



Mobile Networks: Exposure Levels and Deployment Policies

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GSM Association

**Regional Seminar: Non-Ionizing Radiation:
Keys for Deployment of Infrastructure and Health Protection**
Buenos Aires, Argentina, 16–7 December 2010



The GSM Association (GSMA)



Latin
America

- International trade association for mobile industry.
- EMF policy should be evidenced based.
- EMF program:
 - Support for independent research.
 - Support for members.
 - External communications.



Latin America Science Review

- Independent.
- Regional and international.
- Science, standards, policies.
- English, Spanish and Portuguese.
- www.wireless-health.org.br

Latin American Experts Committee on High Frequency
Electromagnetic Fields and Human Health

Scientific Review

**Non-Ionizing Electromagnetic Radiation
in the Radiofrequency Spectrum and its
Effects on Human Health**

With a Review on the Standards and Policies of
Radiofrequency Radiation Protection in Latin
America

Organized by:



The Edumed Institute for Education In Medicine and Health
Independent Research Group on the Impacts of Mobile
Technologies on Health

June 2010

Presentation Outline

- Need for infrastructure.
- Exposure levels.
- Deployment policies.
- Essentials of communication.

Sources of Mobile Data Growth

1 Mobile broadband



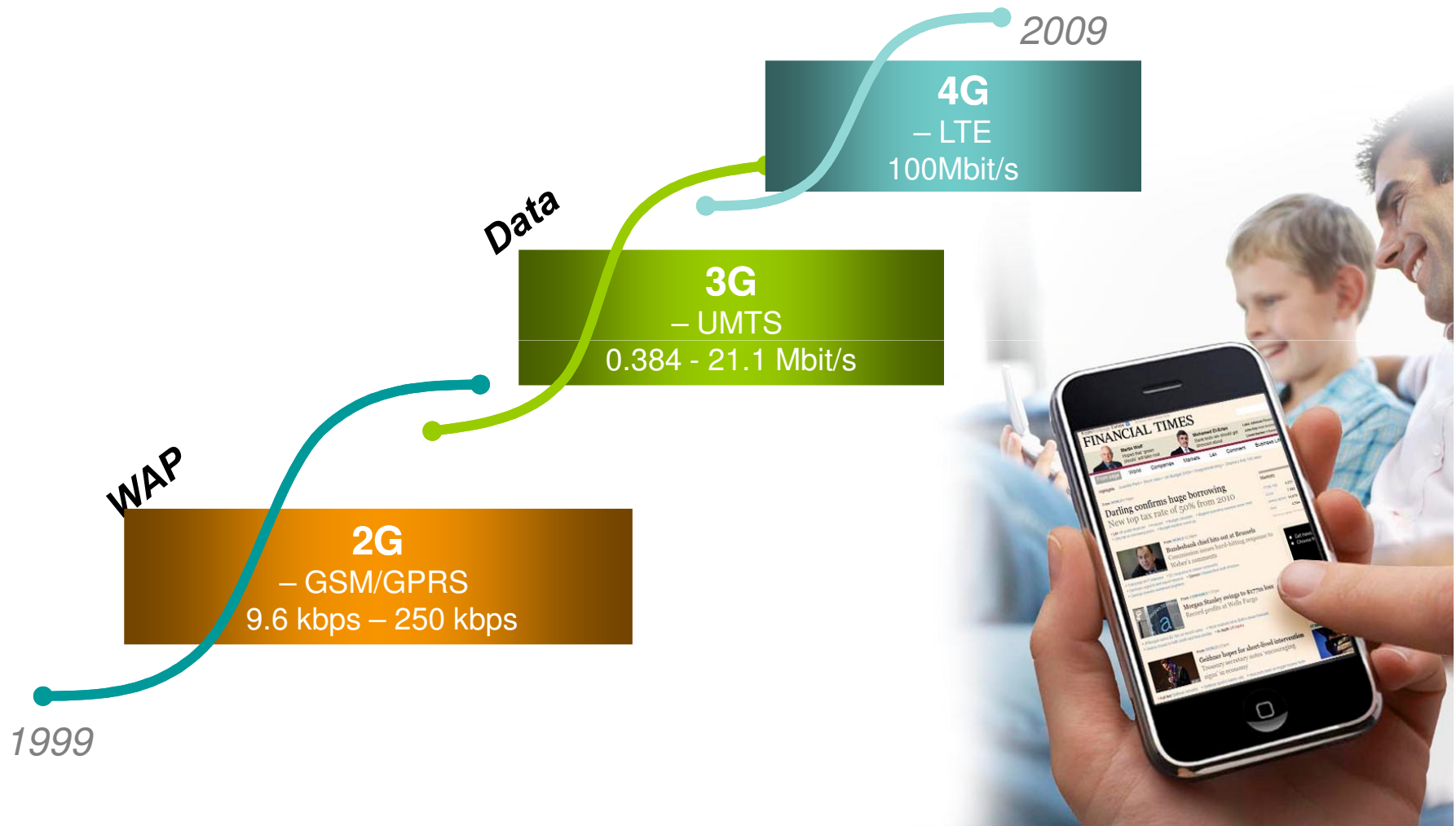
2 Smart phones



3 Machine-to-machine

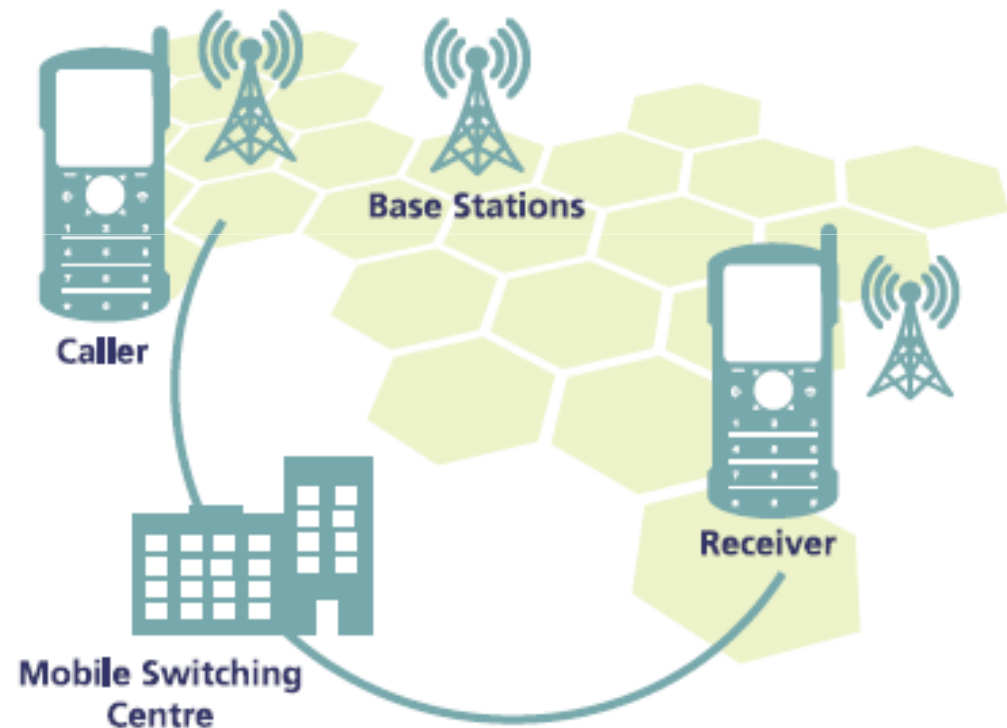


Ten Thousand Times Faster in 10 Years



Demand for Mobile Network Infrastructure

- More base stations to provide :
 - More capacity.
 - Higher data rates.



