Report to 3GPP PCG #24

April 21, 2010

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Global mobile Suppliers Association

www.gsacom.com

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Scope of report

- Activity update
- Progress of LTE
- Communications

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Global mobile Suppliers Association (GSA)

- Expanding GSA portfolio of surveys, reports fact sheets
- All available at www.gsacom.com

Facts-based research by GSA
Leveraging strong links in the industry
Objective analysis
Widely referenced by the industry, commentators, analysts, policy-makers, media

Capacity and performance evolution

WCDMA, HSPA and HSPA+

LTE

EDGE and EDGE Evolution

Eco-systems, including user devices

Mobile broadband success stories

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Mobile Broadband Update

GSA calculates that there are over 2.4 billion GSM, WCDMA and HSPA subs in commercial HSPA-enabled networks globally

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Commercial WCDMA networks	347
Countries WCDMA launched in	144
WCDMA 3G network market share	> 75%
WCDMA subs (incl. HSPA) Dec 09	453 m
Commercial EDGE networks	487
Countries EDGE launched in	190
GPRS networks evolved to EDGE	> 80%
HSPA networks with EDGE	> 70%
HSPA network commitments	388
Commercial HSPA networks	341
Countries HSPA launched in	143
Live WCDMA networks with HSPA	> 98%

HSPA subscriptions (Dec 09)	217 m
HSDPA networks 3.6 Mbps or higher	> 80%
HSDPA networks 7.2 Mbps or higher	> 54%
HSDPA devices launched	2,137
Commercial HSUPA networks	100
Networks with HSUPA launched	~ 30%
HSUPA devices launched	493
HSPA devices with EDGE support	> 80%
HSPA+ network commitments	103
Countries with HSPA+ network commitments	51
21 Mbps HSPA+ networks launched	46
28 Mbps HSPA+ networks launched	6
LTE network commitments	64
Countries with LTE network commitments	31

Source: GSA surveys and reports – up to April 16, 2010

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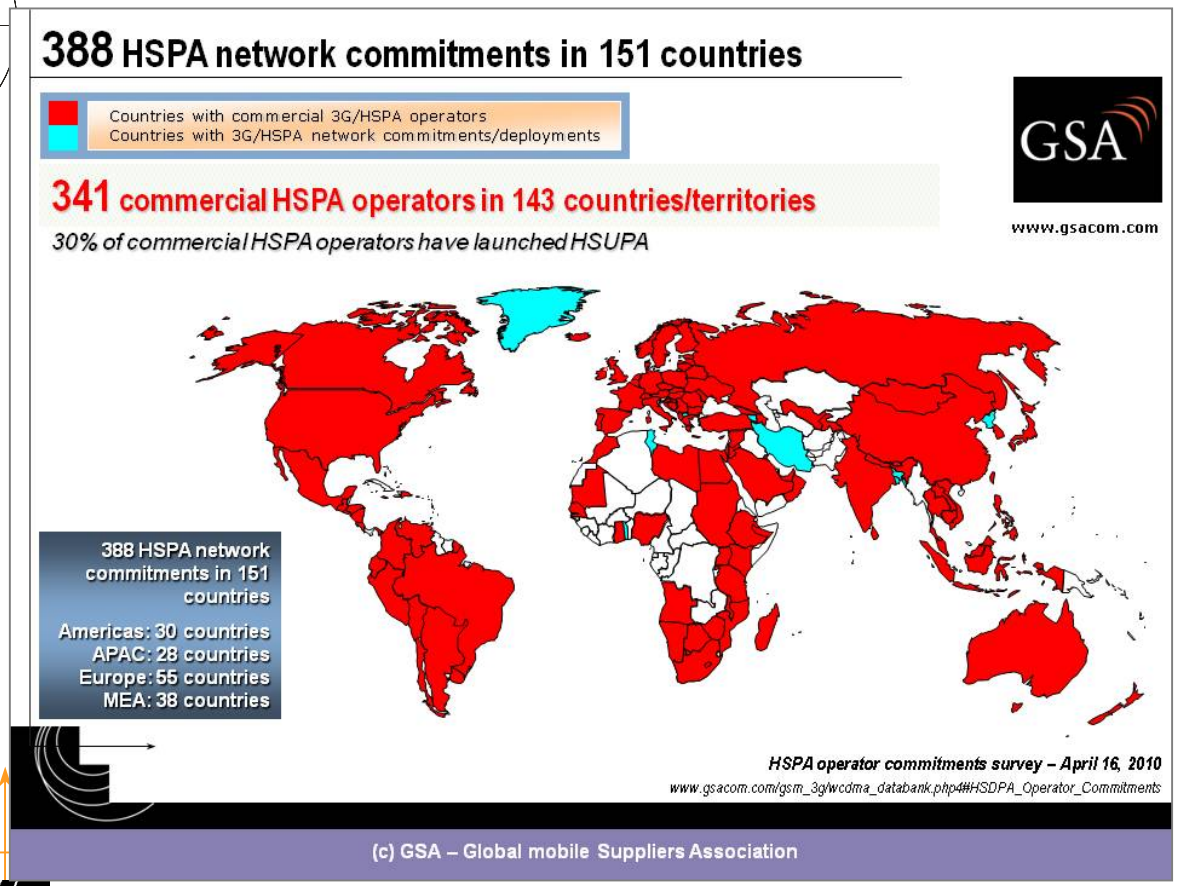
Over 98% of commercial WCDMA operators have launched HSPA

