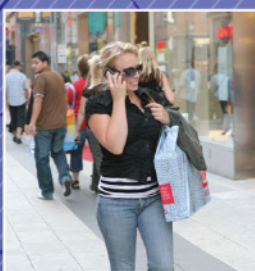
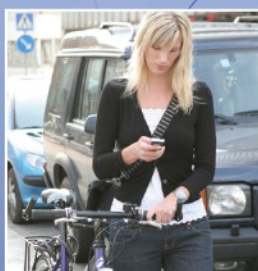




CONSULTING

GSM Europe Health & Environment Building Mobile Networks:

European Mobile Operator Responses to Public Concern



GSM Europe Health & Environment

Building Mobile Networks: European Mobile Operator Responses to Public Concerns

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This study was commissioned by GSM Europe, the European interest group of the GSM Association, and undertaken by Ovum Consulting. The report is based on responses provided by the members of GSM Europe, mobile operators and national trade associations, across EU-27 member states and Switzerland during the period of August/September 2007.

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1. Executive Summary

Mobile network infrastructure and the adoption of mobile services are now considered as key indicators of European economies. To ensure national coverage, mobile operators are required to install base stations across the country so that every user is able to benefit from the use of mobile services.

Base stations are installed to provide geographic coverage and additional network capacity where needed. The introduction of new mobile services (e.g. 3G) requires additional, technology-specific base stations. Operators may be required, as a condition of their licence, to install base stations nationally to meet government or regulatory coverage targets, and they are increasingly required to support increasing demand for concurrent calls as a base station can only carry a certain number of calls whilst providing the required service quality.

The installation of base station facilities necessary for network deployment has increased the public concern toward the alleged health impact of radio signals and other environmental concerns. The mobile industry recognises that public fears should be addressed as a matter of principle and in an open and transparent manner.

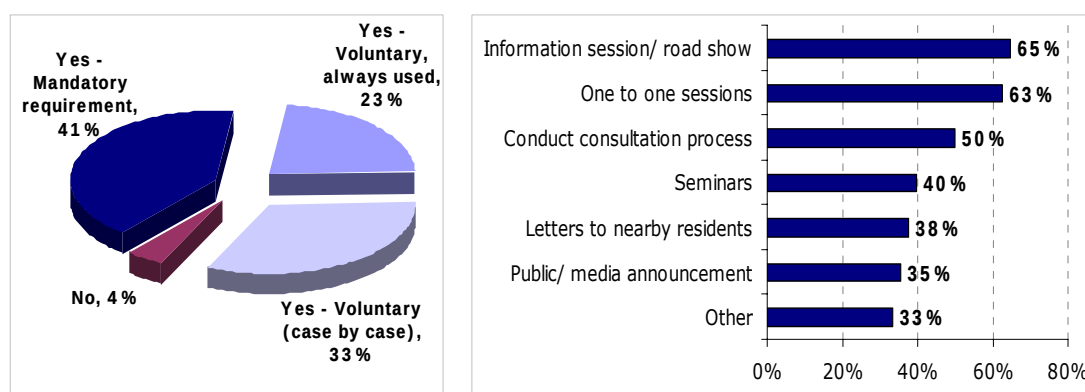
Ovum Consulting has conducted a survey with all GSM Europe (GSME) Members in the European Union Member States and Switzerland to assess actions taken by mobile operators in relation to the GSME Recommendations¹, a self-regulatory framework on good practice for network rollout.

The main conclusions of the survey of mobile operators and trade associations are summarised below:

- There is strong support for the GSME Recommendations as shown below. The industry recognises public concerns and takes actions to mitigate these concerns, e.g. establishing formal processes for information provision to the public and the authorities, implementing site sharing and using alternative designs to minimise the visual impact of sites. 90% of operators follow a company or national policy for good practice of network rollout.
- For 96% of the operators, processes are in place to facilitate information exchange between the industry and key stakeholders. In 41% of the cases, these processes are a mandatory requirement. Voluntary initiatives by operators exceed 50% of the cases.
- Operators use a variety of methods to inform key stakeholders, primarily local authorities, public or local communities and the regulator. Other interest groups include media, health agencies, other mobile operators, landlords, politicians and key-opinion leaders.

