

Global Mobile Broadband Market Update

Network deployments and device ecosystem developments

- HSPA/HSPA+
- LTE / LTE-Advanced
- Mobile HD voice / VoLTE
 - LTE Broadcast
 - 5G

April 24, 2014



Published by GSA

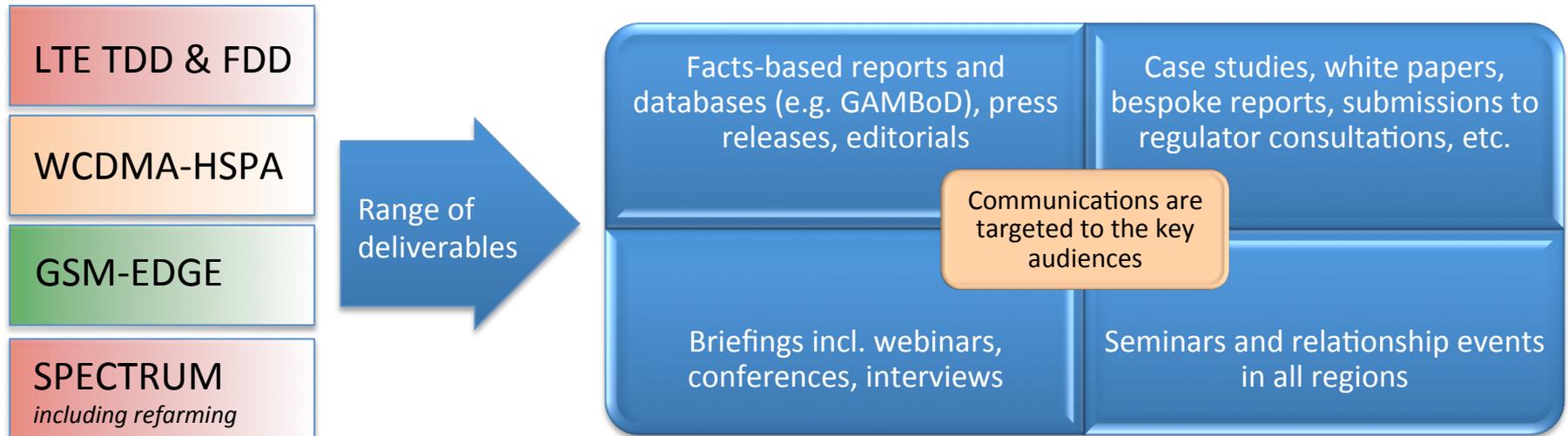
Global mobile Suppliers Association
www.gsacom.com

GSA Secretariat: info@gsacom.com



Strategy and role of GSA

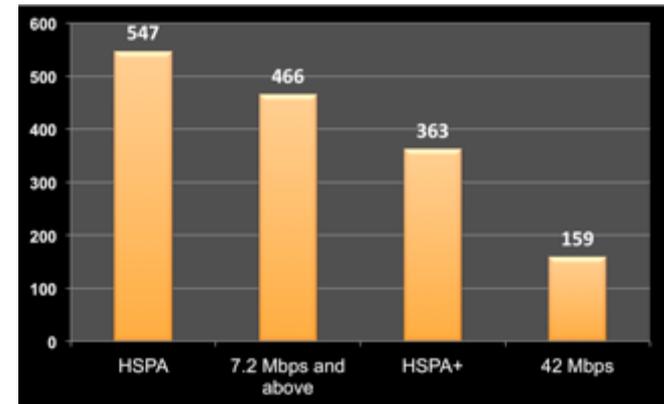
- ❑ GSA “*Global mobile Suppliers Association*”. Members are mobile communications suppliers
- ❑ Inform, educate, influence opinion of benefits / opportunities with mobile communications using 3GPP technologies: GSM/EDGE, WCDMA-HSPA/HSPA+, LTE/LTE-Advanced providing facts, statistics, and trends
- ❑ Own-researched and produced reports and papers
 - ❑ *working directly with stakeholders, investors, developers, suppliers, etc.*
 - ❑ *regulatory developments including spectrum and licensing*
 - ❑ *operator commitments, network deployments, commercial launches, market acceptance, subscriptions*
 - ❑ *development of the devices ecosystems to maturity, the participants, encourage new ecosystems*



3G/WCDMA systems launched *mobile broadband*

- ❑ First commercially launched WCDMA network: 2001
- ❑ HSPA upgrade promoted wider acceptance from 2005
- ❑ 547 networks are commercially launched in 205 countries
 - ❑ *All WCDMA operators have deployed HSPA*
- ❑ 1.473 billion WCDMA subscribers including HSPA (Q4 2013)
- ❑ 363 HSPA operators i.e. over 66% have deployed HSPA+
- ❑ Deployment of 42 Mbps DC-HSPA+ continues as a major trend in 2014
 - ❑ 159 DC-HSPA+ networks (29% of all HSPA networks) are commercially launched in 83 countries
- ❑ 335 operators i.e. over 61% have commercially launched HSUPA
 - ❑ 261 operators support 5.8 Mbps peak data on uplink
 - ❑ An additional 18 networks support 11.5 Mbps

- ❑ HSPA/HSPA+ is the dominant MBB technology
- ❑ Wide coverage footprint + competition in all regions
 - ❑ Large ecosystem, thousands of user devices
 - ❑ Benefited from technology neutrality policies
 - ❑ *80 UMTS900 systems deployed in 900 MHz*

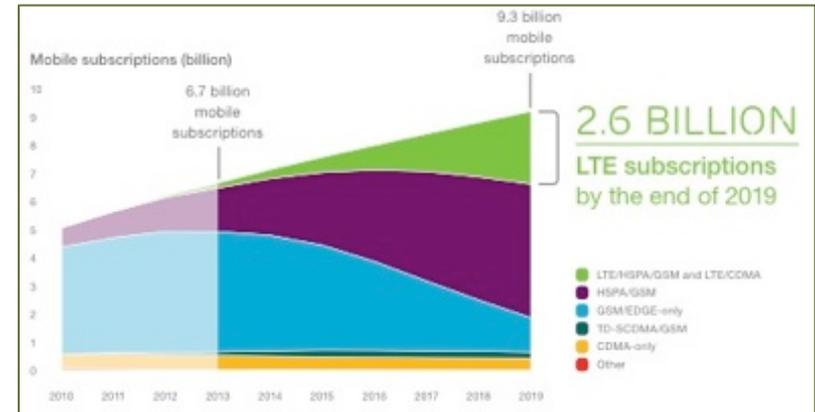
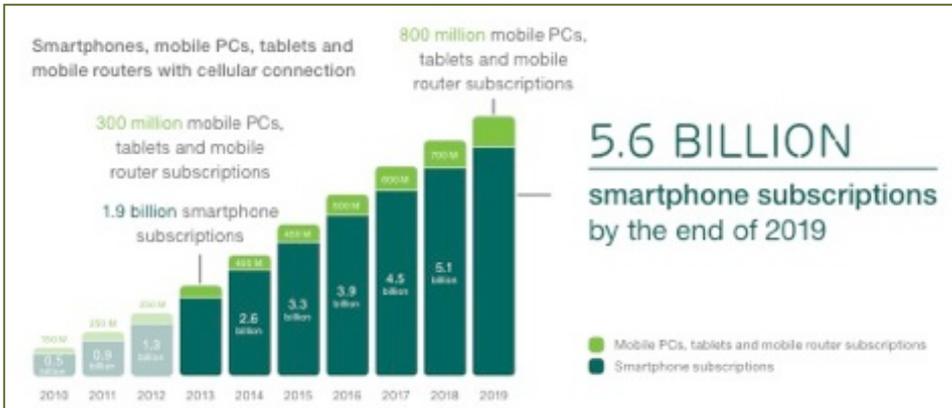
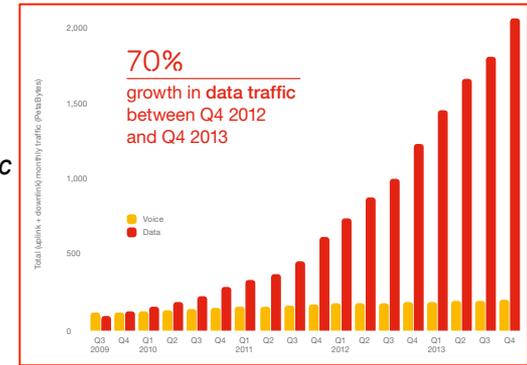