- ❑ Evolution to HSPA+ is the main trend in 2010
- ❑ Over 70% of HSPA operators have also committed to EDGE



341 commercial HSPA networks launched in 143 countries

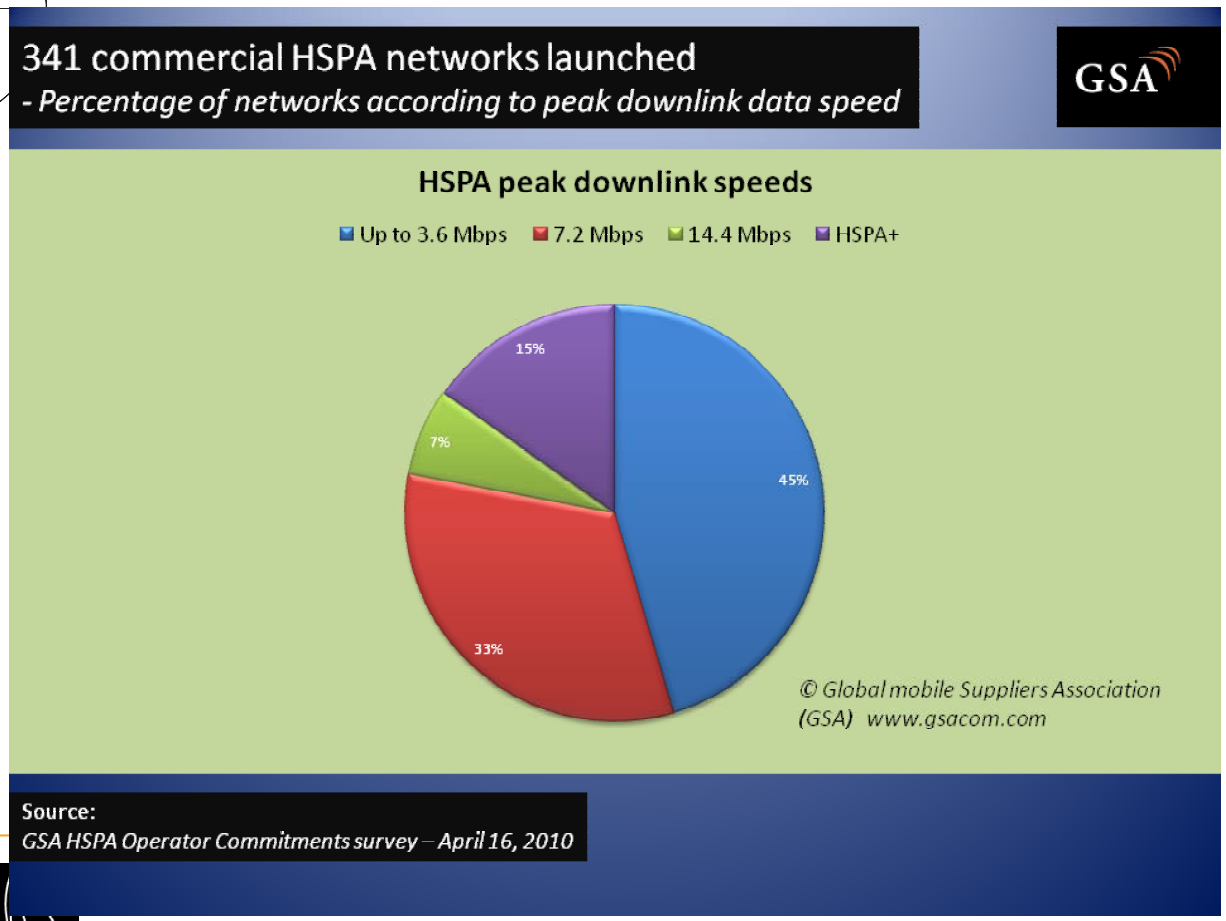
100 HSUPA networks launched

Over 2,300 HSPA devices launched in the market

Source:
GSA surveys – April 2010

HSPA+ is enabling operators to deliver higher data capacities at lowest cost per byte delivered

- ❑ 103 network commitments, 51 countries; 52 HSPA+ systems launched
- ❑ HSPA+ has a strong evolution path

