

Addressing Electromagnetic fields concerns

ISR presentation
29/09/2009



agenda

1 electromagnetic fields in few words

2 antennas : respect of ICNIRP limits at the heart of our corporate policy

3 mobile phones : responsibility as a driver

agenda

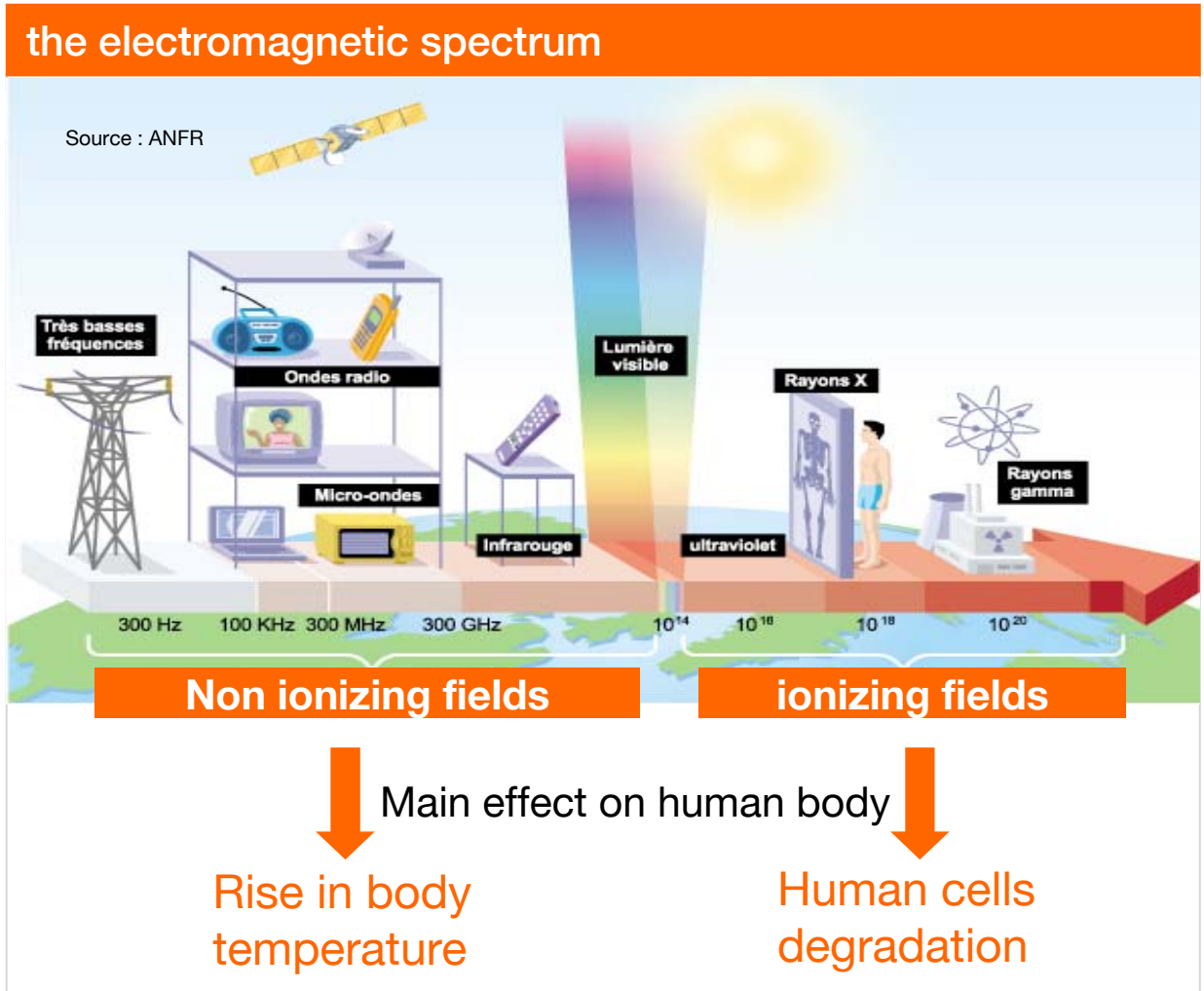
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1 | electro magnetic fields are everywhere

