

# mobile data : impact on IT & network strategy

Vivek Badrinath

executive vice president  
IT networks & product support

France Telecom

December, 8<sup>th</sup> 2008



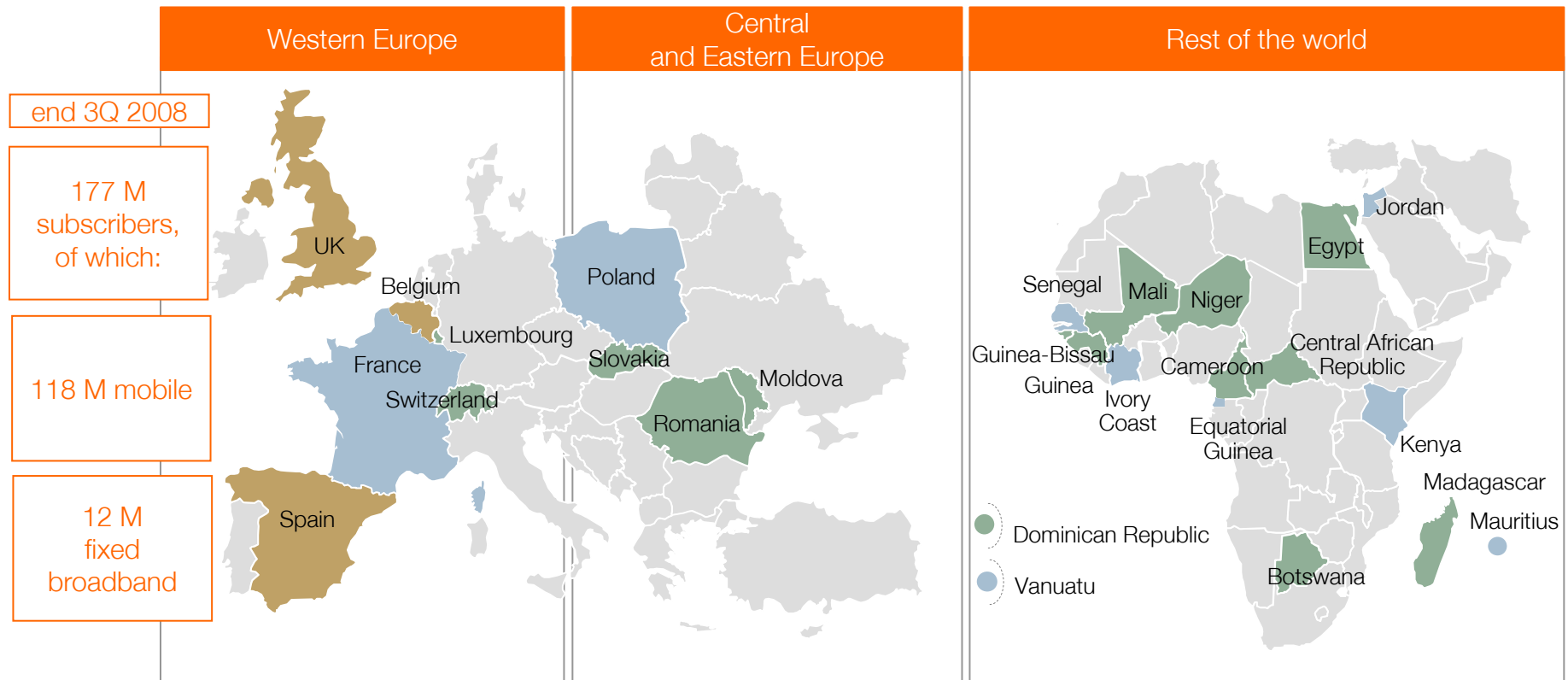
# agenda

1 IT&N summary

2 focus on mobile data

- technology
- roadmap
- scalability levers

# one IT&N: serving consumers in 27 countries



→ also serving corporates in 220 countries and territories

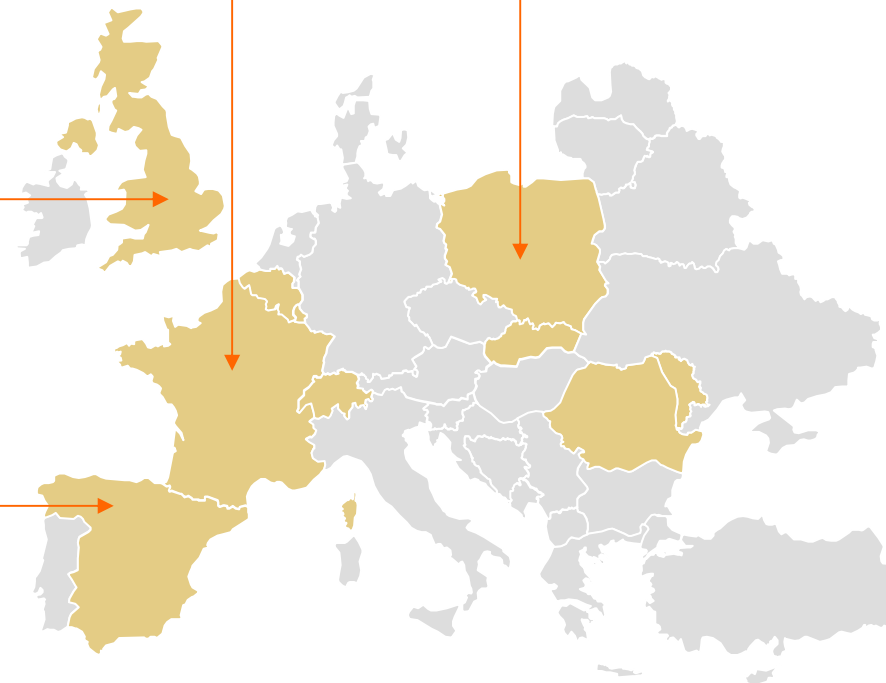
# one IT&N : highlights in four major European countries

France			
coverage		subscribers	
ADSL	98%	ADSL	8,0m
3G+Edge	99%	mobile	24,5m
3G+(HSDPA)	68%	mobile BB	9,9m

Poland			
coverage		subscribers	
ADSL	97%	ADSL	2,1m
3G+Edge	99%	mobile	14,1m
3G+(HSDPA)	35%	mobile BB	4,1m