Source: GSA's HSPA Operator Commitments report

Published on February 13, 2014

Drivers towards LTE

- ❑ 60% of phones sold in Q4 2013 were smartphones, compared to 45% in Q4 2012
 - ❑ Around 1 billion smartphones sold in 2013
- ❑ 70% growth in data traffic between Q4 2012 and Q4 2013 driven mainly by video
 - ❑ 10x growth in mobile data traffic is expected between 2013 and 2019
 - ❑ video expected to increase 55% annually up to end 2019 when it will be > 50% of mobile data traffic
- ❑ 2.1 billion mobile broadband subs globally (Q4 2013), estimated 4x growth by 2019
- ❑ 200 million LTE subscriptions (Q4 2013)
 - ❑ predicted to reach 2.6 billion in 2019
 - ❑ LTE will cover over 65% of the world's population in 2019

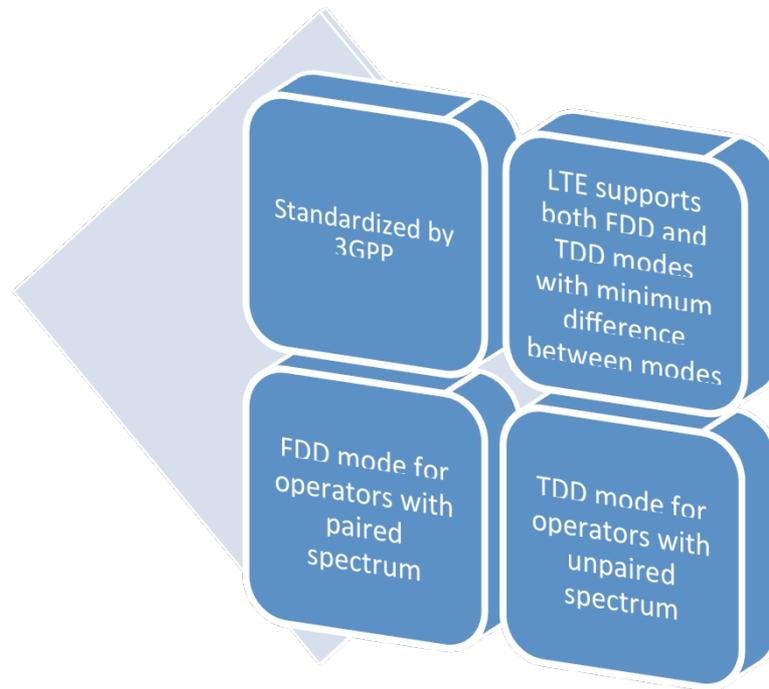


Ericsson Mobility Report – November 2013 and Interim Update, February 2014



Two Duplex Modes of LTE: 3GPP LTE standard supports both FDD and TDD modes

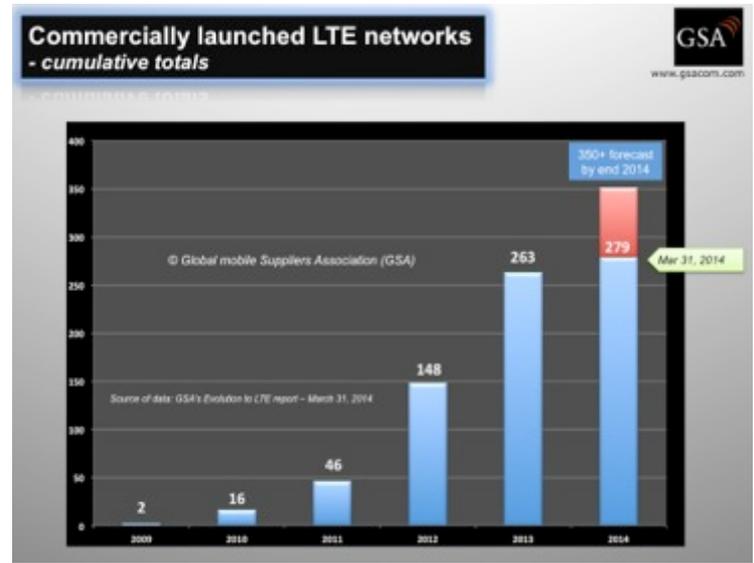
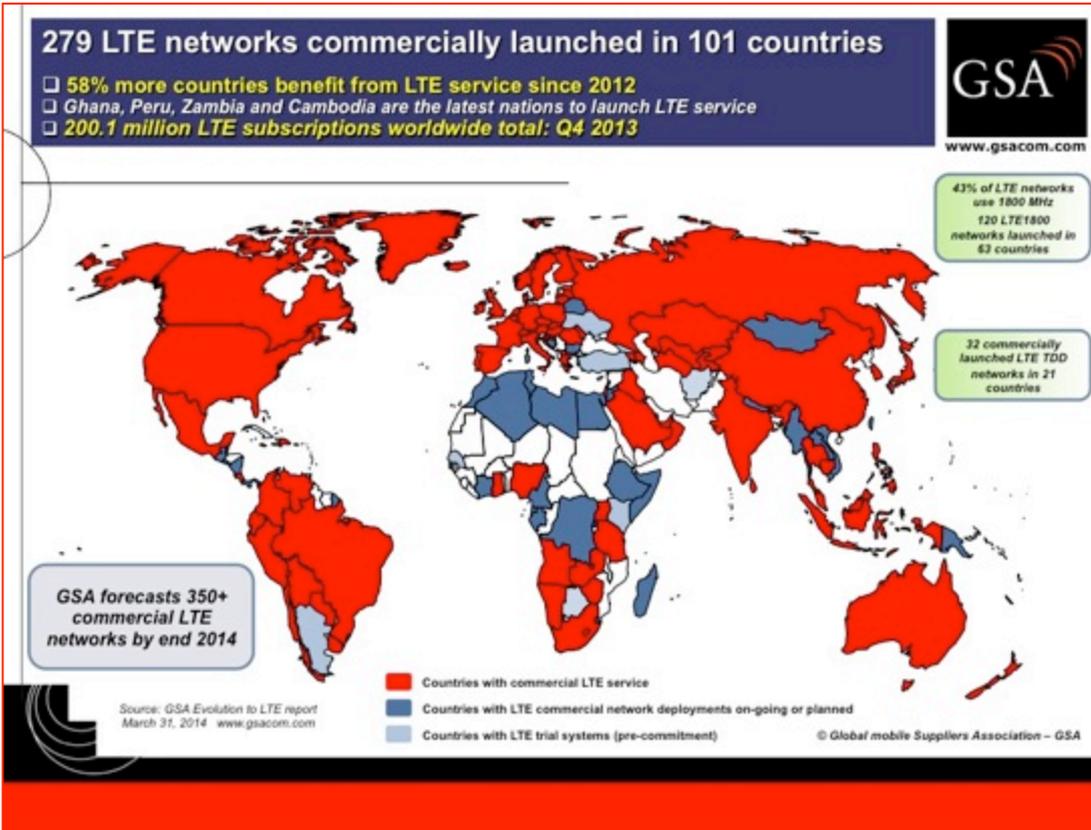
LTE
technology
is
mainstream



LTE's global economies of scale can be leveraged in FDD and TDD network deployments and user terminal production



LTE – commercial service in 101 countries !