¹http://www.gsmworld.com/gsm europe/documents/health/recommendation_network_rollout_good_practice.pdf

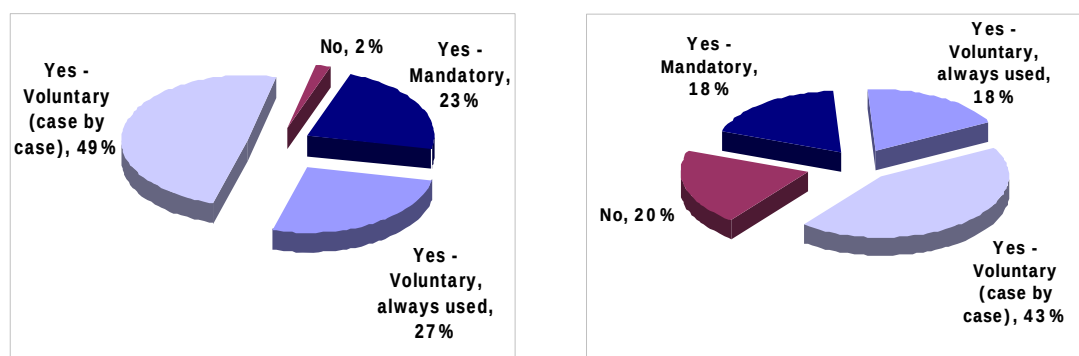
Figure 1.1 & 1.2: Do you have a formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans? / How do you facilitate the information flow?



Source: Ovum for GSME Study

- The survey indicates that operators proactively inform the public about their requirements to install more antennas and sites categorisation. In over 75% and 60% of the cases respectively, this is part of a voluntary programme.

Figure 1.3 & 1.4: Have you communicated the need to install more network antennas to the public? / Do you conduct a consultation programme or involve local communities in the categorisation of the sites²?



Source: Ovum for GSME Study

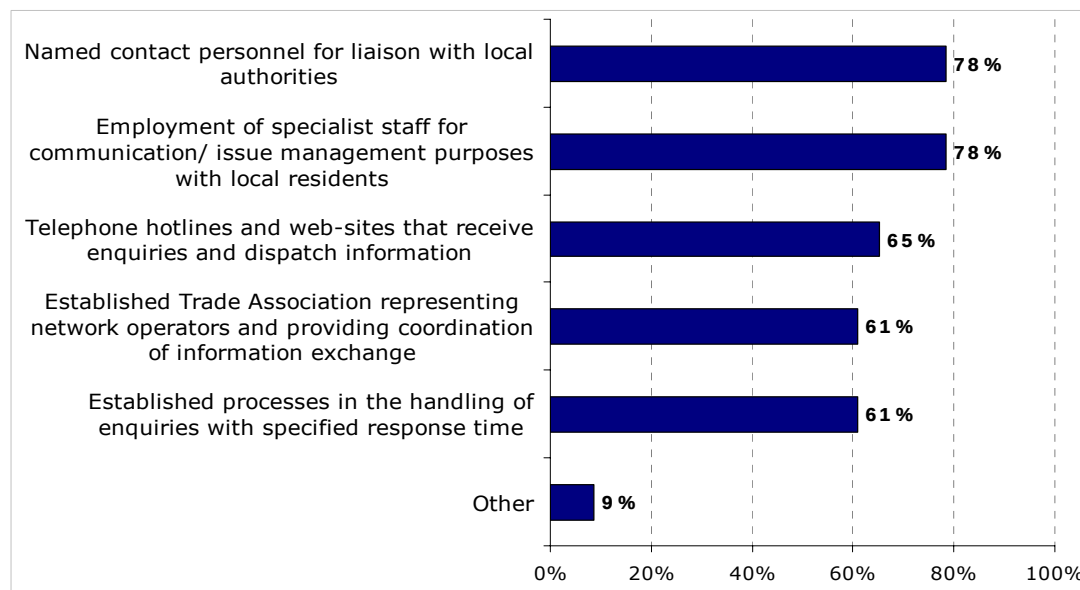
- All operators share infrastructure for base stations, with more than 5 different types of infrastructure being shared on average by an operator (e.g. tower or roof-mounted sites, other telecommunication mast, other operator's facilities and radio installations). The

² Site categorisation is used in some countries to assess the level of consultation required. It is not a measure of whether a site should or should not be progressed.

survey results show that 83% of 3G operators (with 2G operations) share sites with their current 2G facilities/sites. All operators expect to maintain or increase (78% of operators) their site sharing over the next 5 years.

