3G/UMTS and its evolution

worldwide deployments and services - Perspectives for Africa

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Chairman, UMTS Forum

Summary

- **About the UMTS Forum**
- **3G/UMTS market update: deployments including HDSPA**
- **3G/UMTS operator strategies: which services are boosting ARPU and subscriber base**
- **Perspectives for the Middle-East & Gulf**

About The UMTS Forum

The UMTS Forum is an international, cross-sector industry body comprising operators, manufacturers, regulators, application developers, research organisations and IT industry players.

OBJECTIVES

To promote a common vision of the development and evolution of 3G/UMTS and to ensure its worldwide commercial success:

➢ by expressing a strong industry voice promoting 3G/UMTS technology and its evolutions through lobbying and promotional actions globally

➢ by forging dialogue between operators, manufacturers, administrations & regulators, and other market players that can ensure commercial success for all

➢ by providing market knowledge to aid rapid development and uptake of new services and applications

To provide practical support to industry, administrations and policy-makers:

➢ by offering guidance to governmental and financial communities, providing marketing input to technical standardization bodies (the Forum is a Market Representation Partner of 3GPP), and advising on spectrum requirements both for the present and future 3G systems

➢ through its membership of the three sectors of ITU, in the activities of which it participates regularly - such as the ITU-R WP8F – in view of preparation for the next World Radio Conference 2007 (WRC-07)

The UMTS Forum serves the interests of all its members through educational and promotional activities in its role as the voice of the 3G mobile market.

ITU/BDT Regional Seminar on Broadband Wireless Access (BWA) for rural and remote areas for Africa
Yaoundé 18-21 September 2006

UMTS Forum Key Focus Areas

Work-plan 2006 in summary

Vision, Future Research & Market	Spectrum & Regulation	Technical Issues & Implementation
Evolution of 3G/UMTS	Global spectrum and spectrum arrangements for UMTS/IMT-2000 and its evolutions	Complementary technologies (mobile, Broadband Wireless Access...)
Services & Applications	Preparations for WRC-07	Mobile TV
Market forecasts, customer perspective and trends	Advice to industry and administrations on 3G licensing	3G standardisation and support to 3GPP
Relationships with international bodies (ITU, EC, CEPT/ECC...)		
Emerging markets action plan (including 'BRIC')		
Relationships with international media and financial community		
Visibility and participation at conferences, exhibitions, seminars and workshops		

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The mass market embraces 3G/UMTS

Some **big** numbers…

Around **110 million** 3G subscribers worldwide,

including more than **80 million** 3G/UMTS subscribers

about **3** times as many UMTS/W-CDMA subscribers as CDMA2000 EV-DO worldwide

Around **120** W-CDMA networks launched commercially

Almost **400** W-CDMA devices launched or announced

Industry sources including Wireless Intelligence, September 2006

Approaching 120 W-CDMA network launches

EUROPE		
Austria	operator	launch
Austria	Mobilkom	Apr-03
	H3G Austria	May-03
	Connect / One	Dec-03
	Tele.ring	Dec-03
	T-Mobile	Jul-04
Belgium	Proximus	May-04
Bulgaria	Mobiltel	Mar-06
Croatia	VIPNet	Jan-05
	T-Mobile	Jun-05
Czech Rep.	T-Mobile	Oct-05
	Eurotel	Dec-05
Cyprus	Areeba	Dec-05
	CYTA	Apr-06
Denmark	HI3G Denmark	Oct-03
	TDC	Oct-05
Estonia	EMT	Oct-05
Finland	Telia sonera	Oct-04
	Saunalahti	Jan-05
	Radiolinja/Elisa	Nov-04
	DNA	Dec-05
France	SFR	Jun-04
	Orange	Sep-04
Germany	Vodafone	May-04
	T-Mobile	May-04
	e-plus	Aug-04
	O2	Jul-04
Greece	Vodafone	Aug-04
	Cosmote	May-04
	TIM	Jan-04
Guernsey	Wave Telecom	Dec-04
Hungary	T-Mobile	Sep-05
	Pannon GSM	Oct-05
	Vodafone	Dec-05
Ireland	O2	Sep-05
	Vodafone	Jul-04
	H3G Ireland	Jul-05
Isle of Man	Manx	Nov-05

