

Country Case Study: ITALY

The impact of EMF exposure limits on future
innovative technology deployment

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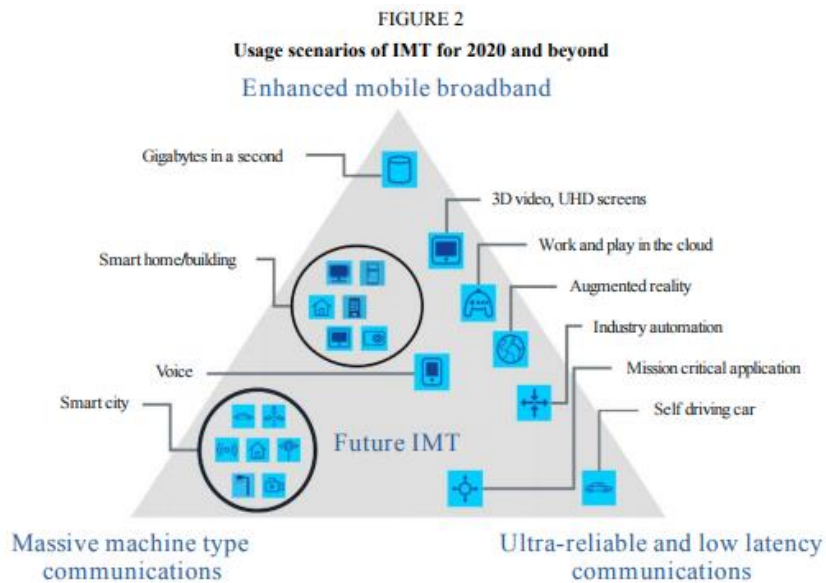
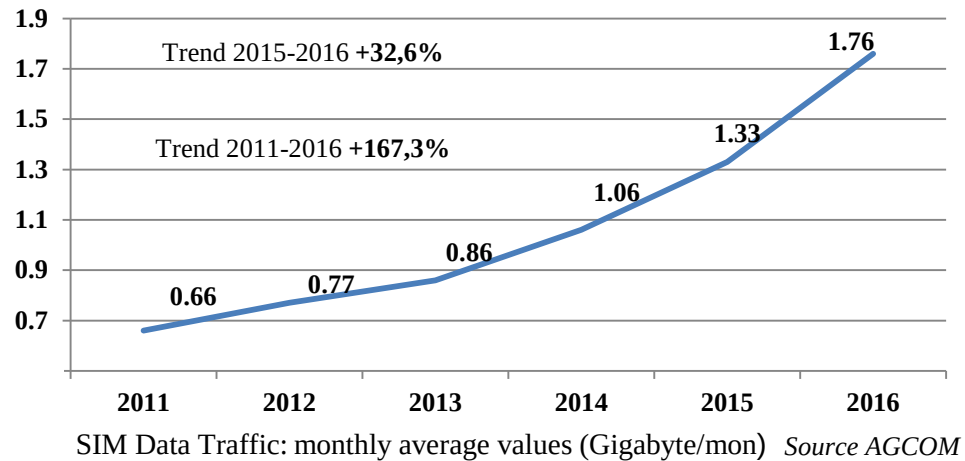
Fondazione Ugo Bordon

Expert Meeting: Electromagnetic Field Level and 5G Roll-out 2-3 nov 2017 - Rome

Italy & 5G (1)

In Italy:

- The paradigm «mobile first» is winning
- Large growing of data traffic on mobile networks
- Ultra Broad Band Strategy (2015 March)



M.2083-02

Source Rec. ITU-R M.2083-0

Italy & 5G (2)

Next Spectrum Allocation for Mobile Communication (2018)

694-790 MHz

3.6-3.8 GHz

26.5-27.5 GHz

5G Economic Impact in Italy:

- 6,8 billions of euros of Investment
- Employment effect on over 200.000

Work in progress: 5G pre-commercial Trials in 5 Cities (3.7-3.8 GHz)

Area 1: Milano



Area 2: Bari – Matera



Area 3: Prato – L'Aquila



Italian limits VS ICNIRP limits (1)

