



LTE Operator Strategies

Key Drivers, Deployment
Strategies, CAPEX, OPEX,
Price Plans, ARPUs and Ser-
vice Revenues 2012 - 2016

March 2012





Overview:

Skyrocketing mobile broadband demand is driving an ever increasing number of commercial LTE network deployments. This surge has seen the number of LTE subscriptions already surpass 7 Million subscriptions worldwide, and over 300+ commercial LTE user device launches. As Mobile Network MNOs (MNOs) remain committed to deliver mobile broadband services over their LTE networks, a number of critical questions remain unanswered:

- How much revenue can an MNO generate with an LTE deployment ?
- What is the typical ARPU for an LTE subscription worldwide or in particular regional market and how will it fluctuate in the next 5 years ?
- What is the relative Total Cost of Ownership (TCO) of an LTE network in comparison to competing technologies such as HSPA + and WiMAX ?
- What is the market outlook for VoLTE (Voice over LTE) and wholesale LTE networks, and when would the first VoLTE deployments take place ?
- How much CAPEX and OPEX would an MNO require to deploy at LTE network, and what strategies can be adopted to minimize both CAPEX and OPEX ?

Covering over 325 global MNOs in 120 countries, this report answers the aforementioned questions by quantifying LTE service revenues, subscriptions, ARPUs, CAPEX and OPEX. In addition, the report reviews key trends in LTE deployment strategies such as VoLTE and SMS over LTE, the wholesale deployment model, Self-Organizing Networks (SONs) and the emergence of the data off-load (small cells, Het-Nets, Wi-Fi offload) equipment market.

The report further provides a global review of LTE price plans and key MNO strategies for LTE pricing and marketing. The report is supplement by an excel based interactive forecasting suite that can be used to forecast LTE service revenue, ARPUs, and subscriptions for particular regional markets, countries or MNOs from 2011 till 2016.

Report Benefits

- A Global review of LTE price plans and pricing and marketing strategies for MNOs worldwide
- LTE service revenues, ARPUs and subscriptions by region, country and operator for 2011, and forecasts till 2016
- LTE deployment strategies and key trends including VoLTE, Wholesale deployment model and FDD/TD-LTE integration
- CAPEX and OPEX requirements and strategies for LTE MNOs, including a review of CAPEX commitments by major MNOs worldwide
- Overview of the LTE market including key market drivers, commercial network deployments, subscriptions and device launches (as of March 2012) and frequency spectrum selection and fragmentation



Key Findings:

ARPUs and Operator Service Revenues

- Driven by early adoption among the enterprise users, LTE ARPUs will peak in 2012 reaching 88 USD per month, and drop down by a YoY decline of 16 % over the next five years as the consumer market segment gains a higher market share.
- Having already surpassed 7 Million subscriptions, LTE subscriptions are set to grow at a CAGR of 150 % over the next five year period.
- Growing at a CAGR of 80 % global LTE service revenues will reach 291 Billion, representing a lucrative market for worldwide MNOs. LTE service revenues presently account for 15 Billion USD.
- While the Asia Pacific region will attain the highest number of subscriptions by 2016, the North America and Western Europe region will retain market leadership in terms of service revenues according for almost 60 % of all LTE service revenues worldwide.

Deployment Strategies

- Mind Commerce estimates the first VoLTE deployments will take place in Q4'2012, with US and Korean MNOs the first to enter the market.
- While early market prospects in the US appear to be deteriorated, the wholesale LTE model will increasingly gain momentum over the next 5 years, and we expect to see the first commercial launch by UK Broadband in 1H 2012.

CAPEX and OPEX Strategies

- By 2016, the Total Cost of Ownership (TCO) for LTE will remain 44 % lower than HSPA+ and 50 % than WiMAX.
- If used to full potential, SON technology has the potential to reduce worldwide LTE deployment CAPEX \$ 55 Billion, and \$ 15 Billion in OPEX by 2016

Pricing Strategies

Most MNOs are adopting tiered based price plans based on volume and speed in order to maximize revenue while managing capacity. Unlimited plans may gain momentum as MNOs learn to divert revenues with OTT (Over-The-Top) players with technologies such as VoLTE, and as they attain cheaper network TCO by deploying small cells and WiFi offload equipment.

Target Audience:

- Mobile Network Operators (MNOs): Will make well-informed decisions about deployment strategies, CAPEX/OPEX reduction and price plans. Furthermore, "Greenfield" operators will understand how to capitalize on LTE technology by assessing the strategies of well established CSPs and MNOs.
- Mobile Network Infrastructure Vendors and Handset Manufacturer: Will assess particular issues faced by MNOs investing in LTE and align their product offerings accordingly.
- Application Developers: Will evaluate opportunities to invest in developing applications and services that run on LTE networks by understanding the market dynamics of LTE.
- Investors: Will better understand the LTE technology and its market potential, its value chain and potential. This report will help investors evaluate the investment prospects in the promising LTE ecosystem.

Companies in Report:

- | | | | |
|-----------------------------|----------------------------------|-------------------------------------|--|
| • 3 Australia | • Batelco Bahrain | • Claro Brazil | • ECMS |
| • Aero 2 | • Belcel | • Claro Chile | • Elisa Estonia |
| • Aircel | • Belgacom Mobile | • Clearwire | • Elisa Finland |
| • AIS | • Bell Wireless Affiliates | • CMHK | • Emirates Integrated Telecommunications Company |
| • Alestra | • Bermuda Digital Communications | • Cofetel | • EMT Estonia |
| • Altech Stream Rwanda | • Bharti | • Colombia Movil | • EMTS |
| • AM Wireless Uruguay | • Bharti Airtel Nigeria | • Comunicaciones Celulares Colombia | • enitel movil |
| • America Movil Peru | • Bhutan Telecom | • Conecel | • Entel PCS Telecomunicaciones |
| • America Movil Puerto Rico | • Bité Latvia | • Corporacion Digital Venezuela | • E-Plus |
| • AMX Argentina | • Bité Lithuania | • Cosmo Bulgaria Mobile | • Ericsson |
| • AMX Paraguay | • B-Mobile Brunei | • Cosmote | • Etihad Etisalat |
| • ANCEL | • Bouygues Telecom | • Cosmote Romania | • Etisalat Misr |
| • Apple | • British Telecom | • CSL New World | • Etisalat Sri Lanka |
| • Aquafon | • BSNL | • CTM | • Etisalat UAE |
| • Armentel | • Cadcomms | • CYTA | • Everything Everywhere (Orange & T-Mobile JV) |
| • AT&T Mobility Puerto Rico | • CamGSM | • Dhiraagu | • FarEastTone |
| • AT&T Mobility USA | • Celcom Malaysia | • Dialog Axiata | • FCC |
| • Augere | • Cell C | • DiGi | • Free Mobile |
| • AVEA | • Cell One | • Digicel Jamaica | • Geocell |
| • Azercell | • China Mobile | • Disk Network | • Gibraltar Telecom |
| • Azerfon | • China Telecom | • DNA Finland | • Globacom Nigeria |
| • Babilon Mobile | • China Unicom | • DSTCom | • Globe Telecom |
| • Bakcell | • Chunghwa Telecom | • DTAC | |
| • Batelco Bahamas | • Claro Brazil | • eAccess | |
| | • Claro Brazil | • Eagle Mobile | |

Companies in Report (cont):