EUROPE		
country	operator	launch
Italy	H3G Italy	Mar-03
	TIM	May-04
	Vodafone	May-04
	Wind	Oct-04
Latvia	LMT	Mar-06
Luxembourg	Tango (Tele2)	Jun-04
	VOXmobile S.A	May-04
	LuxGSM (P&T)	May-04
Netherlands	Vodafone	Apr-04
	T-mobile	Nov-05
	KPN Mobile	Jul-04
Norway	Telenor	Dec-04
	Telia Netcom	Mar-05
Portugal	Vodafone	May-04
	TMN	Apr-04
	Optimus	Jun-04
Poland	Polkomtel	Sep-04
	PTC	Apr-05
Romania	Vodafone-Connex	Apr-05
	Orange Romania	Jun-06
Slovak Rep.	T-Mobile - Eurotel	Jan-06
	Orange	Mar-06
Slovenia	Mobitel	Feb-04
Spain	Vodafone	May-04
	Telefonica Moviles	May-04
	Amena	Oct-04
Sweden	H3G Sweden	Jun-03
	3GIS	Aug-03
	Telia Sonera	Mar-04
	Telenor	Apr-04
	Tele 2	Jun-04
Switzerland	Swisscom	Oct-04
	Orange	Sep-05
	Sunrise	Dec-05
UK	H3G UK	Mar-03
	T-Mobile	Jul-04
	Orange	Jul-04
	Vodafone	Apr-04
	O2	Oct-04

In orange: new networks commercially launched

Operators that have deployed both W-CDMA and EDGE networks

Source: Sofrecom (10th July 2006), GSA - W-CDMA deployments worldwide (16th June 2006)

As of 10th July 2006, 40 cellcos are operating both EDGE and W-CDMA networks in 28 countries worldwide, and 29 operators in 19 European countries

ASIA-PACIFIC		
country	operator	launch
Australia	H3G Australia	Apr-03
	Optus	Apr-05
	Telstra	Sep-05
	Vodafone	Oct-05
Hong Kong	H3G HK	Jan-04
	CSL	Dec-04
	Smartone	Dec-04
	Sunday Comm.	Jun-05
Japan	NTT DoCoMo	Oct-01
	Vodafone KK	Dec-02
Malaysia	Maxis	Jul-05
	Telekom Malaysia	May-05
	Celcom	Apr-05
New Zealand	Vodafone	Aug-05
Philippines	SMART	Feb-06
	Globe	Mar-06
Singapore	SingTel mobile	Dec-04
	Mobile One	Dec-04
	StarHub	Apr-05
South Korea	SKT	Jun-05
	KTF	Sep-05
Taiwan	Taiwan Mobile	May-05
	VIBO Telecom	Dec-05
	FarEas Tone	Jul-05
	Chunghwa Telecom	Jul-05

W-CDMA in commercial operations		
	Countries	Operators
Worldwide	50	117
Europe	30	76

REST OF THE WORLD		
country	operator	launch
Bahrain	MTC Vodafone	Dec-03
Brunei	B-Mobile Comm	Sep-05
Israel	Cellcom	Jun-04
	Partner	Aug-04
Kuwait	Watanyia	Feb-06
	MTC-Vodafone	Dec-05
Mauritius	Emtel	Nov-04
Saudi Arabia	Etisalat	Jun-06
	STC	Jul-06
South Africa	Vodacom	Dec-04
	MTN	Jun-05
Syria	Areeba	Jun-06
Tajikistan	TT-Mobile	Jun-05
	Babilon-Mobile	Jul-05
USA	Cingular Wireless	Jul-04
UAE	Etisalat	Jun-04

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W-CDMA subscriber evolution worldwide

