastern Europe Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 294: Eastern Europe Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 295: Eastern Europe Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 296: Eastern Europe Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 297: Eastern Europe Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 298: Eastern Europe Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 299: Eastern Europe Remote Radio Head (RRH) Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 300: Eastern Europe Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 301: Eastern Europe Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 302: Eastern Europe Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 303: Latin & Central America Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 304: Latin & Central America 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 305: Latin & Central America Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 306: Latin & Central America Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 307: Latin & Central America Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 308: Latin & Central America GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 309: Latin & Central America GSM Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 310: Latin & Central America CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 311: Latin & Central America CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 312: Latin & Central America W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 313: Latin & Central America W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 314: Latin & Central America LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 315: Latin & Central America LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 316: Latin & Central America TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 317: Latin & Central America TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 318: Latin & Central America WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 319: Latin & Central America WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 320: Latin & Central America Macrocell Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 321: Latin & Central America GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 322: Latin & Central America CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 323: Latin & Central America W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 324: Latin & Central America Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 325: Latin & Central America 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 326: Latin & Central America WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 327: Latin & Central America EPC Revenue: 2010 - 2020 (\$ Million)

Figure 328: Latin & Central America Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 329: Latin & Central America Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 330: Latin & Central America Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 331: Latin & Central America Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 332: Latin & Central America Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 333: Latin & Central America Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 334: Latin & Central America Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 335: Latin & Central America Remote Radio Head (RRH) Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 336: Latin & Central America Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 337: Latin & Central America Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 338: Latin & Central America Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 339: Middle East & Africa Macrocell RAN & Mobile Core Revenue: 2010 – 2020 (\$ Million)

Figure 340: Middle East & Africa 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 341: Middle East & Africa Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 342: Middle East & Africa Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 343: Middle East & Africa Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 344: Middle East & Africa GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 345: Middle East & Africa GSM Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 346: Middle East & Africa CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 347: Middle East & Africa CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 348: Middle East & Africa W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 349: Middle East & Africa W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 350: Middle East & Africa LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 351: Middle East & Africa LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 352: Middle East & Africa TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 353: Middle East & Africa TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 354: Middle East & Africa WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 355: Middle East & Africa WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 356: Middle East & Africa Macrocell Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 357: Middle East & Africa GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 358: Middle East & Africa CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 359: Middle East & Africa W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 360: Middle East & Africa Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 361: Middle East & Africa 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 362: Middle East & Africa WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 363: Middle East & Africa EPC Revenue: 2010 - 2020 (\$ Million)

Figure 364: Middle East & Africa Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 365: Middle East & Africa Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 366: Middle East & Africa Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 367: Middle East & Africa Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 368: Middle East & Africa Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 369: Middle East & Africa Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 370: Middle East & Africa Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 371: Middle East & Africa Remote Radio Head (RRH) Unit Shipments: 2010 -

2020 (Thousands of Units)

Figure 372: Middle East & Africa Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 373: Middle East & Africa Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 374: Middle East & Africa Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 375: North America Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 376: North America 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 377: North America Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 378: North America Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 379: North America Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 380: North America GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 381: North America GSM Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 382: North America CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 383: North America CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 384: North America W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 385: North America W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 386: North America LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 387: North America LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 388: North America TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 389: North America TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 390: North America WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 391: North America WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 392: North America Macrocell Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 393: North America GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 394: North America CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 395: North America W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 396: North America Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 397: North America 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 398: North America WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 399: North America EPC Revenue: 2010 - 2020 (\$ Million)

Figure 400: North America Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 401: North America Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 402: North America Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 403: North America Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 404: North America Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 405: North America Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 406: North America Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 407: North America Remote Radio Head (RRH) Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 408: North America Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 409: North America Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 410: North America Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 411: Western Europe Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 412: Western Europe 2G/3G vs. 4G Macrocell RAN & Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 413: Western Europe Macrocell RAN Revenue: 2010 - 2020 (\$ Million)

Figure 414: Western Europe Macrocell RAN Base Station Shipments: 2010 - 2020

Figure 415: Western Europe Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 416: Western Europe GSM Macrocell Base Station Shipments: 2010 - 2020

Figure 417: Western Europe GSM Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 418: Western Europe CDMA2000/EV-DO Macrocell Base Station Shipments: 2010 - 2020

Figure 419: Western Europe CDMA2000/EV-DO Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 420: Western Europe W-CDMA/HSPA Macrocell Base Station Shipments: 2010 - 2020