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RF Exposure Assessments

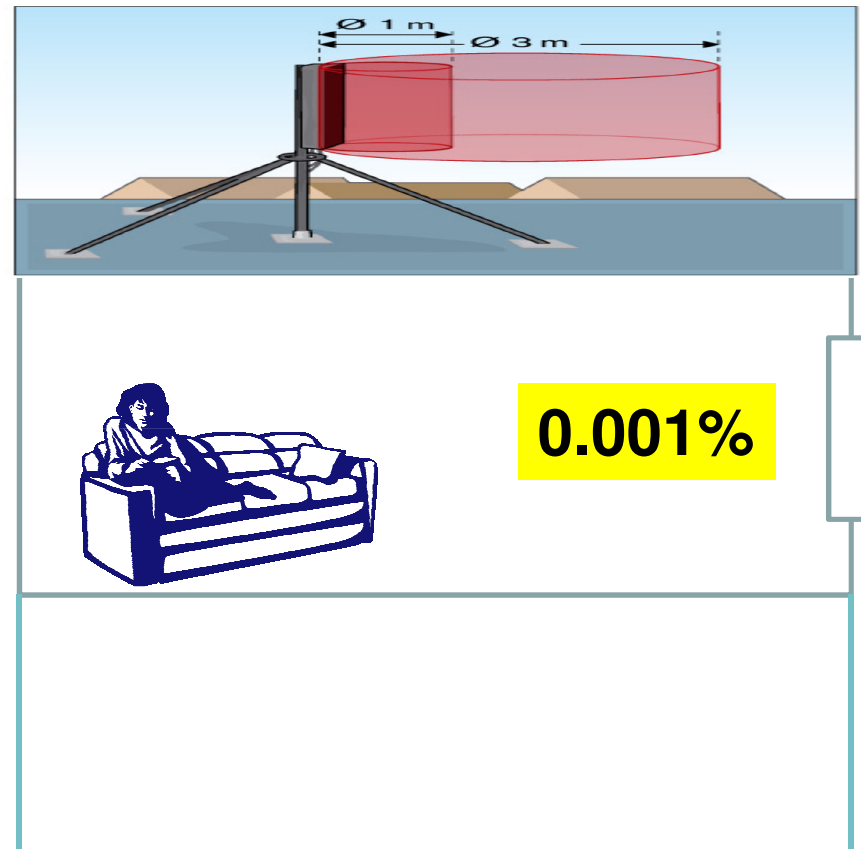
- Compliance – relatively high fields:
 - Calculation.
 - Absorbed energy – Specific Absorption Rate (SAR).
 - Broadband.

- Environmental surveys – low level fields:
 - Calculation.
 - Broadband.
 - Narrowband.



Compliance Zones For Base Station Antennas

- Generally low power:
 - 1 W to 40 W.
- Sector antennas transmit forward.
- Mounted so that public cannot access.
- Rooftop workers.
- Averaging time.



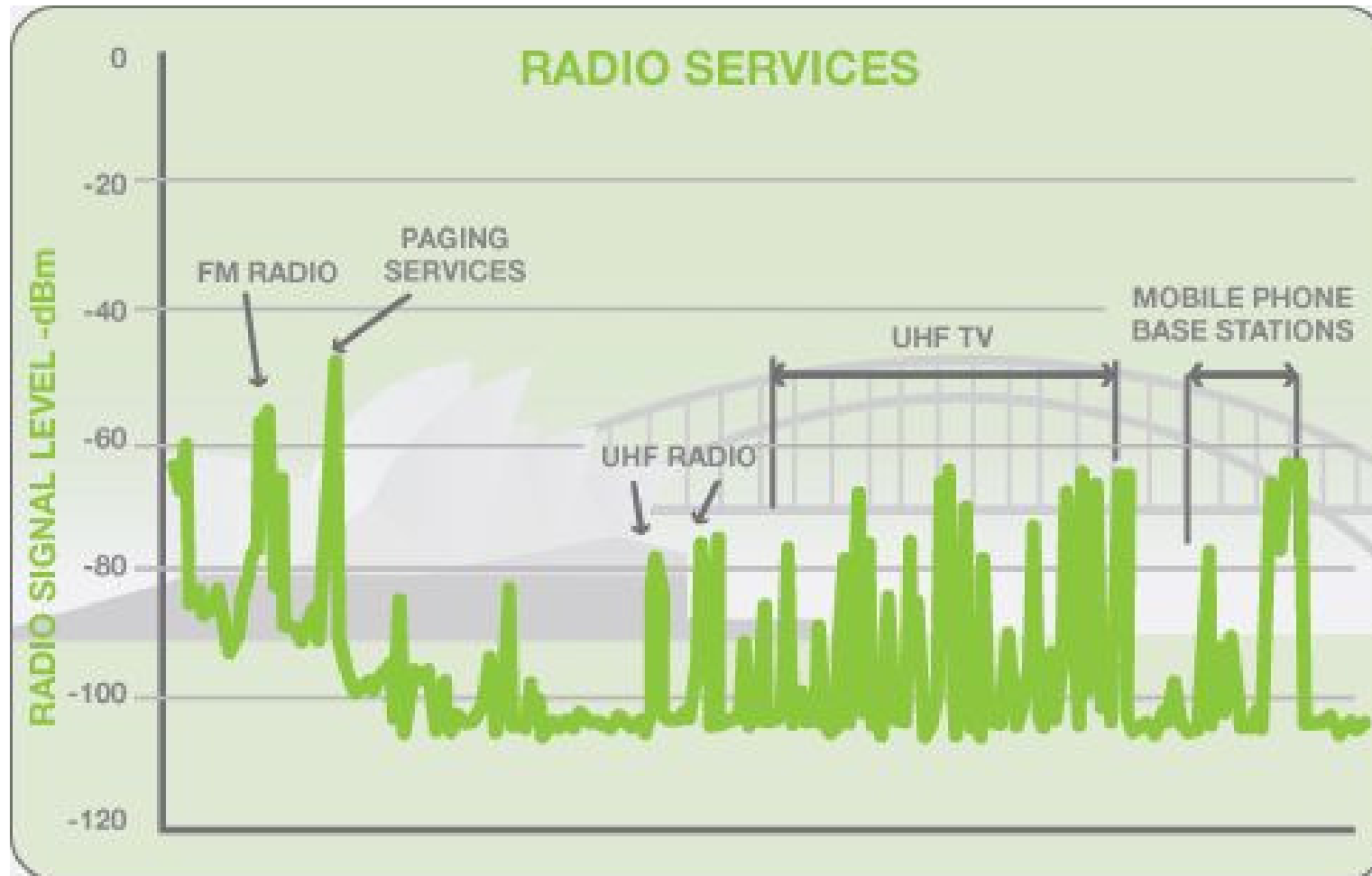
EMF-NET, Occupational exposure fact sheet: Mobile phone base station, 2008. Determination of the general public exposure around GSM and UMTS base stations, Bornkessel et al., Radiat Prot Dosimetry, 124(1):40-47, March 1, 2007.

Management of RF Compliance

- Assess exposure levels.
- Identify areas.
- Implement controls.
- Access procedures.