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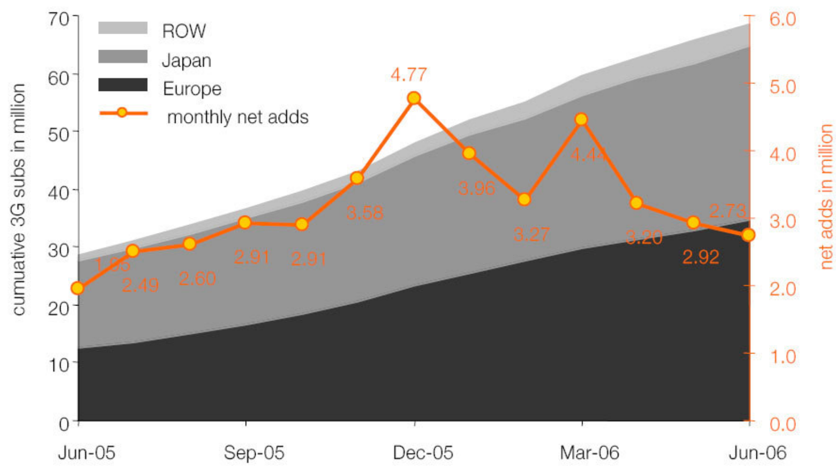

Source: EMC / SOFRECOM

A regional view
Asia Pacific and W. Europe largest W-CDMA markets

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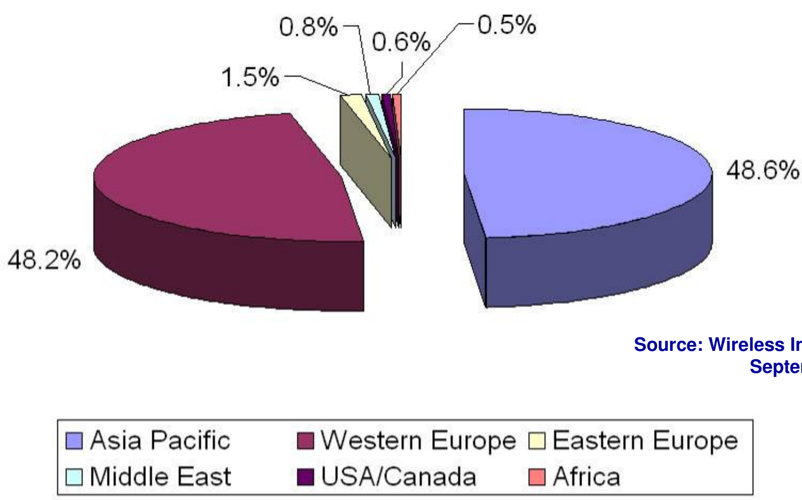
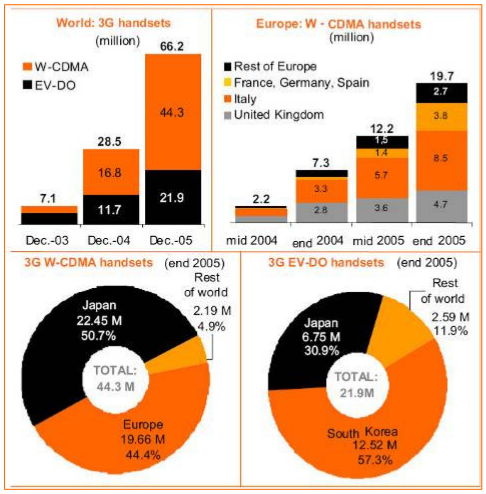


Source: Wireless Intelligence September 2006

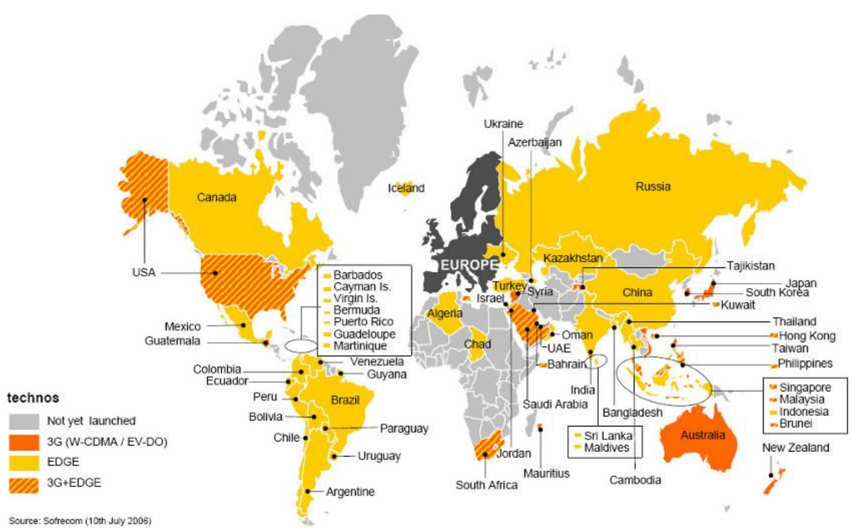
Growth driven by an improved customer experience