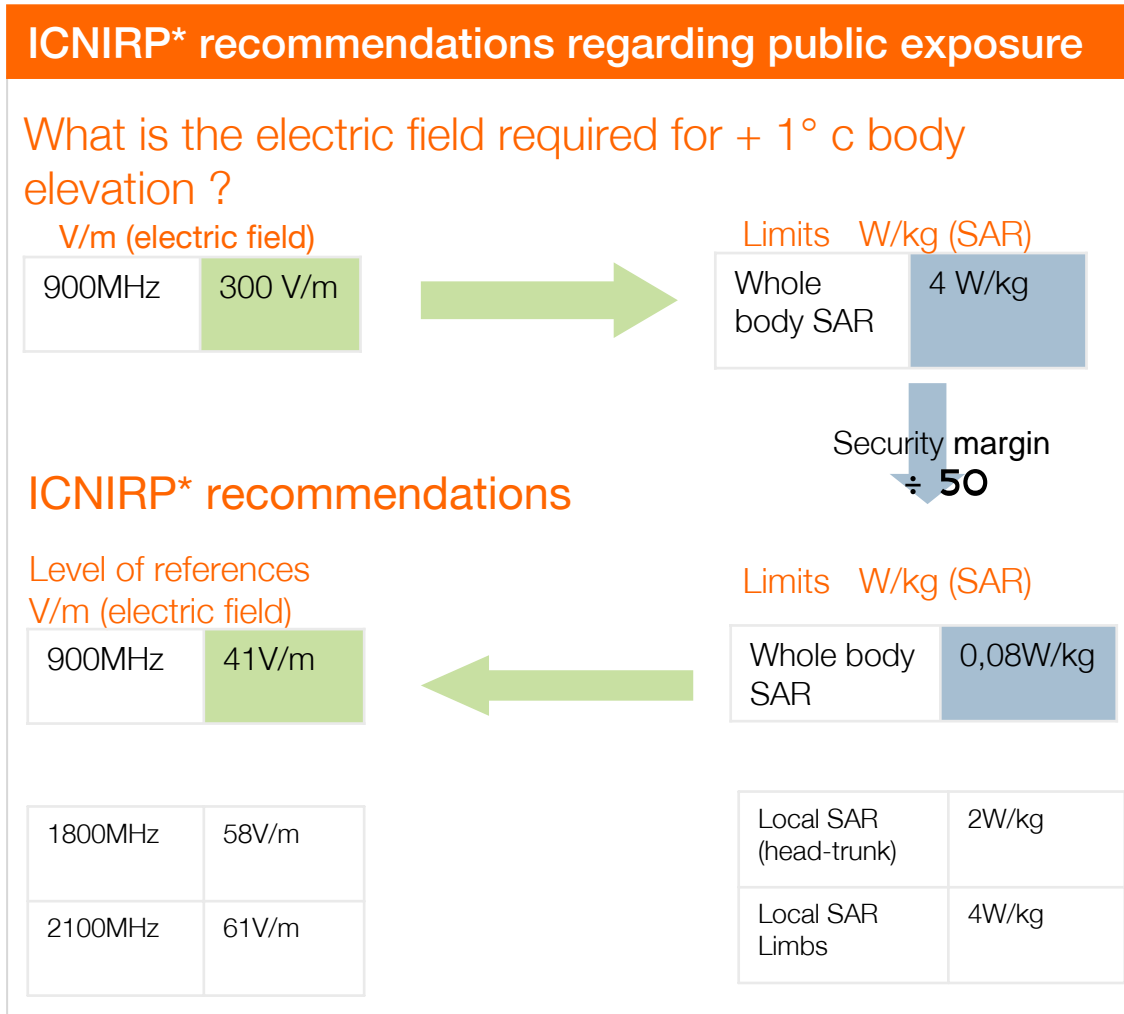
radio frequencies are non-ionizing ones



Insight

- radio, TV and mobile phone frequencies are in the same non ionizing spectrum range
- contrary to ionizing fields, non ionizing fields do not damage cells or increase cancer risk
- mobile phone use electromagnetic waves in frequency bands of :
 - 900MHz
 - 1800MHz
 - 2100MHz

1 | a domain handled by scientific recommendations



Insights

- the Specific Absorption Rate (SAR) quantifies the absorbed power per mass unit
- to reduce people exposure, ICNIRP recommends International limits
- above 4 watts/kg, the body temperature can increase of 1°C
- a security factor of : 50
- ICNIRP considers that to date there are no known health effects below :
 - Whole body : 0.08 W/kg
 - Local SAR over 10 grams : 2 W/kg (in non extremity)

* ICNIRP : International Commission on non ionizing protection

1 | long track record of worldwide scientific researches

Orange brings its expertise by taking an active part in dosimetry research

numerous studies published in the world end of 2008

| Type of study | Ongoing | Not-yet published | Published |
|---------------|------------|-------------------|--------------|
| Physics | 81 | 14 | 479 |
| Epidemiology | 43 | 11 | 273 |
| Human | 58 | 17 | 207 |
| Animal | 47 | 30 | 781 |
| Cellular | 61 | 30 | 448 |
| Total | 290 | 102 | 2 188 |

numerous independant contributors



Insights

- Orange actively participates in Research by taking part in international standardization working groups (e.g. CENELEC, IEC, ITO, ETSI) for equipment design and installation.
- Orange focuses its contribution in dosimetry and metrology
- Orange contributes financially to public research as laid out in the WHO Research agenda
- Orange monitors worldwide scientific research in order to remain aware of the latest results concerning EMF, and make this information readily available to everyone