- The use of alternative design and installations to reduce the visual impact of sites is a key element of operators' network rollout policies and the great majority of operators (94%) use such techniques.
- All operators report that existing and new base stations comply with national, European and/or international (ICNIRP³) limits. All certifications are referred to exposure limits that the operator's country has adopted. The main reason for site measurements is to respond to specific concerns of the public or others.
- Operators take special care of complaints and enquiries about base station planning and EMF issues. Almost all operators (98%) responded that processes have been established to address individual issues (e.g. consumer or site-specific).

Figure 1.5: What are the methods used to manage complaints and enquiries? (Multiple responses possible)



Source: Ovum for GSME Study

- The approach to implementing the GSME recommendations varies between countries for a number of reasons:
 - o the operator's network rollout policy may need to comply with national requirements for network rollout good practice. National policies do however largely reflect GSM Europe Recommendations

³ ICNIRP: International Commission on Non-Ionizing Radiation Protection (<http://www.icnirp.de>)

- o the level of public concern about EMF issues may be influenced by particular interest groups and the media
- o companies with multi-national operations may have network rollout guidelines and policies which are followed by all group members
- o a national trade association may coordinate national activity and help facilitate EMF-related information flow to the local authorities and other key stakeholders the requirements provided by national governments and agencies, and their advice to the public vary (e.g. additional precautionary measures) resulting in different needs for communications by the operator. Operators' experience and research indicates that such measures increase public concern⁴
- Public concern is mainly expressed as related to possible health issues. Operators report that significant complaints/ enquiries appear from only 7% of the sites which may suggest that complaints are primarily local.
- There is no evidence for a general increase in public concern in the surveyed countries; 68% of operators responded that the level of concern had remained about the same over the last 18 to 24 months or actually decreased. This is clearly shown in the following table for each of the complaints categories.

Figure 1.6: Trends in the level of concerns (last 18-24 months)

	Increased	Decreased	No change
Health	39%	8%	53 %
Environment	28%	5%	67 %
Aesthetic	19%	6%	75 %
Technology	3%	14%	83 %
Other	33%	0%	67 %

Source: Ovum for GSME Study

The vast majority of the respondents (93%) stated that their actions related to GSM Europe Recommendations have contributed to keep the level of complaints and enquiries stable or even caused a decrease. This result may suggest that GSM Europe Recommendations is a communication and implementation tool which when utilised by the industry may control or lower public concerns.

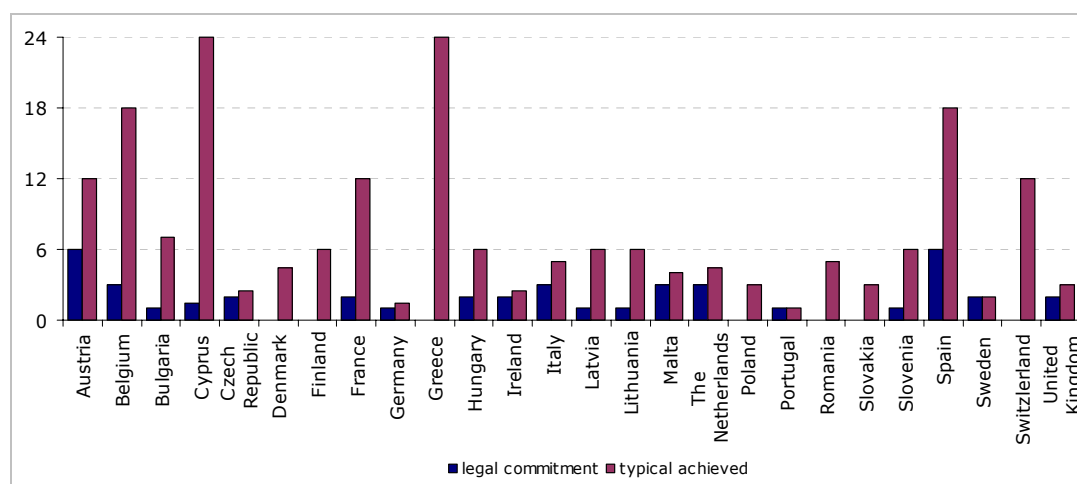
⁴ Wiedemann et al, (2006). The Impacts of Precautionary Measures and the Disclosure of Scientific Uncertainty on EMF Risk Perception and Trust. *Journal of Risk Research*, 9(4), pp. 361 - 372.