Increased 3G/UMTS market uptake driven by:

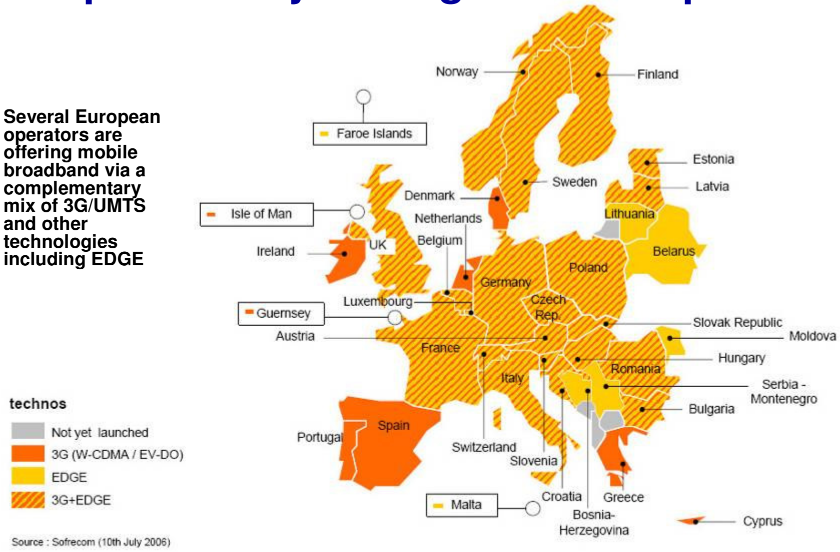
- **Increased choice of terminals**
- **Smaller size and lower weight**
- **Improved battery life**
- **Reduction in entry cost (e.g. Christmas promotional offers by operators)**
- **Strong customer incentives through attractive tariff plans (e.g. pre-pay and fixed-price packages) – often aligned with 2/2.5G pricing**
- **Better customer experience through improved network coverage**

3G/EDGE deployments: a global picture

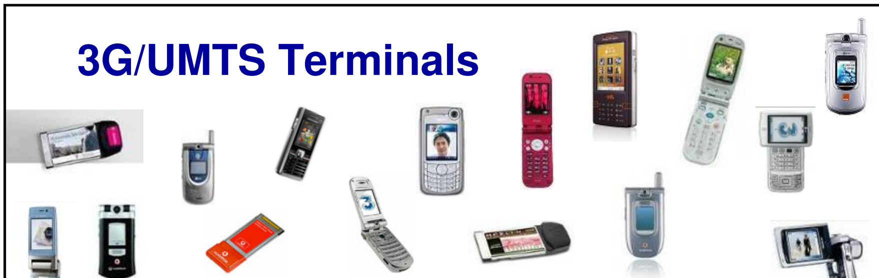


Complementary strategies in Europe

Several European operators are offering mobile broadband via a complementary mix of 3G/UMTS and other technologies including EDGE



3G/UMTS Terminals



- September 2006: Almost 400 3G/W-CDMA/HSDPA terminals (handsets and PC cards) commercially available or announced by a growing range of European, Asian and US vendors
- Latest models compare with 2G handsets in terms of battery life, weight and size

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3G operator strategies: service offerings

MOBILE TV

Sport is the most popular content:

- Orange proposed Eurosport TV channel in France and UK (followed by Vodafone in Germany and Netherlands).
- Vodafone Germany proposed ‘Budesliga Show’ analysis and interviews on day’s football matches, combined with alert services
- T-Mobile proposed ‘DSF mobile TV’ including German domestic league and UEFA Champions League football matches