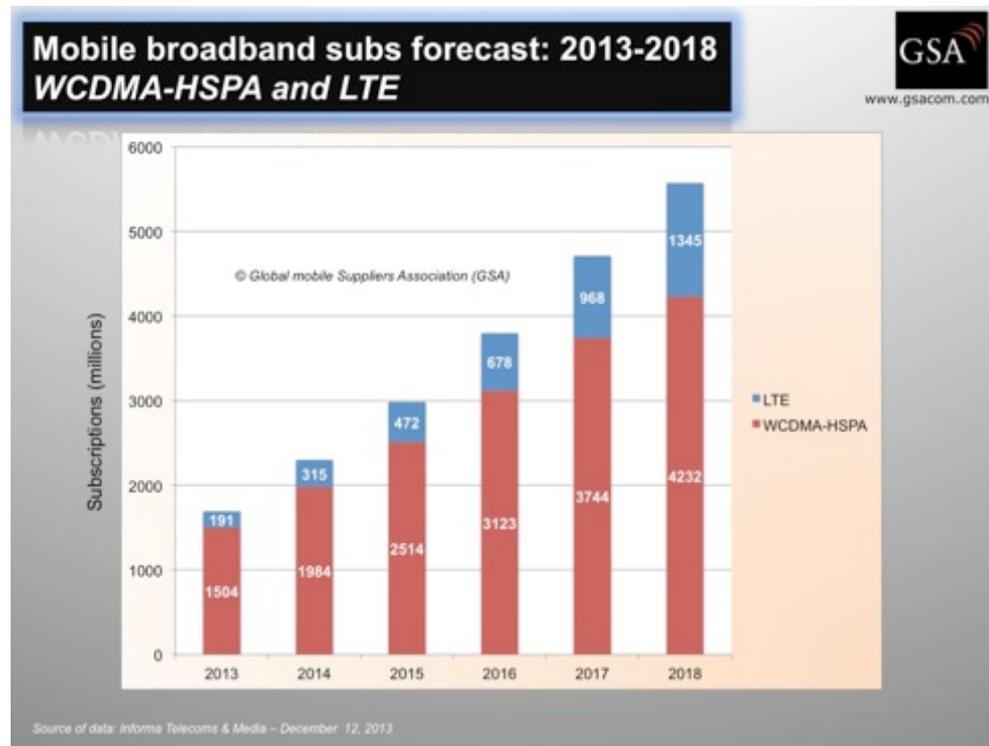
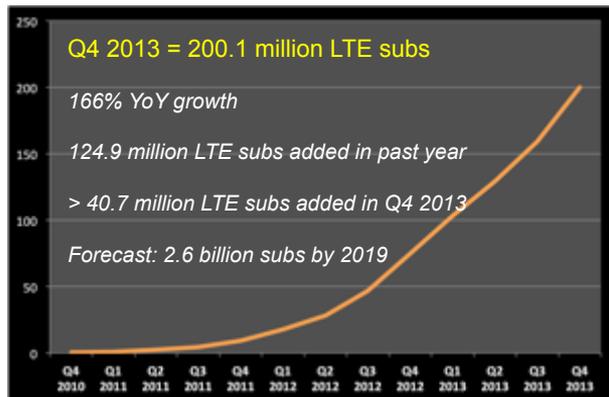


247 operators launched using FDD mode only
 19 operators launched using TDD mode only
 13 operators launched using FDD & TDD modes

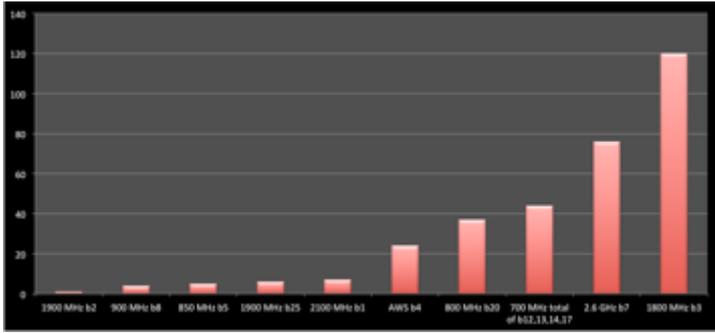
279 total commercially launched networks

Source: GSA's Evolution to LTE report
 Published on March 31, 2014

LTE subscriptions growth

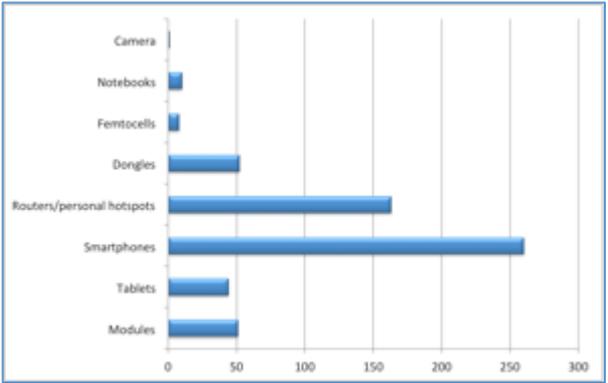


1800 MHz: mainstream / most prominent LTE band globally



LTE is deployed using 1800 MHz (band 3) spectrum in 43% of commercially launched LTE networks

- Most used contiguous bands for LTE:
- #1 Band 3 (1800 MHz)
 - #2 Band 7 (2.6 GHz)
 - #3 Band 20 (800 MHz)