- GrameenPhone
- GSM BiH
- GSM Kazakhstan
- H3G
- HI3G
- HI3G Denmark
- HiSilicon
- HTC
- Huawei
- Hutchison 3G Austria
- Hutchison 3G Ireland
- Hutchison 3G UK
- Hutchison Hong Kong
- ICE Costa Rica
- Iceland Telecom
- Idea Cellular
- Indigo-Somoncom
- Indosat
- Infotel Broadband
- Ipko Net
- Iusacell Celular
- Kar-Tel
- KDDI
- Kibris Telsim
- KKTCCell
- KPN Group Belgium
- KPN Mobile
- KT Corp
- K-Telecom
- Kyivstar
- LG U+
- Lightsquared
- LMT
- Magticom
- Manx Telecom
- Maxis Communications
- MegaCom
- MegaFon
- Meteor Communications
- Metro PCS
- Mfone
- MobiFone
- Mobile TeleSystems
- Mobile TeleSystems Belarus
- MobileOne
- Mobilicity
- mobilkom Austria
- Mobilkom Czech Republic
- mobilkom Liechtenstein
- Mobilna Srpska
- MobilTel
- Mobistar
- Mobitel Georgia
- Mobitel Slovenia
- Mobitel Sri Lanka
- Moldcell
- Monaco Telecom
- Motorola
- Movil de Entel
- Movilnet
- MTN
- MTN Ghana
- MTN Nigeria
- MTNL
- MTS Mobility
- MTS-Ukraine
- MTS-Uzbekistan
- NBN Australia
- Ncell
- Nepal Telecom
- Net4Mobility
- Netcom
- Network Norway
- Nokia Siemens Networks
- Nova
- NTT DoCoMo
- Núcleo
- O2 (UK)
- O2 Germany
- O2 Ireland
- Ofcom
- Omantel
- Omnitel
- One
- Open Mobile
- Openwave Systems Limited
- Optus
- Orange (Poland)
- Orange Armenia
- Orange Austria
- Orange France
- Orange Jordan
- Orange Luxembourg
- Orange Moldova
- Orange Romania
- Orange Senegal
- Orange Slovak Republic
- Orange Spain
- Orange Switzerland
- Otecel
- Other
- P&T Luxembourg
- P4
- Pantech
- PCCW Mobile
- PMCL
- Polkomtel
- Public Mobile
- Q-TEL
- Radiomóvil Dipsa
- RCS&RDS
- RIM
- Rogers Wireless Communications
- Safaricom
- Safaricom
- Samsung
- SaskTel Mobility
- Saudi Telecom Company
- Sequan
- SFR
- Si.mobil
- SingTel Mobile
- SK Telecom
- Sky Mobile
- Smart Communications
- SmarTone-Vodafone
- SMTC Saudi Arabia
- Softbank Mobile
- Sonaecom Servicos Comunicacoes
- Sprint Nextel Puerto Rico
- Sprint Nextel USA
- STA
- Starcomms
- StarHub
- Sunrise
- Swisscom Mobile
- Tacom
- Taiwan Mobile Company
- Tango Luxembourg
- Tashi Infocomm
- Tata Teleservices
- TDC Mobil
- TelCell
- Tele2 Croatia
- Tele2 Estonia
- Tele2 Latvia
- Tele2 Lithuania
- Tele2 Nederland
- Tele2 Sweden
- Telecel Paraguay

Companies in Report (cont):

- Telecom Italia
- Telecom New Zealand
- Telecom Personal
- Telefonía Celular de Nicaragua
- Telefonica Móviles
- Telefónica Móviles Argentina
- Telefónica Móviles Chile
- Telefónica Móviles Colombia
- Telefónica Móviles del Uruguay
- Telefónica Móviles Mexico
- Telefonica Moviles Venezuela
- Telefonica O2 Czech Republic
- Telefonica O2 Slovak Republic
- Telekom Baltija
- Telekom Srbija
- Telemar PCS (Oi)
- Telemar PCS (Oi)
- Telemar PCS (Oi)
- Telenet Tecteo Bidco
- Telenor Denmark
- Telenor Hungary
- Telenor Mobil
- Telenor Montenegro
- Telenor Pakistan
- Telenor Serbia
- Telenor Sweden
- Telia Denmark
- TeliaSonera Finland
- TeliaSonera Sweden
- Telkomsel
- Telstra
- Telus Mobility
- Tikona
- TIM Brasil
- TIM Brasil
- TIM Brasil
- TMN
- T-Mobile Austria
- T-Mobile Croatia
- T-Mobile Czech Republic
- T-Mobile Germany
- T-Mobile Hungary
- T-Mobile Macedonia
- T-Mobile Montenegro
- T-Mobile Netherlands
- T-Mobile Poland
- T-Mobile Slovak Republic
- T-Mobile USA
- TMP Uganda
- TT Mobile
- Tunisiana
- Turkcell
- Tus Mobil
- UCell
- UK Broadband
- UNE EPM Telecomunicaciones
- Unitel Uzbekistan
- Vala
- Velcom
- Verizon Wireless
- VIBO
- Videotron
- Viettel Vietnam
- VimpelCom
- VinaPhone
- VIPnet
- Vivacom
- Vivo
- Vivo
- Vodacom South Africa
- Vodafone Australia
- Vodafone Czech Republic
- Vodafone D2
- Vodafone Egypt
- Vodafone Espana
- Vodafone Essar
- Vodafone Greece
- Vodafone Hungary
- Vodafone Iceland
- Vodafone Ireland
- Vodafone Italia
- Vodafone Libertel
- Vodafone New Zealand
- Vodafone Portugal
- Vodafone Romania
- Vodafone Turkey
- Vodafone UK
- Wataniya Maldives
- Wind
- WIND Hellas
- Wind Mobile
- XL Axiata
- Yoigo
- Yota
- Zain Bahrain
- Zain Jordan
- Zain Kuwait
- Ziggo
- ZTE



Table of Contents:

List of Tables	9
1	Introduction 18
1.1	Executive Summary 18
1.2	Topics Covered 19
1.3	Key Findings 20
1.3.1	ARPUs and Operator Service Revenues 20
1.3.2	Deployment Strategies 20
1.3.3	CAPEX and OPEX Strategies 20
1.3.4	Pricing Strategies 20
1.4	Target Audience 21
1.5	Companies Mentioned 22
2	Present Overview of the LTE Market 31
2.1	Key Drivers for LTE Adoption 31
2.1.1	Skyrocketing Mobile Broadband Usage 31
2.1.2	Opportunities for Higher ARPUs 32
2.1.3	CAPEX Efficient Broadband Availability in Rural Areas 32
2.1.4	Spectral Efficiency and Reduction in RAN OPEX 33
2.1.5	Vendor Commitments 33
2.1.6	Maintaining Technology Leadership 34
2.2	50 + LTE Commercial Networks Worldwide 35
2.3	7+ Million Subscriptions Worldwide 36
2.4	300 + Commercial LTE Device Launches 37
2.5	Frequency Spectrum Selection & Fragmentation 39
3	Key Trends in LTE Deployments 41
3.1	MNO Technology Migration Paths for LTE 41
3.2	Rollout Strategies 42
3.3	Interoperability with 3G and 2G Systems 43
3.4	VoLTE & SMS over LTE Services 44
3.4.1	Circuit Switched Fall Back (CSFB) 44
3.4.2	VoLGA 45
3.4.3	VoIMS 46
3.4.4	The Threat of OTT Solutions 48
3.4.5	VoLTE Deployment Plans 48
3.4.5.1	MetroPCS (US) 48
3.4.5.2	Verizon Wireless (US) 48
3.4.5.3	AT&T Mobility (US) 49
3.4.5.4	LG U+ (Korea) 49
3.4.5.5	CSL (Hong Kong) 50
3.4.6	VoLTE Development Roadmap 50
3.5	Migration Towards LTE-Advanced 52
3.5.1	ITU Approval as the Official 4G Standard 52
3.5.2	Operator Commitments to LTE-Advanced 53
3.5.2.1	AT&T Mobility (US) 53
3.5.2.2	Sprint (US) 53
3.5.2.3	NTT DoCoMo (Japan) 53
3.5.2.4	SK Telecom (South Korea) 53
3.5.2.5	Korea Telecom (South Korea) 53
3.6	The FDD vs. TDD Debate 54
3.6.1	Interoperability b/w FDD and TD LTE 55
3.6.2	Heterogeneous TDD/WiMAX Networks 56
3.7	The Wholesale LTE Deployment Model 57
3.7.1	Growing Interest in the Wholesale Model 57
3.7.2	LightSquared (US) 57
3.7.3	Clearwire (US) 59
3.7.4	Dish Network (US) 60
3.7.5	UK Broadband (UK) 61
3.7.6	British Telecom Wholesale (UK) 62
3.7.7	Yota (Russia) 63
3.7.8	Aero2 (Poland) 64
3.7.9	MVS Comunicaciones (Mexico) 65
3.7.10	Kenyan Government 66
3.7.11	Net4Mobility (Sweden) 67
3.7.12	NBN (Australia) 68
3.8	LTE Traffic Management Strategies 69
3.9	Managing ROI with LTE Investments 72
4	LTE Service, Pricing & Marketing Strategies 73
4.1	Differentiating LTE from 3G Services 73
4.2	A Global Review of LTE Pricing Plans 73
4.2.1	North America 74
4.2.2	Asia Pacific 75
4.2.3	Europe 76
4.2.4	Middle East & Africa 76
4.2.5	Price Comparison: Average Cost per GB of Data 77
4.3	LTE Pricing & Marketing Strategies 78
4.3.1	Elimination of Unlimited Tariffs 78
4.3.2	Innovative Pricing for Traffic Off-loading to WiFi 78
4.3.3	Free LTE Service Trials 79
4.3.4	Capitalizing on the '4G' Term 79
4.3.5	Setting LTE Support as Standard Requirement for all Smartphone Releases 80
5	LTE CAPEX & OPEX Strategies 81
5.1	Mobile Network CAPEX on the Rise 81
5.2	LTE CAPEX Model 81
5.2.1	LTE CAPEX Estimates for Typical Tier-1 MNOs 81
5.2.2	CAPEX Categorization 82
5.2.3	Cost of LTE Base Station and RAN Deployment 83
5.2.4	Base Station Upgrade Costs 85
5.2.5	Core Network Equipment Costs 87