The Italian law is based on 3 different protection level

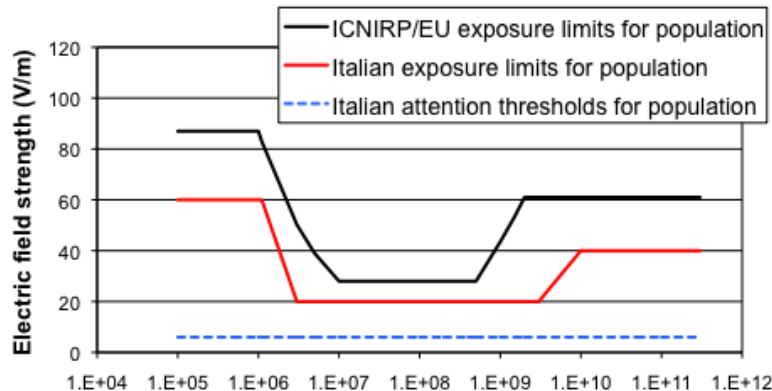


TABLE 3 COMPARISON BETWEEN ICNIRP REFERENCE LEVELS AND ITALIAN LEVELS FOR THE PUBLIC EXPOSURE TO RF FIELDS

FREQUENCY BAND [MHz]	ICNIRP LIMIT [V/m]	ITALIAN LIMIT [V/m]
800	39	6
900	41	
1800	58	
2100	61	
2600	61	

- The Italian regulatory framework dates back to 1998, before the issuing of ICNIRP Guidelines and European Recommendation 1999/519/EC
- **Regulators privileged a cautious approach** to give response to the emerging public concern **rather than endorsing evidence-based protection policies**
- Subsequent regulatory evolution in 2001 and 2003 confirmed the original framework and **reaffirmed the role of political choices over scientific guidelines**
- In 2012: legislative decree to determine the EMF power reduction factors for buildings

Italian limits VS ICNIRP limits (2)

- The **revised the norm (December 2012)** does **not change the limits** and introduces **new evaluation and computation methods of exposure limits, attention value and quality target**.
- In **2016 (4 years since the law issue)** the new normative law was completed, as prescribed, by **Guide Lines** drawn up by agencies for environmental protection (ISPRA and ARPA).
- However the Application Guidelines delivered by the environmental agencies reducing the effect of the whole regulation: for example **the power reduction factors for indoor exposure in windowed buildings is anyway set to 0 dB**.
- In this way the revised norm **is not a valid tool** to overtake the problems so **it is mandatory a limit review**.

Practical fall-out of the Italian approach (1)

The application of the Italian law affects the EMF exposure and wireless broadband scenario in a number of ways, among which:

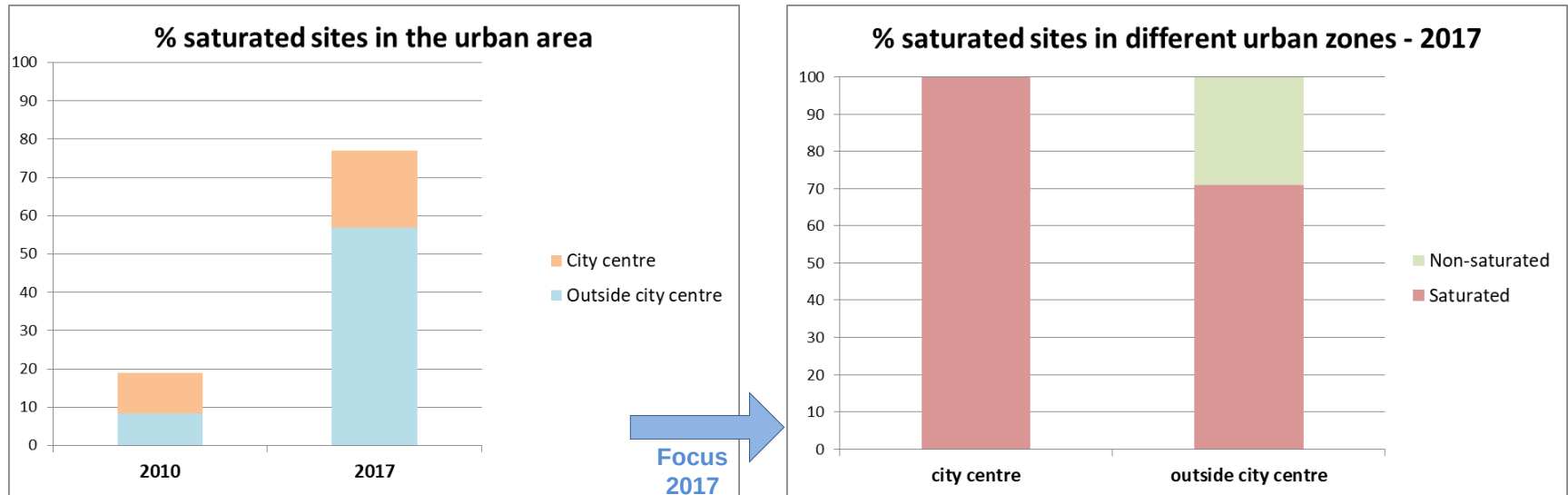
- **Significant local differences between theoretical and actual exposure levels**, due to the cautious assumption adopted in the authorisation process.
- **Exposure levels over the landscape much lower than imposed thresholds**
- **Additional constraints on networks layout and sub-optimal network plan** (mobile terminals not working with the lowest possible power emission)
- In Italy the strong development experienced for the evolution of 4G networks and, in the perspective of 5G systems, must necessarily **collide** with the additional constraints imposed by the current regulatory framework for exposure to electromagnetic fields.