Many Radio Sources in the Environment

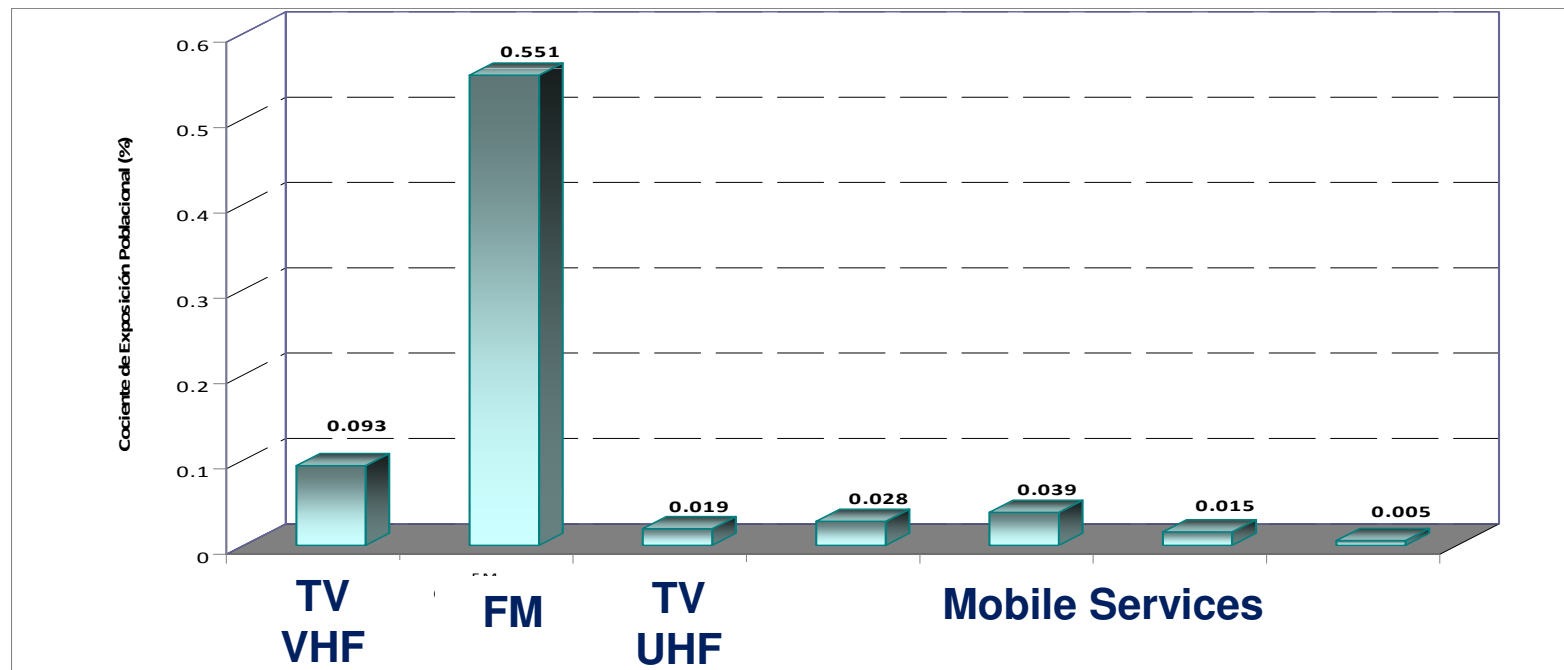


www.emfexplained.info

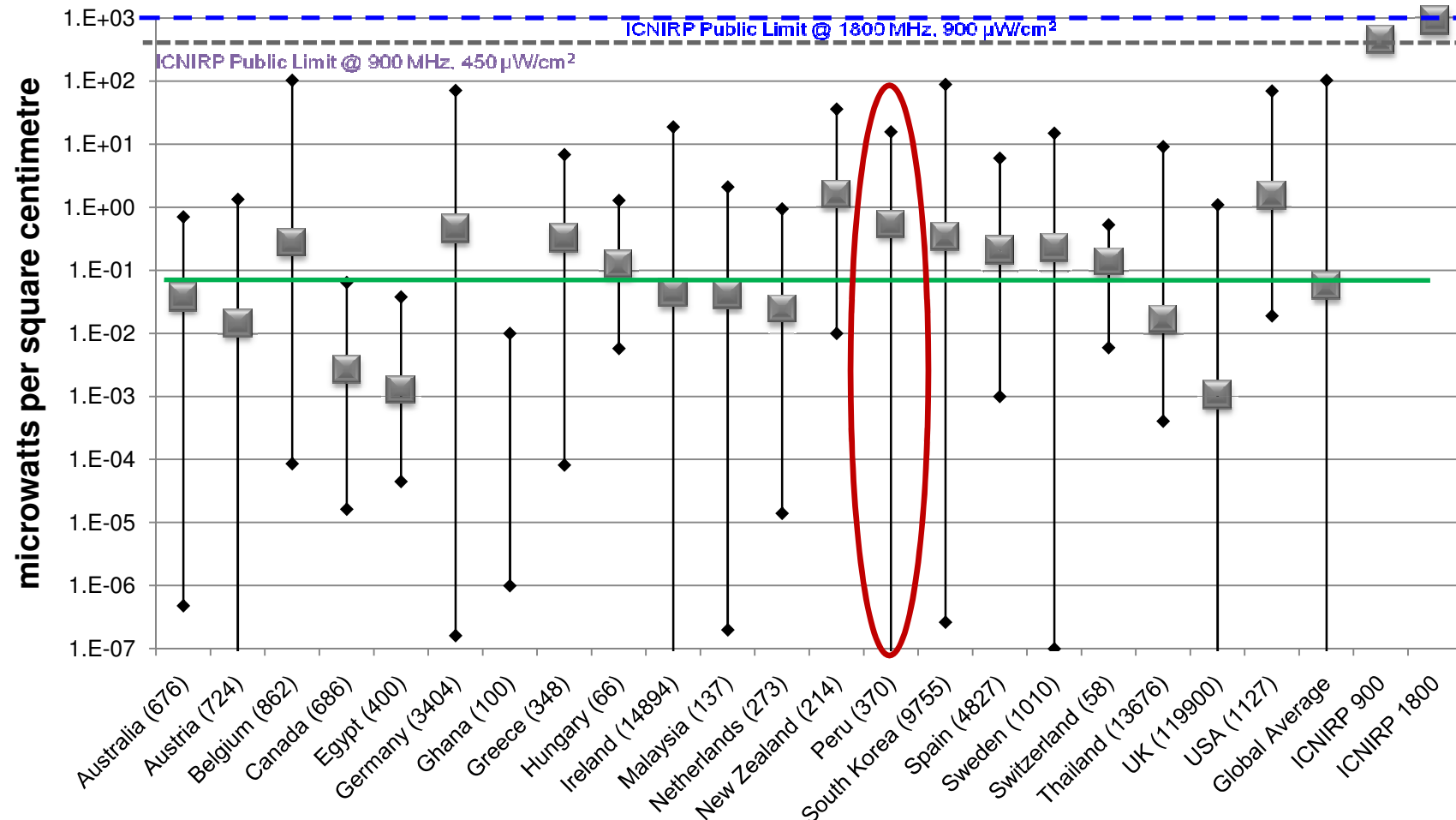
Exposure Levels in Latin America

- Very low exposures.
- Similar to broadcast.