1

a global scientific consensus on no adverse health effects confirmed by most recent Health Authorities opinions



« Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects “- WHO Fact Sheet n°304, May 2006



“ Several groups of independent experts appointed by the WHO, the European commission or by the French government have studied the effects on health of electromagnetic fields on a world, European or national level. *All these groups concluded that in the current state of scientific knowledge and given the low levels of exposure to electromagnetic fields around relay stations, the hypothesis of a risk to the health of populations living near to the stations cannot be envisaged* - French Health Ministry, August 2009



“It is the opinion of ICNIRP that the scientific literature published since the 1998 guidelines has provided no evidence of any adverse effects below the basic restrictions and does not necessitate an immediate revision of its guidance on limiting exposure to high frequency electromagnetic fields”- *Opinion from ICNIRP, August 2009*

COMAR

COMAR recommends that public health officials continue to base their policies on RF safety limits recommended by established and sanctioned international organizations such as the Institute of Electrical and Electronics Engineers International Committee on Electromagnetic Safety and the International Commission on Non-Ionizing Radiation Protection, which is formally related to the World Health Organization - Committee on Man and Radiation (USA) Health Physics, September 2009

1 | reports call into question current recommendations their lack of balance and methodology make them toothless



Doubt

"The scientific evidence tells us that our safety standards are inadequate, and that we must protect ourselves from exposure to EMF due to power lines, cell phones and the like." Research professor and Editor Martin Blank PhD (Associate Professor, Columbia University College of Physicians and Surgeons) in BIOINITIATIVE Report – 12/03/2009



**EC FP6
Coordination Action**

Denunciation of doubt by international authorities

« There is a lack of balance in the report; no mention is made in fact of reports that do not concur with authors' statements and conclusions. The results and conclusions are very different from those of recent national and international reviews on this topic. » European Commission – 2007 in reaction to BioInitiative Report

COMAR

« COMAR [...] concludes that the weight of scientific evidence in the current RF bioeffects literature does not support the safety limits recommended by the BioInitiative group. For this reason, COMAR recommends that government authorities and public health officials continue to base their policy on RF safety limits recommended by established and sanctioned international organizations such as IEEE/ICES and ICNIRP, which are formally recommended by WHO » - COMAR Technical information statement - 2009

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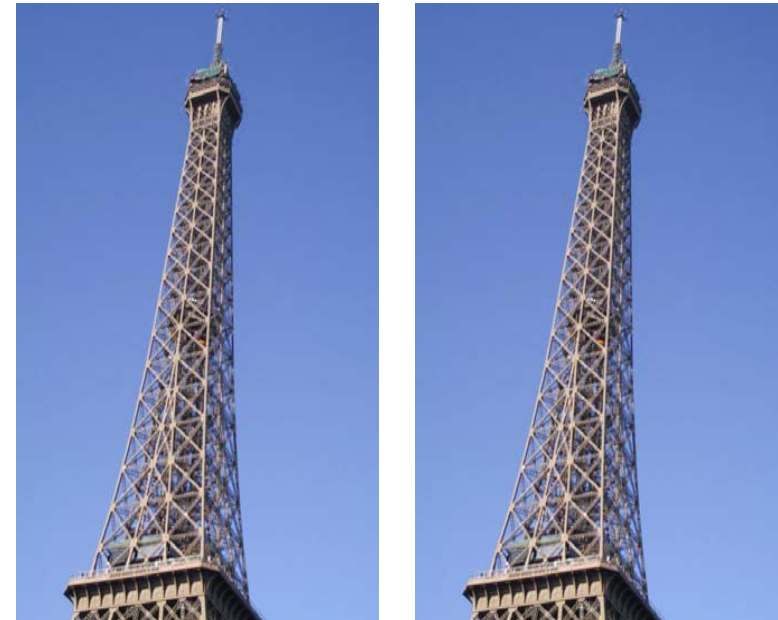
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2

TV and radio broadcast give historical background for EMF exposure from antennas

no health effect identified for 50 years for TV broadcast



Power of all mobile antennas
deployed in France

Orange emission :
c. 60 000 base stations spread over whole
territory with power of 20 to 40 watt each