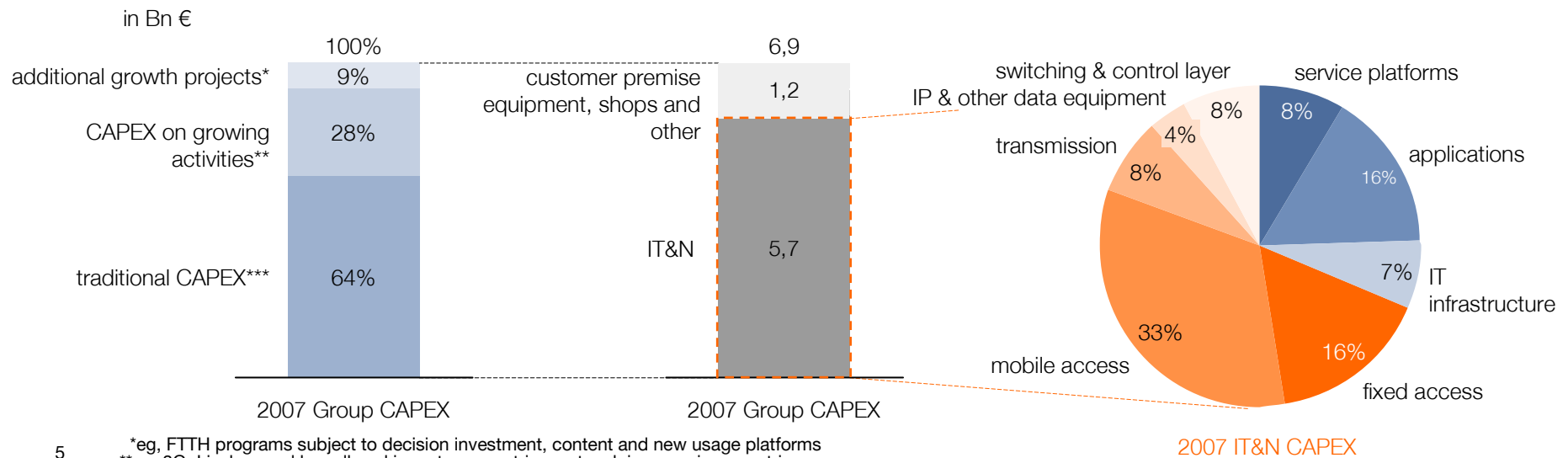
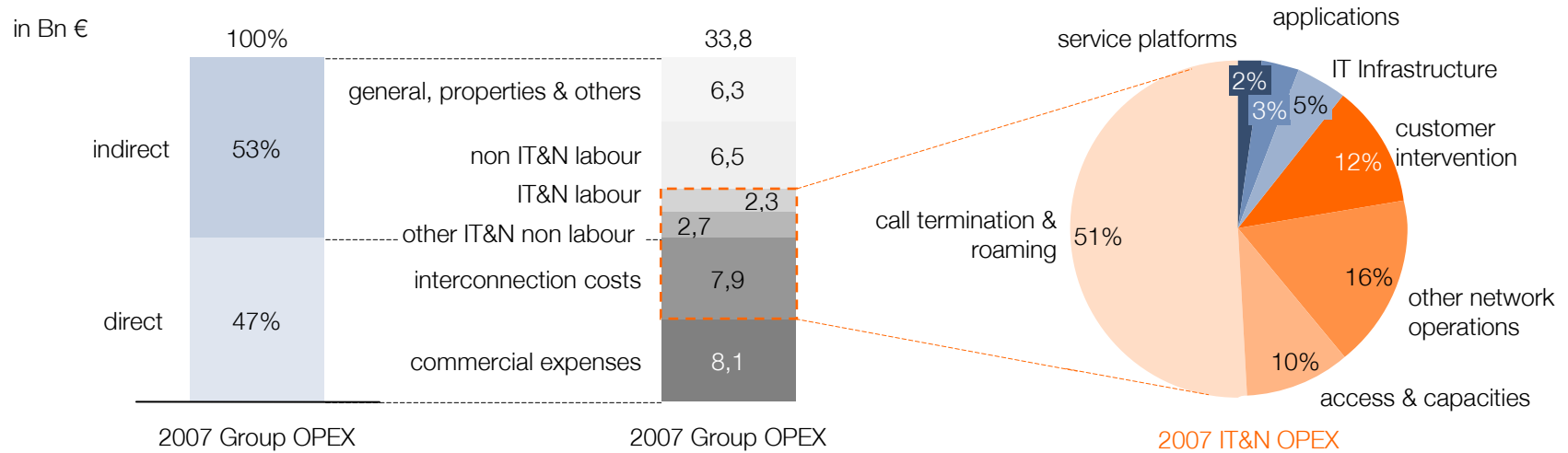
UK			
coverage		subscribers	
ULL	59%	ADSL	1m
3G+Edge	93%	mobile	15,8m
3G+(HSDPA)	71%	mobile BB	2,9m

Spain			
coverage		subscribers	
ULL	67%	ADSL	1,2m
3G+Edge	93%	mobile	11,2m
3G+(HSDPA)	81%	mobile BB	2,8m



note : end 3Q 2008 figures

# in 2007, 47% of Group OPEX were direct and 37% of CAPEX were for growth



\*eg, FTTH programs subject to decision investment, content and new usage platforms  
 \*\*eg, 3G, Livebox and broadband in mature countries, network in emerging countries  
 \*\*\*eg, PSTN and 2G legacy network and IT in mature countries, real estate