Figure 421: Western Europe W-CDMA/HSPA Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 422: Western Europe LTE FDD Macrocell Base Station Shipments: 2010 - 2020

Figure 423: Western Europe LTE FDD Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 424: Western Europe TD-LTE Macrocell Base Station Shipments: 2010 - 2020

Figure 425: Western Europe TD-LTE Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 426: Western Europe WiMAX Macrocell Base Station Shipments: 2010 - 2020

Figure 427: Western Europe WiMAX Macrocell RAN Base Station Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 428: Western Europe Macrocell Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 429: Western Europe GSM Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 430: Western Europe CDMA2000 Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 431: Western Europe W-CDMA Base Station Controller Revenue: 2010 - 2020 (\$ Million)

Figure 432: Western Europe Mobile Core Revenue: 2010 - 2020 (\$ Million)

Figure 433: Western Europe 3G Packet Core Revenue: 2010 - 2020 (\$ Million)

Figure 434: Western Europe WiMAX ASN & CSN Revenue: 2010 - 2020 (\$ Million)

Figure 435: Western Europe EPC Revenue: 2010 - 2020 (\$ Million)

Figure 436: Western Europe Home Location Register (HLR) Revenue: 2010 - 2020 (\$ Million)

Figure 437: Western Europe Mobile Switching Subsystem Revenue: 2010 - 2020 (\$ Million)

Figure 438: Western Europe Small Cell Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 439: Western Europe Small Cell Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 440: Western Europe Carrier WiFi Unit Shipments: 2010 - 2020 (Thousands of Units)

Figure 441: Western Europe Carrier WiFi Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 442: Western Europe Distributed Antenna Systems (DAS) Revenue: 2010 - 2020 (\$ Million)

Figure 443: Western Europe Remote Radio Head (RRH) Unit Shipments: 2010 - 2020

(Thousands of Units)

Figure 444: Western Europe Remote Radio Head (RRH) Unit Shipment Revenue: 2010 - 2020 (\$ Million)

Figure 445: Western Europe Macrocell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 446: Western Europe Small Cell Backhaul Revenue: 2010 - 2020 (\$ Million)

Figure 447: METIS Members

Figure 448: Investments in 5G R&D: 2010 – 2020 (\$ Million)

Figure 449: METIS 5G Requirements

Figure 450: SWOT Analysis of the Wireless Network Infrastructure Market

LIST OF COMPANIES MENTIONED

“R” (Spain)

21 VIANET GROUP

2K TELECOM

3 AUSTRIA

3 DENMARK

3 HK

3 IRELAND

3 ITALIA

3 SWEDEN

365 MEDIA

3ROAM

4IPNET

6WIND

A1 Telekom

Aalborg University

Aalto-University

Ablaze

Accedian

Accelleran

Actelis

Actix

Adams NetWorks

ADLINK

ADTRAN

ADVA

Advantech

Aero2

Aerohive
Aeronet
Aircel
Aircell
Aircom International
AirHop Communications
Airspan
Airtel Nigeria
Airvana
AIS/DPC Thailand
Al Madar
Alaska Communications
Albis Technologies
Alcatel-Lucent
Alfa
Algar Telecom (CTBC)
Algerie Telecom
Alpha Networks
Altel
Altera
Alvarion
Andorra Telecom
Andrew/CommScope
Anite
Antares Group
Antel
Anvaya Networks
Aptilo
Aqiva Wireless
Aquaфон
Argela
Aricent
Armentel
Aruba
Aruba Networks
Asiaspace
Askey
ASOCS
Astellia

AT&T Mobility
Athena Wireless Communications
Atrica
Avanti
Avea
Aviat Networks
Axerra Networks
Axis Teknologies
Azercell
Azerfon
b-lite
Babilon Mobile
Bakcell
Bakrie Telecom
Batelco
Bayan Telecommunications
BayRICS
Beeline
Beeline Lao
BelAir
BelCel
Belgacom / Proximus
Bell Mobility
BendBroadband
BeST (Life)
BH Telecom
Bharti Airtel
Bhutan Telecom
Big Switch Networks
BigAir
BLiNQ Networks
Bluegrass Cellular
Blueline
BluWan
BMW
Bollere Telecom
Bouygues Telecom
Brazil Army
Brazil Sao Paulo Military Police