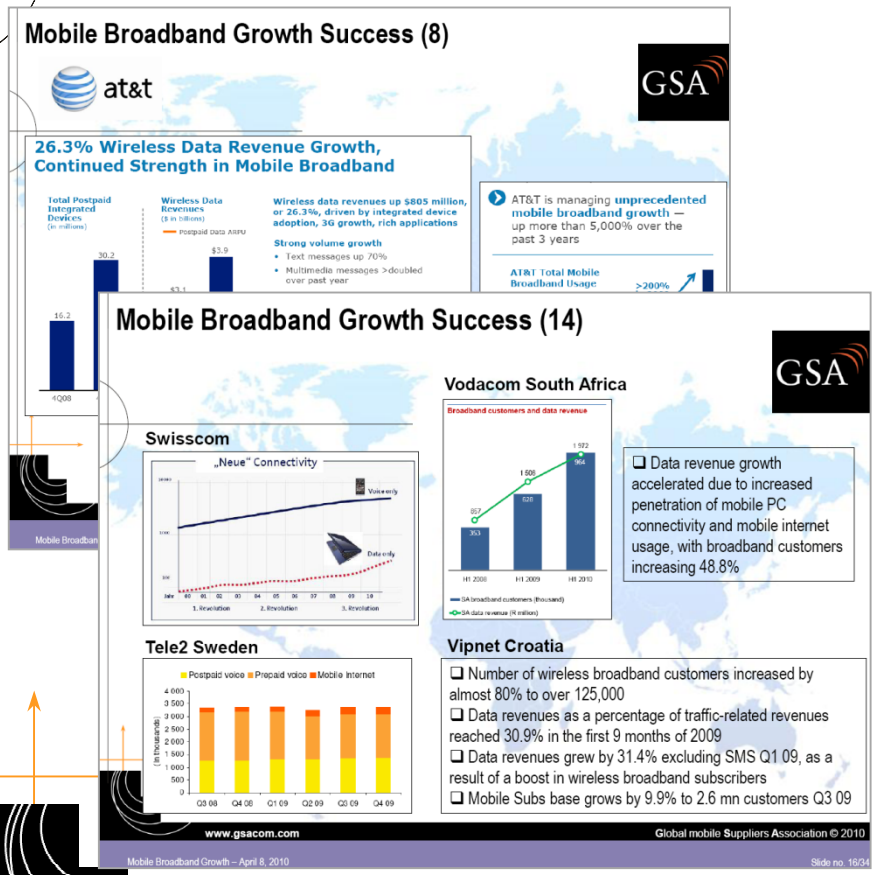


GSA forecasts ~ 90 HSPA+ networks will be commercially launched by end 2010

Source:
GSA surveys – April 2010

Sharing mobile broadband success stories

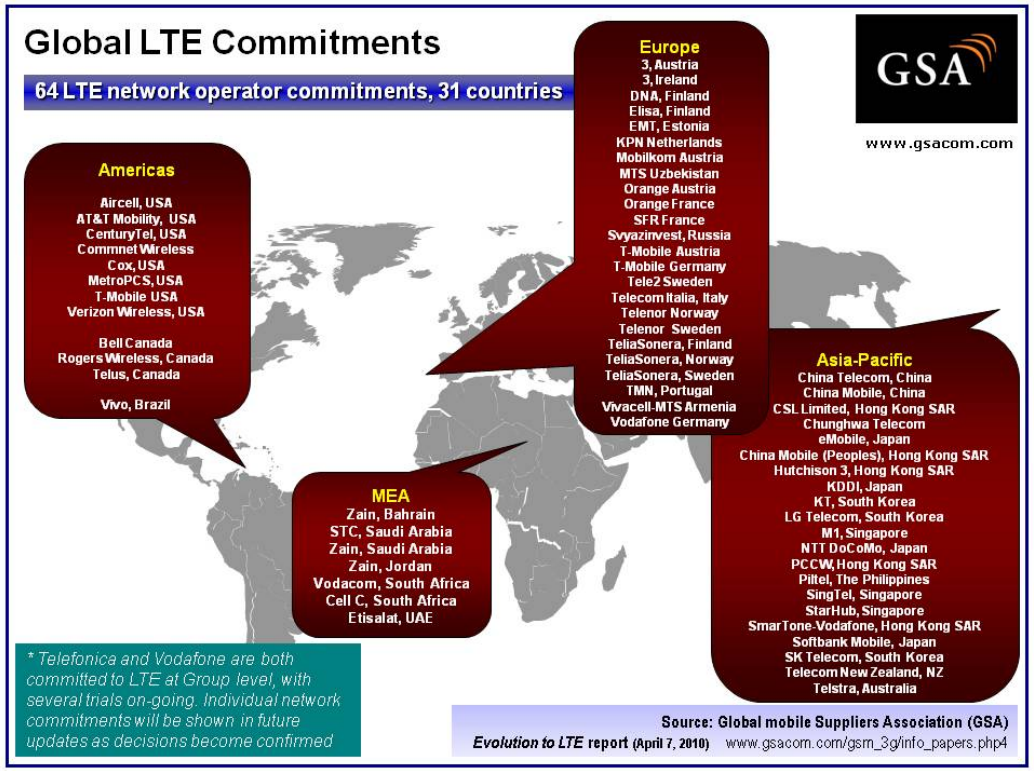
- ❑ Providing evidence of traffic and revenue growth
- ❑ Enabled by HSPA



Source:
GSA report – April 8, 2010

LTE market reality: systems launched in Stockholm, Oslo

- 64 firm LTE network operator commitments in 31 countries
- Improving eco-system
- Up to 22 LTE networks anticipated to be in service by end 2010
- An additional 24 "pre-commitment" trials identified



LTE is clearly the main direction for the industry

Source:
GSA Evolution to LTE report – April 7, 2010

LATEST NEWS: on April 15, 2010 China Mobile has inaugurated a TD-LTE network at the site of the Shanghai World Expo 2010

Global status of LTE

GSA

Global mobile Suppliers Association

INFORMATION PAPER

April 7, 2010

GSM/3G MARKET/TECHNOLOGY UPDATE

Evolution to LTE

3GPP Long Term Evolution (LTE), targets capacity and data rate speed, data throughput enhancements and low latency, to support new services, and features requiring higher levels of capability and performance. Business users and consumers today browse the Internet or send and receive e-mails using HSPA-enabled notebooks, or with HSPA modems and dongles, and send/receive video or music on 3G/HSPA phones. LTE is the next step in the user experience, which will enhance more demanding applications such as interactive TV, mobile video blogging, advanced games and professional services. Downlink and uplink data rates are significantly higher, supported by the necessary network architecture and technology enhancements. LTE reduces the cost per Gigabyte delivered, essential for addressing the mass market. The new system supports a full IP-based network, and harmonization with other radio access technologies.