Table of Contents (cont.):

5.2.6	Mobile Backhaul Cost Implications	88	and Subscriptions 2011 - 2016	116	
5.3	CAPEX commitments by Major MNOs	90	6.1.2	Regional Distribution of Revenue Share 2011 - 2016	118
5.3.1	Verizon Wireless (USA)	90	6.2	LTE Operator Subscriptions, ARPU & Service Revenues by Region	127
5.3.2	AT&T Mobility (USA)	91	6.2.1	North America	127
5.3.3	T-Mobile (USA)	92	6.2.1.1	Regional Subscriptions, ARPU & Service Revenues 2011 - 2016	127
5.3.4	NTT DoCoMo (Japan)	93	6.2.1.2	Revenue Distribution by Country 2011 - 2016	129
5.3.5	KDDI (Japan)	94	6.2.1.3	USA	130
5.3.6	Everything Everywhere (UK)	95	6.2.1.4	Canada	132
5.3.7	Etisalat (UAE)	96	6.2.2	Western Europe	134
5.3.8	Korea Telecom (Korea)	97	6.2.2.1	Regional Service Revenues 2011 - 2016	134
5.3.9	SK Telecom (Korea)	98	6.2.2.2	Revenue & Subscriptions Distribution by Country 2011 - 2016	136
5.3.10	China Mobile (China)	99	6.2.2.3	Austria	137
5.3.11	MVS Comunicaciones (Mexico)	101	6.2.2.4	Belgium	139
5.4	Network Sharing	102	6.2.2.5	Denmark	141
5.4.1	Passive Network Sharing	103	6.2.2.6	Finland	143
5.4.2	Active Network Sharing	103	6.2.2.7	France	145
5.4.3	Management Independence	104	6.2.2.8	Germany	147
5.4.4	The LTE Advantage	104	6.2.2.9	Greece	149
5.4.5	Prominent LTE Network Sharing Deals	104	6.2.2.10	Ireland	151
5.4.5.1	Tele2 and Telenor (Sweden)	104	6.2.2.11	Italy	153
5.4.5.2	Telus and Bell (Canada)	104	6.2.2.12	Luxembourg	155
5.4.5.3	Telefónica O2 (Germany)	104	6.2.2.13	Netherlands	157
5.4.5.4	Telefónica Worldwide	105	6.2.2.14	Norway	159
5.4.5.5	MTS and VimpelCom (Russia)	105	6.2.2.15	Portugal	161
5.4.5.6	T-Mobile and Orange (Poland)	105	6.2.2.16	Spain	163
5.4.5.7	Vodafone Worldwide	105	6.2.2.17	Sweden	165
5.4.5.8	Qtel (Qatar)	106	6.2.2.18	Switzerland	167
5.5	The Potential of Self Organising Networks (SONs) to cut CAPEX & OPEX	107	6.2.2.19	Turkey	169
5.6	Smallcells, HetNets & WiFi Offload: The Key to CAPEX & OPEX Reduction	109	6.2.2.20	UK	171
5.6.1	The Answer to Coverage Limitation	109	6.2.2.21	Rest of Western Europe	173
5.6.2	Easing both CAPEX and OPEX Requirements	110	6.2.2.22	Andorra	174
5.6.3	MNO Intentions for Femtocell & Small Cell Deployments	111	6.2.2.23	Cyprus	175
5.6.4	WiFi Offload to Remain a Permanent Solution	111	6.2.2.24	Gibraltar	176
5.6.5	A Review of MNO Investments on LTE Offload Equipment	112	6.2.2.25	Iceland	177
5.6.5.1	SK Telecom's Dual-Mode WiFi-LTE Femtocell	112	6.2.2.26	Isle of Man	178
5.6.5.2	Korea Telecom's: World's First Smallcell LTE Deployment	113	6.2.2.27	Liechtenstein	179
5.6.5.3	AT&T Mobility: Planned LTE Femtocell Trial	114	6.2.2.28	Monaco	180
5.6.5.4	Virgin Media UK LTE Femtocell Trial	115	6.2.3	Asia Pacific	181
6	LTE Operator Service Revenues, ARPU and Subscriptions 2011 - 2016	116	6.2.3.1	Regional Service Revenues 2011 - 2016	181
6.1	Global LTE Operator Service Revenues	116	6.2.3.2	Revenue Distribution by Country 2011 - 2016	183
6.1.1	Global LTE Operator Service Revenues		6.2.3.3	Australia	184
			6.2.3.4	Bangladesh	186
			6.2.3.5	China	188
			6.2.3.6	Hong Kong	190

Table of Contents (cont.):

6.2.3.7 India	192		
6.2.3.8 Indonesia	194		
6.2.3.9 Japan	196		
6.2.3.10 Malaysia	198		
6.2.3.11 New Zealand	200		
6.2.3.12 Pakistan	202		
6.2.3.13 Philippines	204		
6.2.3.14 Singapore	206		
6.2.3.15 South Korea	208		
6.2.3.16 Taiwan	210		
6.2.3.17 Thailand	212		
6.2.3.18 Vietnam	214		
6.2.3.19 Rest of Asia Pacific	216		
6.2.3.20 Bhutan	217		
6.2.3.21 Brunei	218		
6.2.3.22 Cambodia	219		
6.2.3.23 Macau	220		
6.2.3.24 Maldives	221		
6.2.3.25 Nepal	222		
6.2.3.26 Sri Lanka	223		
6.2.4 Middle East	224		
6.2.4.1 Regional Service Revenues 2011 - 2016	224		
6.2.4.2 Revenue Distribution by Country 2011 - 2016	226		
6.2.4.3 Iran	227		
6.2.4.4 Iraq	229		
6.2.4.5 Israel	231		
6.2.4.6 Saudi Arabia	233		
6.2.4.7 Rest of the Middle East	235		
6.2.4.8 Bahrain	236		
6.2.4.9 Jordan	237		
6.2.4.10 Kuwait	238		
6.2.4.11 Oman	239		
6.2.4.12 Qatar	240		
6.2.4.13 UAE	241		
6.2.5 Eastern Europe	242		
6.2.5.1 Regional Service Revenues 2011 - 2016	242		
6.2.5.2 Revenue Distribution by Country 2011 - 2016	244		
6.2.5.3 Albania	246		
6.2.5.4 Belarus	248		
6.2.5.5 Bosnia	250		
6.2.5.6 Bulgaria	252		
6.2.5.7 Croatia	254		
6.2.5.8 Czech Republic	256		
6.2.5.9 Estonia	258		
6.2.5.10 Georgia	260		
6.2.5.11 Hungary	262		
6.2.5.12 Latvia	264		
6.2.5.13 Lithuania	266		
6.2.5.14 Macedonia	268		
6.2.5.15 Moldova	270		
6.2.5.16 Montenegro	272		
6.2.5.17 Poland	274		
6.2.5.18 Romania	276		
6.2.5.19 Russia	278		
6.2.5.20 Serbia	280		
6.2.5.21 Slovakia	282		
6.2.5.22 Slovenia	284		
6.2.5.23 Ukraine	286		
6.2.5.24 Uzbekistan	288		
6.2.5.25 Rest of Eastern Europe	290		
6.2.5.26 Armenia	291		
6.2.5.27 Azerbaijan	292		
6.2.5.28 Kazakhstan	293		
6.2.5.29 Kirghizstan	294		
6.2.5.30 Kosovo	295		
6.2.5.31 Tadjikistan	296		
6.2.6 Latin & Central America	297		
6.2.6.1 Regional Service Revenues 2011 - 2016	297		
6.2.6.2 Revenue Distribution by Country 2011 - 2016	299		
6.2.6.3 Argentina	300		
6.2.6.4 Bolivia	302		
6.2.6.5 Brazil	304		
6.2.6.6 Chile	306		
6.2.6.7 Colombia	308		
6.2.6.8 Ecuador	310		
6.2.6.9 Mexico	312		
6.2.6.10 Paraguay	314		
6.2.6.11 Peru	316		
6.2.6.12 Uruguay	318		
6.2.6.13 Venezuela	320		
6.2.6.14 Rest of Latin & Central America	322		
6.2.6.15 Bahamas	323		
6.2.6.16 Bermuda	324		
6.2.6.17 Bolivia	325		
6.2.6.18 Costa Rica	326		
6.2.6.19 Jamaica	327		
6.2.6.20 Netherlands Antilles	328		
6.2.6.21 Nicaragua	329		
6.2.6.22 Puerto Rico	330		
6.2.7 Africa	331		
6.2.7.1 Regional Service Revenues 2011 - 2016	331		
6.2.7.2 Revenue Distribution by Country 2011 - 2016	333		
6.2.7.3 Algeria	334		
6.2.7.4 Egypt	336		
6.2.7.5 Kenya	338		
6.2.7.6 Morocco	340		
6.2.7.7 Nigeria	342		
6.2.7.8 South Africa	344		
6.2.7.9 Sudan	346		
6.2.7.10 Tanzania	348		
6.2.7.11 Tunisia	350		
6.2.7.12 Rest of Africa	352		
6.2.7.13 Ghana	353		
6.2.7.14 Namibia	354		
6.2.7.15 Rwanda	355		
6.2.7.16 Senegal	356		
6.2.7.17 Uganda	357		