# agenda

1

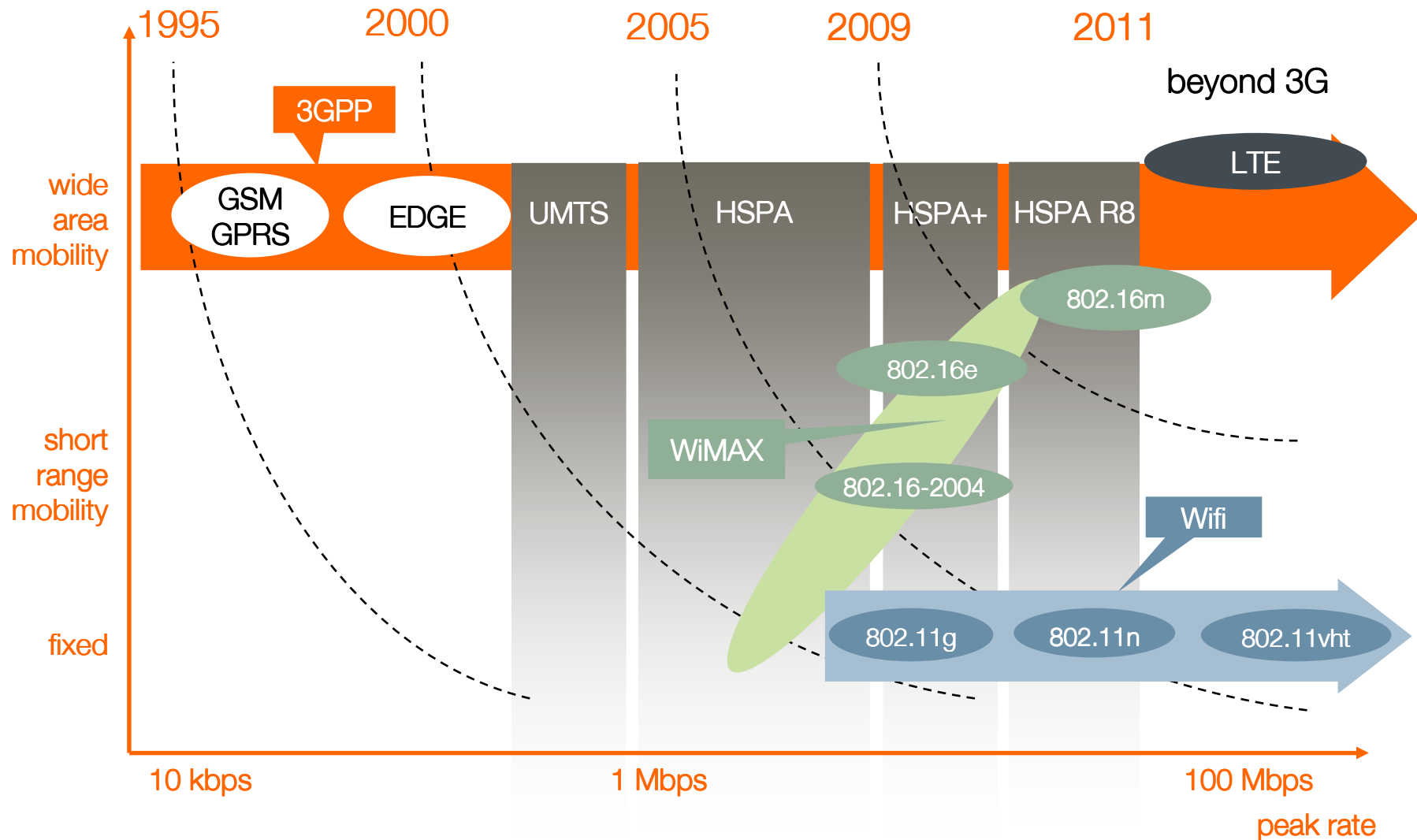
IT&N summary

2

focus on mobile data

- technology
- roadmap
- scalability levers

# wireless access networks: peak throughput increasing, yet bandwidth is shared among customers



# next generation wireless access: broadband roadmap

3G

- > 9M 3G customers mid-2008, more than 2x year on year in most Orange countries
- introduction of 3G shows strong increase in data traffic
- moderate capacity extensions needed thanks to scalability of Gigabit Ethernet, IP and WDM

3G+

- HSDPA delivered in top cities with 7.2 Mbps capable downlink in 2008, 14.4Mbps capable in 2009
- improved uplink performance with HSUPA, with  $\approx$  2 Mbps capable (>5 Mbps capable in 2009)
- all new 3G sites HSPA-enabled from beginning 2008
- latency also improved, enhancing overall customer experience

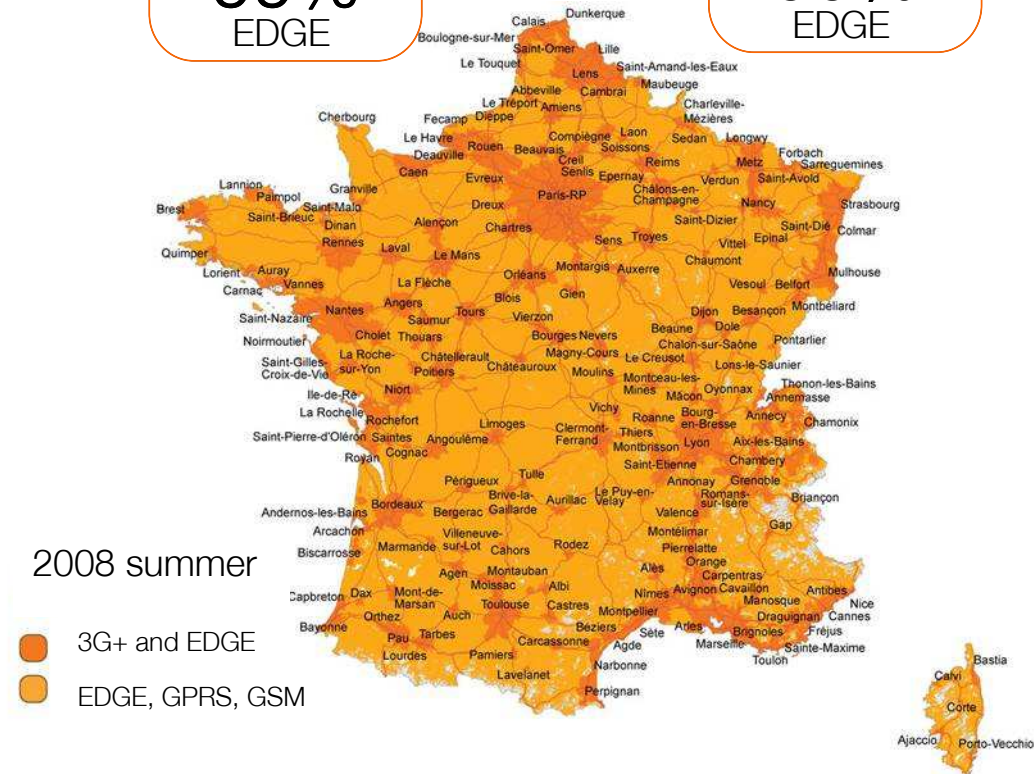
Wimax

- potential technology for fixed broadband access in specific conditions (e.g. Romania and some Africa countries without 3G)