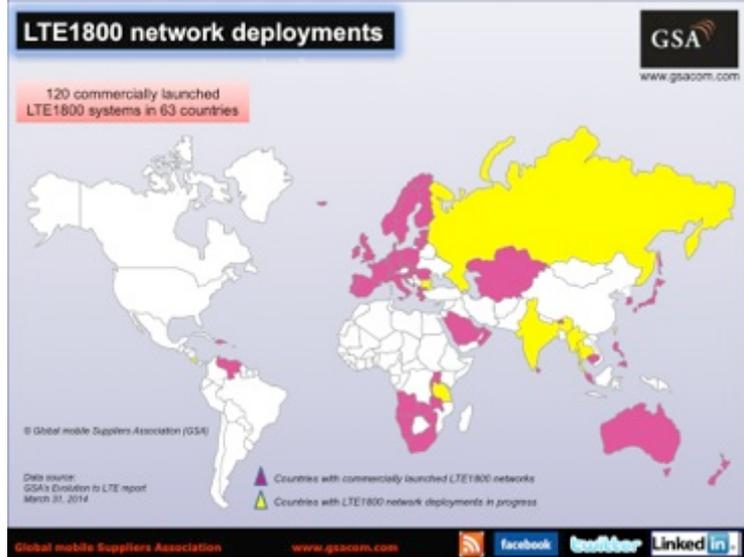


1800 MHz has the largest LTE devices ecosystem

589 LTE1800 (band 3) user devices announced
 152% YoY growth in no. of LTE1800 products

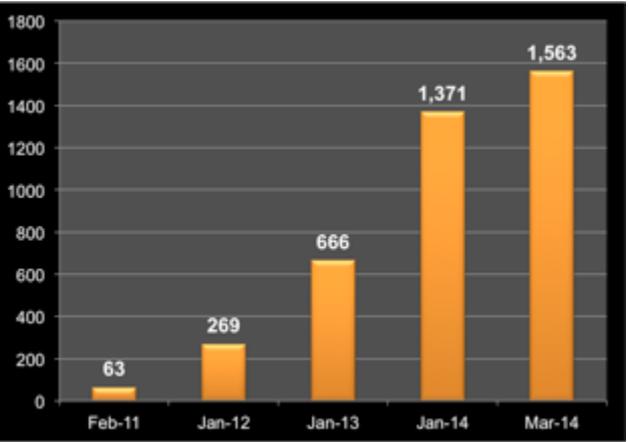
37% of LTE devices can operate in 1800 MHz

All form factors supported



120 commercially launched LTE1800 systems in 63 countries
 ... several more are now being deployed

LTE user devices

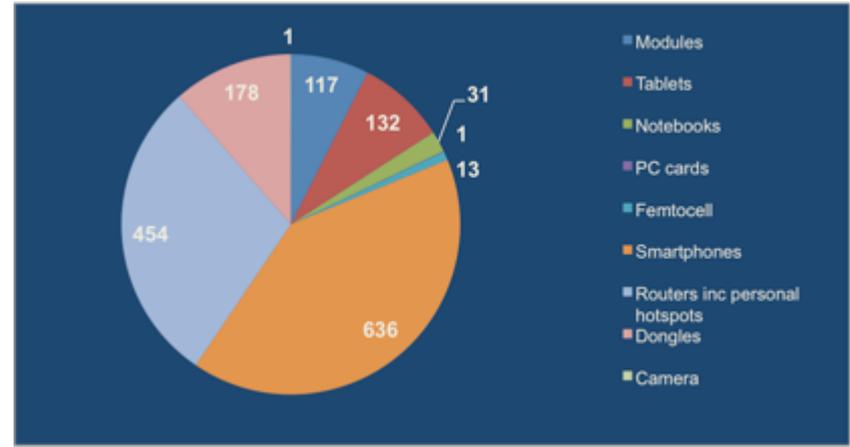


FDD and TDD products

1,563 LTE user devices announced

742 new LTE devices announced in past year = 90% YoY growth

154 manufacturers = 58% YoY growth



40.6% of LTE devices are smartphones

LTE FDD

1800 MHz band 3	589 devices
2600 MHz band 7	582 devices
2100 MHz band 1	423 devices
800 MHz band 20	392 devices
800/1800/2600 tri-band	340 devices
AWS band 4	334 devices
700 MHz bands 12 or 17	327 devices
850 MHz band 5	282 devices
700 MHz band 13	275 devices
900 MHz band 8	246 devices
1900 MHz band 2	169 devices
1900 MHz band 25	97 devices

LTE TDD

2600 MHz band 38	278 devices
2300 MHz band 40	269 devices
1900 MHz band 39	125 devices
2600 MHz band 41	120 devices
3500 MHz band 42,43	17 devices

LTE / 3G fallback

- Most LTE operators have existing 2G and 3G network operations
- These networks generally offer wider & deeper coverage than LTE networks in the initial deployment phase
- Offering LTE users the opportunity to use i.e. "fallback to" 3G systems is of major strategic importance

- 1,130 LTE devices also operate on either HSPA, HSPA+ or DC-HSPA+ networks
- 570 LTE devices support DC-HSPA+
- 359 LTE devices support EV-DO
- 105 LTE devices support TD-SCDMA

99% of LTE handsets are 3G/multimode

Source: GSA's Status of the LTE Ecosystem report
Published on March 19, 2014

LTE TDD: network deployments and ecosystem

32 commercially launched LTE TDD networks in 21 countries

Country	Operator	TDD frequency	TDD band	LTE mode
Australia	NBN Co.	2.3 GHz	40	TDD
Australia	Optus	2.3 GHz	40	TDD + FDD
Bahrain	Menatelecom	3.5 GHz	42	TDD
Brazil	On Telecomunicacoes	2.6 GHz	38	TDD
Brazil	Sky Brasil Services	2.6 GHz	38	TDD
Canada	Sasktel	2.6 GHz	41	TDD + FDD
China	China Mobile	Various	39/40/41	TDD
China	China Telecom	2.6 GHz	40, 41	TDD
China	China Unicom	2.6 GHz	40, 41	TDD
Hong Kong	China Mobile Hong Kong	2.3 GHz	40	TDD + FDD
India	Bharti Airtel	2.3 GHz	40	TDD
Indonesia	PT Intermux	2.3 GHz	40	TDD
Japan	Softbank XGP/LTE TDD	2.6 GHz	41	TDD + FDD
Nigeria	Spectranet	2.3 GHz	40	TDD
Nigeria	Swift Networks	2.3 GHz	40	TDD
Oman	Omantel	2.3 GHz	40	TDD + FDD
Poland	Aero2	2.6 GHz	38	TDD + FDD
Russia	MegaFon / Moscow	2.6 GHz	38	TDD + FDD
Russia	MTS / Moscow	2.6 GHz	38	TDD + FDD
Russia	Vainakh Telecom	2.3 GHz	40	TDD
Saudi Arabia	Mobily	2.6 GHz	38	TDD + FDD
Saudi Arabia	STC	2.3 GHz	40	TDD + FDD
South Africa	Telkom Mobile (8ta)	2.3 GHz	40	TDD
Spain	COTA/Murcia4G	2.6 GHz	38	TDD
Spain	Nec-Sky	3.5 GHz	42	TDD
Sri Lanka	Dialog Axiata	2.3 GHz	40	TDD + FDD
Sri Lanka	Lanka Bell	2.3 GHz	40	TDD
Sri Lanka	SLT	2.6 GHz	38	TDD
Sweden	3 Sweden	2.6 GHz	38	TDD + FDD
Uganda	MTN	2.6 GHz	41	TDD
UK	UK Broadband	3.5 GHz	42, 43	TDD
USA	Sprint	2.6 GHz	41	TDD + FDD