List of Tables

Table 1: TCO for Mobile Broadband Technologies (2011 - 2016)	64
Table 2: LTE Price Plans in North America Q1'2012 (Selected MNOs)	66
Table 3: LTE Price Plans in Asia Pacific Q1'2012 (Selected MNOs)	67
Table 4: LTE Price Plans in Europe Q1'2012 (Selected MNOs)	68
Table 5: LTE Price Plans in the Middle East Q1'2012 (Selected MNOs)	68

List of Figures

Figure 1: Map of Commercial LTE Deployments Worldwide	37
Figure 2: LTE Subscriptions by Country Q4'2011	38
Figure 3: LTE Subscriptions by Operator Q4'2011	39
Figure 4: LTE Devices Available Through Commercial MNOs	40
Figure 5: LTE Technology Migration Paths Survey Results	43
Figure 6: Reference Architecture for CS Fallback for UMTS/GSM	47
Figure 7: Voice over IMS in LTE	49
Figure 8: SRVCC Architecture for E-UTRAN to 3GPP UTRAN/GERAN	49
Figure 9: LightSquared LTE-Satellite Network Model	60
Figure 10: Service Diversity in LTE Networks	71
Figure 11: Policy Based Traffic Offloading	72
Figure 12: Savings Attained from Video Traffic Optimization	73
Figure 13: Average Cost per GB based on LTE Price Plans Worldwide	79
Figure 14: Percentage Estimates of Network CAPEX - Developed Markets	84
Figure 15: Percentage Estimates of Network CAPEX - Emerging Markets	84
Figure 16: Cost of LTE Base Station Deployment by Terrain (USD Thousands)	85
Figure 17: Cost of LTE Base Station Equipment 2009 - 2015 (USD)	86
Figure 18: LTE RAN Infrastructure Revenues 2010 - 2015	86
Figure 19: Cost of a Rural Site Upgrade	87
Figure 20: Cost of an Urban Site Upgrade	87
Figure 21: Cost of a New Rural Site Deployment	88
Figure 22: LTE Infrastructure Revenues by Equipment Type 2010 - 2015	89
Figure 23: Fiber vs. Microwave Mobile Backhaul Cost Comparison	91
Figure 24: Verizon Wireless LTE Coverage Map	92
Figure 25: AT&T Mobility (USA) LTE Coverage Map	93
Figure 26: NTT DoCoMo (Japan) LTE Device Portfolio	95
Figure 27: LTE Infrastructure Spending Market Share by Region (2015)	102
Figure 28: Illustration of Self Organizing Networks	109
Figure 29: Small Cell and Flexible Networking Concept Diagram	112
Figure 30: Global LTE Operator Service Revenues 2011 - 2016 (USD Billions)	118
Figure 31: Global LTE Operator Subscriptions 2011 - 2016 (Millions)	119
Figure 32: LTE Subscriber ARPU Projections by Region 2011 - 2016 (USD)	120
Figure 33: LTE Operator Service Revenues by Region 2011 - 2016 (USD Billions)	120
Figure 34: LTE Operator Subscriptions by Region 2011 - 2016 (Millions)	121
Figure 35: LTE Subscriber ARPU Projections by Region 2011 - 2016 (USD)	121
Figure 36: LTE End User Device Shipments by Region 2011 - 2016 (Millions)	122
Figure 37: LTE End User Device Shipments Revenues by Region 2011 - 2016 (USD Billions)	122
Figure 38: Global LTE Operator Service Revenue Market Share by Region (2011)	123
Figure 39: Global LTE Operator Subscriptions Market Share by Region (2011)	123
Figure 40: Global LTE Operator Service Revenue Market Share by Region (2012)	124
Figure 41: Global LTE Operator Subscriptions Market Share by Region (2012)	124
Figure 42: Global LTE Operator Service Revenue Market Share by Region (2013)	125
Figure 43: Global LTE Operator Subscriptions Market Share by Region (2013)	125
Figure 44: Global LTE Operator Service Revenue Market Share by Region (2014)	126

List of Figures (cont.)

Figure 45: Global LTE Operator Subscriptions Market Share by Region (2014)	126
Figure 46: Global LTE Operator Service Revenue Market Share by Region (2015)	127
Figure 47: Global LTE Operator Subscriptions Market Share by Region (2015)	127
Figure 48: Global LTE Operator Service Revenue Market Share by Region (2016)	128
Figure 49: Global LTE Operator Subscriptions Market Share by Region (2016)	128
Figure 50: North America LTE Operator Service Revenues 2011 - 2016 (USD Billions)	129
Figure 51: North America LTE Operator Subscriptions 2011 - 2016 (Millions)	130
Figure 52: North America LTE ARPU Projections 2011 - 2016 (USD)	130
Figure 53: North America LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	131
Figure 54: North America LTE Subscriptions by Country 2011 - 2016 (Millions)	131
Figure 55: USA LTE Operator Service Revenues 2011 - 2016 (USD Billions)	132
Figure 56: USA LTE Subscriptions 2011 - 2016 (Millions)	132
Figure 57: USA LTE Subscriptions by Operator 2011 - 2016 (Millions)	133
Figure 58: Canada LTE Operator Service Revenues 2011 - 2016 (USD Billions)	134
Figure 59: Canada LTE Subscriptions 2011 - 2016 (Millions)	134
Figure 60: Canada LTE Subscriptions by Operator 2011 - 2016 (Millions)	135
Figure 61: Western Europe LTE Operator Service Revenues 2011 - 2016 (USD Billions)	136
Figure 62: Western Europe LTE Subscriptions 2011 - 2016 (Millions)	136
Figure 63: Western Europe LTE ARPU Projections 2011 - 2016 (USD)	137
Figure 64: Western Europe LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	138
Figure 65: Western Europe LTE Subscriptions by Country 2011 - 2016 (Millions)	138
Figure 66: Austria LTE Operator Service Revenues 2011 - 2016 (USD Billions)	139
Figure 67: Austria LTE Subscriptions 2011 - 2016 (Millions)	139
Figure 68: Austria LTE Subscriptions by Operator 2011 - 2016 (Millions)	140
Figure 69: Belgium LTE Operator Service Revenues 2011 - 2016 (USD Billions)	141
Figure 70: Belgium LTE Subscriptions 2011 - 2016 (Millions)	141
Figure 71: Belgium LTE Subscriptions by Operator 2011 - 2016 (Millions)	142
Figure 72: Denmark LTE Operator Service Revenues 2011 - 2016 (USD Billions)	143
Figure 73: Denmark LTE Subscriptions 2011 - 2016 (Millions)	143
Figure 74: Denmark LTE Subscriptions by Operator 2011 - 2016 (Millions)	144
Figure 75: Finland LTE Operator Service Revenues 2011 - 2016 (USD Billions)	145
Figure 76: Finland LTE Subscriptions 2011 - 2016 (Millions)	145
Figure 77: Finland LTE Subscriptions by Operator 2011 - 2016 (Millions)	146
Figure 78: France LTE Operator Service Revenues 2011 - 2016 (USD Billions)	147
Figure 79: France LTE Subscriptions 2011 - 2016 (Millions)	147
Figure 80: France LTE Subscriptions by Operator 2011 - 2016 (Millions)	148
Figure 81: Germany LTE Operator Service Revenues 2011 - 2016 (USD Billions)	149
Figure 82: Germany LTE Subscriptions 2011 - 2016 (Millions)	149
Figure 83: Germany LTE Subscriptions by Operator 2011 - 2016 (Millions)	150
Figure 84: Greece LTE Operator Service Revenues 2011 - 2016 (USD Billions)	151
Figure 85: Greece LTE Subscriptions 2011 - 2016 (Millions)	151
Figure 86: Greece LTE Subscriptions by Operator 2011 - 2016 (Millions)	152
Figure 87: Ireland LTE Operator Service Revenues 2011 - 2016 (USD Billions)	153
Figure 88: Ireland LTE Subscriptions 2011 - 2016 (Millions)	153
Figure 89: Ireland LTE Subscriptions by Operator 2011 - 2016 (Millions)	154
Figure 90: Italy LTE Operator Service Revenues 2011 - 2016 (USD Billions)	155
Figure 91: Italy LTE Subscriptions 2011 - 2016 (Millions)	155
Figure 92: Italy LTE Subscriptions by Operator 2011 - 2016 (Millions)	156
Figure 93: Luxembourg LTE Operator Service Revenues 2011 - 2016 (USD Billions)	157