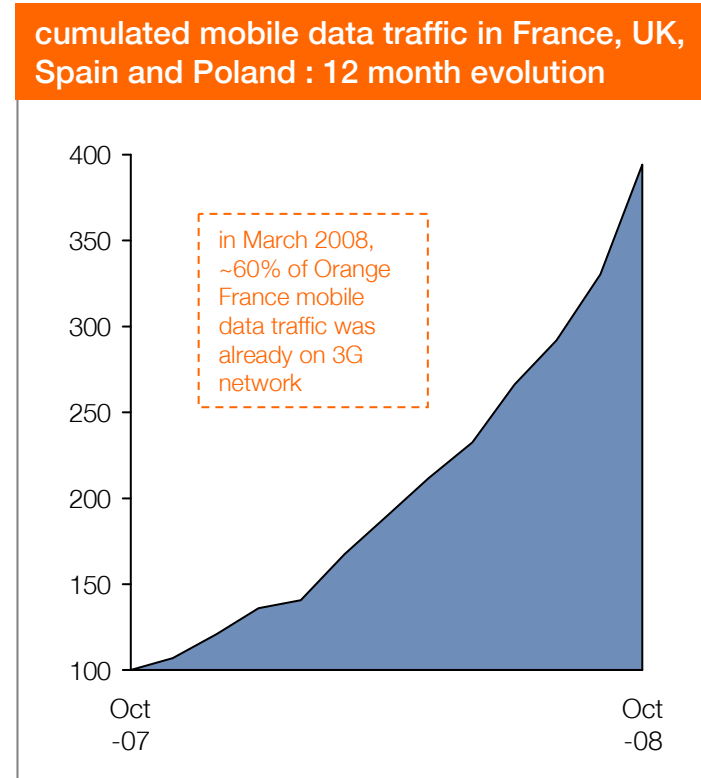
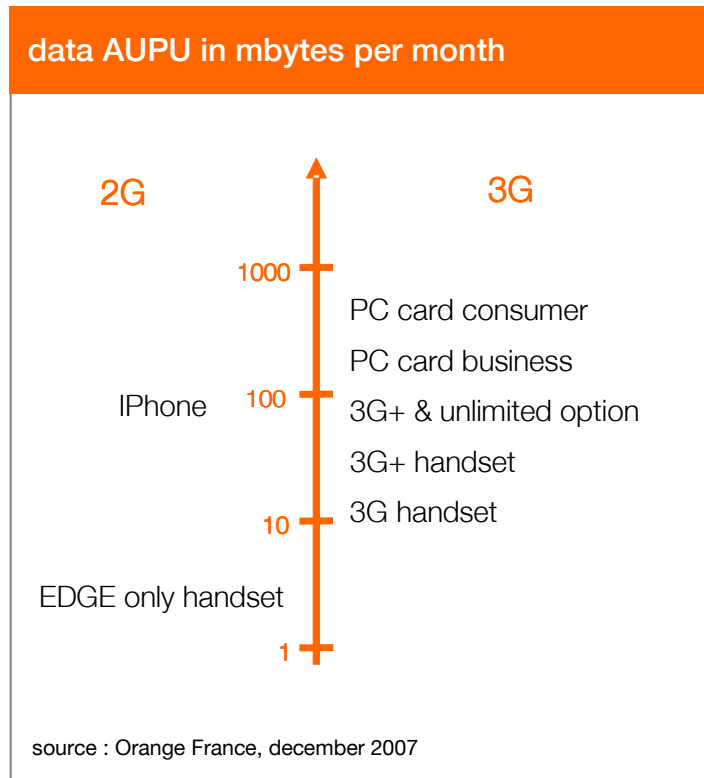


# extending 3G+ coverage: example of France

- High Speed Uplink (HSUPA) tested in Lyon end of 2007
- end of 2008: 71% of population covered with 3G+, including 53% at 7.2 Mbps capable downlink
- HSUPA deployment in 2008: 71% of population covered at 1.4 Mbps capable uplink end of 2008
- 2009: deployment of 14.4 Mbps capable downlink and 5.8 Mbps capable uplink
- 2009: extension of 3G+ coverage in less dense areas beyond 75% of the population