Average population exposure near base stations – data for Peru

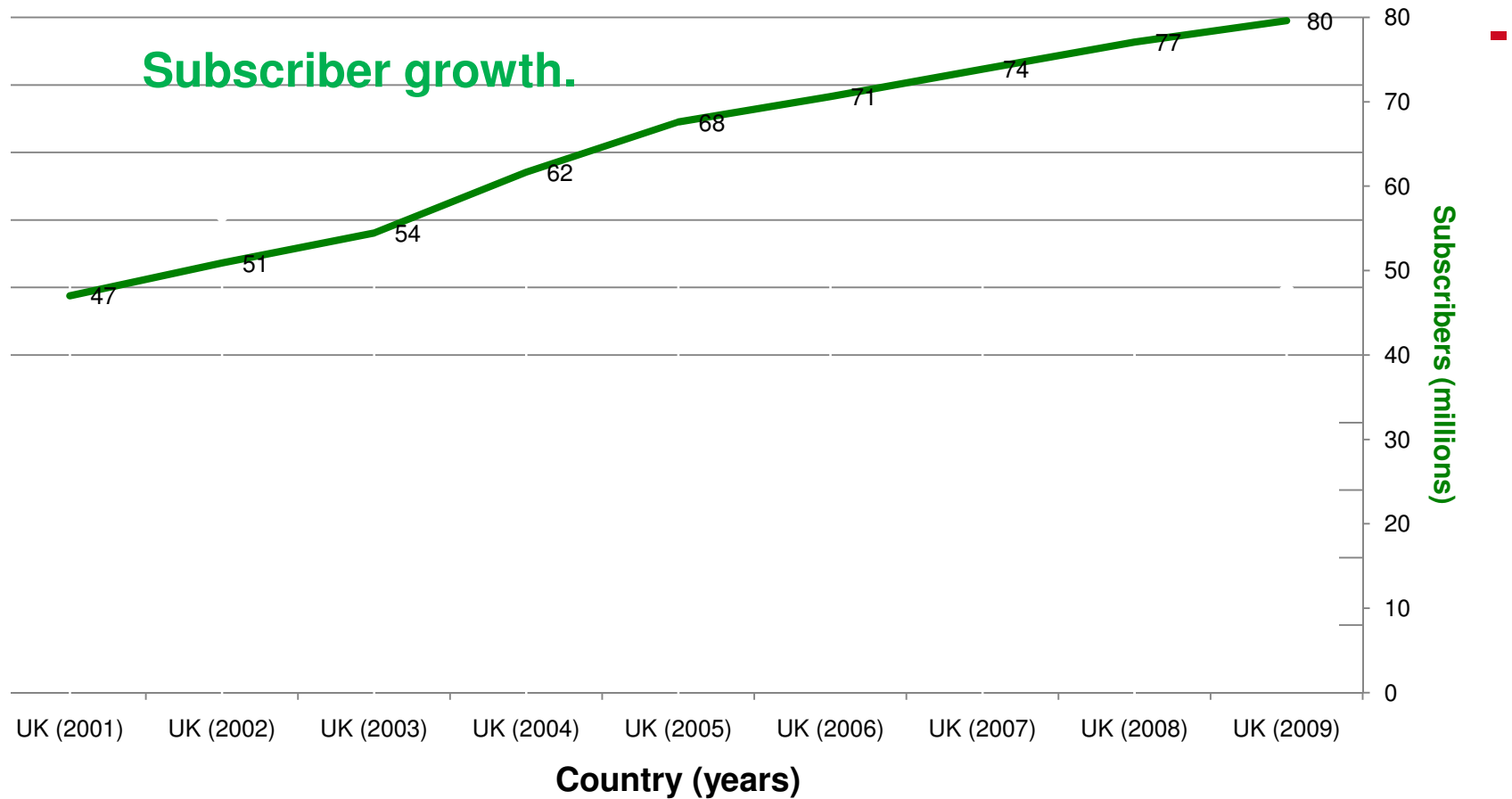


Summary Data – All Countries



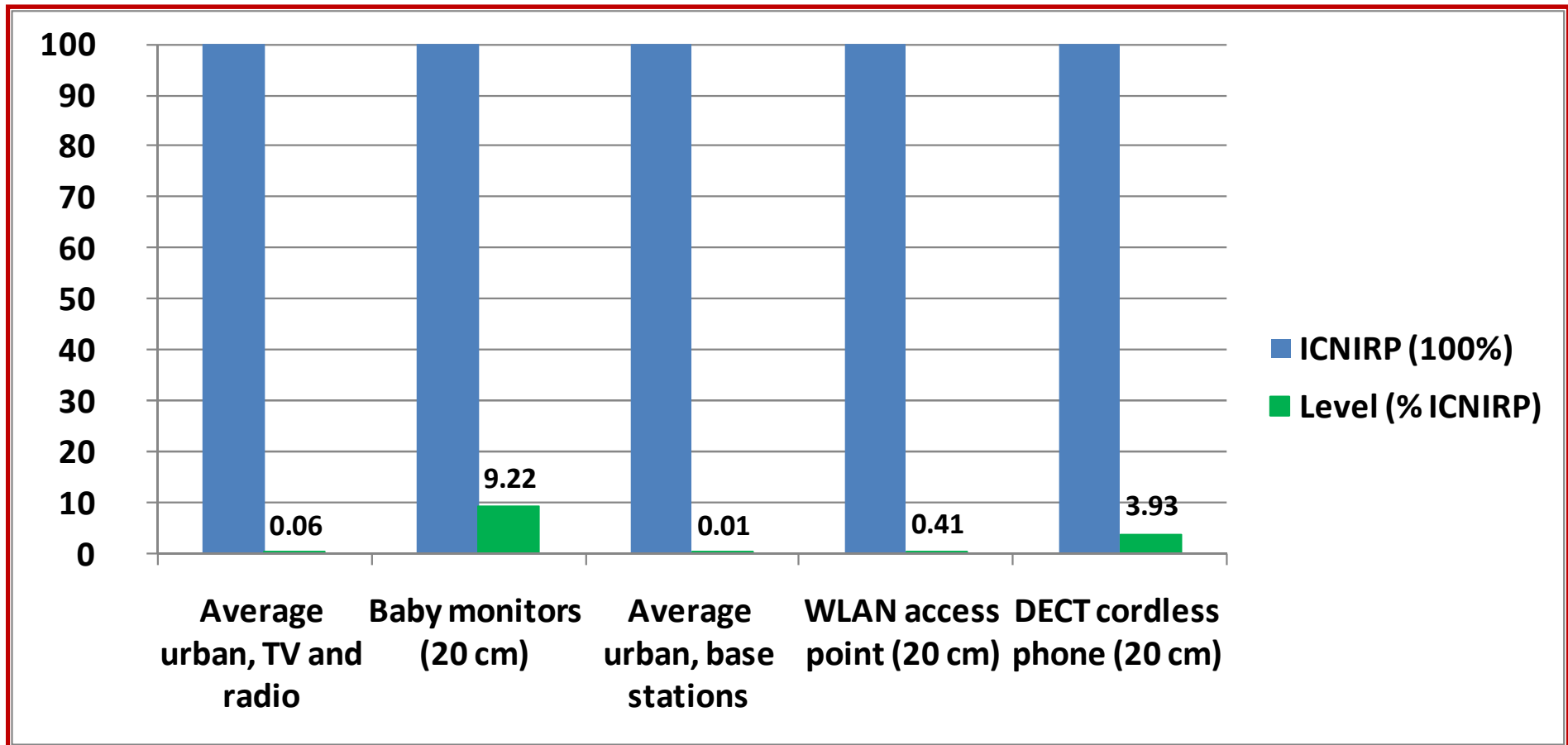
Global average 7,000 times below ICNIRP.

Summary Data – UK Time Trends

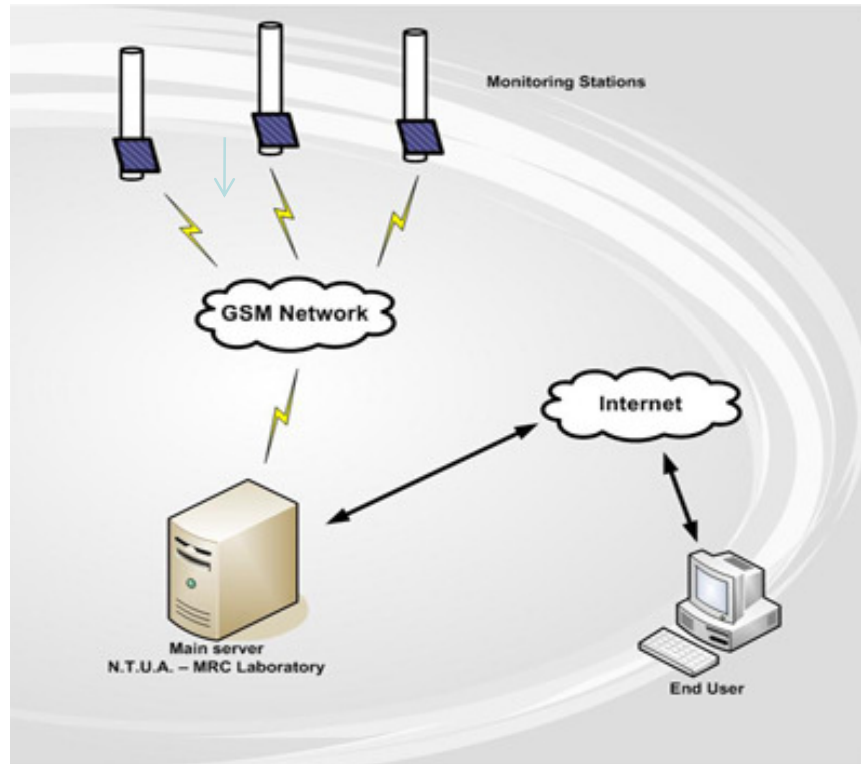


Exposures not affected by network growth.