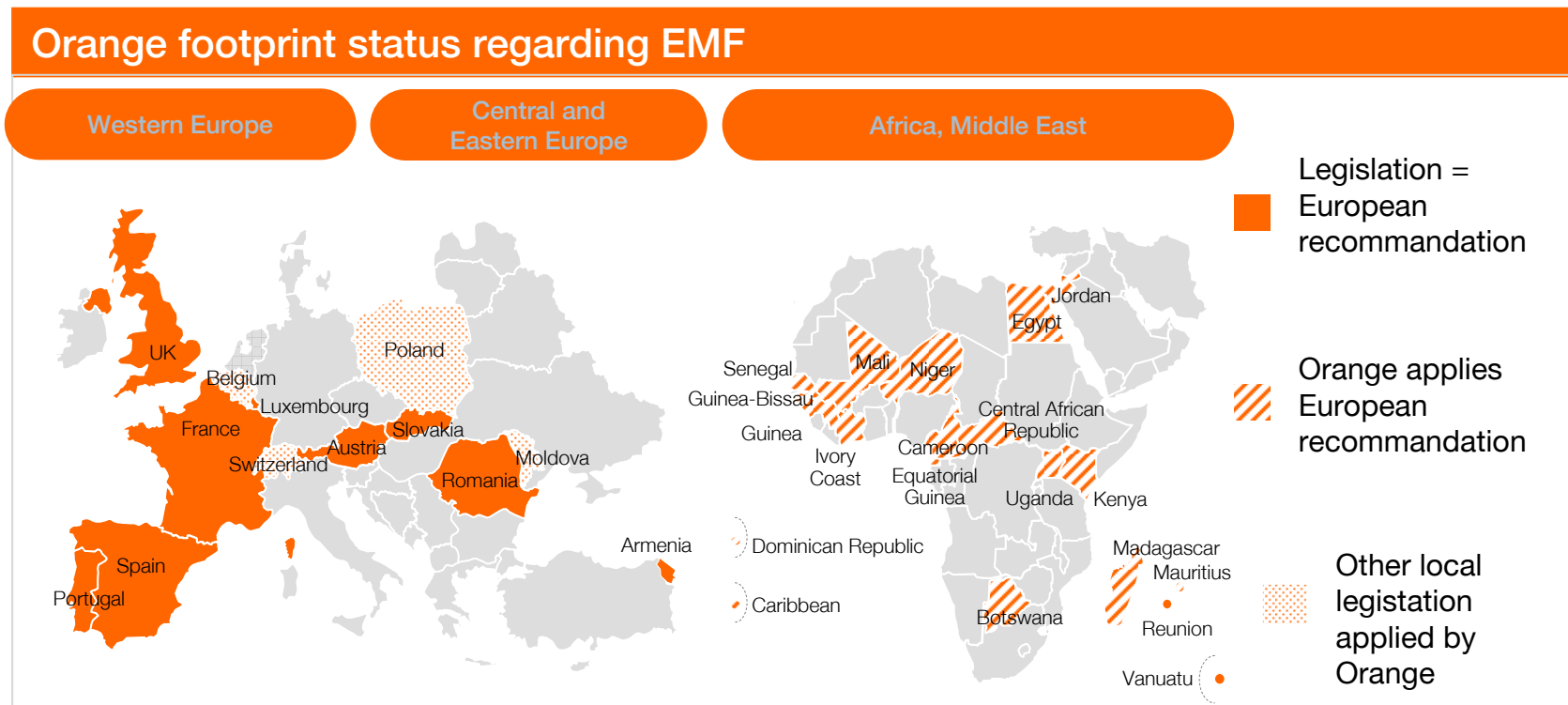
2 Eiffel towers TV Broadcasting
power

Eiffel tower emission :
6 transmitters of 100 to 500 kilo watt each
for analog TV broadcasting + TNT + FM
radio