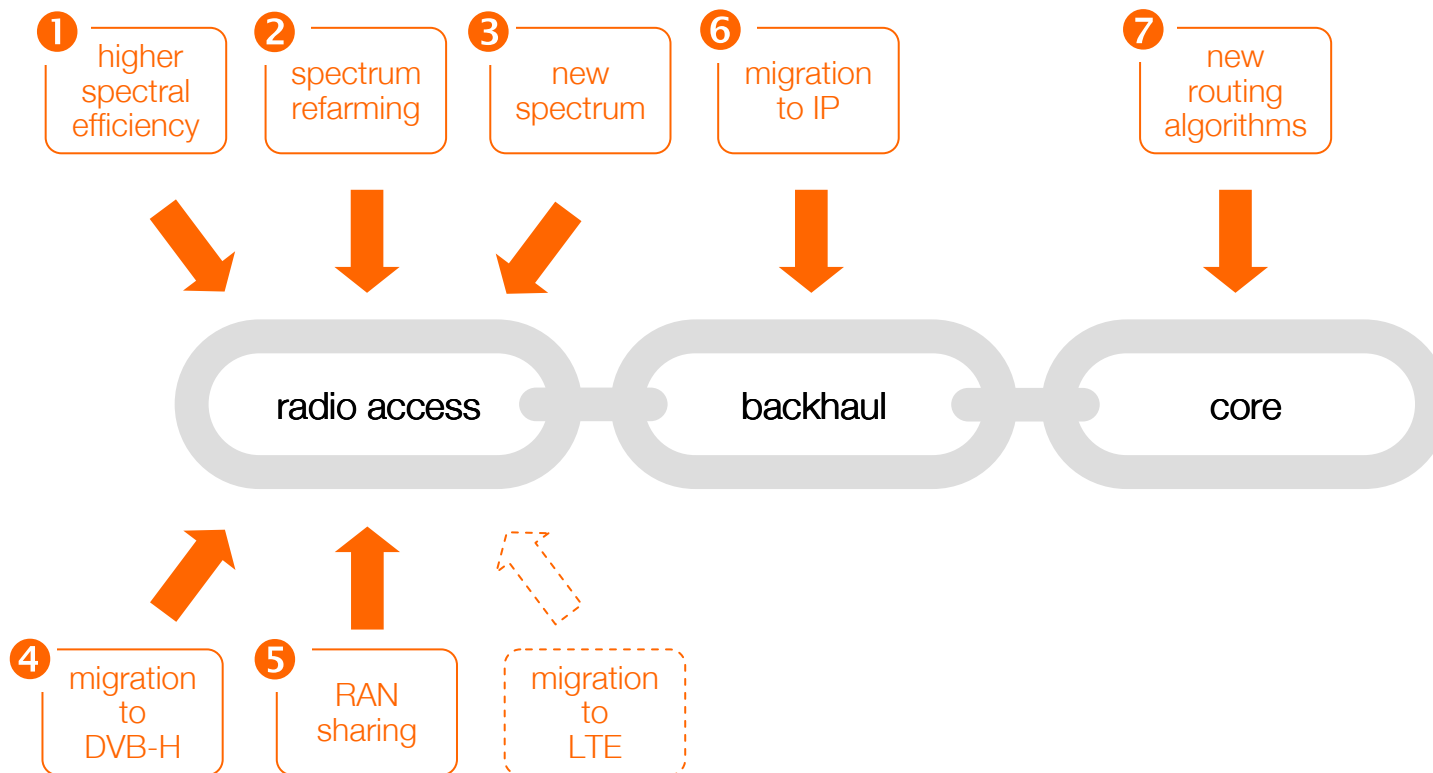


# mobile data traffic: multiplied by 4 over the last 12 months in the four major Orange countries



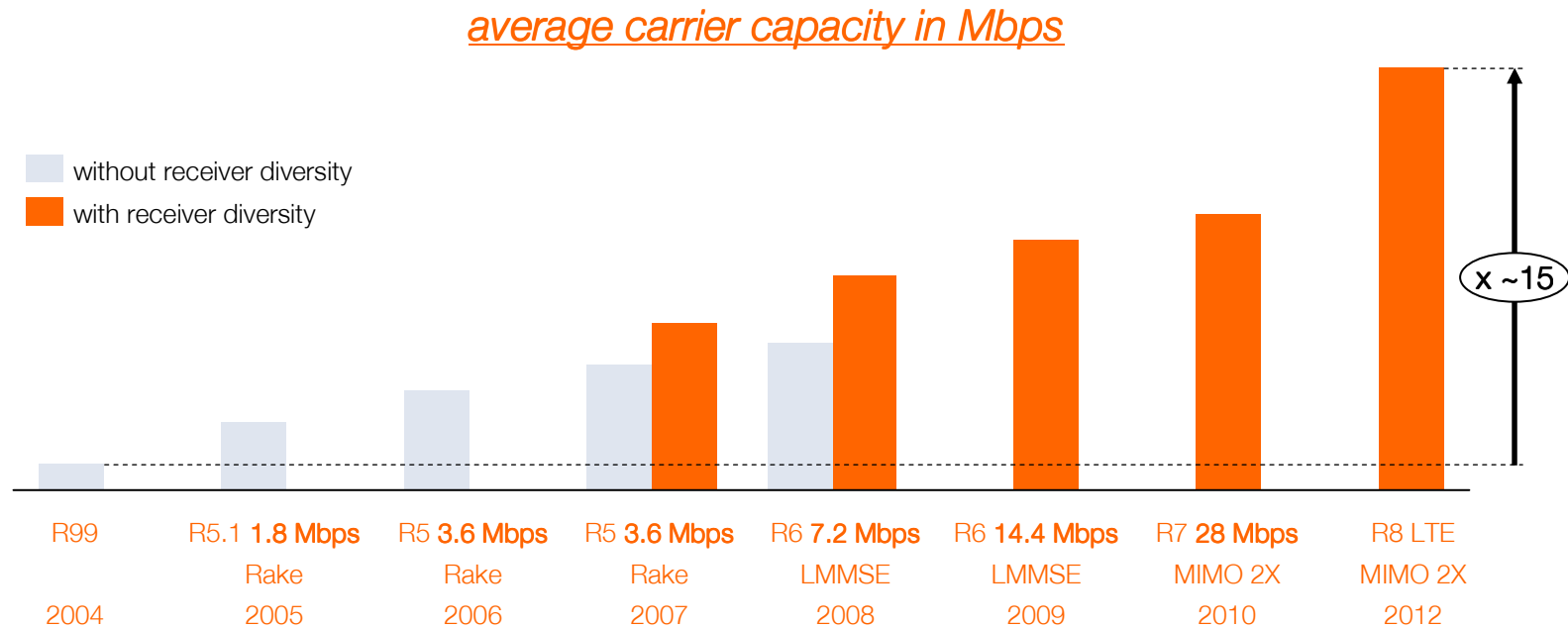
➔ traffic growth driven by new HSPA capable devices and video / Internet based services

within next 5 years, a combination of 7 levers will help absorb mobile data traffic growth without creating new radio sites



→ beyond next 5 years, migration to LTE will yield new optimization levers

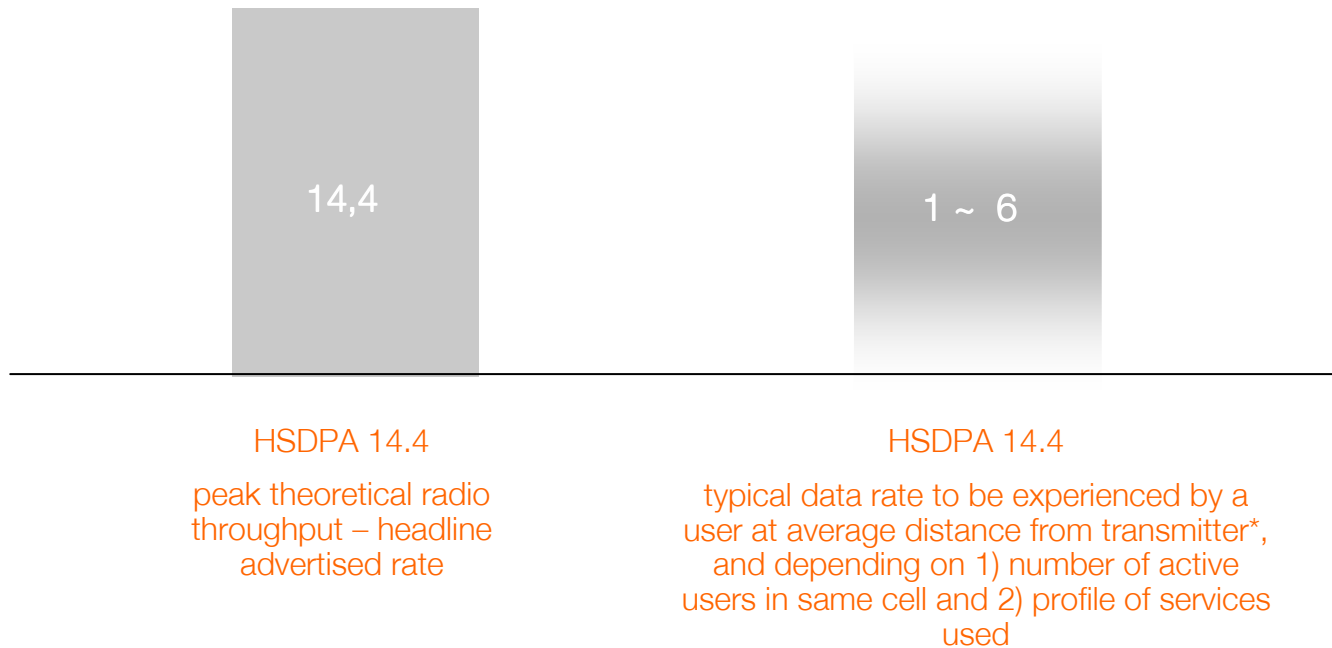
# 1 radio efficiency improves regularly with new features