List of Figures (cont.)

Figure 94: Luxembourg LTE Subscriptions 2011 - 2016 (Millions)	157	
Figure 95: Luxembourg LTE Subscriptions by Operator 2011 - 2016 (Millions)	158	
Figure 96: Netherlands LTE Operator Service Revenues 2011 - 2016 (USD Billions)		159
Figure 97: Netherlands LTE Subscriptions 2011 - 2016 (Millions)	159	
Figure 98: Netherlands LTE Subscriptions by Operator 2011 - 2016 (Millions)	160	
Figure 99: Norway LTE Operator Service Revenues 2011 - 2016 (USD Billions)	161	
Figure 100: Norway LTE Subscriptions 2011 - 2016 (Millions)	161	
Figure 101: Norway LTE Subscriptions by Operator 2011 - 2016 (Millions)	162	
Figure 102: Portugal LTE Operator Service Revenues 2011 - 2016 (USD Billions)	163	
Figure 103: Portugal LTE Subscriptions 2011 - 2016 (Millions)	163	
Figure 104: Portugal LTE Subscriptions by Operator 2011 - 2016 (Millions)	164	
Figure 105: Spain LTE Operator Service Revenues 2011 - 2016 (USD Billions)	165	
Figure 106: Spain LTE Subscriptions 2011 - 2016 (Millions)	165	
Figure 107: Spain LTE Subscriptions by Operator 2011 - 2016 (Millions)	166	
Figure 108: Sweden LTE Operator Service Revenues 2011 - 2016 (USD Billions)	167	
Figure 109: Sweden LTE Subscriptions 2011 - 2016 (Millions)	167	
Figure 110: Sweden LTE Subscriptions by Operator 2011 - 2016 (Millions)	168	
Figure 111: Switzerland LTE Operator Service Revenues 2011 - 2016 (USD Billions)		169
Figure 112: Switzerland LTE Subscriptions 2011 - 2016 (Millions)	169	
Figure 113: Switzerland LTE Subscriptions by Operator 2011 - 2016 (Millions)	170	
Figure 114: Turkey LTE Operator Service Revenues 2011 - 2016 (USD Billions)	171	
Figure 115: Turkey LTE Subscriptions 2011 - 2016 (Millions)	171	
Figure 116: Turkey LTE Subscriptions by Operator 2011 - 2016 (Millions)	172	
Figure 117: UK LTE Operator Service Revenues 2011 - 2016 (USD Billions)		173
Figure 118: UK LTE Subscriptions 2011 - 2016 (Millions)	173	
Figure 119: UK LTE Subscriptions by Operator 2011 - 2016 (Millions)	174	
Figure 120: LTE Operator Service Revenues in the Rest of Western Europe 2011 - 2016 (USD Billions)	175	
Figure 121: LTE Operator Subscriptions in the Rest of Western Europe 2011 - 2016 (USD Billions)	175	
Figure 122: Andorra LTE Subscriptions 2011 - 2016 (Millions)	176	
Figure 123: Andorra LTE Subscriptions by Operator 2011 - 2016 (Millions)	176	
Figure 124: Cyprus LTE Subscriptions 2011 - 2016 (Millions)	177	
Figure 125: Cyprus LTE Subscriptions by Operator 2011 - 2016 (Millions)	177	
Figure 126: Gibraltar LTE Subscriptions 2011 - 2016 (Millions)	178	
Figure 127: Gibraltar LTE Subscriptions by Operator 2011 - 2016 (Millions)	178	
Figure 128: Iceland LTE Subscriptions 2011 - 2016 (Millions)	179	
Figure 129: Iceland LTE Subscriptions by Operator 2011 - 2016 (Millions)	179	
Figure 130: Isle of Man LTE Subscriptions 2011 - 2016 (Millions)	180	
Figure 131: Isle of Man LTE Subscriptions by Operator 2011 - 2016 (Millions)	180	
Figure 132: Liechtenstein LTE Subscriptions 2011 - 2016 (Millions)	181	
Figure 133: Liechtenstein LTE Subscriptions by Operator 2011 - 2016 (Millions)	181	
Figure 134: Monaco LTE Subscriptions 2011 - 2016 (Millions)	182	
Figure 135: Monaco LTE Subscriptions by Operator 2011 - 2016 (Millions)	182	
Figure 136: Asia Pacific LTE Operator Service Revenues 2011 - 2016 (USD Billions)		183
Figure 137: Asia Pacific LTE Subscriptions 2011 - 2016 (Millions)	183	
Figure 138: Asia Pacific LTE ARPU Projections 2011 - 2016 (USD)	184	
Figure 139: Asia Pacific LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	185	
Figure 140: Asia Pacific LTE Subscriptions by Country 2011 - 2016 (Millions)	185	
Figure 141: Australia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	186	
Figure 142: Australia LTE Subscriptions 2011 - 2016 (Millions)	186	
Figure 143: Australia LTE Subscriptions by Operator 2011 - 2016 (Millions)	187	

List of Figures (cont.)