Adapted format for a different use – operators forge deals with media companies and create specially-adapted content (e.g. 2-3 min clips):

- Vodafone launched the ’24: Conspiracy’ streaming programme in arrangement with Fox Entertainment. In partnership with national RAI TV (Italy) and Sky (UK), totalling more than 1 million streams of its exclusive Sky Mobile TV offer in 2 wks
- Amena launched in November special series for mobile viewers ‘Los SuperVillanos’
- Three signed contract with Disney to use clips from hit series ‘Lost’

Operators give free unlimited access to encourage users:

- In Germany, Vodafone and T-Mobile include free mobile TV in tariff plans for initial period; Vodafone UK included free viewing of Sky Mobile TV

3G operator strategies: service offerings

MOBILE MUSIC

New music portals and music catalogues extended:

- TIM Italy launched its i.music store and T-Mobile launched ‘Musicload’ in Germany.

Exclusive content adds value:

- T-Mobile signed 18-month deal and France Telecom Group signed deal with Madonna to exclusively offer their music.
- Three signed deal with EMI Music UK to include exclusive content from Robbie Williams, Kylie Minogue and Coldplay in its ‘Video Jukebox’ service. 10 million full-length video downloads in 6 months following service launch in 2004.
- Three also announced in June 2005 that 30 million music tracks have been downloaded or streamed on its networks in 9 global markets since service launched.

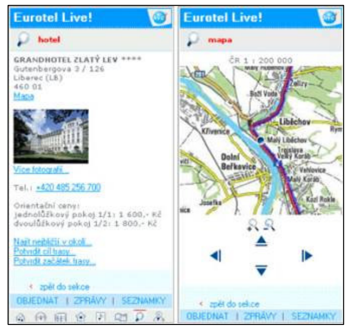
The phone becomes a music player:

- Phones now integrate music players… internal memory now facilitates adoption of this service

Examples of innovative service offerings

Eurotel Praha offers Map Search service on its “Eurotel Live” 3G portal.

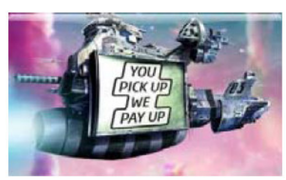
- 3G customers can search for cities and streets and plan travel itineraries on their mobile device.
- Users can enter a city, street or an address to retrieve a colour map and show the best travel route.
- Shows hotels, hospitals, pharmacies, ATMs and post offices
- Over 14,000 restaurants, historical monuments and other landmarks also included.



Innovative tariff proposals… case study

British operator Three is “paying” its customers for receiving calls and messages, up to €0.07 per minute and €0.03 per SMS.

- Credit gained can be used to buy call minutes and services.
- Customers can only use this credit bonus when they buy a new “WePay” prepay topup, minimum price €15.
- Credit must be used within 30 days of the top-up.



More innovative tariff proposals…

Clearer, more attractive pricing for 3G services

SFR in France, Wind in Italy and DoCoMo in Japan have now opted not to differentiate between 2G and 3G pricing.

3G videotelephony has been the subject of many price initiatives, such as free calls for one year with TIM or billing at voice prices in France.

Vodafone Italia charges only for the first minute of the call with the "Infinity Video" option.

Vodafone Portugal and its Best500 plan including 500 minutes of voice and videotelephony to be shared between four numbers.

Source: Orange / SOFRECOM

3G/UMTS drives ARPU: the evidence

3G customers at NTT DoCoMo in Japan spend €21 each month more than DoCoMo's 2G customers, i.e. an ARPU of €65 for 3G compared with €44 for 2G [September 2005]

Average 3G customers in the UK also spend €21 each month more than 2G customers, i.e. an ARPU of €64 for 3G compared with €43 for 2G [September 2005]

Source: Orange / SOFRECOM / survey by Telephia.