- improvement requires devices at the same level of standard to achieve full capability
- some devices features greatly influence capacity, notably receiver diversity and advanced receiver

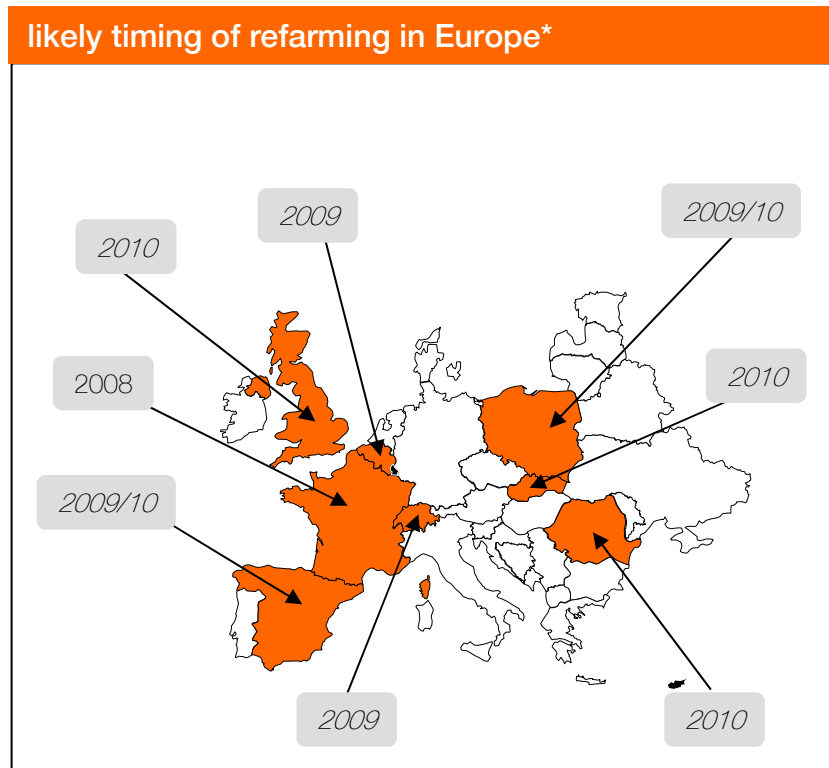
# 1 yet, peak theoretical radio throughput does not directly translate into end user bandwidth experience

in Mbps



\* higher data rates can be achieved if user is closer to the transmitter

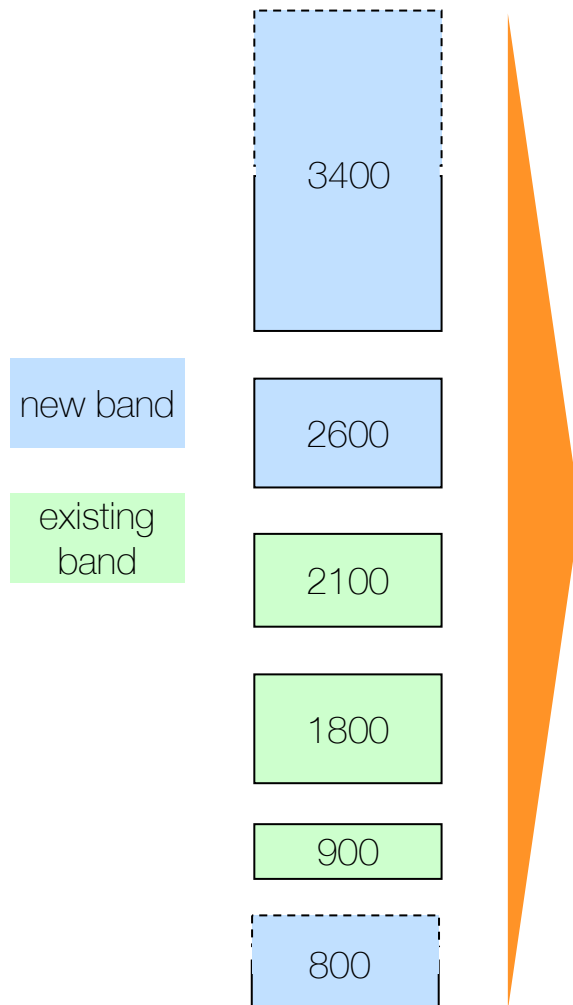
## 2 refarming will allow Orange to fully exploit its existing spectrum assets



\*forecast data in italics

- use of 900/1800 bands is limited to GSM technology by European GSM directive
- likely to be repealed in early 2009 to allow for technology neutral approach to spectrum management (refarming)
- responsibility of each member state to determine how it will implement the repeal
- in some countries, e.g. France, it is already effective
- timing in most other countries will be 2009-10