- GSM Europe members actively support independent research programmes in the areas of mobile technologies, health, environment and social concerns. All operators contribute to GSMA⁵ programmes.

Base Station Planning Permission in Europe

- Requirements for permits for base station deployment vary largely from one European country to the other. Procedures can be defined at different government levels, even though generally the local authority (municipality) is the main point of referral for the process. In addition, general requirements related to regional or national levels legislation usually have to be met. Figure 1.6 shows timescales information contained in the country tables presented in Annex II.
- As a general observation, delays are more likely to occur in cases in which a direct authorizing intervention of the central government or of a number of bodies other than the local planning authority is required. On the other hand some countries, such as Italy and Portugal, have implemented tacit approval mechanisms to avoid delays related to bureaucratic inefficiencies. Some countries have effective systems of exemptions for small installations or certain site upgrades. When comparing this data with the 2004 report prepared by GSM Europe on the same topic⁶ we notice that timescales for permission granting have not changed dramatically.

Figure 1.7 Comparison between legal commitment and typically achieved timescales for granting planning permission on a per country basis (# of months)



Source: Ovum for GSME Study

Health Research and Public Concern

⁵ GSMA is the global trade association representing of mobile operators using the GSM family of technologies.

⁶http://www.gsmworld.com/gsm europe/documents/health/base_station_planning_report_europe_170504.pdf

Extensive research has been conducted into possible health effects of exposure to many parts of the frequency spectrum. The mobile industry is a significant contributor to national and international research programs. The consensus of all reviews conducted so far indicates that exposures below the limits recommended in the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998) EMF guidelines, covering the full frequency range from 0 - 300 GHz, do not produce any known adverse health effects. This has been reconfirmed by the European Commissions independent scientific committee SCENIHR⁷ However, there are gaps in knowledge that still need to be filled in order that better health risk assessments can be made.

The World Health Organization (WHO) concludes that:

*"With more and more research data available, it has become increasingly unlikely that exposure to electromagnetic fields constitutes a serious health hazard, nevertheless, some uncertainty remains. The original scientific discussion about the interpretation of controversial results has shifted to become a societal as well as political issue."*⁸

Specifically for wireless networks the WHO states:

*"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."*⁹

Conclusions from the Survey

Based on the results presented above, a number of conclusions may be considered to enhance the effectiveness of operators' actions and initiatives:

1. It is crucial for the mobile industry to closely monitor and audit these processes in order to be regularly reassured that informative programmes and other initiatives have the results anticipated by the industry. It is reported that despite operators' efforts and actions, public and local authorities are not always receptive to accept the points presented in these programmes due to lack of trust in the accuracy of and credibility in the information provided. Governments on national, regional and local level therefore play a decisive role in trusted and science-based communications. It is important that trust in these communications is established with the recipients.
2. Risk communication activities must address public concerns. The industry is working to provide community-specific information (e.g. to discuss particular base station deployments and the benefits to the community where the deployment takes place) and to help address local concerns through frequent interaction with interested stakeholders. The level of activity should be proportionate to the level of public concern.