BridgeWave Communications
Broadcom
Brocade
Browan
BSNL
BT
BTC
BTI Systems
BTI Wireless
BTL
BUCD
Bulgaria Vivacom
C Spire Wireless
C&S
Cable and Wireless
Cambium Networks
Cambridge Broadband Networks (CBNL)
Canoga Perkins
Carolina West Wireless
Carrier Access Corporation
Cavium
CBL Bahamas
CCS
Ceclcom Axiata
CeedTec
Celcite
Cell C
Cellcom
Cello (Optiway and Cellvine)
Celtro
CenturyLink
Ceragon
Ceragon
Chalmers University of Technology
Chariton Valley Comms
Charles Industries
Chat Mobility
China Mobile
China Mobile Hong Kong

China Telecom
China Unicom
CHT
Cielo
Ciena
Cisco
City of Charlotte Council
Claro
Clear Mobitel
CNT
Cobham/Axell Wireless
Coherent Logix
Colorado Valley
Comba
Comba Telecom
Commnet Wireless
Communication Components Inc. (CCI)
Contela
ConteXtream
Convergence Technologies
Copper Valley Telecom
Corning/MobileAccess
Cosmote
COTA Murcia4G
Cross Telephone
Crown Castle
CSI
CSL Limited
Custer Telephone
Cyan
Datame
Datang Mobile
DBD
Dedicado
DeltaNode
Deutsche Telekom
Dhiraagu
Dialog Axiata LTE TDD later FDD
Dialogic

DiGi
Digicel
Digicel Fiji
Digitel
Digitel Jamaica
Dish Network
D-Link
DNA
DOCOMO Euro-Labs
DoCoMo Pacific
DragonWave
DTAC – TriNet
Du
E Plus
eAccess
Eastlink
E-Band Communications
ECI Telecom
Econet Wireless
Eden Rock Communications
Edgewater
EE
EION
Elisa
EMT
Entel
EnergyAustralia Ausgrid
EnGenius
Entel Movil
Entel PCS
Entel Peru
Enterasys
ERA/T-Mobile Poland
Ericsson
ETC
Etex Telephone Co-op
EtherReach
Ethertronics
Ethio Telecom

Ethos
Etisalat
Etisalat Misr
Evolve Broadband
Exalt
ExteNet Systems
Extreme Networks
FarEasTone
FastBack Networks
Fastlink (Regional Telecom)
Femtel
FibroLAN
Firetide
Fitel
Fjaraskipti (Vodafone Iceland)
Fortinet
FPT Telecom
Fraunhofer-Gesellschaft
Freescale Semiconductor
Fujitsu
Gemtek
Genband
Georgia Magticom
Glo Mobile
Globacom
Global Mobile
Global Wireless Technologies (GWT)
Globe
GoNet Systems
Goodman Networks
Gore
GrenTech
Guineanet
Handlink
Hatteras
Hitachi
HP
Huahuan
Huawei

Hutchison
IBW International
ICE
iConnect
IDC Moldova
iDirect
IM2
Imagine Group
Infovista (Mentum)
InnerWireless (Acquired by Black Box)
Institut Mines-Télécom
Intel
InterDigital
Intracom
Intucell Systems (Acquired by Cisco)
Inwi
Iowa Statewide Interoperable Communications Board (ISICSB)
ip.access
IPITEK
Islandcom
IT&E Guam
JDSU (Arieso)
Juni
Juniper
Juniper Networks
Kcell
KDDI
Kentrox
Kordia
KPN
KPN Base
KPU (Alaska)
KT
KT Corp Rwanda
KTH - Royal Institute of Technology
Lanka Bell
Lantiq
Lattelecom
Leap Wireless/Cricket

LG U+
LightPoint Communications
Lightsquared
LIME
Linkem
LMT
LSI
LTC
M1
Manx Telecom
Mascom Wireless
Massnet
MAX Telecom
Maxim Integrated
Maxis
MaxyTel
Megafon
Menatelecom
Meru Networks
Mesaplexx
Meteor
Microwave Networks
Mid-Rivers Communications
Milmex
mimoOn
Mindspeed Technologies
Ministry of Industry, Development and Reform Commission - China
Ministry of Science - China
Ministry of Science, ICT and Future Planning (MSIP) - Korea
MiSpot
Mobile Norway/Tele2
Mobily
Mobinil
Mobistar
Mobitel
Moldcell
Monaco Telecom
Mongolia Telecom
Mosaic Telecom