Figure 144: Bangladesh LTE Operator Service Revenues 2011 - 2016 (USD Billions)	188
Figure 145: Bangladesh LTE Subscriptions 2011 - 2016 (Millions)	188
Figure 146: Bangladesh LTE Subscriptions by Operator 2011 - 2016 (Millions)	189
Figure 147: China LTE Operator Service Revenues 2011 - 2016 (USD Billions)	190
Figure 148: China LTE Subscriptions 2011 - 2016 (Millions)	190
Figure 149: China LTE Subscriptions by Operator 2011 - 2016 (Millions)	191
Figure 150: Hong Kong LTE Operator Service Revenues 2011 - 2016 (USD Billions)	192
Figure 151: Hong Kong LTE Subscriptions 2011 - 2016 (Millions)	192
Figure 152: Hong Kong LTE Subscriptions by Operator 2011 - 2016 (Millions)	193
Figure 153: India LTE Operator Service Revenues 2011 - 2016 (USD Billions)	194
Figure 154: India LTE Subscriptions 2011 - 2016 (Millions)	194
Figure 155: India LTE Subscriptions by Operator 2011 - 2016 (Millions)	195
Figure 156: Indonesia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	196
Figure 157: Indonesia LTE Subscriptions 2011 - 2016 (Millions)	196
Figure 158: Indonesia LTE Subscriptions by Operator 2011 - 2016 (Millions)	197
Figure 159: Japan LTE Operator Service Revenues 2011 - 2016 (USD Billions)	198
Figure 160: Japan LTE Subscriptions 2011 - 2016 (Millions)	198
Figure 161: Japan LTE Subscriptions by Operator 2011 - 2016 (Millions)	199
Figure 162: Malaysia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	200
Figure 163: Malaysia LTE Subscriptions 2011 - 2016 (Millions)	200
Figure 164: Malaysia LTE Subscriptions by Operator 2011 - 2016 (Millions)	201
Figure 165: New Zealand LTE Operator Service Revenues 2011 - 2016 (USD Billions)	202
Figure 166: New Zealand LTE Subscriptions 2011 - 2016 (Millions)	202
Figure 167: New Zealand LTE Subscriptions by Operator 2011 - 2016 (Millions)	203
Figure 168: Pakistan LTE Operator Service Revenues 2011 - 2016 (USD Billions)	204
Figure 169: Pakistan LTE Subscriptions 2011 - 2016 (Millions)	204
Figure 170: Pakistan LTE Subscriptions by Operator 2011 - 2016 (Millions)	205
Figure 171: Philippines LTE Operator Service Revenues 2011 - 2016 (USD Billions)	206
Figure 172: Philippines LTE Subscriptions 2011 - 2016 (Millions)	206
Figure 173: Philippines LTE Subscriptions by Operator 2011 - 2016 (Millions)	207
Figure 174: Singapore LTE Operator Service Revenues 2011 - 2016 (USD Billions)	208
Figure 175: Singapore LTE Subscriptions 2011 - 2016 (Millions)	208
Figure 176: Singapore LTE Subscriptions by Operator 2011 - 2016 (Millions)	209
Figure 177: South Korea LTE Operator Service Revenues 2011 - 2016 (USD Billions)	210
Figure 178: South Korea LTE Subscriptions 2011 - 2016 (Millions)	210
Figure 179: South Korea LTE Subscriptions by Operator 2011 - 2016 (Millions)	211
Figure 180: Taiwan LTE Operator Service Revenues 2011 - 2016 (USD Billions)	212
Figure 181: Taiwan LTE Subscriptions 2011 - 2016 (Millions)	213
Figure 182: Taiwan LTE Subscriptions by Operator 2011 - 2016 (Millions)	213
Figure 183: Thailand LTE Operator Service Revenues 2011 - 2016 (USD Billions)	214
Figure 184: Thailand LTE Subscriptions 2011 - 2016 (Millions)	214
Figure 185: Thailand LTE Subscriptions by Operator 2011 - 2016 (Millions)	215
Figure 186: Vietnam LTE Operator Service Revenues 2011 - 2016 (USD Billions)	216
Figure 187: Vietnam LTE Subscriptions 2011 - 2016 (Millions)	216
Figure 188: Vietnam LTE Subscriptions by Operator 2011 - 2016 (Millions)	217
Figure 189: LTE Operator Service Revenues for the Rest of Asia Pacific 2011 - 2016 (USD Billions)	218
Figure 190: LTE Subscriptions in the Rest of Asia Pacific 2011 - 2016 (Millions)	218
Figure 191: Bhutan LTE Subscriptions 2011 - 2016 (Millions)	219
Figure 192: Bhutan LTE Subscriptions by Operator 2011 - 2016 (Millions)	219
Figure 193: Brunei LTE Subscriptions 2011 - 2016 (Millions)	220
Figure 194: Brunei LTE Subscriptions by Operator 2011 - 2016 (Millions)	220
Figure 195: Cambodia LTE Subscriptions 2011 - 2016 (Millions)	221
Figure 196: Cambodia LTE Subscriptions by Operator 2011 - 2016 (Millions)	222

List of Figures (cont.)

Figure 197: Macau LTE Subscriptions 2011 - 2016 (Millions)	222
Figure 198: Macau LTE Subscriptions by Operator 2011 - 2016 (Millions)	223
Figure 199: Maldives LTE Subscriptions 2011 - 2016 (Millions)	223
Figure 200: Maldives LTE Subscriptions by Operator 2011 - 2016 (Millions)	224
Figure 201: Nepal LTE Subscriptions 2011 - 2016 (Millions)	224
Figure 202: Nepal LTE Subscriptions by Operator 2011 - 2016 (Millions)	225
Figure 203: Sri Lanka LTE Subscriptions 2011 - 2016 (Millions)	225
Figure 204: Sri Lanka LTE Subscriptions by Operator 2011 - 2016 (Millions)	226
Figure 205: Middle East LTE Operator Service Revenues 2011 - 2016 (USD Billions)	226
Figure 206: Middle East LTE Subscriptions 2011 - 2016 (Millions)	227
Figure 207: Middle East LTE ARPU Projections 2011 - 2016 (USD)	227
Figure 208: Middle East LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	228
Figure 209: Middle East LTE Subscriptions by Country 2011 - 2016 (Millions)	229
Figure 210: Iran LTE Operator Service Revenues 2011 - 2016 (USD Billions)	229
Figure 211: Iran LTE Subscriptions 2011 - 2016 (Millions)	230
Figure 212: Iran LTE Subscriptions by Operator 2011 - 2016 (Millions)	230
Figure 213: Iraq LTE Operator Service Revenues 2011 - 2016 (USD Billions)	231
Figure 214: Iraq LTE Subscriptions 2011 - 2016 (Millions)	232
Figure 215: Iraq LTE Subscriptions by Operator 2011 - 2016 (Millions)	232
Figure 216: Israel LTE Operator Service Revenues 2011 - 2016 (USD Billions)	233
Figure 217: Israel LTE Subscriptions 2011 - 2016 (Millions)	234
Figure 218: Israel LTE Subscriptions by Operator 2011 - 2016 (Millions)	234
Figure 219: Saudi Arabia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	235
Figure 220: Saudi Arabia LTE Subscriptions 2011 - 2016 (Millions)	236
Figure 221: Saudi Arabia LTE Subscriptions by Operator 2011 - 2016 (Millions)	236
Figure 222: LTE Operator Service Revenues in the Rest of the Middle East 2011 - 2016 (USD Billions)	237
Figure 223: LTE Subscriptions in the Rest of the Middle East 2011 - 2016 (Millions)	238
Figure 224: Bahrain LTE Subscriptions 2011 - 2016 (Millions)	238
Figure 225: Bahrain LTE Subscriptions by Operator 2011 - 2016 (Millions)	239
Figure 226: Jordan LTE Subscriptions 2011 - 2016 (Millions)	239
Figure 227: Jordan LTE Subscriptions by Operator 2011 - 2016 (Millions)	240
Figure 228: Kuwait LTE Subscriptions 2011 - 2016 (Millions)	240
Figure 229: Kuwait LTE Subscriptions by Operator 2011 - 2016 (Millions)	241
Figure 230: Oman LTE Subscriptions 2011 - 2016 (Millions)	241
Figure 231: Oman LTE Subscriptions by Operator 2011 - 2016 (Millions)	242
Figure 232: Qatar LTE Subscriptions 2011 - 2016 (Millions)	242
Figure 233: Qatar LTE Subscriptions by Operator 2011 - 2016 (Millions)	243
Figure 234: UAE LTE Subscriptions 2011 - 2016 (Millions)	243
Figure 235: UAE LTE Subscriptions by Operator 2011 - 2016 (Millions)	244
Figure 236: Eastern Europe LTE Operator Service Revenues 2011 - 2016 (USD Billions)	244
Figure 237: Eastern Europe LTE Subscriptions 2011 - 2016 (Millions)	245
Figure 238: Eastern Europe LTE ARPU Projections 2011 - 2016 (USD)	245
Figure 239: Eastern Europe LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	246
Figure 240: Eastern Europe LTE Subscriptions by Country 2011 - 2016 (Millions)	247
Figure 241: Albania LTE Operator Service Revenues 2011 - 2016 (USD Billions)	248
Figure 242: Albania LTE Subscriptions 2011 - 2016 (Millions)	248
Figure 243: Albania LTE Subscriptions by Operator 2011 - 2016 (Millions)	249
Figure 244: Belarus LTE Operator Service Revenues 2011 - 2016 (USD Billions)	250
Figure 245: Belarus LTE Subscriptions 2011 - 2016 (Millions)	250
Figure 246: Belarus LTE Subscriptions by Operator 2011 - 2016 (Millions)	251
Figure 247: Bosnia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	252

List of Figures (cont.)