LTE is needed to accommodate huge traffic growth

Traffic rising/revenue falling

40x – 100x traffic increase

which may need to be supported across many frequency bands

Traffic

Revenue & traffic de-coupled

Revenues

Time

LTE standardization is complete and approved by 3GPP within Release 8, and is the basis for initial LTE deployments worldwide. The LTE standard supports both FDD and TDD modes with the same specification and hardware components.

LTE is on track, attracting global industry support. With the HSPA mobile broadband eco-system in place, LTE is the natural migration choice for GSM/HSPA network operators. As a result of collaboration between 3GPP, 3GPP2 and IEEE, there is a roadmap for CDMA operators to evolve to LTE. It is clear that LTE is the next generation mobile broadband system of choice also for many CDMA operators, particularly leading players. Successful handovers between CDMA and LTE networks were demonstrated and announced in August 2009, showing how activities such as video downloading and web surfing were maintained as the user moved between LTE & CDMA coverage areas. The LTE TDD mode provides a future-proof evolutionary path for TD-SCDMA, another 3GPP standard. An LTE TDD demonstration network is being readied for the Shanghai 2010 World Expo, which opens on May 1. As a result we have with LTE one single global standard, which in turn will secure and drive even higher economies of scale and also simplify roaming.

64 LTE network commitments worldwide

On December 15, 2009 TeliaSonera launched the world's first LTE services in Sweden and Norway

GSA confirms in this report (April 7, 2010)

- **64 LTE network commitments in 31 countries**
- **Up to 22 LTE networks in service by end 2010**
- **39 or more LTE networks in service by end 2012**

GSA believes that over time LTE will be the choice for many more operators and be introduced according to business needs. Several more operators are testing/trialing LTE and further announcements are expected. Infrastructure solutions now shipping offer an easy upgrade path to LTE.

A total of 88 operators in 42 countries have committed to deploy LTE systems or are engaged in trials or other planning activities.

Availability of new spectrum, particularly in the 2.6 GHz and Digital Dividend bands (700, 800 MHz), is a crucial factor for LTE deployments in many countries, as are the regulatory conditions, and will directly determine deployment and launch dates in those markets.

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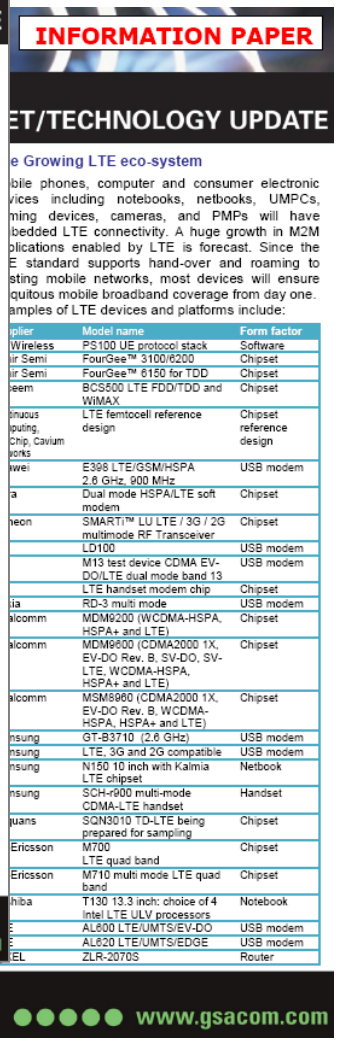