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Keys for 3G operator success

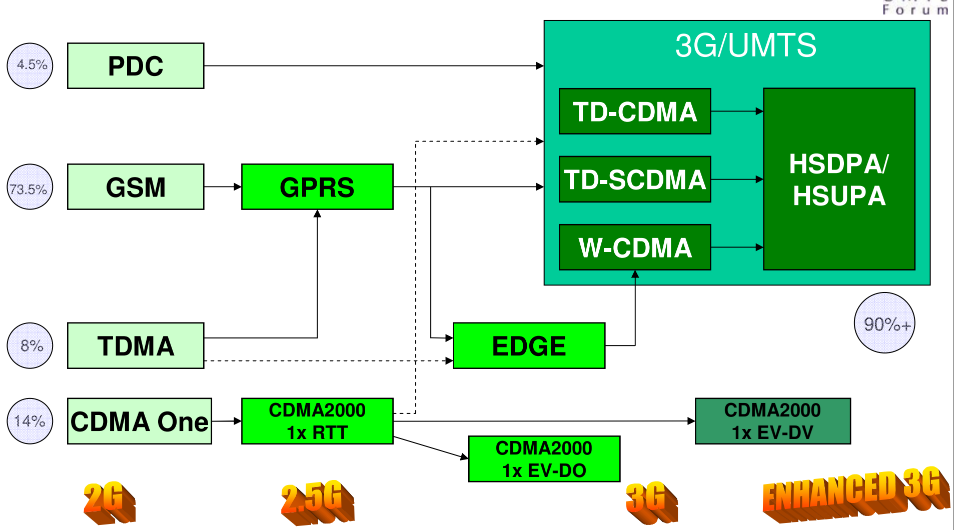
Market uptake of mobile data services depends on these key success factors:

- **Research into customer needs and availability of high quality, tailored local content and applications**
- **Strong platform integration (networks and terminals interoperability)**
- **Effective content integration**
- **Extensive, optimized network coverage (full is always preferable to partial…) with efficient handover from 3G>2G**
- **'Network externality' effect (utility and usage grows by a square factor in proportion to the number of users)**
- **Scale of addressable market (bringing proportional economies of scale)**
- **Availability of economic handsets tailored to market needs**
- **Create strong revenue models that drive demand and encourage usage**
- **Easy to understand customer tariffs**
- **Strong marketing support**

Source: various inc. Sina Mobile

Based on these criteria, the leading mobile data market in the world is Japan (more than 90% of users subscribe to mobile data services), while the second is South Korea (more than 50% of users subscribe to mobile data).

3G Operator Evolution Options (Mid 2004)



HSDPA (High Speed Downlink Packet Access)
The next step in evolution of the 3GPP air interface

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HSDPA = high speed mobile broadband, enabling a wide variety of high bandwidth multimedia services including:

- high quality streaming video,
- fast downloads of high resolution images and large files,
- interactive e-mails & gaming,
- telematics,…

Compared with WCDMA, HSDPA:

1. increases throughput (2→14.4 Mbps): total and average per user
2. reduces latency
3. increases data capacity up to 5x in dense urban environments (micro-cells)

HSDPA: Global deployment status

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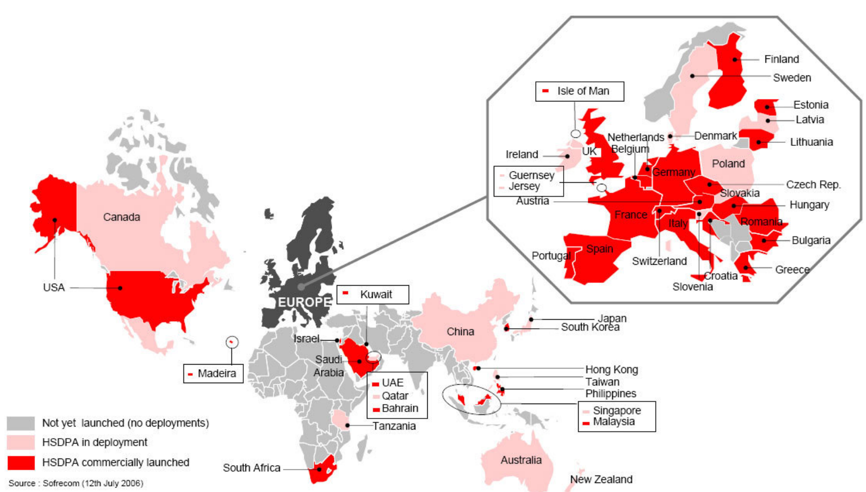

HSDPA: Global deployment status

HSDPA Deployements

HSDPA in commercial operations	Countries	Operators
Worldwide	31	45
Europe	20	29

As of 12th July 2006 104 operators have announced that they are deploying HSDPA in 51 countries. Of these, 45 have already launched services commercially in 31 countries.