2

European position as a reference

Orange applies ICNIRP recommendations across all its footprint



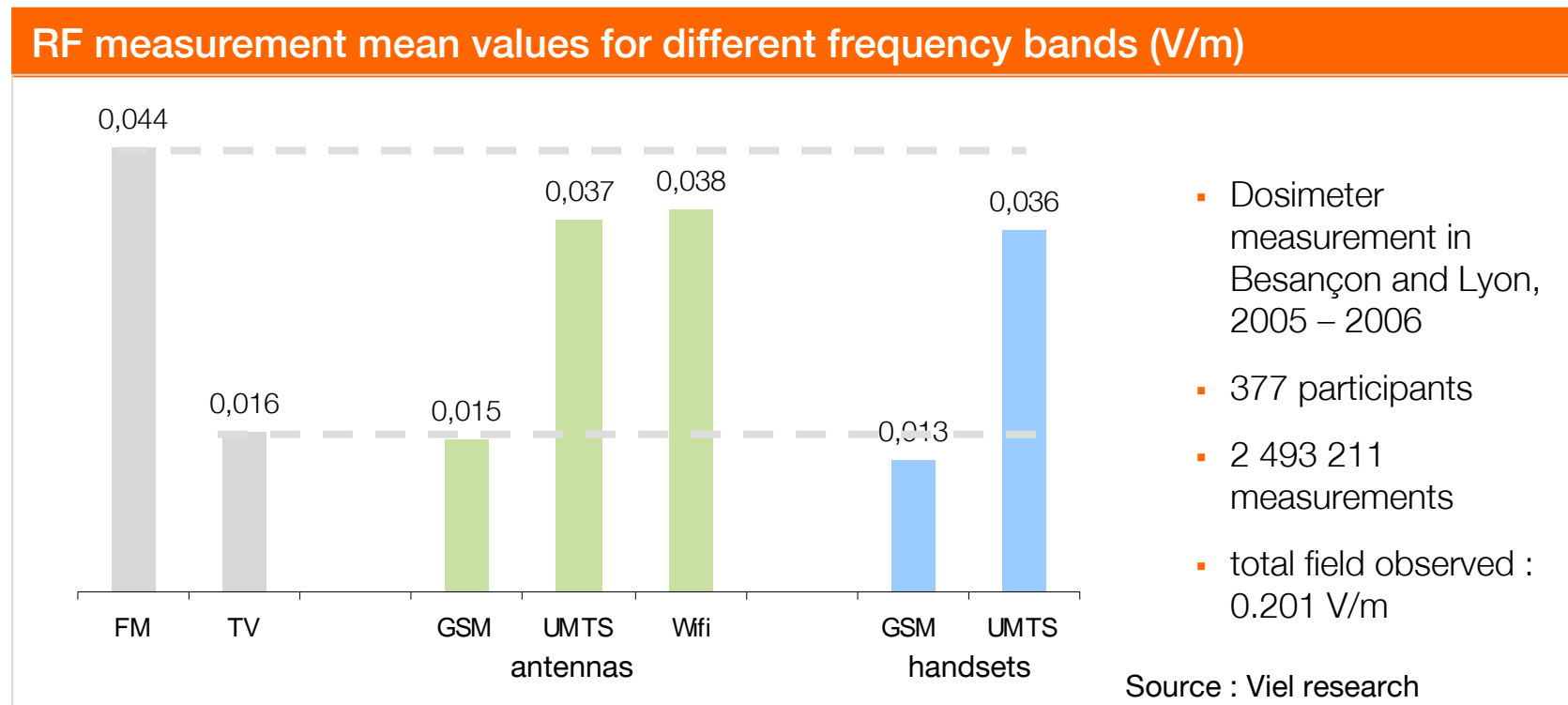
Insight

- Orange complies with national specific legislations
- Orange systematically applies ICNIRP and IEEE international recommendations in the absence of national legal standards
- Orange measures and audits (France, Switzerland, UK...) show full compliance

2

EMF exposure

measurements show very limited average exposure



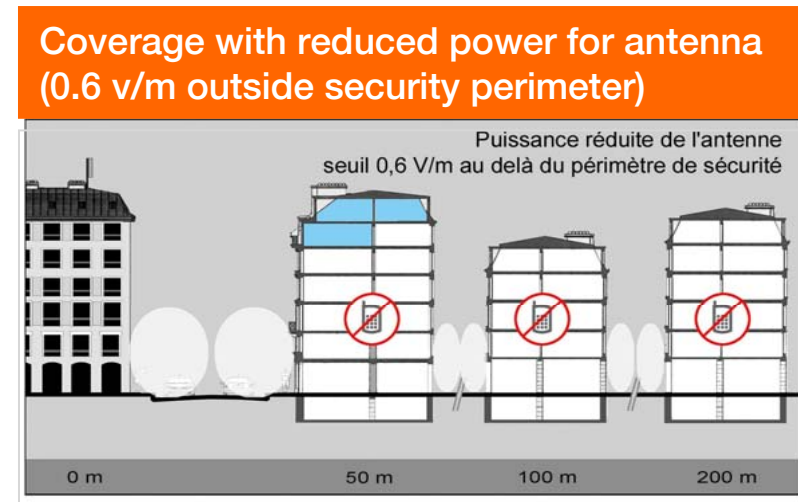
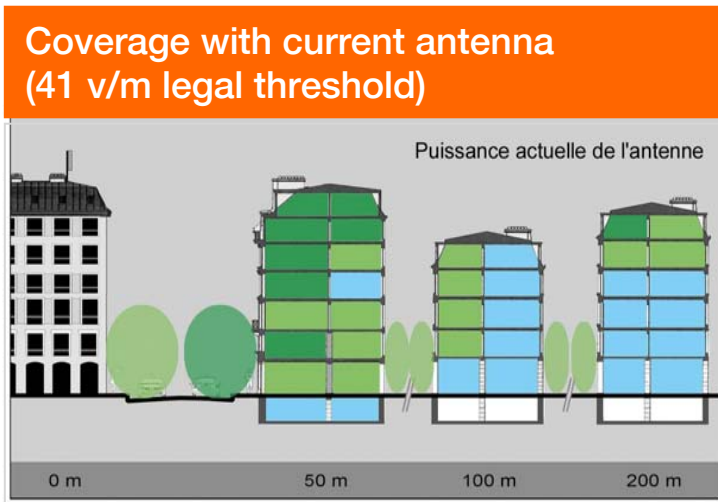
Insight

- Antennas deployment real conditions show very limited average exposure
- regular simulations and experimentations across the footprint
- In France following Grenelle2/ComOp, vast campaign with simulations and experimentation launched.