INFORMATION PAPER

ET/TECHNOLOGY UPDATE

e Growing LTE eco-system

bile phones, computer and consumer electronic vices including notebooks, netbooks, UMPCs, ming devices, cameras, and PMPs will have bedded LTE connectivity. A huge growth in M2M plications enabled by LTE is forecast. Since the E standard supports hand-over and roaming to sting mobile networks, most devices will ensure quitous mobile broadband coverage from day one. amples of LTE devices and platforms include:

plier	Model name	Form factor
Wireless	PS100 UE protocol stack	Software
ir Semi	FourGee™ 3100/6200	Chipset
ir Semi	FourGee™ 6150 for TDD	Chipset
eem	BCS500 LTE FDD/TDD and WiMAX	Chipset
tinuous puting, Chip, Cavium orks	LTE femtocell reference design	Chipset reference design
wei	E398 LTE/GSM/HSPA 2.6 GHz, 900 MHz	USB modem
a	Dual mode HSPA/LTE soft modem	Chipset
eon	SMARTi™ LU LTE / 3G / 2G multimode RF Transceiver	Chipset
	LD100	USB modem
	M13 test device CDMA EV-DO/LTE dual mode band 13	USB modem
	LTE handset modem chip	Chipset
ia	RD-3 multi mode	USB modem
alcomm	MDM9200 (WCDMA-HSPA, HSPA+ and LTE)	Chipset
alcomm	MDM9600 (CDMA2000 1X, EV-DO Rev. B, SV-DO, SV-LTE, WCDMA-HSPA, HSPA+ and LTE)	Chipset
alcomm	MSM8960 (CDMA2000 1X, EV-DO Rev. B, WCDMA-HSPA, HSPA+ and LTE)	Chipset
nsung	GT-B3710 (2.6 GHz)	USB modem
nsung	LTE, 3G and 2G compatible	USB modem
nsung	N150 10 inch with Kalmia LTE chipset	Netbook
nsung	SCH-r900 multi-mode CDMA-LTE handset	Handset
uans	SQN3010 TD-LTE being prepared for sampling	Chipset
Ericsson	M700 LTE quad band	Chipset
Ericsson	M710 multi mode LTE quad band	Chipset
hiba	T130 13.3 inch: choice of 4 Intel LTE ULV processors	Notebook
E	AL800 LTE/UMTS/EV-DO	USB modem
E	AL820 LTE/UMTS/EDGE	USB modem
EL	ZLR-2070S	Router

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More information in

Evolution to LTE report

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FDD and TDD

Network commitments

Trials

Launches

System performance

Eco-system including platforms, devices

Testing

Industry market forecasts

IMT-Advanced

Global mobile Suppliers Association (GSA)

- ❑ Services and applications
- ❑ Service delivery
- ❑ Business models

EXAMPLE

HD voice

Explaining and promoting benefits, opportunities
Showing and encouraging the eco-system

HD voice based on the AMR Wideband technology

GSA - March 2010
(regular updates planned)

GSA

INFORMATION PAPER

Global mobile Suppliers Association

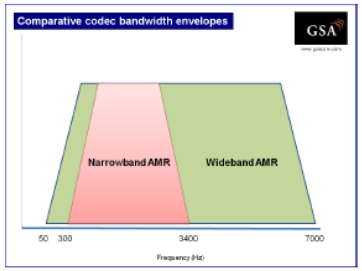
March 2010

GSM/3G MARKET/TECHNOLOGY UPDATE

HD voice based on the AMR Wideband technology

HD voice, based on the AMR (Adaptive Multi Rate) Wideband technology (W-AMR) enables high-quality voice calls in mobile networks and an improved user experience. It provides significantly higher voice quality for calls between mobile phones supporting the feature, and can be implemented in GSM and WCDMA (UMTS) networks. The higher voice quality of HD voice improves the call experience and allows people to better share feelings, do business and communicate information. HD voice can help operators to clearly differentiate their offerings and can enable high quality services to voice dependent business like call center services, information services, emergency services etc. HD voice is also ideal for conference calls and can contribute to a reduction in business travel and raise productivity while reducing the environmental impact. HD voice also helps people hear better in noisy environments.

W-AMR speech technology is standardized in 3GPP Release 5. The new speech-compression algorithm doubles voice bandwidth (50–7000 Hz) compared to the current narrowband speech codec (300–3400 Hz) without extra radio or transmission requirements.