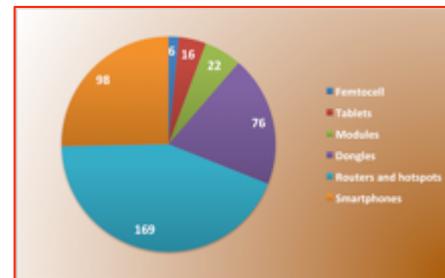
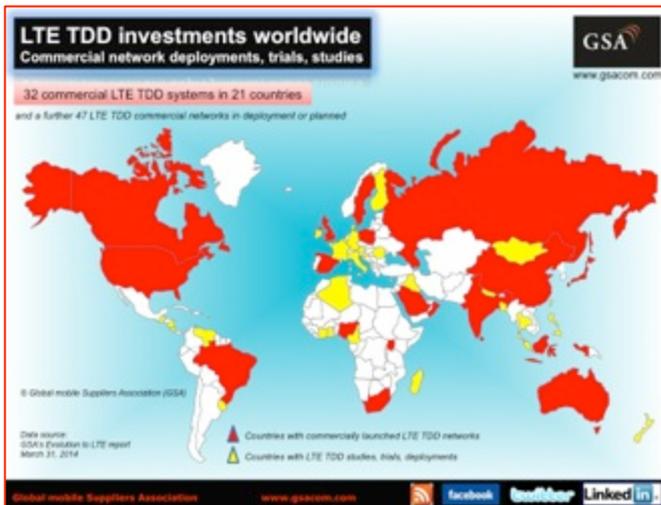
47 LTE TDD commercial networks in deployment or planned

Country	Operator	Band	Country	Operator	Band
Algeria	Aloétrie Télécom	To be confirmed	Indonesia	First Media	40
Azerbaijan	Sazz	42, 43	Indonesia	IM2	40
Bangladesh	Banlajalion	38	Iraq	MaxTel	To be confirmed
Bangladesh	Oilo/BIEL	38	Iraq	Tishknet	To be confirmed
Bangladesh	Qubee	38	Ireland	Imagine Group	42, 43
Belgium	b-lite	42	Italy	AFT-Linkem	42, 43
Belgium	BUCD	38	Madagascar	Biueline	40
Cameroon	YouMee	To be confirmed	Malaysia	Asiaspace	40
Canada	ABC	42	Malaysia	P1	40
Costa Rica	IBW Intl	40	Monrovia	Ulusnet	42
Côte d'Ivoire	YooMee	To be confirmed	Monteneoro	Velatel	42
Croatia	Velatel	42	Nepal	Nepal Telecom	40
Denmark	3 Denmark	38	Nicaragua	IBW Intl	40
Dominican Rep	Wind Telecom	38	Nigeria	Mobilitel	40
El Salvador	IBW Intl	40	Nigeria	Zoda Fones	38
Finland	Datanet	38	Poland	Milnrex	42
France	Bolloré	42	Puerto Rico	Aeronet	41
Germany	DBD	42	Romania	2K Telecom	38
Ghana	Biu Telecoms	38	Russia	Osnova Tel.	40
Guatemala	IBW Intl	40	Russia	Rostelecom	40
Hong Kong	3 HK	40	Russia	Smoltelemcom	42
India	Tikona Dtoital	40	Saudi Arabia	ITC	42
India	Airtel	40	UK	NSV (BT)	38
India	RIL	40			

TDD (TD-LTE) mode is the optimal solution for use in unpaired spectrum

32 commercially launched LTE TDD networks in 21 countries

- ❑ 13 networks are combined FDD + TDD systems: *dual mode is becoming more common*
- ❑ another 47 TDD (TD-LTE) networks in deployment or planned
- ❑ several additional operators undertaking studies and trials
- ❑ LTE TDD (TD-LTE) has achieved global traction



387 devices (221 more than a year ago) operate in LTE TDD mode
All form factors supported
Multi-band, multi-mode devices are available from all major chipset and device manufacturers

3GPP band	Frequency	Number of networks
40	2.3 GHz	16
38	2.6 GHz	9
41	2.6 GHz	7
42	3.5 GHz	3
39	1.9 GHz	1

China Mobile LTE TDD network uses bands 39, 40 and 41

Source: GSA's Status of the Global LTE TDD Market report
Published on April 16, 2014

GAMBoD enables comprehensive analysis of LTE devices ecosystem



www.gsacom.com/gambod

GAMBoD, the **GSA Analyzer for Mobile Broadband Devices**, is a unique search and analysis tool developed by GSA for mobile broadband devices, allowing searches by supplier, form factor, features, peak downlink and uplink speeds, and operating frequency. Results are presented in list form, or as a spreadsheet, or in charts. An RSS feed can be set up to alert as new devices are added to the database. Charts may be inserted into documents or presentations, subject to accreditation of GSA as the source.

GAMBoD is available only to qualified site users, which GSA defines as representatives of GSA Member companies who have registered using their corporate email address, or representatives of network operators who have registered using their corporate email address.

GSA also offers medium and large-size enterprises the opportunity to subscribe as an “Associate of GSA” with the principle benefit of a licence for its employees to use the GAMBoD tools. Download full details - including the annual fee - via the link on the home page to document "Associate of GSA subscription”

Access to GAMBoD

Member companies of GSA:
free for all employees

Network Operators: free for all employees

Associate of GSA: GBP 2,500 annual fee covers all employees

GAMBoD-HSPA

For HSPA, HSPA+ and DC-HSPA+ user devices

Search by manufacturer, product name, form factor, peak downlink and uplink speeds, HSPA operating frequencies, support for EDGE, WLAN, GPS/A-GPS, EV-DO, HD Voice (W-AMR), DTM, and LTE

GAMBoD-LTE

For LTE user devices (1,563 devices @ March 18, 2014)

Search by manufacturer, product name, form factor, LTE operating frequencies, Cat 4 support, Cat 6 support, VoLTE, and 3G fallback including HSPA, HSPA+, DC-HSPA+, EV-DO, or TD-SCDMA

FDD spectrum selector bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 20, 25
TDD spectrum selector bands 38, 39, 40, 41, 42, 43

LTE-Advanced improves spectrum efficiency, delivers increases in capacity and coverage, and the ability to support more customers/devices more efficiently, to maintain and improve the user experience of mobile broadband. Key features include:

- Carrier Aggregation
- Higher order MIMO
- SON/Hetnets
- Interference management
- Relays

LTE-Advanced is market reality today

Carrier aggregation is commercially in service and combines spectrum in different bands (interband) e.g. in Saudi Arabia, South Korea and the USA, enabling theoretical peak downlink data throughput of 150 Mbps

Several operators are deploying up to 20 MHz paired spectrum using the carrier aggregation feature “intraband” with contiguous or non-contiguous spectrum to achieve similar performance when used with Category 4 terminals

- 233 models of Category 4 devices (about 15% of all LTE devices) are announced

LTE networks that support Cat 4 user devices are commercially launched in many countries including Australia, Austria, Canada, Denmark, Estonia, Finland, Germany, Hong Kong, Hungary, Latvia, Lithuania, Japan, Moldova, Netherlands, New Zealand, Norway, Poland, Russia, Singapore, Spain, Sweden, Switzerland, UAE, UK, USA

Many operators are deploying two paired 20 MHz carriers (e.g. 20 MHz paired in 1800 MHz combined with 20 MHz paired in 2.6 GHz) to support Category 6 devices (peak 300 Mbps downlink)

- Megafon launched the world's first 300 Mbps LTE-Advanced system in February 2014
- GSA expects that tens of commercial LTE-A Cat 6 300 Mbps networks will be launched by mid-2015
- 3 Category 6 user terminals are announced