Motorola Solutions
Movitel
Movilmax
Movilnet
Movistar
MRV Communications
MTA
MTC
MTC Touch
M-Tel
MTN
MTN Uganda
MTNL
MTPCS
MTS
MTS Allstream
MTS Belarus
MTS Ukraine
Myanmar P & T
National and Kapodistrian University of Athens
Nawras
NBN Co.
Ncell
NEC
Neo-Sky
Neotel
Nepal Telecom
NetGear
Netronome
NewNet
Nexius
NITA
Node-H
NOKIA
Nomadix
Nomor Research
NorthwestCell
Nova
NSN

nTelos
nTelos Wireless
NTT DoCoMo
Nuage Networks (Alcatel-Lucent)
O2 Secure Wireless
Octasic
Oi
Omantel
Omnitel
On Telecomunicacoes
ONE
Ooredoo
Open Mobile
Optimus
Optiway
Optus
Orange Armenia
Orange Austria
Orange Dominicana
Orange France
Orange Liechtenstein
Orange Luxembourg
Orange Mauritius
Orange Moldova
Orange Romania
Orange Slovak Republic
Orange Spain
Orange Switzerland
Orange Uganda
Orckit Corrigent
Osnova Telecom
Overture
P&T
P1 Networks
P4 (Play)
Pandetel
Panhandle Telephone Co-op
PCCW
Peoples Telephone Co-op

Personal
Pioneer Cellular
Plexxi
Polkomtel Plus
Positron-Aktino
Powerwave Technologies
Poznan University of Technology
Proxim
PTK Centertel (Orange)
Public Service Wireless
Public Wireless
PureWave Networks
PVT
Qualcomm
QuCell
Quortus
RAD Data Systems
Radisys
RADWIN
Rakon
RCS & RDS
Redline Communications
REDtone
Reliance
Reverb Networks
RF Window
RFNet
RFS (Radio Frequency Systems)
Rogers Wireless
Rostelecom
Ro-Timak Technology
Ruckus Wireless
RusViet Telecom
RWTH Aachen
S and R Communications
S&T Telephone Cooperative
Safaricom
Sagebrush Cellular (Nemont)
Sagem

Sagemcom
SAI
SAI Technology
Saima Telecom
Samsung
Sasktel
Sazz
Sercom
SerComm
SFR
SGRITA
Shentel
Shyam
Shyam Networks
Si.mobil
SIAE Microelectronics
Siemens
Siklu
Siminn
SingTel
SK Telecom
SK Telesys
Sky Brazil
Smart Communications
Smartone
SMARTS
Smile
Smoltelecom
Softbank
Softbank Mobile
SOLiD Technologies
Spectranet
SpeedConnect
SpiderCloud Wireless
Sprint
Sprint Nextel
Sprocket Wireless
SRT Communications
SSTL

Star Microwave
Starcomms
StarHub
STC
Stoke
Strata Networks
Strix Systems
Sub10 Systems
Sunrise Communications
Surflink Communications
SWIFT Networks
Swisscom
Sycamore
Syringa Wireless
T Mobile
Tango
Tango Networks
Taqua
Tarana Wireless
Tata Elxsi
TDC
TE Connectivity (Tyco Electronics Connectivity)
Tecom
TEKTELIC
Telcel
Telco Systems
Tele2
Tele2 Kazakhstan
Tele2 Sweden
Telecom Italia Mobile (TIM)
Telecom Malaysia
Telecom New Zealand
Telefonica Movistar
Telefonica O2
Telefonica O2 Ireland
Telefonica O2 UK
Telefonica Peru
Telefonica Spain
Telekom Srpske