Network commitments

Orange Moldova launched the first commercial HD voice service in 2009, which is marketed as the High Definition (HD) voice service that is available throughout their WCDMA network. Several more mobile operators have started to implement HD voice in their networks.

Orange has announced plans to launch mobile HD voice service on its networks in Belgium, France, Luxembourg, Spain and the UK during 2010. The company says it plans to offer 8 mobile HD voice phones in 1H 2010, and that all of its handsets are expected to support HD voice by end 2011.

3 UK has announced deployment of HD voice and plans service launch in 2010. Telstra, Australia has announced HD voice deployment and commercial availability in 2010 on its "transcoder-free operation (TrFO)" ready network. HD voice is being trialled by other network operators. Further commitments are expected to follow.

Deploying HD voice allows operators to offer improved speech and audio quality of multimedia content. Customers benefit from enhanced speech clarity and intelligibility. HD voice also enables operators to offer improvements to existing services such as conference calls, personalized ring tones, audio broadcasts and new IP-based services.

According to 3GPP, 12.65 kbit/s or higher coding bit-rates provide high-quality wideband audio (the lower bit-rates of 8.85 and 6.6 kbit/s are for temporary use during adverse radio conditions or periods of cell congestion). In subjective tests it was shown that the HD voice wideband codec produces better results than the best narrow-band codec (12.2 kbit/s).

Network aspects

Ordinarily the voice payload for transport in the core network is PCM-coded at 64 kbit/s according to ITU-T Rec. G.711. Narrowband AMR is transcoded to/from PCM which degrades voice quality, adding signal processing complexity. Analog PCM-based transport cannot be used with W-AMR as G.711 only applies to narrowband voice. W-AMR must be based on one of two complementary 3GPP standards: tandem-free operation (TFO) or transcoder-free operation (TrFO).

The introduction of W-AMR into GSM systems requires TFO, which is part of 3GPP GERAN, which does not require substantial modification of the core network. W-AMR and TFO can also be introduced into UMTS. A better option however, is to use the recommended TrFO. The combination of TFO and TrFO enables W-AMR calls between all types of 3GPP mobile devices (i.e. GSM/EDGE and UMTS/WCDMA-HSPA).

HD voice eco-system: User Devices

Leading manufacturers have launched W-AMR enabled devices supporting HD voice. The first HD voice phone was the Nokia 6720c launched for Orange Moldova. Nokia has a range of phones which can be activated for W-AMR support by operator request, including E52, E55, and E72.

Sony Ericsson has announced 2 new HD voice ready phones in its GreenHeart range - the Elm (available from Q1 2010), and the Hazel (available from Q2 2010).

New products supporting HD voice will be included in future updates of this paper. Updates are welcome to info@gsacom.com

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❑ Spectrum

REPORTS INCLUDE:

UMTS900

Digital Dividend

Global mobile Suppliers Association (GSA)