HSPA+ evolution with Carrier Aggregation

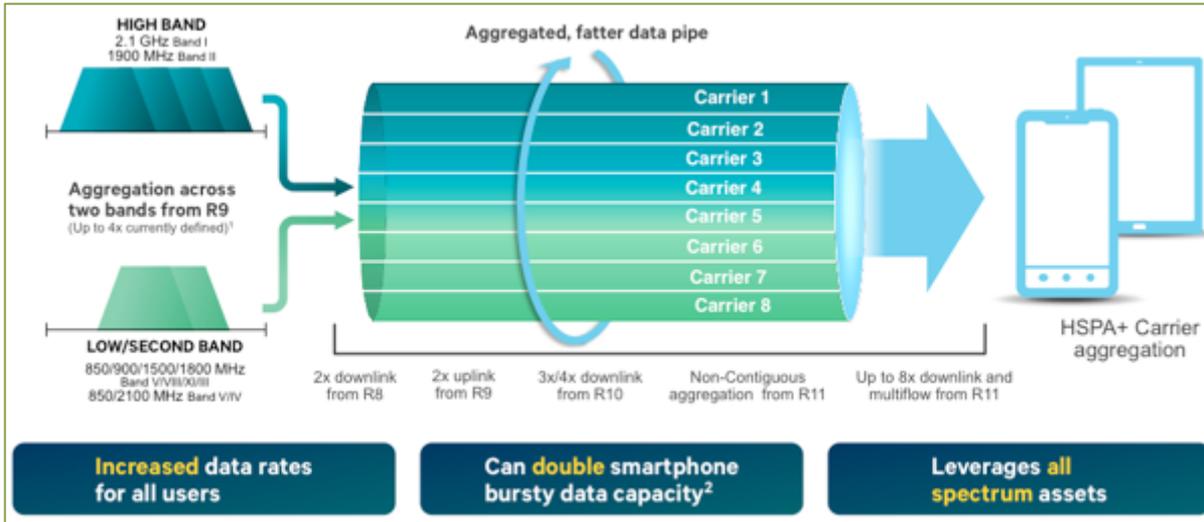
About 75% of LTE operators have also deployed HSPA or HSPA+ systems (source: GSA)

- ❑ HSPA systems are important now, and will be in future, for delivery of mobile broadband together with LTE

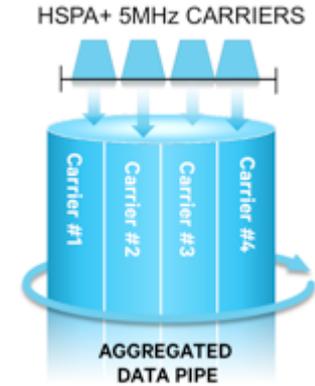
HSPA+ carrier aggregation is widely deployed on Release 8 systems

- ❑ 159 commercial 42 Mbps DC-HSPA networks in 83 countries

Release 9 defines aggregation across up to 4 bands



Source of charts: Qualcomm Inc.



Release 10 enables carrier aggregation of up to 4 carriers

Carrier aggregation enhances broadband experience

Download from www.gsacom.com the Qualcomm presentation

Evolution of HSPA+ Carrier Aggregation

Mobile Broadband users are demanding spontaneous access to video content, a higher-quality experience and more convergent mobile services than ever before. Owing to the popularity and adoption of smartphones and tablets, mobile subscriptions for high data consumption devices are expected to reach 8 billion by 2019. Mobile data traffic is expected to grow 10 fold between 2013 and 2019, driven mainly by video.

LTE Broadcast enables operators to efficiently launch media services over LTE to meet this demand.

LTE Broadcast offers mobile-network operators a profitable business proposition through service differentiation, new revenue opportunities, and more efficient distribution of live and other digital media. LTE Broadcast enables multiple users to receive the same content simultaneously. LTE broadcast can deliver the same content to multiple users with the capability to support a virtually unlimited number of users simultaneously, thereby maintaining efficient use of spectrum and network investments. LTE broadcast is set to open new business models for mobile network operators.



Invitation to join
LTE-Broadcast

2014 is expected to be an important year for LTE Broadcast market developments

LTE-Broadcast market developments:

- First commercial launch of LTE Broadcast by KT on January 27, 2014
- World's first stadium trial of LTE Broadcast made by Telstra on January 31, 2014
<https://www.youtube.com/watch?v=7llbiCo-uUk>
- Trial during SuperBowl 2014 by Verizon Wireless
- Europe's first live trial of LTE Broadcast made in a football stadium by Vodafone Germany
- Etisalat to trial LTE Broadcast
- SingTel to trial LTE broadcast
- EE will be implementing trials in the coming months

LTE Broadcast content on <http://www.gsacom.com>

- LTE Broadcast – a revenue enabler in the mobile media era (Ericsson)
- Broadcast over LTE (BBC)

LinkedIn group for discussion, news, information sharing:

LTE-Broadcast <http://www.linkedin.com/groups?gid=7435919>



LTE is already widely recognized as the global foundation for cellular communication for commercial users, as well as the dominant public safety technology.

In most parts of the world, public safety organizations use dedicated systems for their mission critical communications. These have primarily been designed and built to provide narrowband services such as dispatching, simple messaging and mission critical voice. But public safety users now have the opportunity to expand this scope thanks to rapid advances in technical development and the implementation of globally standardized solutions – such as LTE – brought to the market by commercial players.

Thanks to its global scale and high volumes, LTE offers both users and service providers the benefits of a single communications network that can provide multiple applications and services at low prices. But for the public safety community in particular, the key advantages of LTE are its ease of interoperability with other networks and its inherently high performance in terms of low latency, data-rates and spectral efficiency.

Using standardized solutions ensures interoperability among vendors. It allows emergency services networks to benefit from developments in the commercial sector as user demands within public safety change rapidly – while at the same time continuing to provide reliable emergency services.

The priority for public safety agencies should be finding the right deployment scenario and operator business model. Taking a broad view, public safety networks should continue to be built on a dedicated emergency services core, with options beyond this – from roaming over commercial networks to a complete dedicated network – depending on local needs and conditions.

Resources on the GSA website

- ❑ Key characteristics of a Public Safety LTE network
- ❑ Public Safety Mobile Broadband
- ❑ LTE Standards for Public Safety: 3GPP view
- ❑ Delivering Public Safety Communications with LTE

Log in to <http://www.gsacom.com>

and search for the titles on

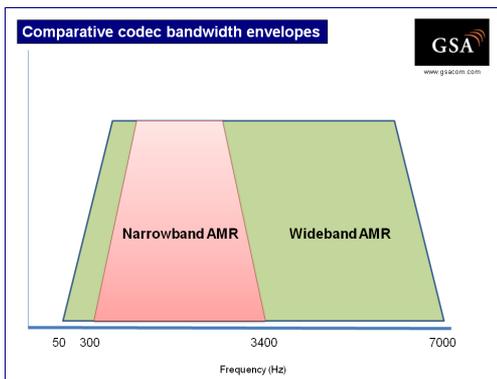
http://www.gsacom.com/gsm_3g/info_papers.php4

HD voice service on mobile networks

100 mobile operators launched HD voice service
 (up to 25.03.14)
 Over 31% YoY growth