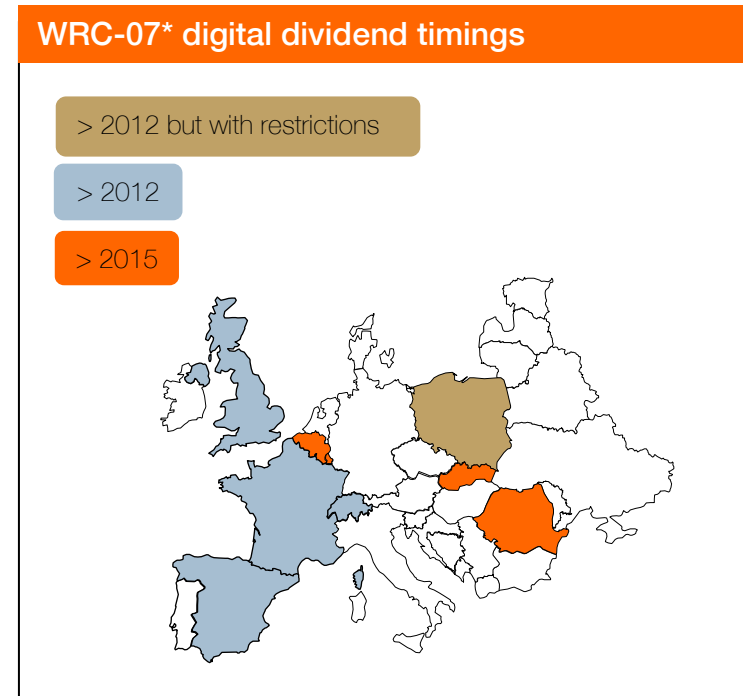
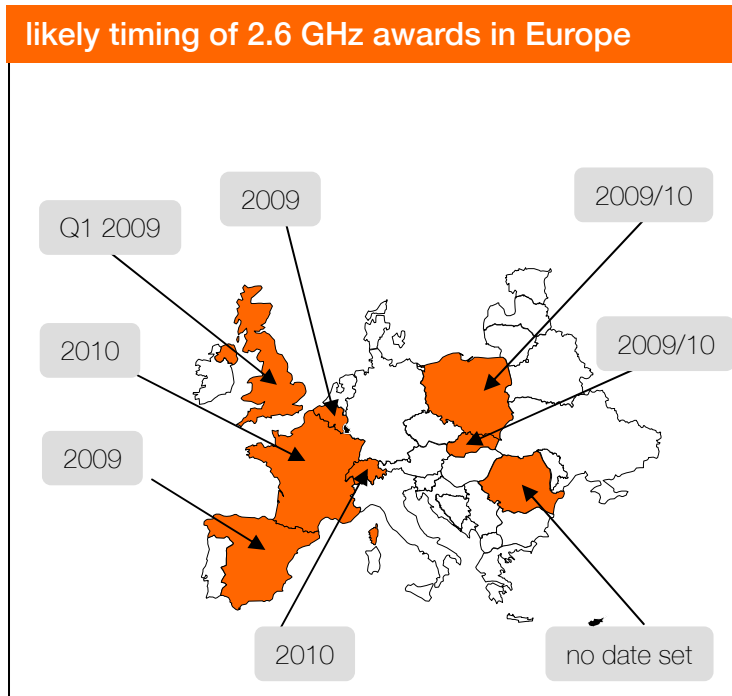
### 3 there are a number of options to deliver increased spectrum capacity



#### key determinants of spectrum strategy

- level of new band harmonisation (scale economies)
- device support for new bands
- quality of spectrum band (levels of interference with other bands)
- amount of spectrum available within band
- frequency of spectrum band (lower is generally better but usually less spectrum available)
- refarming of existing country spectrum holdings
- price of spectrum award
- timing of new band availability

### 3 likely timing of spectrum awards on Orange footprint



\* World Radiocommunication Conference 2007



## 4 mobile TV: the best quality everywhere

### 3G / 3G+

- unlimited number of channels
- VOD
- interactive services

- HD Mobile TV over 3G / 3G+ already launched in France, Switzerland and Portugal
- 2009 launches in the UK, Spain and Poland

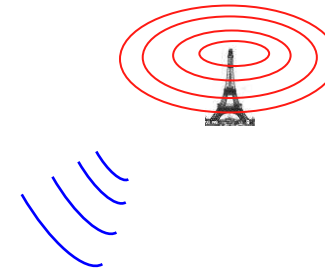
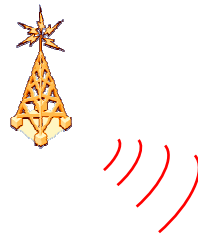
### Wifi / UMA

- HD Mobile TV over Wifi / UMA launched in France
- availability of more than 7,5M Livebox in Europe

### mobile multicast

- unlimited number of simultaneous viewers
- limited (~15/20) number channels

- One (Orange Austria) has launched DVB-H in June 2008
- on-going preparation of DVB-H launches in France and Poland, and TdTV trial in the UK



→ improving mobile TV coverage, including indoor, with seamless switching between best-of-breed networks, is our 1<sup>st</sup> priority

## 5 RAN sharing in Spain

### UTRAN 3G sharing

- accelerate UMTS coverage in areas below 25,000 inhabitants, reducing the number of site needed for deployment, allowing mobile access to broadband in small cities, reducing environmental impact, operating costs and investment
- agreement with Vodafone to deploy 5,000 Nodes B (2,500 per operator) over 2007-2011, splitting Spain into 2 areas

### current status

- 29% population coverage in RAN sharing areas
- 15% indoor coverage in RAN sharing Areas
- node B rollout on track
- some nodes B in RAN sharing area will be moved and reused in non RAN sharing areas



→ approx. 170 M€ CAPEX and OPEX savings over 5 years targeted by Orange

## 5 radio site sharing in UK

### 2G and 3G site share

- whilst remaining competitors, cooperative site sharing agreement signed with Vodafone covering consolidation of existing 2G and 3G sites and rollout of new sites.