Typical Exposures from Wireless Services

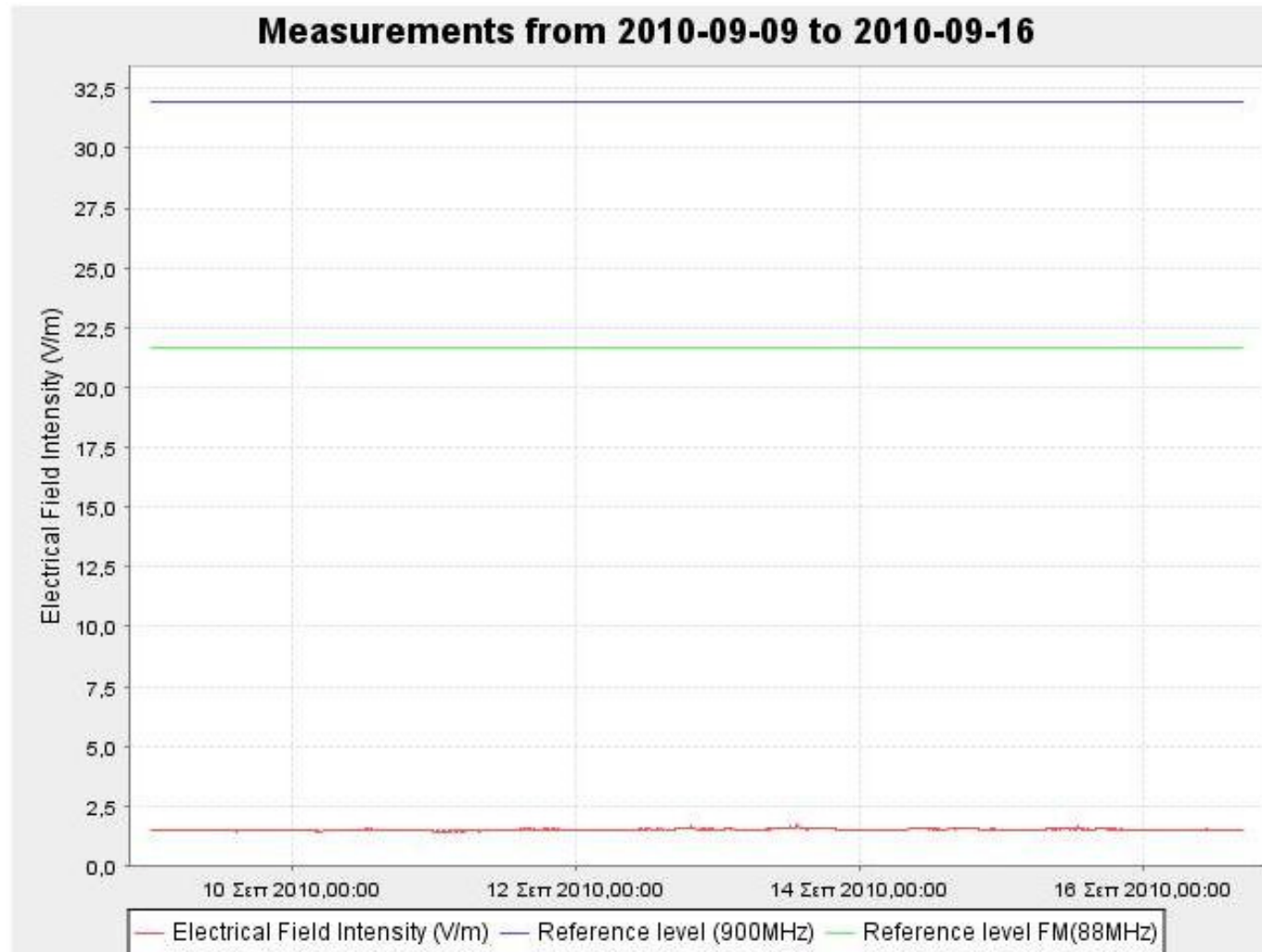


Pedion 24: Greek Measurement System

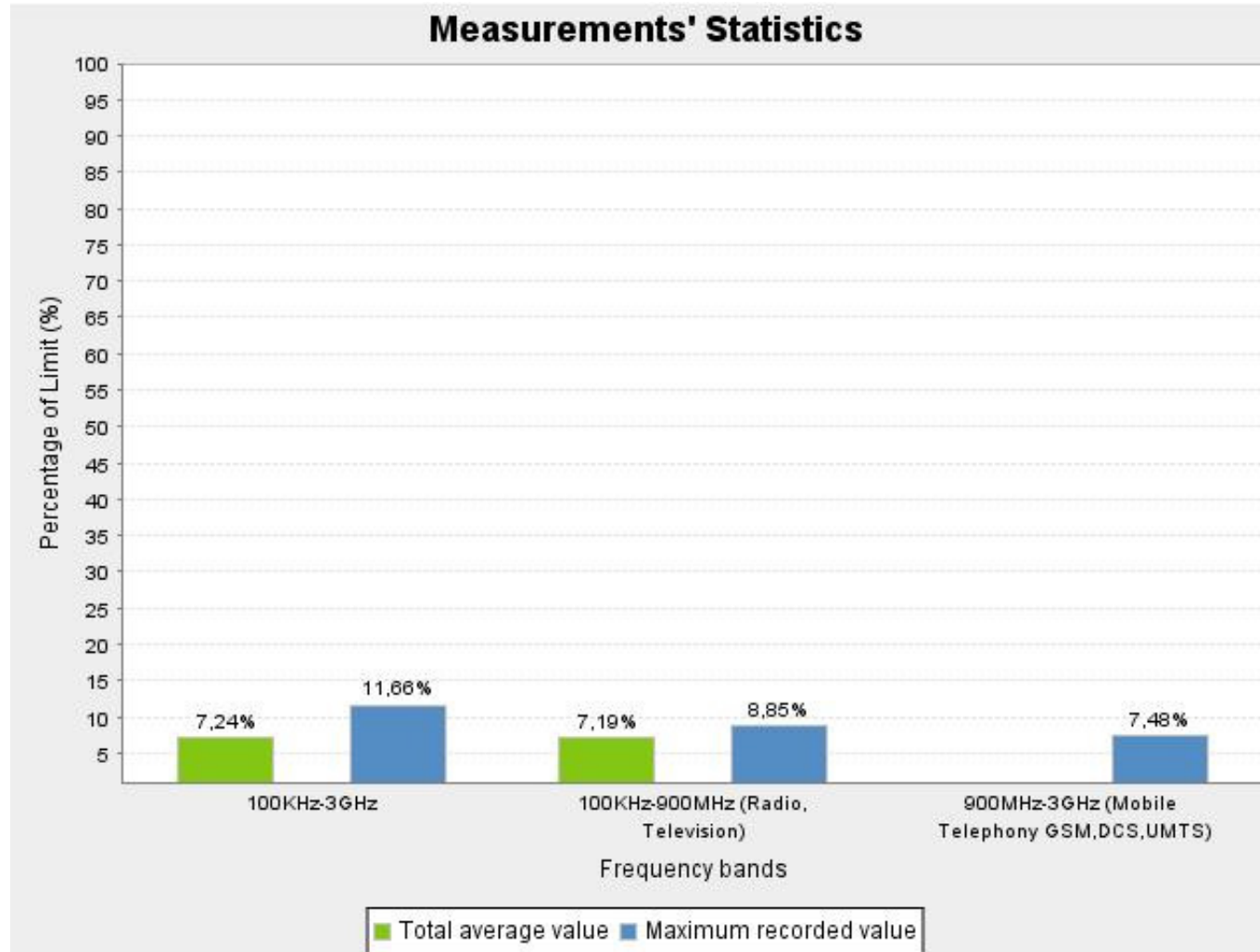


- Monitoring stations.
- Central storage of data.
- User-friendly site.
- 24h by 7d measurements.
- www.pedion24.gr

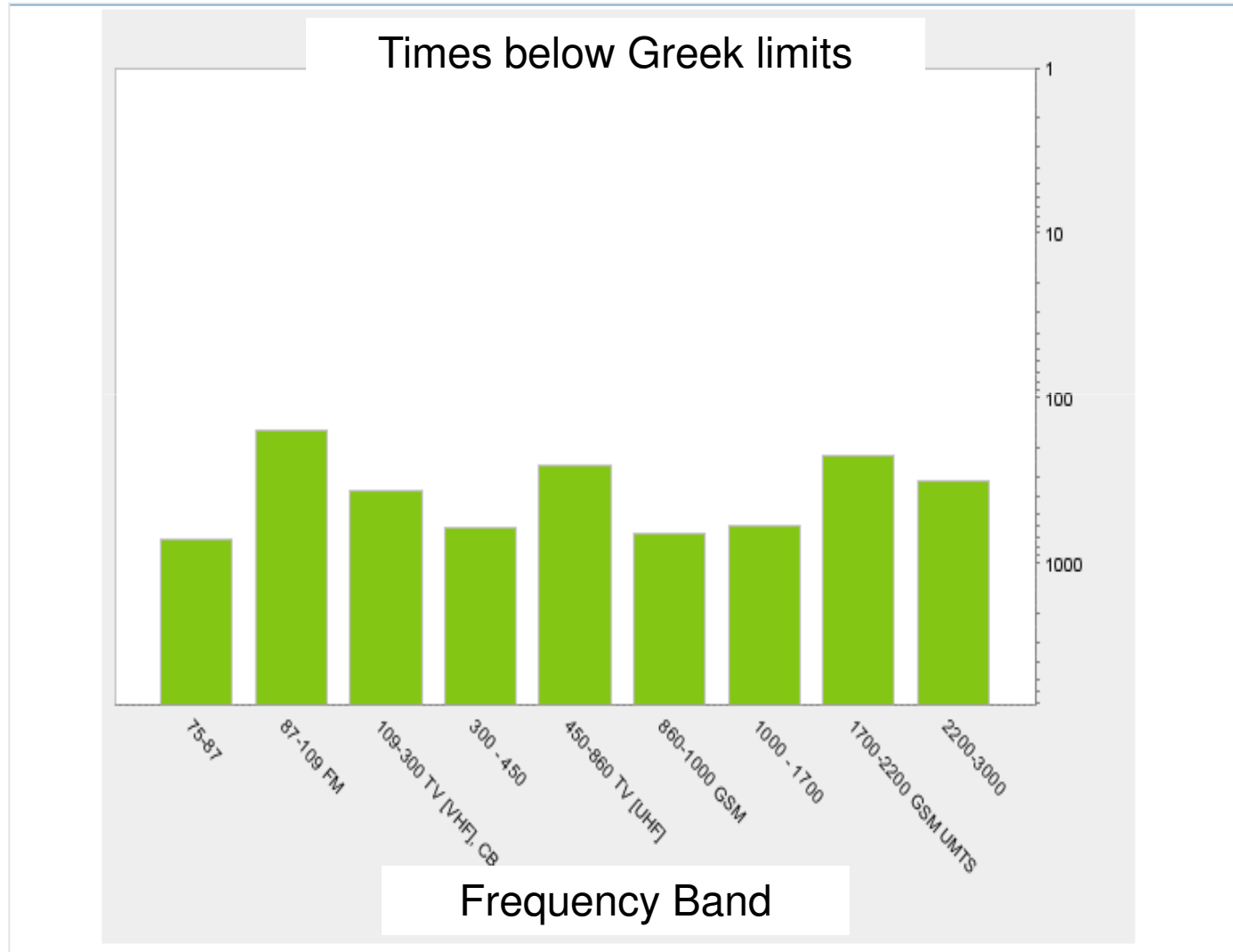
Pedion 24: Typical Measurements – 7 Days