2

EMF exposure

less powerful antenna means more antennas to achieve the same quality of service



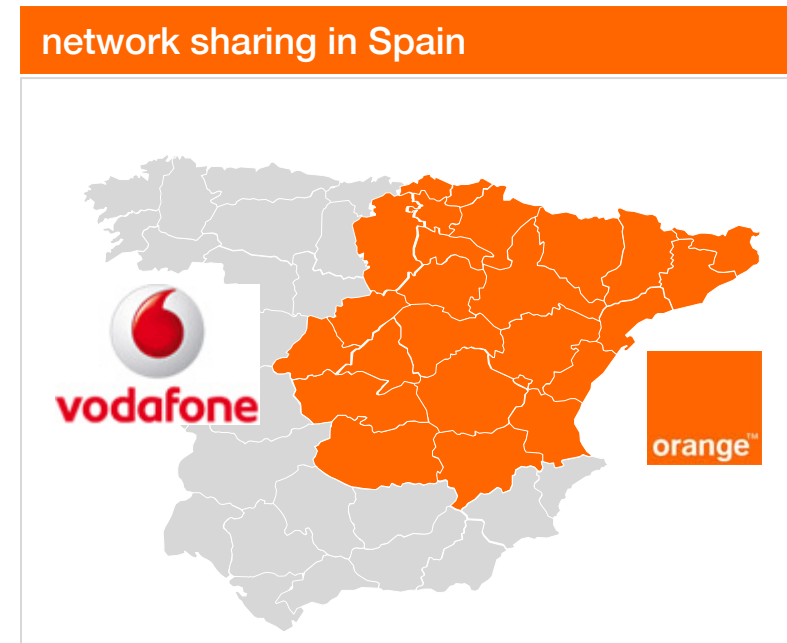
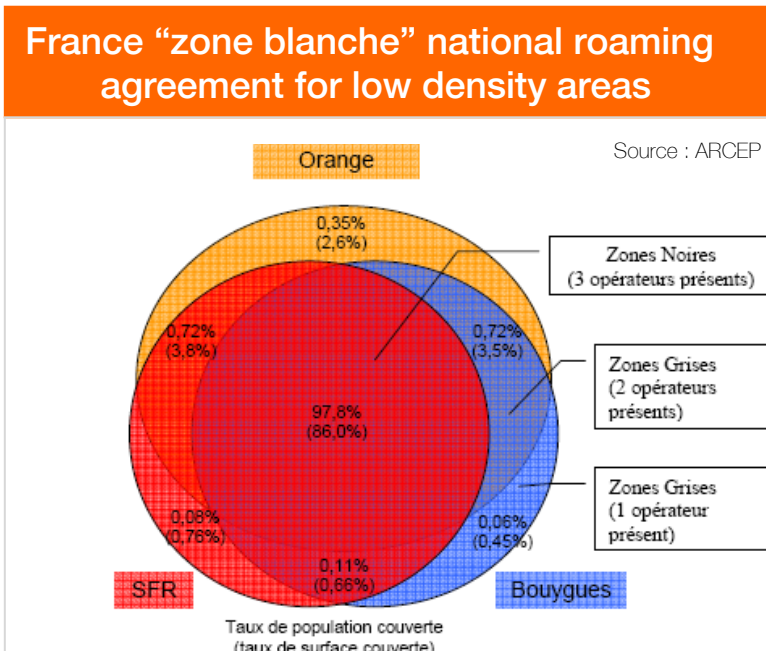
Insight

- Internal experiments show that to reach same indoors coverage with 0.6 v/m antennas, their number should be multiplied several hundred times
 - Issue of visual pollution
 - Need to put the antennas closer to the street
- Orange network architecture optimizes quality of service (voice and data) and power (cost of electricity consumption)

2

EMF exposure

Orange initiative to reduce EMF exposure



Insight

- **specific roaming agreement** : France “zone blanche” agreement with operators for non dense areas allows for better coverage without sur-numerous antennas
- **Network sharing** : Orange and Vodafone have shared their 3G radio networks in 19 rural areas of Spain. The two operators expect to be able to reduce their impact in the rural areas by 40%, while also increasing coverage by 25%.
- **Orange Lab’s research** : LSDN (low SAR devices and Network) research programme launch in 2006 to optimize people exposure according to their communication needs