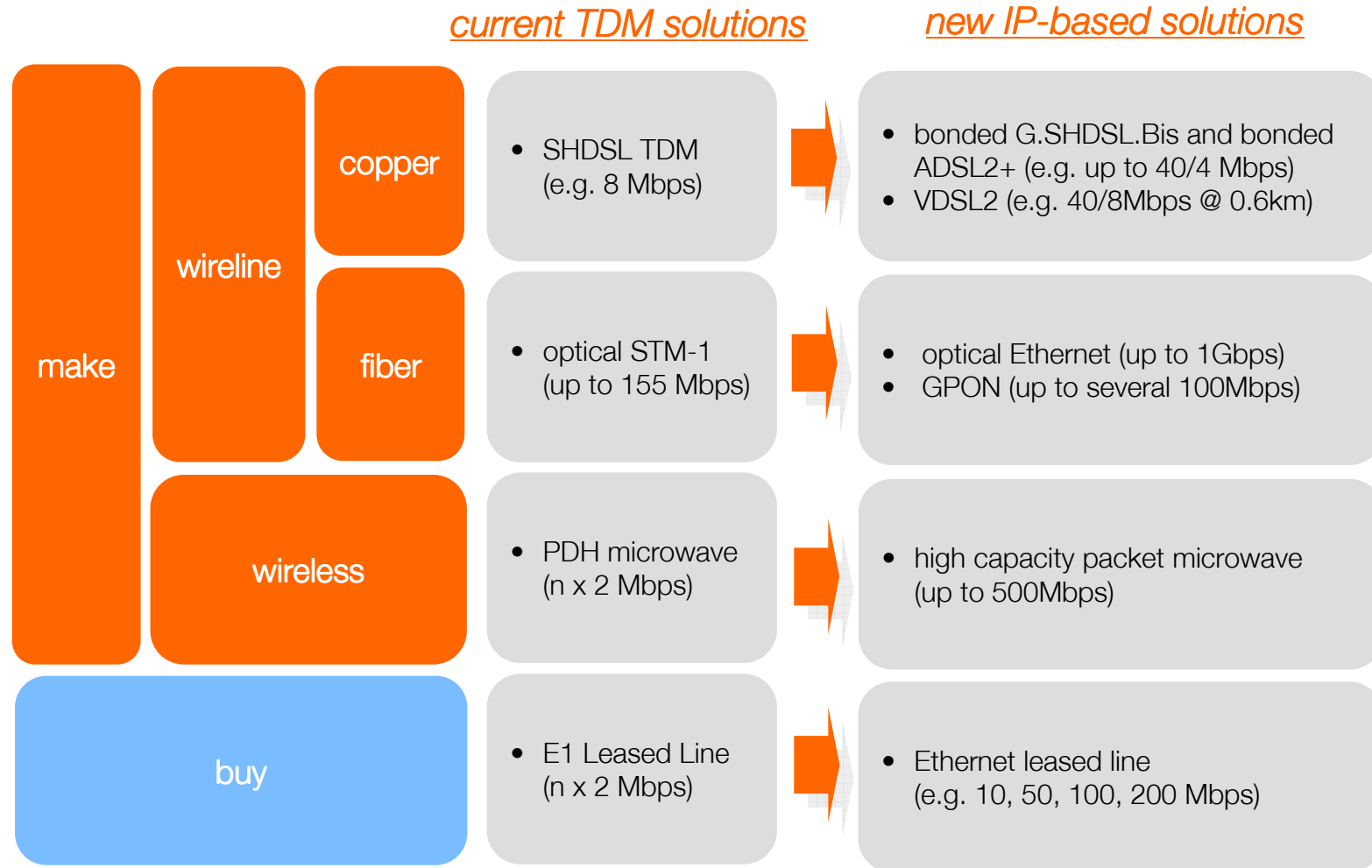
### benefits

- customers will be able to make calls and use the mobile internet in a wider geographic area
- the expected reduction in costs releases money to reinvest in other products and services
- positive impact on the environment from site reduction

### moving forwards

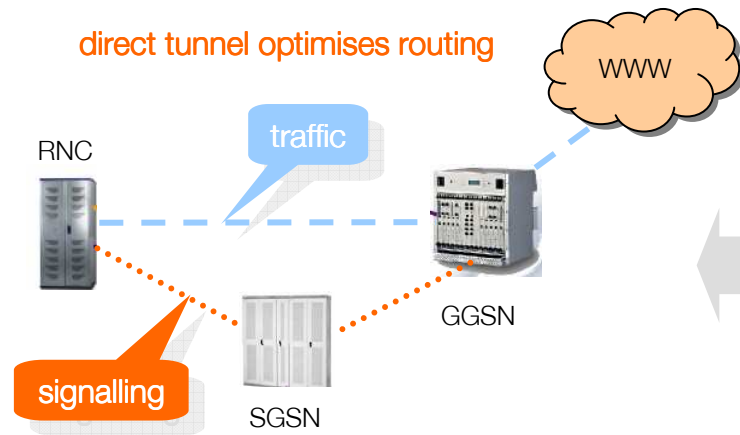
- long term commitment made to investigate further opportunities with Vodafone

## ⑥ new IP backhaul solutions reduce unit costs



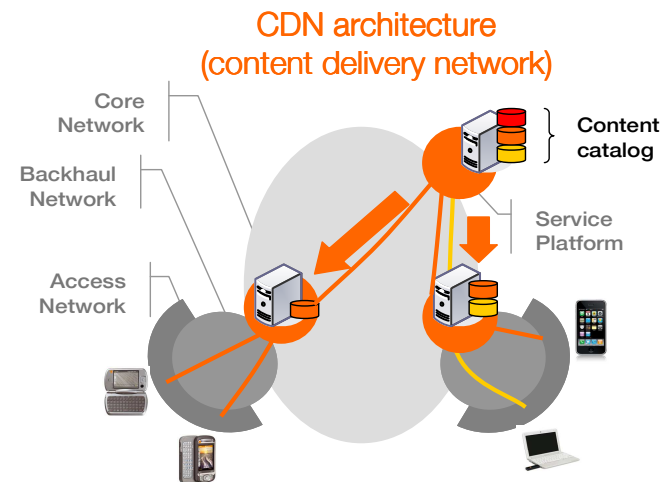
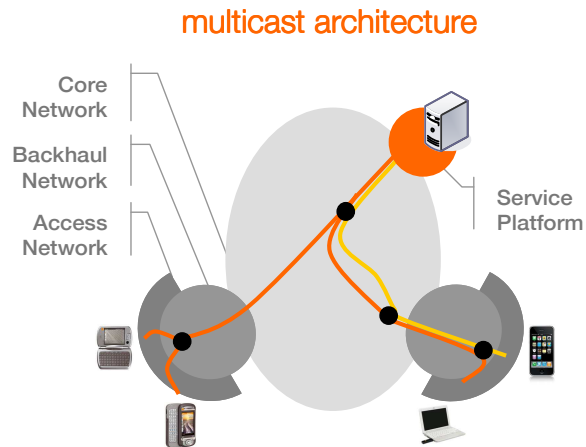
➔ migration from TDM solutions to IP based solutions provides lower cost per bit and scalability towards high traffic volumes

# 7 routing in the network can be optimised for the different data services



RNC: Radio Network Controller  
SGSN: Serving GPRS Support Node  
GGSN: Gateway GPRS Support Node

for high traffic data services such as real time TV premium channels, real time TV long tail, Video on Demand, internet access, video streaming, solutions are being developed to minimise investment, provide quality of service and scalability





thank you