Mobile HD service launched in 71 countries

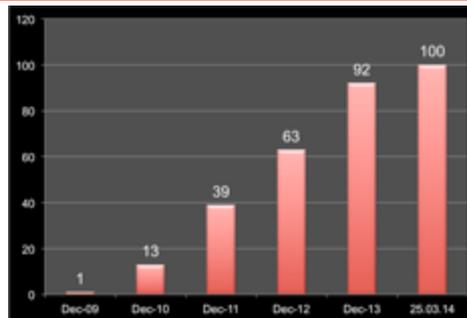
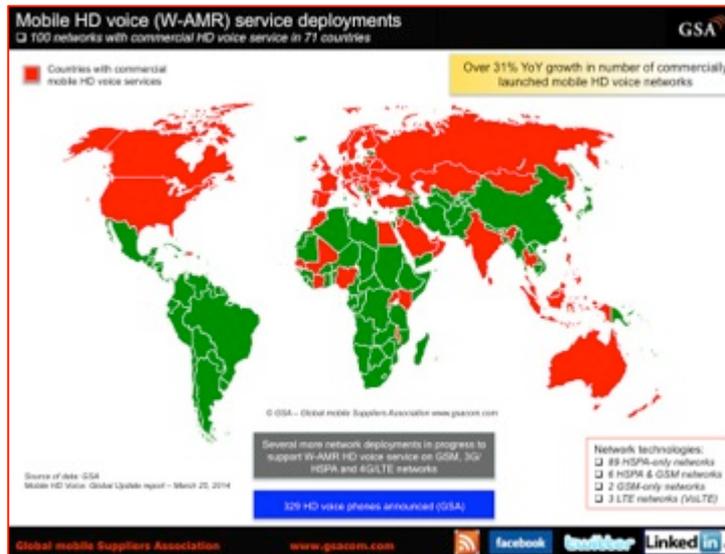
329 models of HD voice (W-AMR) enabled mobile phones now available (including VoLTE devices)



W-AMR enabled HD voice launches

- 89 HSPA-only networks
- 6 HSPA and GSM networks
- 2 GSM-only networks
- 3 LTE networks (VoLTE)

100 NETWORKS TOTAL



Press release
http://www.gsacom.com/news/gsa_404.php

Approaching 1 in 5 HSPA operators offer HD voice service

329 HD-voice enabled mobile phones (including operator and frequency variants) – more than twice the number of a year ago

19 manufacturers

HD voice is supported by the leading brands and phone models

Source:
 GSA's Mobile HD voice: Global Update report
 GSA's HD voice (W-AMR) mobile phones and suppliers report

Voice on LTE networks

3 operators launched HD voice on LTE networks (VoLTE)

- ❑ VoLTE-enabled HD voice services and user terminals are market reality
- ❑ The first wave of VoLTE service launches that include HD voice (W-AMR) has begun

❑ Drivers for supporting voice in LTE networks

- ❑ Expanding LTE network coverage
- ❑ Increase in LTE smartphone usage
- ❑ Spectrum efficiency and other operational aspects

❑ VoLTE is the preferred implementation

- ❑ CSFB can be considered as the first phase of voice evolution for mobile LTE services
- ❑ Many operators committed to commercially launch VoLTE in 2014
- ❑ No need to wait

Some of the 57 VoLTE phones already announced



Country	Operator	VoLTE status
South Korea	KT	Launched
South Korea	LG U+	Launched
South Korea	SK Telecom	Launched
Australia	Optus	Trialling
Austria	T Mobile	Trialling
Bulgaria	Max Telecom	In deployment
Canada	Sasktel	In deployment
Canada	Telus	In deployment
China	China Mobile	In deployment
Ecuador	CNT	Planned
Germany	DT	In deployment
Germany	E Plus	Planned
Germany	O2	In deployment
Hong Kong	CSL	Soft-launched
Hong Kong	PCCW	In deployment
India	Bharti Airtel	Trialling
India	RIL	Trialling
India	Videocon	Planned
Japan	NTT DoCoMo	Planned
Japan	Softbank	In deployment
Lebanon	Alfa	In deployment
Netherlands	Tele2	In deployment
Netherlands	Vodafone	Study phase
Russia	Yota	In deployment
Saudi Arabia	Mobily	In deployment
Singapore	StarHub	In deployment
Slovakia	T-Mobile Slovensko	Planned
Slovenia	Telekom Slovenije	In deployment
Spain	Telefonica	Trialling
Sweden	Tele2	In deployment
Sweden	TeliaSonera	In deployment
Turkey	Avea	Trialling
UAE	Etisalat	In deployment
UK	EE	In deployment
USA	AT&T	In deployment
USA	C-Spire	In deployment
USA	T Mobile US	In deployment
USA	US Cellular	In deployment
USA	Sprint	In deployment
USA	Verizon Wireless	In deployment
USA	VTel	Trialling

Additional announcements are provided in GSA's latest Evolution to LTE report

VoLTE commitments and deployment status
© GSA – Global mobile Suppliers Association

Members' papers educate and influence the key audiences

- MEMBER BENEFIT: GSA member organizations may promote their corporate information papers, presentations etc. on the GSA website to its highly targeted global industry audience - including to over 62,500 registered users
- Excellent complement to Members' own corporate and marketing communications channels to educate, position and influence*
- Feedback is provided on % share of downloads by organization type (e.g. analysts, operators, suppliers, policy-makers, etc.)*
- Delivers greater reach to key audiences than most event sponsorships = higher return on investment (RoI)*

GSA Members papers downloads

Most popular: Q1 2014

Sign in to download any of these papers from http://www.gsacom.com/gsm_3g/info_papers.php4

www.gsacom.com

GSA member organizations may promote their information papers, presentations and jointly-branded white papers on the GSA website to a highly targeted global industry audience including over 62,500 registered users. This service is a major membership benefit as a valuable complement to their existing channels. Members are provided with statistics confirming the different organization types downloading their documents - including % share of downloads per file.

Member	Title	Q1 2014	All-time total
ERICSSON	Ericsson Mobility Report – Interim, February 2014	619	619
QUALCOMM	LTE Advanced – Evolving and expanding into new frontiers	609	609
ERICSSON	Public Safety Mobile Broadband	439	439
QUALCOMM	Extending LTE Advanced to unlicensed spectrum	396	396
HUAWEI	APT700 LTE Whitepaper	330	760
HUAWEI	5G: A technology vision	327	1407
QUALCOMM	Evolution of HSPA+ Carrier Aggregation	249	249
QUALCOMM	Qualcomm Technologies and APT700	221	221
ERICSSON	APT700 Market Update	214	214
ERICSSON	Ericsson Mobility Report – November 2013	158	855

Most downloaded Member paper in March 2014 QUALCOMM LTE Advanced – Evolving and expanding into new frontiers

Global mobile Suppliers Association
www.gsacom.com

Greater and more efficient reach - for better RoI using GSA

ADDRESSABLE AUDIENCE: Annual GSA membership (Over 60,000 registered site users) vs Conference silver sponsor (100 conference delegates)

A presentation or white paper from a GSA member company placed on the GSA website typically achieves 700+ downloads, and is often much higher

GSA membership typically delivers a higher return on investment than conference sponsorship

Chart (right) shows how, for one document, the messages delivery cost via the GSA website is much lower than a conference sponsorship

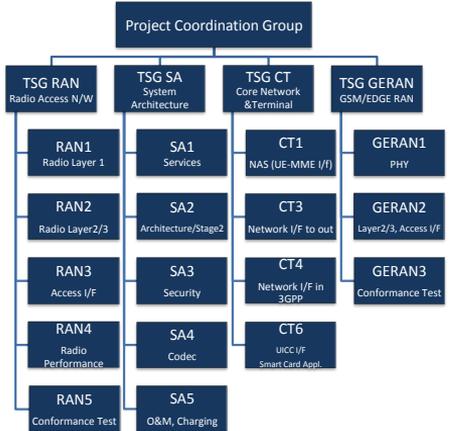
AND CAN BE REDUCED EVEN FURTHER

Since standard membership allows up to 4 papers to be placed on the GSA website per membership year

GSA (**G**lobal mobile **S**uppliers **A**ssociation) represents leading GSM, 3G/HSPA and 4G/LTE suppliers worldwide. Our reports and information papers deliver key facts and stats, explain market developments, trends and opportunities, and are the most widely referenced across the industry. GSA shows how international technology standards and alignment of spectrum band choices for mobile network deployments deliver the largest economies of scale and the widest choice of terminals at lowest cost for users. Other activities include holding seminars, briefings, case studies, providing support to campaigns, and speaking at industry events. GSA monitors and regularly provides updates on LTE network deployments and launches worldwide, regulatory developments, and the availability of user devices. These reports in particular are highly anticipated and closely followed by our global website audience that includes over 62,500 registered site users.