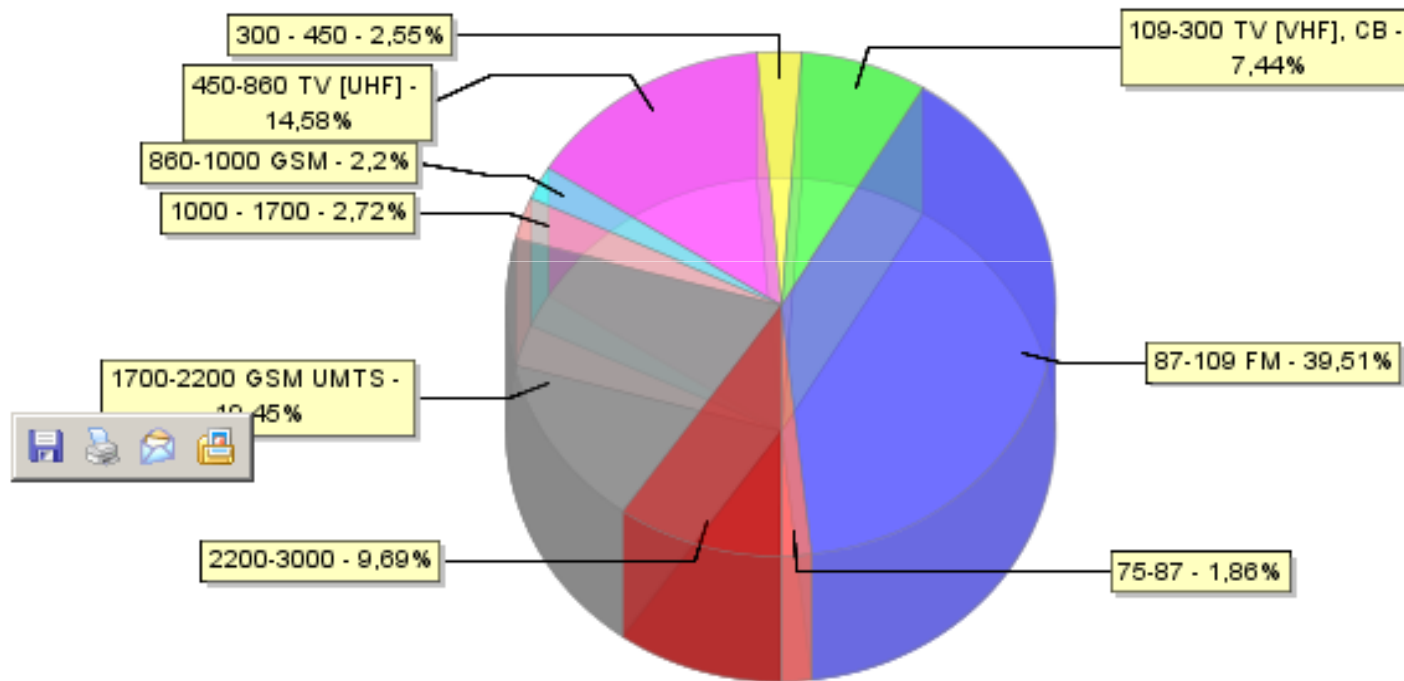
Pedion 24: Measurements Statistics – 7 Days



Pedion 24: 6 Month Summary Results



Pedion 24: Contribution by Sources



Evaluation of RF Monitor Systems

- Impact on public concern.
- Impact on deployment.
- Cost-effectiveness.
- Alternatives.

Childhood Cancer Near Base Stations

BMJ

RESEARCH

Mobile phone base stations and early childhood cancers:
case-control study

- National study:
 - 6,985 subjects, 76,890 base station antennas.
 - Assessed mother's exposure during pregnancy.
- *'There is no association between risk of early childhood cancers and estimates of the mother's exposure to mobile phone base stations during pregnancy.'*

Mobile phone base stations and early childhood cancers: case-control study, Elliott et al., BMJ, 340:c3077-, June 22, 2010.

WHO Commissioned Systematic Review

Research

Systematic review on the health effects of exposure to radiofrequency electromagnetic fields from mobile phone base stations

Martin Röösli,^a Patrizia Frei,^a Evelyn Mohler^a & Kerstin Hug^a

- *'...our review does not indicate an association between any health outcome and radiofrequency electromagnetic field exposure...'*
 - Evidence strong for acute effects.
 - Weaker for long-term and children.

Systematic review on exposure to base station radiation, Röösli et al., WHO Bulletin, Published online: 5 October 2010.



WHO Conclusion - Wireless Networks



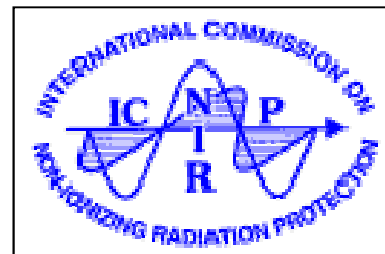
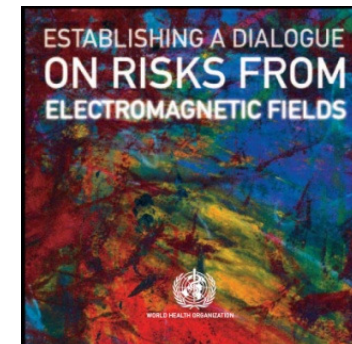
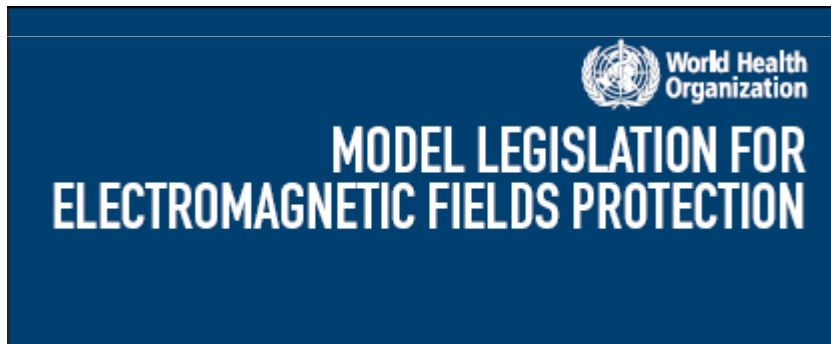
- Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.

<http://www.who.int/mediacentre/factsheets/fs304/en/index.html>

Presentation Outline

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Harmonised EMF Policy



RF Policy Principles

- Governments:
 - Evidence based limits and consistent mast policy.
 - Avoid policies that create alarm.
 - Communicate using trusted health agencies.

- Industry:
 - Self-assessment based declarations of compliance.
 - Improve consultation and design practices.
 - Active partner in communication.

Outline RF Policy Framework

- Adopt WHO/ITU recommended limits.
- Distinguish national and local responsibilities.
- Adopt national planning policies:
 - Determine licensing authority and notification requirements.
 - Decision period for site licence.
 - Clear process for decision making.
- Consider:
 - Exemptions for small antennas or site adjustments.
 - Permit site sharing where technically and commercially feasible.
- Compliance through declaration for both devices and antenna sites:
 - Operators conduct self-assessment.
 - International testing of devices.
 - Potential for audit.
- Communicate.

Exposure limits in Europe

- 1999/519/EC Recommendation – ICNIRP public.
 - Technical regulations for products (R&TTE - 1999/5/EC).
 - National legislation for installations.
- 2004/40/CE Directive – ICNIRP worker.

ICNIRP – September 2009:

'...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...'

Implementation of *Basic Restrictions (products)*

- Generally the same as the EC recommendation.
- Mobile phones comply with EC recommendation.
- Cyprus, Denmark, Germany, Ireland, Lithuania, Slovenia and Slovakia have not legislated for the basic restrictions.
- More restrictive levels applied in Belgium and Greece for certain sources.

Source: Adapted from *Report from the Commission on the Application of Council Recommendation of 12 July 1999 (1999/519/EC) on the Limitation of the Exposure of the General Public to Electromagnetic Fields (0 Hz To 300 GHz), Second Implementation Report 2002-2007, COM(2008)/532, September 2008.*

Implementation of *Reference Levels (installations)*

- Generally the same as the EC recommendation.
- More restrictive levels applied in Belgium, Bulgaria, Greece, Italy, Luxembourg, Poland, Slovenia and Switzerland.
- ‘Sensitive areas.’
- Czech Republic, Denmark, Hungary, Latvia and Slovakia have no specific legislative measures.