Telenet Belgium
Telenor Denmark
Telenor Hungary
Telenor Montenegro
Telenor Norway
Telenor Sweden
Telesis
TeliaSonera
TeliaSonera Norway
TeliaSonera Sweden
Telkom Mobile (8ta)
Telkomsel Indonesia
Tellabs
Telrad
Telstra
Telus
Texas Energy Network
Texas Instruments
TFL
Thomson
T-Hrvatski Telekom
Thumb Cellular
Tigo
Tikona
TIM Brasil
TMC
TMN (Portugal Telecom)
T-Mobile Czech Republic
T-Mobile Hungary
T-Mobile Macedonia
T-Mobile Netherlands
T-Mobile Puerto Rico
T-Mobile Slovensko
T-Mobile USA
TN Mobile
TOT Thailand
TPG Internet
TP-Link
TRaC Global

Trango Systems
Transmode
Tranzeo
Triatel
Tricom
Tropos
True Move
TSKL
TTK
Tunisiana
Turkcell
U Mobile
UbeeAirWalk
Ubidyne GmBH
Ubiquisys
Ubiquiti Networks
u-blox
UCell
UK Broadband
Ulusnet
Umniah
Une-EPM
United Nations
United Wireless
Unitel
Universitaet Bremen
Universitat Politècnica de València
University of Kaiserslautern
University of Oulu
US Cellular
UTStarcom (Star Solutions)
Vainakh Telecom
VDC (VNPT)
Velatel
Velatel-Aerostrong
Verizon Wireless
Videocon
Videotron
Viettel

Vimpelcom
VIP mobile
VIPNet
Visafone Communications
Viva
Vivacell-MTS
Vivato
Vivo
VMWare
Vodacom
Vodacom Tanzania
Vodafone
Vodafone Australia
Vodafone Czech Republic
Vodafone Egypt
Vodafone Fiji
Vodafone Greece
Vodafone Ireland
Vodafone Italy
Vodafone New Zealand
Vodafone Portugal
Vodafone Qatar
Vodafone Romania
Vodafone Spain
Vodafone UK
Vox
VTel Wireless
Vubiq
Wataniya
Wataniya Telecom
WBS (iBurst)
West Central Wireless
Wi-Ex
Wi-Fi Alliance
Wilson Electronics
Wind
Wind Mobile
Wireless Broadband Alliance
Wistron NeWeb Corp (WNC)

Woosh
Xilinx
XL Axiata
Xplornet
Yoigo
Yota
YTL Communications Yes
Zain
Zain Jordan
Zain Saudi
Zamtel
Zhone
Ziggo
Zinwave
Zoda Fones
ZTE

About

What is the Wireless Network Infrastructure Market?

Wireless network infrastructure represents the backbone of all cellular communication networks worldwide. Traditionally restricted to define the macrocell RAN and core network equipment markets, the term “Wireless Network Infrastructure” now entails a multitude of technologies that are utilized to bring a wireless carrier network into operation.

HetNet RAN Market for 2G/3G/4G

In addition to macrocell infrastructure, there are also other options to add additional coverage and capacity to a mobile network. The most common alternatives include strategically deployed small cells and WiFi access points, which have so far been deployed by more than 150 operators worldwide.

Often marketed under the “HetNet” RAN infrastructure banner, other options include alternative deployment models such as Distributed Antenna Systems (DAS) and the emerging Cloud RAN architecture which concentrates the processing of the RAN segment of a mobile network in one or more, centralized data centers.

Interest from Vertical Markets

Unlike traditional voice centric technologies, both WiMAX and LTE have witnessed considerable interest from vertical sectors such as public safety, healthcare, energy, transportation and defense, driven by their interest in mobile broadband applications. We, thus expect that vertical markets to play a role in ongoing LTE investments. In fact, the public safety sector has already witnessed a number of private LTE deployments to serve public safety agencies. We expect public safety LTE infrastructure spending to surpass \$5 Billion by the end of 2020.

Global Mobile Network CapEx

Global mobile network CapEx is expected to increase from nearly \$170 Billion in 2014 to \$203 Billion in 2020, growing at a CAGR of 3%. As macrocell RAN infrastructure spending will decline overtime, operators will invest significant proportions of their CapEx towards HetNet infrastructure and emerging technologies such as NFV & SDN

software and the required infrastructure to run these.

Initial LTE FDD Rollouts: 2010 - 2011

This period saw significant investments in macrocell FDD LTE infrastructure, with several nationwide rollouts of the technology by tier 1 operators in the US, South Korea and Japan. A lower TCO and a move towards a more widely recognized 3GPP ecosystem was a major motive for many of the early LTE adopters (most were primarily CDMA operators).

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