GSA is a **Market Representation Partner** in 3GPP with a seat on its **Project Co-ordination Group (PCG)**

GSA co-operates with other key organizations including COAI, ETSI, GSM Association, ICU, and ITU



Join the discussion in the GSA's LinkedIn group
www.linkedin.com/groups?gid=2313721

+ **subgroups** (search LinkedIn for these names):

- 5G
- APT700 band
- HD Voice (W-AMR)
- LTE-Broadcast
- LTE TDD
- LTE User Devices
- LTE1800
- UMTS900



www.twitter.com/gsacom



www.facebook.com/pages/Global-mobile-Suppliers-Association-GSA/123462771012551



- ❑ Download via the links on www.gsacom.com
 - ❑ Registration page for new site users <http://www.gsacom.com/user/register.php>



New GSA report: LTE in 900 MHz spectrum (3GPP band 8) – market status
Operator commitments
Deployments
Devices ecosystem

APT700 zone
 White papers, presentations, links

- ❑ APT700 presentations at MWC2014: Ericsson, GSA, GSMA, Qualcomm, Telstra <http://www.gsacom.com/apt700>

Recently-added Members' papers

- ❑ Connected Car: Snapdragon Automotive Solutions
- ❑ LTE-Advanced – Evolving and expanding into new frontiers
- ❑ Extending LTE Advanced to unlicensed spectrum

Others

- ❑ Supporting a true digital economy requires intense focus on 5G (Univ. of Surrey)
- ❑ LTE Direct / LTE Proximity Services (Deutsche Telekom)

Authoritative industry reports by GSA

- Some of the many free downloads via the links on www.gsacom.com
- Registration page for new site users <http://www.gsacom.com/user/register.php>

Evolution to LTE Report
Global mobile Suppliers Association
March 23, 2014
GSM/3G MARKET/TECHNOLOGY UPDATE

Introduction
LTE - Long Term Evolution - is a global success. In this latest issue of 'Evolution to LTE' report, GSA provides the current situation including going facts and analysis about the global status and growth of mobile broadband enabled by LTE. This report is regularly updated and free to download by over 82,000 registered user of the GSA website.

Information is provided faster about the LTE system, moving FDD and TDD modes, technical standards, operator investments and commitments including network developments, status, trials, commercial launches, and regulatory developments, including spectrum for LTE-related mobile broadband service network deployments. LTE is a major global standard for both modes, specified by 3GPP. The total capacity of the standard is the same for LTE FDD and LTE TDD. Comparisons from across the industry and globe contribute to both modes within the operationalization of LTE. This has led to global scale and diverse market fragmentation, and is one of the key reasons for LTE's growing success. The report also provides a status update on the LTE user device ecosystem. LTE, LTE-Advanced, LTE roaming, LTE download, the AP700 band, and global LTE subscriptions.

LTE Market Summary - March 2014
279 LTE networks are commercially launched in 161 countries (see p.10-16).
482 operators commercially in 147 countries.
54 pre-commercial trials in 30 more countries.

GSA forecasts 350+ commercially launched LTE networks by end 2014
APNs are included.

1,393 LTE user devices announced
Last month, 800+ units.

© GSA www.gsacom.com

Information for the production of this report was obtained in several ways, including via regular information exchanges between GSA and senior management in research operations with regulatory authorities, suppliers and other stakeholders. This is in addition to consultation and analysis of public records and sources where available including company press releases and articles, in order to accurately confirm facts and ensure that this report reflects the true LTE mobile broadband market situation. Comments about the report including misstatements should be sent to info@gsacom.com.

GSA provides additional LTE-related resources to complement this report, including maps and charts, which can be downloaded by registered site users at www.gsacom.com/news/statistics

Selected charts and maps are also available as PDF files for higher resolution. Related reports include:
= Status of the LTE Ecosystem report
= Status of the Global LTE TDD Market report
= Status of the Global LTE FDD Market report

Copyright © 2014 Global mobile Suppliers Association
All rights reserved. Reproduction or distribution of this report without the prior written permission of GSA is prohibited.
www.gsacom.com

REPORT: Status of the LTE Ecosystem
March 28, 2014

This report by the GSA (Global mobile Suppliers Association) confirms that 1,393 LTE user devices have been launched in the month by 154 suppliers, and provides an analysis of the main equipment and brands. LTE is a mainstream communications system technology with global acceptance based on a large industrial commitment and supported by a mature and rapidly expanding device ecosystem. LTE is the fastest developing mobile communications system technology ever.

© GSA (Global mobile Suppliers Association) www.gsacom.com

Join the discussions in our LinkedIn® group
GSA: www.linkedin.com/groups?gid=2112121

LTE 1800
www.linkedin.com/groups?gid=2122950

LTE TDD
www.linkedin.com/groups?gid=2076065

LTE User Devices
www.linkedin.com/groups?gid=146472

APT700 band
www.linkedin.com/groups?gid=470095

Status of the Global LTE TDD Market

79 commercial LTE TDD networks in deployment or being planned - including 32 commercial 4G+ certified networks in 21 countries

Report published by GSA
Global mobile Suppliers Association
www.gsacom.com

April 16, 2014
© 2014 - Global mobile Suppliers Association

Status of the Global LTE 1800 Market

Operator commitments, network deployments, launches, trials, devices

Report published by the GSA
Global mobile Suppliers Association
www.gsacom.com

April 23, 2014
© 2014 - Global mobile Suppliers Association

GSM/3G MARKET/TECHNOLOGY UPDATE

Operator commitments, network deployments, launches, trials, devices

Report published by the GSA
Global mobile Suppliers Association
www.gsacom.com

April 23, 2014
© 2014 - Global mobile Suppliers Association

GSM/3G MARKET/TECHNOLOGY UPDATE

Operator commitments, network deployments, launches, trials, devices

Report published by the GSA
Global mobile Suppliers Association
www.gsacom.com

April 23, 2014
© 2014 - Global mobile Suppliers Association

GSM/3G MARKET/TECHNOLOGY UPDATE

Operator commitments, network deployments, launches, trials, devices

Report published by the GSA
Global mobile Suppliers Association
www.gsacom.com

April 23, 2014
© 2014 - Global mobile Suppliers Association

Topic zones on www.gsacom.com

LTE1800 zone
LTE in 1800 MHz spectrum
White papers, seminar presentations, plus links to other key resources

Mobile HD Voice zone
HD Voice service enabled by W-AMR
Network launches, deployments, trials, phones - presentations, white papers, more resources

APT700 zone
White papers, presentations, links

PLUS: charts and maps (jpeg and PDF files)
<http://www.gsacom.com/news/statistics>