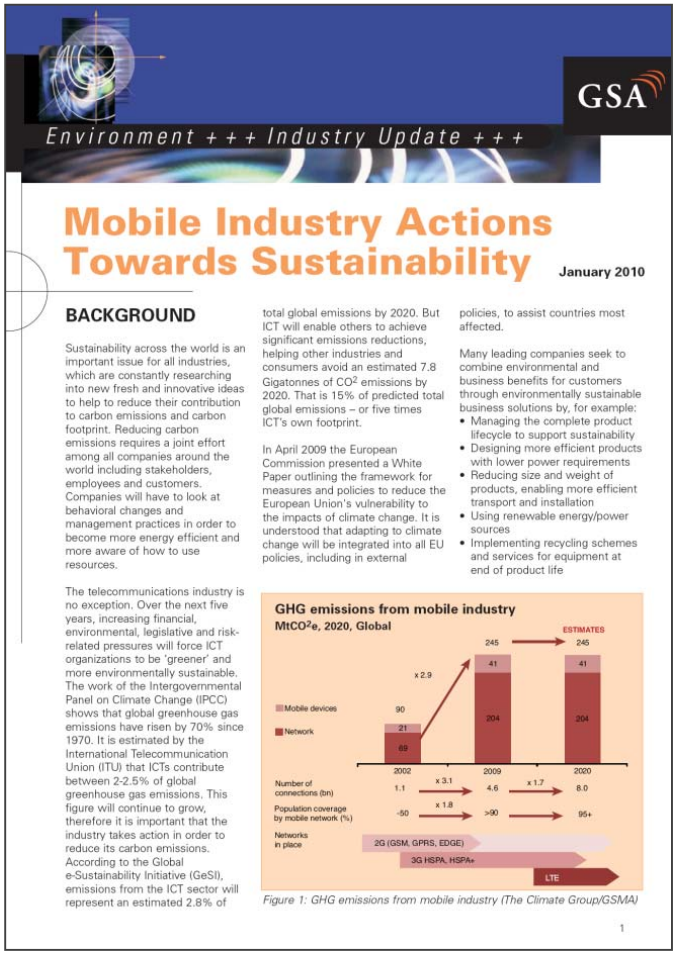
❑ Environment/sustainability

First paper published

More papers will follow

Mobile Industry Actions Towards Sustainability

GSA – January 2010



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Environment +++ Industry Update +++

Mobile Industry Actions Towards Sustainability

January 2010

BACKGROUND

Sustainability across the world is an important issue for all industries, which are constantly researching into new fresh and innovative ideas to help to reduce their contribution to carbon emissions and carbon footprint. Reducing carbon emissions requires a joint effort among all companies around the world including stakeholders, employees and customers. Companies will have to look at behavioral changes and management practices in order to become more energy efficient and more aware of how to use resources.

The telecommunications industry is no exception. Over the next five years, increasing financial, environmental, legislative and risk-related pressures will force ICT organizations to be 'greener' and more environmentally sustainable. The work of the Intergovernmental Panel on Climate Change (IPCC) shows that global greenhouse gas emissions have risen by 70% since 1970. It is estimated by the International Telecommunication Union (ITU) that ICTs contribute between 2-2.5% of global greenhouse gas emissions. This figure will continue to grow, therefore it is important that the industry takes action in order to reduce its carbon emissions. According to the Global e-Sustainability Initiative (GeSI), emissions from the ICT sector will represent an estimated 2.8% of total global emissions by 2020. But ICT will enable others to achieve significant emissions reductions, helping other industries and consumers avoid an estimated 7.8 Gigatonnes of CO^2 emissions by 2020. That is 15% of predicted total global emissions – or five times ICT's own footprint.

In April 2009 the European Commission presented a White Paper outlining the framework for measures and policies to reduce the European Union's vulnerability to the impacts of climate change. It is understood that adapting to climate change will be integrated into all EU policies, including in external policies, to assist countries most affected.

Many leading companies seek to combine environmental and business benefits for customers through environmentally sustainable business solutions by, for example:

- Managing the complete product lifecycle to support sustainability
- Designing more efficient products with lower power requirements
- Reducing size and weight of products, enabling more efficient transport and installation
- Using renewable energy/power sources
- Implementing recycling schemes and services for equipment at end of product life

GHG emissions from mobile industry
MtCO²e, 2020, Global

Figure 1: GHG emissions from mobile industry (The Climate Group/GSMA)

Global mobile Suppliers Association (GSA)

❑ Communications

Website is the main channel with strong traffic growth from visitors globally

❑ file downloads (reports, surveys, information papers, charts, maps etc.) running at record highs

Registered site users system (from 2003) provides metrics to confirm target audiences are being reached; current growth at record high

Social networking services help - examples:

❑ GSA RSS newsfeed producing 100,000 requests/month and growing

❑ GSA LinkedIN Group (established September 2009) has 1,031 Members (www.linkedin.com/groups?gid=2313721)

❑ GSA on Twitter: www.twitter.com/gsacom

Key conferences are supported where presence of target audiences is guaranteed

❑ own organized meetings, events ensure the most efficient targeting (3GPP involvement in some instances)

Regular briefings for media and analysts, editorials, interviews, etc in key publications

❑ statistics/feedback on media coverage and industry references are reviewed

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