⁷ Scientific Committee on Emerging and Newly Identified Health Risks
(http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/04_scenihhr_en.htm)

⁸ Source: WHO (2007) – What Are Electromagnetic Fields? (<http://www.who.int/peh-emf/about/WhatisEMF/en/index5.html>)

⁹ Source: WHO (2006) – Fact Sheet No 304

3. It is important that national research programmes include open publication of the outcomes of such studies as part of the information exchange processes. The conclusions of these studies may also be used to inform government and operators' EMF policies. There is a need for better communication by governments to interested stakeholders of the results and their interpretation. To avoid unnecessary duplication by national research programmes it is recommended that these are based on the WHO¹⁰ research agenda and are co-ordinated at international and EU levels.
4. It is reported that public concern increases during the early phases of network rollout and when there is media coverage (e.g. newspaper articles etc.) claiming unsubstantiated health risks. The involvement of national governments with specialised communication programmes, in conjunction with the mobile industry, can help facilitate public access to updated information regarding EMF developments. Such programmes should be targeted to address local issues and match the level of concern in that country. These programmes should be designed to fill the communication gap, minimise unnecessary concerns and ambiguous messages, and build the confidence of public and local communities.

¹⁰ World Health Organization, International EMF Project (www.who.int/peh-emf/)

2. Introduction

2.1 Study and scope of work

This paper was commissioned by GSM Europe, which represents all 2nd and 3rd generation GSM family cellular network operators in Europe. The paper has been developed with the aims:

- to conduct a survey with GSM Europe Members in the European Union (EU) Member states and Switzerland to assess actions taken by mobile operators in relation to the GSME recommendations for good practice in network rollout
- to provide a country-by-country analysis of status and actions
- to summarise research support at the national, European and international level and provide updated version of the Base Station Planning procedures for each one of the Member States.

The report provides a detailed and accurate summary of actions, initiatives, voluntary codes of practice and mandatory activities that mobile operators have been undertaking toward the implementation of each separate element of the GSM Europe Recommendations. The report also refers to actions being taken by other parties such as governments, national regulators, trade associations and institutions, in that a complete picture is provided at a national level.

The report is based on responses from GSM Europe members to a survey questionnaire prepared by Ovum and agreed with GSM Europe. The actions taken by GSM Europe members to implement the GSM Europe Recommendations for Network Rollout, together with additional data on Base Station Planning Procedures applicable to each country have been assessed.

2.2 Report structure

The report is structured in four Chapters and has two Annexes:

- *Chapter 1:* the Executive Summary
- *Chapter 2:* includes an introduction to mobile technology and the need for base station deployment. GSM Europe's activities related to health and environment are presented in the last section of this chapter
- *Chapter 3:* presents the main conclusions, key findings and outcomes of the survey at an EU level
- *Chapter 4:* provides a summary of the EMF research programs undertaken in EU and international level. The World Health Organization (WHO)'s position in regards to alleged health risks from mobile technology is briefly presented together with the recommendations from the European Council and related actions
- *Annex I:* provides country-specific information about the implementation of GSM Europe Recommendations. Annex I includes information on the level of public concern, operators' codes of practice and audit processes, voluntary actions by Mobile Network

Operators (MNOs), government actions and the exposure guidelines followed in each country

- *Annex II*: provides a summary of Base Station planning procedures across the EU.
- *Annex III*: GSM Europe Recommendations on Network Rollout good practice is presented.

2.3 Social and economic contribution of mobile communication

In recent years, the mobile telecommunications sector has experienced enormous growth in Europe and worldwide with continuously increasing penetration in all European and other countries. New services have been introduced, enabled by more advanced networks. By the end of June 2007, mobile connections had exceeded 700 million in Europe and are projected to 800 million by June 2008.

Mobile communication services are a major catalyst in improving the health, wealth, education and social mobility of people and communities. Mobile services have transformed the way firms operate and are a driving force to the social and economic development of countries in many ways: contribution to GDP¹¹ growth; the direct and indirect creation of jobs and revenue generation for governments. Mobile services play a central role in enabling this productivity growth.¹²

Mobile technology is used in all EU countries for citizens to contact emergency services and recent studies show that the mobile phone has become the device most people turn to in an emergency.¹³ Text messaging is a primary means of communication in the aftermath of a disaster, as mobile networks can generally recover within a few hours or days of a major disaster. Aid agencies make use of text messages and mobile voice service in order to best serve the people affected and provide information according to their needs.