Source: Adapted from *Report from the Commission on the Application of Council Recommendation of 12 July 1999 (1999/519/EC) on the Limitation of the Exposure of the General Public to Electromagnetic Fields (0 Hz To 300 GHz), Second Implementation Report 2002-2007, COM(2008)/532, September 2008.*

EU Base Station Planning – 1 of 2

Country	Authority	Requirements	Timescales	Appeals	Consultation	Exemptions
Austria	Local	Variable	Typical 6 mo.	Administration	Yes	Rooftops
Belgium	Regional	Variable	Typical 6 mo.	Ministry	Local authority	Upgrades
Bulgaria	Local	Health ministry, RF measurements.	No legal	Court	Yes	None
Cyprus	Local/authority	Overlap among authorities.	Legal 6 weeks, Typical 6 mo.	Court	Yes	In-building
Czech Republic	Local	Building permit	2 mo.	Administration/ Court	Limited	Upgrades
Denmark	Local	Building permit	Typical 3-6 mo.	Ministry	Local authority	Upgrades/ sharing
Finland	Local	Building permit and impact analysis	Typical 6 mo.	Administration/ Court	Yes	None
France	Local	Building permit >12m	Legal 1 to 6 mo.	Court	Yes	<12 m, no exterior change.
Germany	Local/authority	Building permit >10m	Typical 6 weeks	Court (rare)	Yes	<10m, limited upgrades
Greece	Local/authority	Up to 7 authorities.	Typical 24 mo.	Court	Yes	Microcells simpler
Hungary	Local	Building permit >6m	Typical 6 mo.	Administration/ Court	Local authority	None
Ireland	Local	Building permit	Typical 2-3 mo.	Planning tribunal	Yes	<12m or <2m on rooftops

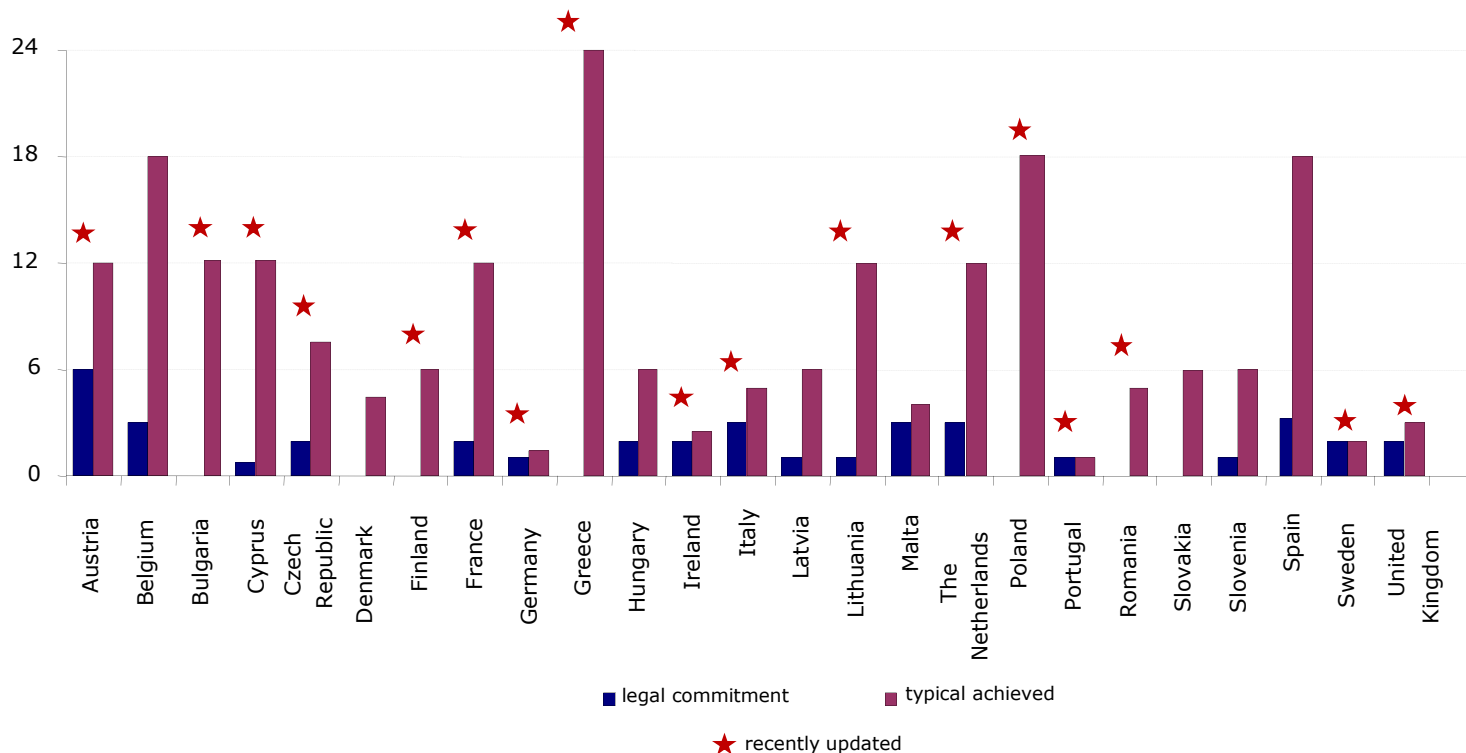
Source: Adapted from *Base Station Planning Permission in Europe*, GSMA Europe, 22 October 2009.

EU Base Station Planning – 2 of 2

Country	Authority	Requirements	Timescales	Appeals	Consultation	Exemptions
Italy	Local/Regional	Building permit	Legal 3 mo.	Court	Authority	Limited
Lithuania	Local and ministries	Building permit, RF measurements	Legal 2 mo., typical 12 mo.	Court	Yes	In-building
Malta	National	Building permit	Typical 4-6 mo.	Administration	Limited	Development zone
Netherlands	Local/building tenants	>40m – full; 5-40m – permit; <5m none.	Typical 3-5 mo. or 9-15 mo.	Court	Yes	Upgrades
Poland	Local	Building permit, RF evaluation	Typical 18- 24 mo.	Administration/ Court	Local authority	None
Portugal	Local	Building permit	Legal 1 mo.	Court	Not mandatory	Upgrades
Romania	Local	Building permit, RF evaluation	Typical 5 mo.	Court (rare)	Not mandatory	None
Slovakia	Local/ministries	Building permit, ministry approval	Typical 3-12 mo.	Administration	Not mandatory	Limited upgrades
Slovenia	Local/ministry	Building permit <10m. Ministry	Typical 6 mo	Court	Local authority	None
Spain	Local/ministry	Building permit, ministry approval	Legal 6 mo, Typical 18 mo.	Administration/ Court	Yes	Limited
Sweden	Local	Building permit	Typical 3 mo.	Administration/ Court	Local authority	None
United Kingdom	Local/planning	<15 m permitted development, not NI	Legal 8 weeks.	Administration/ Court	Yes	Minor upgrades

Source: Adapted from *Base Station Planning Permission in Europe*, GSMA Europe, 22 October 2009.

Administrative Delays in Antenna Deployment



Source: GSMA Europe 10/2009

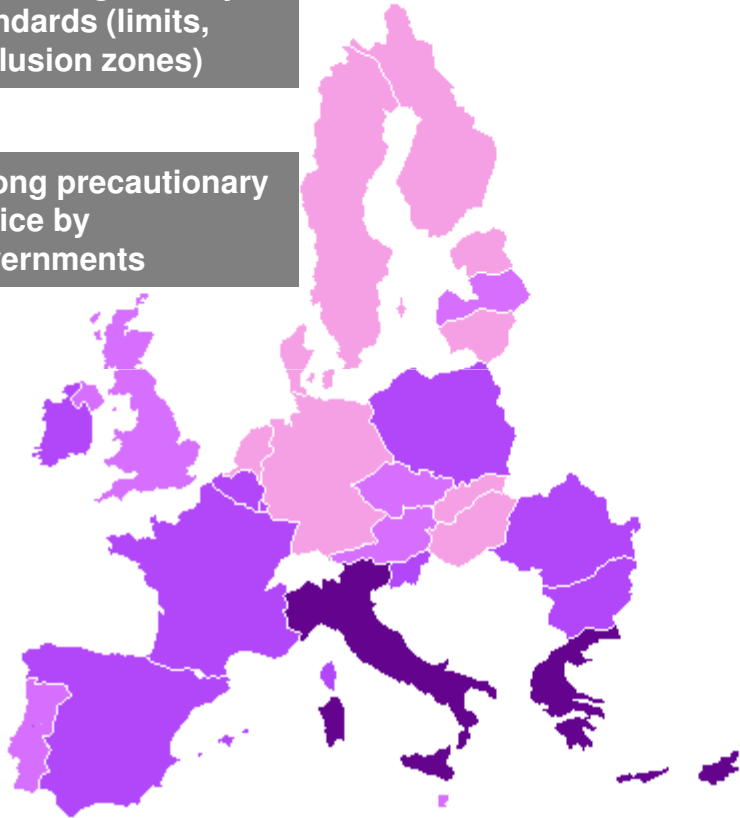
- In ten EU Member States it takes on average **one year or more** to receive all permits necessary to deploy single base station antennas
- Delay mainly caused by administrative permission processes.