EUROPE

country	operator	deployment / launch target	launch
Austria	T-Mobile		Mar-06
	Tele.ring	yes	
	Mobilkom		Jan-06
	H3G	2006	
	One	mid 2006	
Belgium	Proximus		Jun-06
	Mobistar	3Q06	
Bulgaria	MobiTel		Mar-06
Croatia	VIPNet		Apr-06
Czech Rep.	Eurotel Praha		Apr-06
	T-Mobile	2007	
	Oskar-Vodafone	yes	
Denmark	H3G	yes	
Estonia	Elisa	yes	
	EMT		Apr-06
Finland	Elisa		Apr-06
	Finnet	yes	
France	Bouygues Tel	April 2007	
	Orange	end-summer 06	
	SFR		May-06
Germany	T-mobile		Mar-06
	O2	3Q06	
	E-Plus	yes	
	Vodafone		Mar-06
Greece	Cosmote		Jun-06
Guernsey	Cable & Wireless	yes	
Hungary	Pannon GSM	yes	
	Vodafone	yes	
	T-Mobile		May-06
Ireland	O2	yes	
	Vodafone	4Q06	
Isle of Man	Manx		Nov-05
Italy	Vodafone		Jun-06
	H3G		Feb-06
	TIM		May-06
Jersey	Cable & Wireless	yes	
Latvia	Bite	yes	
Lithuania	Bite	yes	
	Omnitel		Jun-06
Madeira	Optimus		Feb-06
Netherlands	T-Mobile		Apr-06
	Telfort	YE06	
	KPN	YE06	
Poland	Polkomtel	2006	
	PTC	2006	
Portugal	Optimus		Apr-06
	TMN		Apr-06
	Vodafone		Mar-06
Romania	Connex-Vodafone		Jun-06
	Orange Romania	2007	
Slovak Rep.	Orange	2006	
Slovenia	Mobitel	yes	
Spain	Movistar		Jul-06
	Vodafone		Jun-06
	Amena		Jun-06
Sweden	H3G	2006	
	3GIS	yes	
Switzerland	Swisscom		Mar-06
	Orange	2006	
	Sunrise	summer 06	
UK	O2	mid-2006	
	Vodafone		Jun-06
	T-Mobile	Aug-06	
	Orange	2H06	
	H3G	2H06	

AMERICAS

country	operator	deployment / launch target	launch
Canada	Rogers Wireless	4Q06	
Mexico	Telcel	2007	
USA	Cingular Wireless		Oct-05
	EDGE Wireless	yes	

ASIA-PACIFIC

country	operator	deployment / launch target	launch
Australia	Vodafone	yes	
	H3G	2007	
	Optus	yes	
	Telstra	2007	
China	China Mobile	yes	
Hong Kong	Sunday	1H06	
	SmarTone-Vodafone		Jun-06
	H3G	3Q06	
	Hong Kong CSL	3Q06	
Japan	NTT DoCoMo	3Q06	
	Vodafone	yes	
	eMobile	Mar-07	
	BB mobile	yes	
Malaysia	Maxis	2006	
	TIME dotCom		May-06
	Celcom		Jun-06
New Zealand	Vodafone	yes	
Philippines	Smart Com.		Apr-06
	Globe Telecom		Mar-06
Singapore	M1	2006	
South Korea	SK Telecom		May-06
	KTF		Jul-06
Taiwan	VIBO	yes	
	Taiwan Mobile	yes	

REST OF THE WORLD

country	operator	deployment / launch target	launch
Bahrain	MTC-Vodafone		May-06
Israel	Cellcom	yes	
	Partner		Mar-06
Kuwait	Watanyia		Feb-06
Qatar	Q-Tel	yes	
Saudi Arabia	Mobily (Etisalat)		Jun-06
	STC		Jun-06
South Africa	MTN		Mar-06
	Vodacom		Mar-06
Tanzania	Vodacom	2006	
UAE	Etisalat		Apr-06