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3

a precautionary approach is still recommended for mobile devices

sanitary authorities regarding mobiles recommend to carry on research and precautionary approach



French Ministry of Health,
January 2008

- *"No scientific proof currently shows that using mobile telephones presents any real risk to health a precautionary approach for either adults or children. [..] As the hypothesis of a risk cannot be completely excluded, a precautionary approach is justified"*



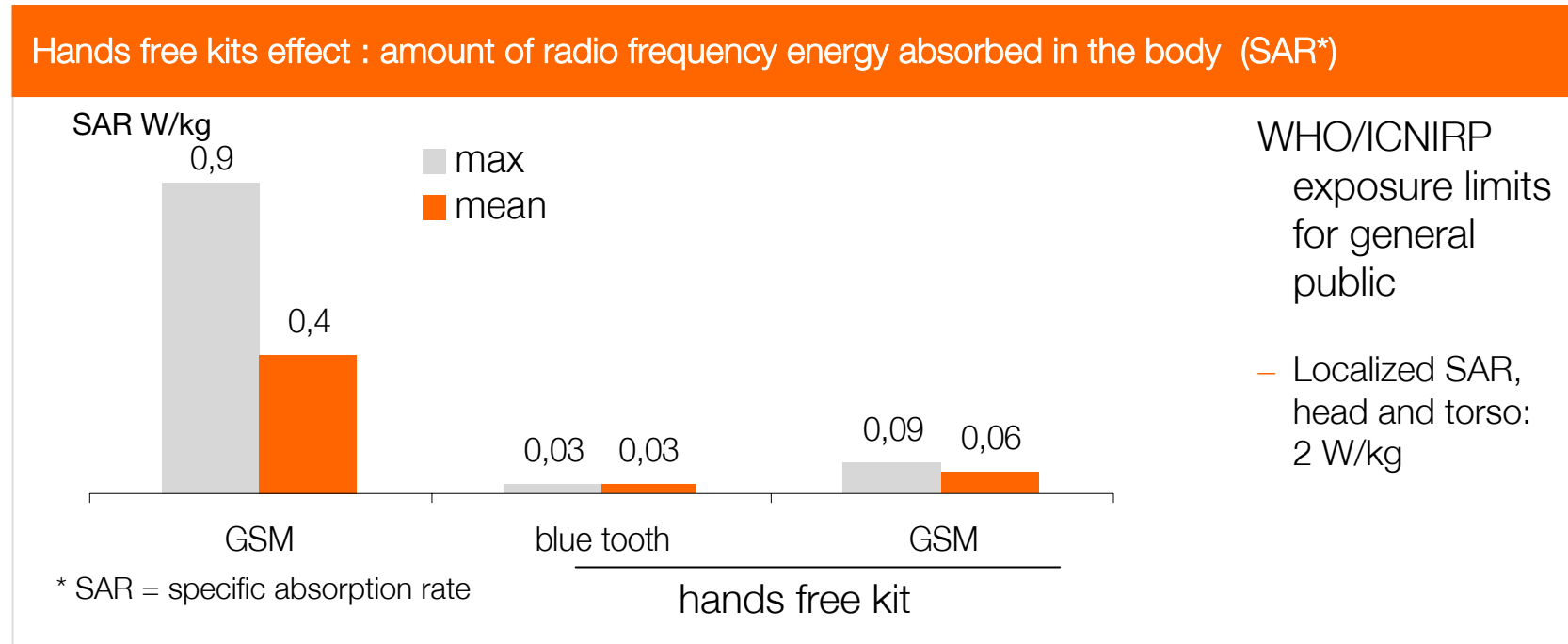
- *The WHO recommends further research into mobile phones – May 2006*

Insight

- Even if there's no established risk, Orange promotes a responsible use policy regarding mobile phones
- a corporate policy based on 2 principles :
 - information transparency
 - hands free headsets kits promotion

3

hands free kit reduces absorption by c.10 SAR is decreasing dramatically with distance