Influence of Policies on Public Concern

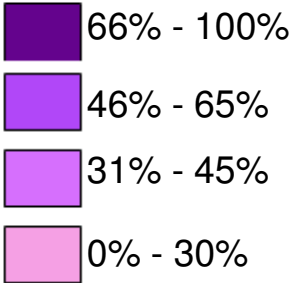
	EL	81%
	IT	81%
	CY	80%
	SI	56%
	ES	54%
	BE	53%
	RO	51%
	FR	50%
	IE	49%
	BG	48%
	LU	47%
	PL	46%
	EU27	46%
	PT	45%
	SK	43%
	LT	39%
	AT	38%
	UK	37%
	MT	37%
	CZ	31%
	DE	29%
	NL	24%
	HU	23%
	EE	23%
	FI	21%
	LV	21%
	SE	17%
	DK	16%

Stricter legal safety standards (limits, exclusion zones)

Strong precautionary advice by governments



2010



Question: QC3. How concerned are you about the potential health risks of electromagnetic fields?
 Answers: Very concerned + Fairly concerned

Data-source: Special Eurobarometer 347, 2010, p. 66; presentation by GSMA Europe



BioInitiative Report Lacks Balance

- *The BioInitiative report (a) does not provide any reason to change the current health risk assessment on exposure to electromagnetic fields and (b) does not include new data and has not taken the scientific quality of the cited reports into consideration in the way that is customary. - Danish National Board of Health, 2007*
- *[The report] is not an objective and balanced reflection of the current state of scientific knowledge and does not provide any grounds for revising the current views as to the risks of exposure to electromagnetic fields. - Health Council Netherlands, 2008.*
- *The BioInitiative Report...has a number of weaknesses and is a selective, rather than a comprehensive, review of the literature in various topical areas. - COMAR, 2009*

Precaution and Radio Signals

- Precautionary principle is not based on ‘zero risks.’
- Needs to be ‘plausible’ evidence to trigger action.
- WHO advises against arbitrary limits.
- Adoption of ICNIRP is precautionary:
 - *‘...such a precautionary approach has already been undertaken...in the adoption of the Australian Standard RPS3 [ICNIRP] with margins of safety...’* (NSW Land & Environment Court)
- Precautionary advice increases concern:
 - *‘...precautionary advice was generally interpreted as causing concern rather than providing reassurance...’* (Barnett et al. 2007)

EU Commission Policy: Digital Agenda & EMF

- Mobile broadband is key part of Digital Agenda.
- Recognition of importance of good management of concerns and need to streamline planning.
 - *EC Communication: Digital Agenda for Europe (May 2010).*
 - *EC Communication: 'European Broadband: investing in digitally driven growth' (Broadband Strategy, 20th Sept. 2010).*
 - *Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the first radio spectrum policy programme (RSPP 20th Sept. 2010).*

GSMA Europe Network Rollout Recommendations

- Adopted in 2001.
- Main elements:
 - Information exchange.
 - Context siting and site sharing.
 - Compliance with exposure limits.
 - Better community engagement.
- Implementation reviews in 2003 and 2007.



Presentation Outline

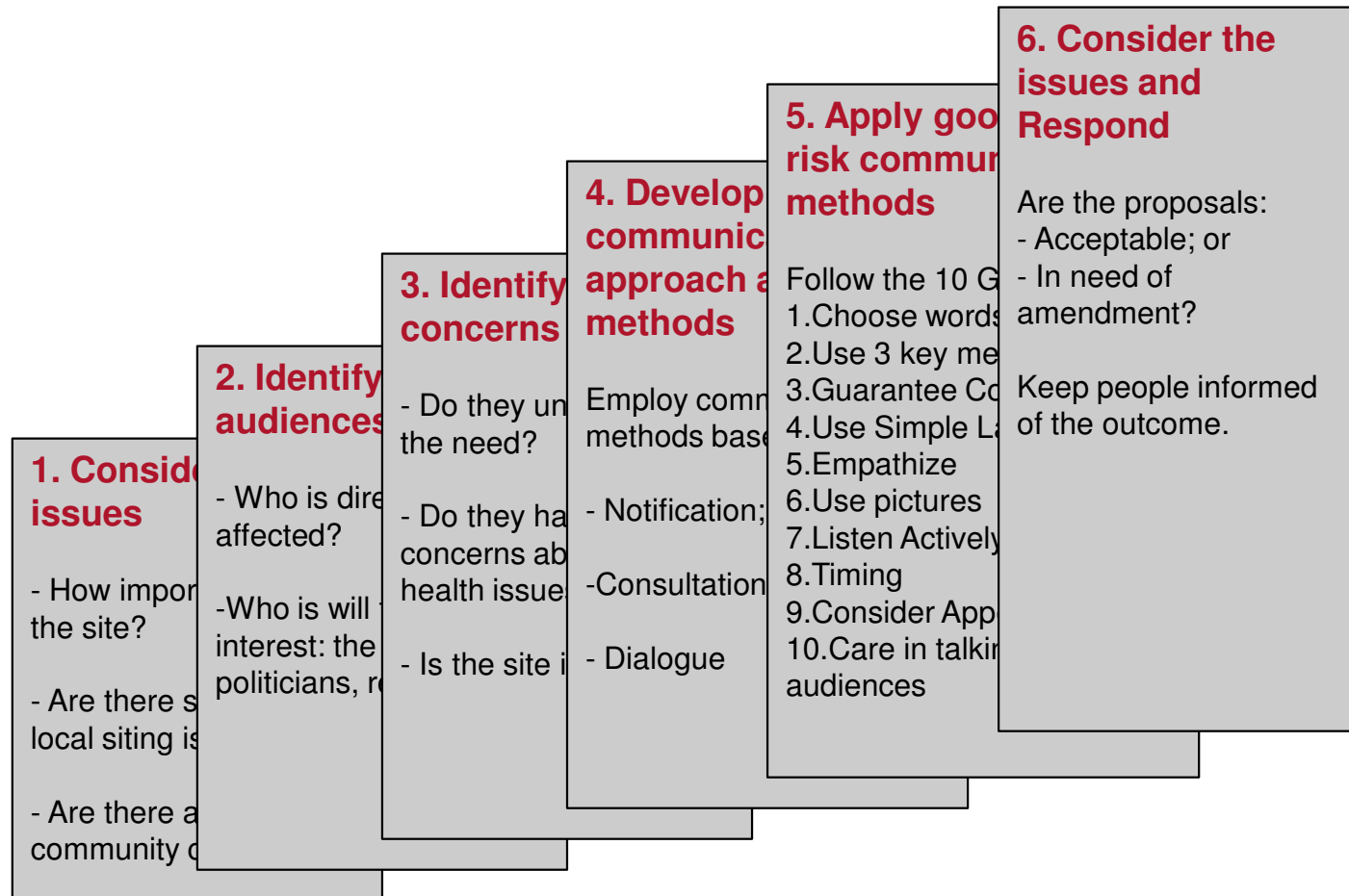
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Essentials of Communication

- Listen.
- Perception is reality.
- Trust first, information second.
- Address concerns.
- Adapt techniques to cultural context.
- Anticipate.




Six Steps for Effective Communication



Summary


- Networks need to grow to support new mobile services.
- Typical exposures from antenna sites are low.
- Poor policy leads to service delays and increased concern.
- Build trust through good communication.

Your input to us?



Mobile Industry Reputation Index

Your progress

 complete

Mobile Industry Reputation Index Q4 2010

Thank you for taking the time to give us your views on the mobile industry. Please answer based on your own perceptions of the industry and not based on how you think others might perceive it. Submitting a completed questionnaire entitles you to a free copy of the most recent 'Wireless Intelligence' Quarterly World Review Report.

1 In your opinion, how much does the mobile industry contribute to the advancement of society in terms of its policies and actions in the following areas?

www.mobilereputationindex.com

Thank You

- **Contact: Dr Jack Rowley**

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Research & Sustainability

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