Practical fall-out of the Italian approach (2)

As an exemplary case of the evolution of the saturation effect we depict a typical Italian city situation where:

- A comparative analysis has been carried out by considering the evolution of the site saturation situation in 2010 and 2017
- The input data used for the **Ugo Bordonni Foundation** evaluations have been provided by Local Region Agency to the Environmental Protection in Italy named “**Arpa**” of Bologna
- A BTS site is assumed «saturated» if the Electromagnetic field simulations experiment an EMF ≥ 5 V/m in selected zones under test for which it is needed to satisfy attention and quality limits (i.e. 6 V/m)
- **Simulations are carried out** by assuming the worst case situation (**radioprotection case**) consider:
 - **Free space propagation;**
 - **BTS operating at maximum transmitted power**
 - **Alpha24 reduction factor applicability**, that is a technique to calculate the average level of electric field during the 24 hours of a BTS under test
- The obtained results provide the **electromagnetic field level (V/m)** in geographical zones where
 - **Attention Value** is no more than **6 V/m;**
 - **Quality Value** is no more than **6 V/m.**

Comparison estimation 2010 and 2017 in a typical italian city



- The percentage of saturated sites has quadrupled from 2010 to 2017, ranging from 19% to 77% of the total of sites in the city area. All sites in the City Centre Town are saturated (100%) and therefore can not accommodate new technologies unless reconfigurations; the percentage of saturated sites in peripheral areas of the city is 71%.
- In conclusion:
 - From 2015 to 2017, **62% of the total existing installations was reconfigured**. Most reconfigured sites were and remain in saturation conditions.
 - In **40% of the reconfigurations** the **alpha24 reduction factor was applied** because site reconfigurations represent an useful method to efficiently manage the electromagnetic space already available
 - The **considerable presence of saturated sites** however **reduces the benefits** of such flexibility and complicates the introduction of new technologies such as the 5G.

Initiative to solve problems

- 2001 Law n. 36/2001 art. 6 institutes the Interministerial Committee for the Prevention and Reduction of Electromagnetic Pollution (CIPRIE)
- CIPRIE main task: updating of knowledge about possible risk on human health due to EMF exposure
- 25 July 2017 Official meeting at the binding of Italian Environment Ministry following a CIPRIE request about the current validity of the Italian EMF exposure limits. Participants: Ministry of Health, Ministry of Economic Development, ISCOM, FUB, ISS, ENEA, ISPRA, Politecnico of Milan, University of Rome «Sapienza», VODAFONE, WIND/3, TIM
- According to the participant opinions:
 - Italian limits haven't a scientific or an epidemiological base
 - It's advisable to adopt the ICNIRP limits
 - It's necessary an urgent upgrading of the law
- Request of Contributions & Comments to agree on a common course of action...but thus far Contributions & Comments only from ASSTEL and Ugo Bordoni Foundation....

This creates a stalling situation that can hardly be overcome

Possible Solutions

It would therefore be desirable an European Union intervention to uniform the Member States limits and align them to reference levels and basic restriction reported in the ICNIRP Guidelines

This would create more favourable conditions for a rapid and uniform development of telecommunications platforms in Europe.