Insight

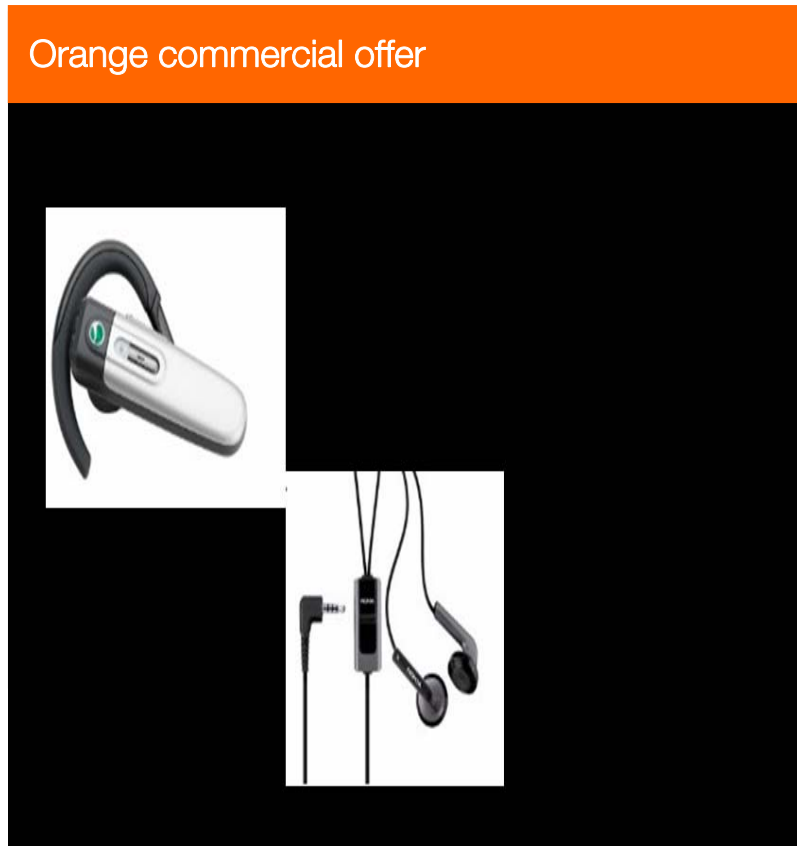
EMF exposure from mobile devices is reduced when

- using a hands free kit
- calling in good reception area (full bar number reception)
- not calling when fast traveling (to reduce handover)

3

promote responsible use of our services

hands free kit promotion



Insight

- Orange promotes use of hands free kits
 - included for free in all mobile devices packages sold in France
 - recommended in all our footprint
- New KPI implemented at Group level: percentage of mobile phone sold with hands free kits in Orange shops

3

promote responsible use of our services transparency for information to consumers

Orange communication tool kits illustrations

performance environnementale : $\times/5$ mon mobile

- > CO₂ xx kg eq CO₂ (fabrication, transport, utilisation)
- > efficacité énergétique ●●●●●
- > préservation des ressources naturelles..... ●●●●●
- > limitation des substances dangereuses..... ●●●●●
- > recyclabilité..... ●●●●●

en partenariat avec 

* exposition aux ondes (DAS) : \times W/kg (maximale autorisée : 2 W/kg)

Orange communication tool kits illustrations

Security information in the manufacturer's notice

- concerning implants, aural equipments, cars, planes, information on SAR certification

Bolito bezpečnostná informácia

Implantované zdravotnícke prístroje

Výrobca upozorňuje, že na nainštalovanie a používanie implantovaných zdravotných prístrojov je potrebné dodržovať špecifické pokyny, ktoré sú súčasťou príslušných návodov na použitie. Každý zdravotný prístroj má svoje špecifické požiadavky na nainštaláciu a používanie. Všetky zdravotné prístroje sú navrhnuté tak, aby boli bezpečné a účinné. Výrobca neodporúča používať zdravotné prístroje, ktoré nie sú určené na použitie v zdravotníckych zariadeniach. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu. Výrobca neodporúča používať zdravotné prístroje, ktoré nie sú určené na použitie v zdravotníckych zariadeniach. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu.

Potenciálne expozície prostredia

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Tiešňové volania

Vo výrobe sú zahrnuté funkcie, ktoré umožňujú uskutočniť núdzové volania. Tieto funkcie sú navrhnuté tak, aby boli bezpečné a účinné. Výrobca neodporúča používať tieto funkcie, ktoré nie sú určené na použitie v núžových situáciách. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu. Výrobca neodporúča používať zdravotné prístroje, ktoré nie sú určené na použitie v zdravotníckych zariadeniach. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu.

INFORMÁCIA O CERTIFIKÁCI (SAR)

Všetchní výrobci přístrojů upozorňují na expozici uživatelů elektromagnetickým vlnám. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu. Výrobca neodporúča používať zdravotné prístroje, ktoré nie sú určené na použitie v zdravotníckych zariadeniach. Každý zdravotný prístroj musí byť nainštalovaný a používaný podľa pokynov výrobcu.

Insight

- SAR is mentioned with devices sold, through our Eco labelling campaign, or in stores
- Orange Health and security information is available – either in Orange guide in handset boxes, and/or in local Orange website.

Orange responsible positioning

- For antennas, scientific consensus on no identified risk for health
 - we have historical background provided by other transmitters
 - Orange applies at least European recommendation across its footprint
 - Orange contributes to scientific research in dosimetry
 - Orange complies with mobile licences requirement in terms of quality of service and coverage across its footprint
- For handsets, lack of historical background lead us to apply precaution principle and promote responsible use
 - Transparency of information for our customers
 - Handsfree kit provided with our devices
 - No dedicated offers for children