Figure 248: Bosnia LTE Subscriptions 2011 - 2016 (Millions)	252
Figure 249: Bosnia LTE Subscriptions by Operator 2011 - 2016 (Millions)	253
Figure 250: Bulgaria LTE Operator Service Revenues 2011 - 2016 (USD Billions)	254
Figure 251: Bulgaria LTE Subscriptions 2011 - 2016 (Millions)	254
Figure 252: Bulgaria LTE Subscriptions by Operator 2011 - 2016 (Millions)	255
Figure 253: Croatia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	256
Figure 254: Croatia LTE Subscriptions 2011 - 2016 (Millions)	256
Figure 255: Croatia LTE Subscriptions by Operator 2011 - 2016 (Millions)	257
Figure 256: Czech Republic LTE Operator Service Revenues 2011 - 2016 (USD Billions)	258
Figure 257: Czech Republic LTE Subscriptions 2011 - 2016 (Millions)	258
Figure 258: Czech Republic LTE Subscriptions by Operator 2011 - 2016 (Millions)	259
Figure 259: Estonia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	260
Figure 260: Estonia LTE Subscriptions 2011 - 2016 (Millions)	260
Figure 261: Estonia LTE Subscriptions by Operator 2011 - 2016 (Millions)	261
Figure 262: Georgia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	262
Figure 263: Georgia LTE Subscriptions 2011 - 2016 (Millions)	262
Figure 264: Georgia LTE Subscriptions by Operator 2011 - 2016 (Millions)	263
Figure 265: Hungary LTE Operator Service Revenues 2011 - 2016 (USD Billions)	264
Figure 266: Hungary LTE Subscriptions 2011 - 2016 (Millions)	264
Figure 267: Hungary LTE Subscriptions by Operator 2011 - 2016 (Millions)	265
Figure 268: Latvia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	266
Figure 269: Latvia LTE Subscriptions 2011 - 2016 (Millions)	266
Figure 270: Latvia LTE Subscriptions by Operator 2011 - 2016 (Millions)	267
Figure 271: Lithuania LTE Operator Service Revenues 2011 - 2016 (USD Billions)	268
Figure 272: Lithuania LTE Subscriptions 2011 - 2016 (Millions)	268
Figure 273: Lithuania LTE Subscriptions by Operator 2011 - 2016 (Millions)	269
Figure 274: Macedonia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	270
Figure 275: Macedonia LTE Subscriptions 2011 - 2016 (Millions)	270
Figure 276: Macedonia LTE Subscriptions by Operator 2011 - 2016 (Millions)	271
Figure 277: Moldova LTE Operator Service Revenues 2011 - 2016 (USD Billions)	272
Figure 278: Moldova LTE Subscriptions 2011 - 2016 (Millions)	272
Figure 279: Moldova LTE Subscriptions by Operator 2011 - 2016 (Millions)	273
Figure 280: Montenegro LTE Operator Service Revenues 2011 - 2016 (USD Billions)	274
Figure 281: Montenegro LTE Subscriptions 2011 - 2016 (Millions)	274
Figure 282: Montenegro LTE Subscriptions by Operator 2011 - 2016 (Millions)	275
Figure 283: Poland LTE Operator Service Revenues 2011 - 2016 (USD Billions)	276
Figure 284: Poland LTE Subscriptions 2011 - 2016 (Millions)	276
Figure 285: Poland LTE Subscriptions by Operator 2011 - 2016 (Millions)	277
Figure 286: Romania LTE Operator Service Revenues 2011 - 2016 (USD Billions)	278
Figure 287: Romania LTE Subscriptions 2011 - 2016 (Millions)	278
Figure 288: Romania LTE Subscriptions by Operator 2011 - 2016 (Millions)	279
Figure 289: Russia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	280
Figure 290: Russia LTE Subscriptions 2011 - 2016 (Millions)	280
Figure 291: Russia LTE Subscriptions by Operator 2011 - 2016 (Millions)	281
Figure 292: Serbia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	282
Figure 293: Serbia LTE Subscriptions 2011 - 2016 (Millions)	282
Figure 294: Serbia LTE Subscriptions by Operator 2011 - 2016 (Millions)	283
Figure 295: Slovakia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	284
Figure 296: Slovakia LTE Subscriptions 2011 - 2016 (Millions)	284
Figure 297: Slovakia LTE Subscriptions by Operator 2011 - 2016 (Millions)	285
Figure 298: Slovenia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	286
Figure 299: Slovenia LTE Subscriptions 2011 - 2016 (Millions)	286
Figure 300: Slovenia LTE Subscriptions by Operator 2011 - 2016 (Millions)	287

List of Figures (cont.)

Figure 301: Ukraine LTE Operator Service Revenues 2011 - 2016 (USD Billions)	288
Figure 302: Ukraine LTE Subscriptions 2011 - 2016 (Millions)	288
Figure 303: Ukraine LTE Subscriptions by Operator 2011 - 2016 (Millions)	289
Figure 304: Uzbekistan LTE Operator Service Revenues 2011 - 2016 (USD Billions)	290
Figure 305: Uzbekistan LTE Subscriptions 2011 - 2016 (Millions)	290
Figure 306: Uzbekistan LTE Subscriptions by Operator 2011 - 2016 (Millions)	291
Figure 307: LTE Operator Service Revenues in the Rest of Eastern Europe 2011 - 2016 (USD Billions)	292
Figure 308: LTE Subscriptions in the Rest of Eastern Europe 2011 - 2016 (Millions)	292
Figure 309: Armenia LTE Subscriptions 2011 - 2016 (Millions)	293
Figure 310: Armenia LTE Subscriptions by Operator 2011 - 2016 (Millions)	293
Figure 311: Azerbaijan LTE Subscriptions 2011 - 2016 (Millions)	294
Figure 312: Azerbaijan LTE Subscriptions by Operator 2011 - 2016 (Millions)	294
Figure 313: Kazakhstan LTE Subscriptions 2011 - 2016 (Millions)	295
Figure 314: Kazakhstan LTE Subscriptions by Operator 2011 - 2016 (Millions)	295
Figure 315: Kirghizstan LTE Subscriptions 2011 - 2016 (Millions)	296
Figure 316: Kirghizstan LTE Subscriptions by Operator 2011 - 2016 (Millions)	296
Figure 317: Kosovo LTE Subscriptions 2011 - 2016 (Millions)	297
Figure 318: Kosovo LTE Subscriptions by Operator 2011 - 2016 (Millions)	297
Figure 319: Tadjikistan LTE Subscriptions 2011 - 2016 (Millions)	298
Figure 320: Tadjikistan LTE Subscriptions by Operator 2011 - 2016 (Millions)	298
Figure 321: Latin & Central America LTE Operator Service Revenues 2011 - 2016 (USD Billions)	299
Figure 322: Latin & Central America LTE Subscriptions 2011 - 2016 (Millions)	299
Figure 323: Latin & Central America LTE ARPU Projections 2011 - 2016 (USD)	300
Figure 324: Latin & Central America LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	301
Figure 325: Latin & Central America LTE Subscriptions by Country 2011 - 2016 (Millions)	301
Figure 326: Argentina LTE Operator Service Revenues 2011 - 2016 (USD Billions)	302
Figure 327: Argentina LTE Subscriptions 2011 - 2016 (Millions)	302
Figure 328: Argentina LTE Subscriptions by Operator 2011 - 2016 (Millions)	303
Figure 329: Bolivia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	304
Figure 330: Bolivia LTE Subscriptions 2011 - 2016 (Millions)	304
Figure 331: Bolivia LTE Subscriptions by Operator 2011 - 2016 (Millions)	305
Figure 332: Brazil LTE Operator Service Revenues 2011 - 2016 (USD Billions)	306
Figure 333: Brazil LTE Subscriptions 2011 - 2016 (Millions)	306
Figure 334: Brazil LTE Subscriptions by Operator 2011 - 2016 (Millions)	307
Figure 335: Chile LTE Operator Service Revenues 2011 - 2016 (USD Billions)	308
Figure 336: Chile LTE Subscriptions 2011 - 2016 (Millions)	308
Figure 337: Chile LTE Subscriptions by Operator 2011 - 2016 (Millions)	309
Figure 338: Colombia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	310
Figure 339: Colombia LTE Subscriptions 2011 - 2016 (Millions)	310
Figure 340: Colombia LTE Subscriptions by Operator 2011 - 2016 (Millions)	311
Figure 341: Ecuador LTE Operator Service Revenues 2011 - 2016 (USD Billions)	312
Figure 342: Ecuador LTE Subscriptions 2011 - 2016 (Millions)	312
Figure 343: Ecuador LTE Subscriptions by Operator 2011 - 2016 (Millions)	313
Figure 344: Mexico LTE Operator Service Revenues 2011 - 2016 (USD Billions)	314
Figure 345: Mexico LTE Subscriptions 2011 - 2016 (Millions)	314
Figure 346: Mexico LTE Subscriptions by Operator 2011 - 2016 (Millions)	315
Figure 347: Paraguay LTE Operator Service Revenues 2011 - 2016 (USD Billions)	316
Figure 348: Paraguay LTE Subscriptions 2011 - 2016 (Millions)	316
Figure 349: Paraguay LTE Subscriptions by Operator 2011 - 2016 (Millions)	317
Figure 350: Peru LTE Operator Service Revenues 2011 - 2016 (USD Billions)	318
Figure 351: Peru LTE Subscriptions 2011 - 2016 (Millions)	318
Figure 352: Peru LTE Subscriptions by Operator 2011 - 2016 (Millions)	319

List of Figures (cont.)