In Orange: Networks commercially launched as of 15th June 2006

Source: Sofrecom (12th July 2006), GSA - GSM/3G market/ technology update (12th July 2006)

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HSDPA: Now a market reality

- 50+ HSDPA networks already in service
- 65+ HSDPA networks planned, in trial or in deployment…

EUROPE

- Orange France in pilot launch
- T-Mobile Germany-Austria & Hungary launched March 06 & May 06
- Mobilkom Austria launched Jan 06
- H3G Italy launched Feb. 06
- Amena (Spain) launched June 06
- Vodafone Germany-Portugal & Italy-Spain-UK-Romania launched Mar. 06 & June 06
- SFR (France) launched bus. June 06
- Optimus Portugal launched April 06
- Elisa Finland & Estonia launched April 06
- Swisscom Switzerland launched Mar. 06
- TIM (Italy) launched May 06
- Mobiltel Bulgaria launched March 06
- Eurotel Czech Rep. launched Apr. 06
- Cosmote Greece launched June 06

ASIA PACIFIC

- NTT DoCoMo in trial
- SmarTone Hong Kong launched June 06
- KTF Korea launched July 06
- SKT Korea launched May 06
- TIME dotCom & Celcom (Malaysia) June 06
- Smart Com & Globe (Philippines) April 06

MIDDLE EAST / AFRICA

- Wataniya Kuwait launched Feb. 06
- Etisalat UAE launched April 06
- MTN & Vodacom (RSA) launched March 06
- Mobily Etisalat & STC (Saudi Arabia) June 06

NORTH AMERICA

- Cingular AT&T US launched Dec 05
- Rogers Wireless Canada in trial

…plus HSUPA launches from 2007

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Mobile Broadband strategies in Europe

Selected examples of HSDPA operator offerings…

ORANGE FRANCE

• HSDPA services introduced for business customers in summer 2006, followed by mass-market consumer offering by Christmas 2006

• 2-3 handsets available from launch (Samsung, Nokia, Motorola…)

•3G available in 24 new cities since beginning of 2006

• Complementary EDGE coverage reached 93% POP by May 2006

VODAFONE UK

• Launched HSDPA business service as '3G broadband' brand in June 2006

• Accessible via Mobile Connect Card, exclusive laptops from Dell, Acer & Lenovo, or by HSDPA network router for office workgroups

• 'Data Unlimited' price plan offers 1GB per month for €65

T-MOBILE GERMANY

• HSDPA available in entire WCDMA network (1,000 towns) by June 2006

• Three "Web and Walk" HSDPA / WLAN boxes available from September, with three flat-rate data tariffs up to 5GB per month for €50

• HSDPA integrated "LIFEBOOK" notebook PC from Fujitsu Siemens

AMENA SPAIN

• HSDPA commercial launch June 2006

• 29% POP initial coverage in Madrid, Barcelona, Seville and major cities

• 41% POP targeted by late 2006

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Africa – deploying 3G/UMTS

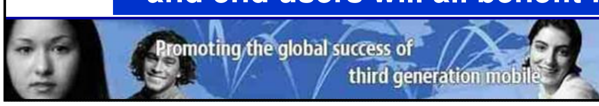
• Africa has already commercially entered the mobile broadband world with 3G/WCDMA and EDGE (South Africa, Algeria, Chad, Egypt, Libya, Mauritius, Somalia, Tanzania, Tunisia…)

• Africa is now taking a step to the next generation of high-speed mobile broadband services with HSDPA (South Africa, Tanzania…)

• With the timely introduction of 3G/UMTS (and HSDPA), Africa can maintain alignment with the GSM/UMTS world and enjoy benefits of:

- greater economies of scale
- simplified international roaming
- IPR export opportunities for services and applications
- wider choice of cost-effective terminals

Africa's operators, equipment manufacturers and end users will all benefit from 3G/UMTS



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For more information

www.umts-forum.org