Figure 353: Uruguay LTE Operator Service Revenues 2011 - 2016 (USD Billions)	320
Figure 354: Uruguay LTE Subscriptions 2011 - 2016 (Millions)	320
Figure 355: Uruguay LTE Subscriptions by Operator 2011 - 2016 (Millions)	321
Figure 356: Venezuela LTE Operator Service Revenues 2011 - 2016 (USD Billions)	322
Figure 357: Venezuela LTE Subscriptions 2011 - 2016 (Millions)	322
Figure 358: Venezuela LTE Subscriptions by Operator 2011 - 2016 (Millions)	323
Figure 359: LTE Operator Service Revenues for the Rest of Latin & Central America 2011 - 2016 (USD Billions)	324
Figure 360: LTE Subscriptions in the Rest of Latin & Central America 2011 - 2016 (Millions)	324
Figure 361: Bahamas LTE Subscriptions 2011 - 2016 (Millions)	325
Figure 362: Bahamas LTE Subscriptions by Operator 2011 - 2016 (Millions)	325
Figure 363: Bermuda LTE Subscriptions 2011 - 2016 (Millions)	326
Figure 364: Bermuda LTE Subscriptions by Operator 2011 - 2016 (Millions)	326
Figure 365: Bolivia LTE Subscriptions 2011 - 2016 (Millions)	327
Figure 366: Bolivia LTE Subscriptions by Operator 2011 - 2016 (Millions)	327
Figure 367: Costa Rica LTE Subscriptions 2011 - 2016 (Millions)	328
Figure 368: Costa Rica LTE Subscriptions by Operator 2011 - 2016 (Millions)	328
Figure 369: Jamaica LTE Subscriptions 2011 - 2016 (Millions)	329
Figure 370: Jamaica LTE Subscriptions by Operator 2011 - 2016 (Millions)	329
Figure 371: Netherlands Antilles LTE Subscriptions 2011 - 2016 (Millions)	330
Figure 372: Netherlands Antilles LTE Subscriptions by Operator 2011 - 2016 (Millions)	330
Figure 373: Nicaragua Antilles LTE Subscriptions 2011 - 2016 (Millions)	331
Figure 374: Nicaragua Antilles LTE Subscriptions by Operator 2011 - 2016 (Millions)	331
Figure 375: Puerto Rico Antilles LTE Subscriptions 2011 - 2016 (Millions)	332
Figure 376: Puerto Rico Antilles LTE Subscriptions by Operator 2011 - 2016 (Millions)	332
Figure 377: Africa LTE Operator Service Revenues 2011 - 2016 (USD Billions)	333
Figure 378: Africa LTE Subscriptions 2011 - 2016 (Millions)	333
Figure 379: Africa LTE ARPU Projections 2011 - 2016 (USD)	334
Figure 380: Africa LTE Operator Service Revenues by Country 2011 - 2016 (USD Billions)	335
Figure 381: Africa LTE Subscriptions by Country 2011 - 2016 (Millions)	335
Figure 382: Algeria LTE Operator Service Revenues 2011 - 2016 (USD Billions)	336
Figure 383: Algeria LTE Subscriptions 2011 - 2016 (Millions)	336
Figure 384: Algeria LTE Subscriptions by Operator 2011 - 2016 (Millions)	337
Figure 385: Egypt LTE Operator Service Revenues 2011 - 2016 (USD Billions)	338
Figure 386: Egypt LTE Subscriptions 2011 - 2016 (Millions)	338
Figure 387: Egypt LTE Subscriptions by Operator 2011 - 2016 (Millions)	339
Figure 388: Kenya LTE Operator Service Revenues 2011 - 2016 (USD Billions)	340
Figure 389: Kenya LTE Subscriptions 2011 - 2016 (Millions)	340
Figure 390: Kenya LTE Subscriptions by Operator 2011 - 2016 (Millions)	341
Figure 391: Morocco LTE Operator Service Revenues 2011 - 2016 (USD Billions)	342
Figure 392: Morocco LTE Subscriptions 2011 - 2016 (Millions)	342
Figure 393: Morocco LTE Subscriptions by Operator 2011 - 2016 (Millions)	343
Figure 394: Nigeria LTE Operator Service Revenues 2011 - 2016 (USD Billions)	344
Figure 395: Nigeria LTE Subscriptions 2011 - 2016 (Millions)	344
Figure 396: Nigeria LTE Subscriptions by Operator 2011 - 2016 (Millions)	345
Figure 397: South Africa LTE Operator Service Revenues 2011 - 2016 (USD Billions)	346
Figure 398: South Africa LTE Subscriptions 2011 - 2016 (Millions)	346
Figure 399: South Africa LTE Subscriptions by Operator 2011 - 2016 (Millions)	347
Figure 400: Sudan LTE Operator Service Revenues 2011 - 2016 (USD Billions)	348
Figure 401: Sudan LTE Subscriptions 2011 - 2016 (Millions)	348
Figure 402: Sudan LTE Subscriptions by Operator 2011 - 2016 (Millions)	349
Figure 403: Tanzania LTE Operator Service Revenues 2011 - 2016 (USD Billions)	350
Figure 404: Tanzania LTE Subscriptions 2011 - 2016 (Millions)	350
Figure 405: Tanzania LTE Subscriptions by Operator 2011 - 2016 (Millions)	351



List of Figures (cont.)

Figure 406: Tunisia LTE Operator Service Revenues 2011 - 2016 (USD Billions)	352
Figure 407: Tunisia LTE Subscriptions 2011 - 2016 (Millions)	352
Figure 408: Tunisia LTE Subscriptions by Operator 2011 - 2016 (Millions)	353
Figure 409: LTE Operator Service Revenues for the Rest of Africa 2011 - 2016 (USD Billions)	354
Figure 410: LTE Subscriptions in the Rest of Africa 2011 - 2016 (Millions)	354
Figure 411: Ghana LTE Subscriptions 2011 - 2016 (Millions)	355
Figure 412: Ghana LTE Subscriptions by Operator 2011 - 2016 (Millions)	355
Figure 413: Namibia LTE Subscriptions 2011 - 2016 (Millions)	356
Figure 414: Namibia LTE Subscriptions by Operator 2011 - 2016 (Millions)	356
Figure 415: Rwanda LTE Subscriptions 2011 - 2016 (Millions)	357
Figure 416: Rwanda LTE Subscriptions by Operator 2011 - 2016 (Millions)	357
Figure 417: Senegal LTE Subscriptions 2011 - 2016 (Millions)	358
Figure 418: Senegal LTE Subscriptions by Operator 2011 - 2016 (Millions)	358
Figure 419: Uganda LTE Subscriptions 2011 - 2016 (Millions)	359
Figure 420: Uganda LTE Subscriptions by Operator 2011 - 2016 (Millions)	35

Order Form

Report Title

**LTE Operator Strategies: Key Drivers, Deployment Strategies, CAPEX, OPEX, Price Plans, AR-
PUs and Service Revenues 2012 - 2016**

License Type

- Single User License**\$ 2,995 USD**
 Company-wide License.....**\$ 6,995 USD**
 Team License (2-5 people) **\$ 3,865 USD**
 Other Licensing options available: Contact
 Mind Commerce

Family/Surname

First Name

Position

Company

Address

Country

Post Code

FAX

Telephone

Email

Order Type

- 



 Order by FAX at 1 877 646 3266

Card Number

Expiration Date (MM/YY)

CV Code

Cardholder's name

Signature

Billing Address

Postcode

Country

Signature

Date

Online Ordering

Customers can order online by visiting report web page:

www.mindcommerce.com/Publications/LTE_MobileOperatorStrategies_2012-2016.php