Mobile network infrastructure and the adoption of mobile services are now being considered as key indicators to European economies. The continuous evolution of mobile communications is directly related to business activities and way of living. The greater number of consumers that can access mobile services the more social welfare gains and benefits end users enjoy.¹⁴

2.4 Mobile technology and network infrastructure

2.4.1 How mobile networks work

A wireless mobile communications network enables users with mobile phones to send and receive information (voice calls, messages, data) by radio signals. A local transceiver, the base

¹¹ GDP: Gross Domestic Product

¹² <http://www.gsmworld.com/digitaldivide/index.shtml>

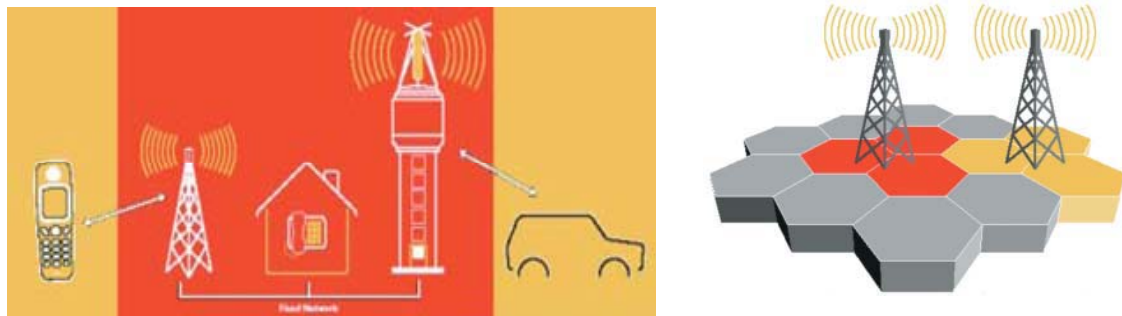
¹³ http://www.gsmworld.com/using/public_policy/esb/disaster_relief.shtml

¹⁴ http://www.gsmworld.com/using/public_policy/esb/research.html

station, transmits and receives radio signals to/ from the mobile phones (Figure 2.1), covering a certain geographical area (Figure 2.2), known as the cell. Radio signals can only travel a certain distance as they are low powered and mostly line-of-sight. Obstructions such as buildings and hills limit the coverage that a single base station can provide. In addition, the mobile phone is a low powered radio device and must be near a base station so that the signal has the required power to reach the base station.

The location where the radio transceiver is installed is called a cell-site, where all the necessary equipment like antennas, masts and associated telecommunication equipment are placed in order to enable the communication between the mobile phone and the base station. The base station is also connected into the mobile network and with other networks (e.g. PSTN¹⁵, other mobile operators' network).

Figures 2.1 and 2.2: Mobile Network, Base Stations & Cell coverage areas



Source: GSMA

The base station is the main part of the telecommunication equipment installed in each cell-site and handles the necessary processing of a call. The base station controls the power transmitted to the mobile phone and also instructs the mobile device to transmit the minimum power required for the user to receive adequate service quality during the call.

The term "cellular" refers to the fact that in order for a wireless network to provide coverage to many sites need to be installed in a cellular layout. This allows mobile users to travel within the coverage area of the cellular network and receive continuous service between cells. The process is called 'hand-over' and to achieve call handover without dropping the call, the coverage from individual base stations must partially overlap. As noted above, due to the limited power that a base-station can transmit, it can only cover a certain area depending on the characteristics of the surrounding terrain (buildings, hills, trees, valleys etc.) and the number of simultaneous calls that need to be served in its area. The size of a cell can vary from 100m or less to 10km or more depending on the location and number of calls to be carried.

2.4.2 New technologies and service evolution

Cellular mobile technology has been continuously evolving for over 20 years, mainly driven by an increasing demand for mobility and continuous communication. Across the European Union,

¹⁵ PSTN: Public Switched Telephone Network

each Member State has granted licences for 2nd Generation (2G) mobile networks. The GSM standard is the most popular network standard for 2G mobile networks and is the one adopted by the majority of European countries. The cross-adoption of a single standard led to multiple benefits for mobile users as they are able to use GSM services in any country which has deployed a GSM network. Economies of scale further help to lower the total cost of ownership and network deployment, ultimately leading to lower tariffs, enabling more subscribers to benefit from mobile technology.

The introduction of 3G mobile networks required access to additional radio spectrum and the governments of each member states have procedures for the allocation of licences and radio spectrum. While GSM networks are optimised to provide voice and low speed data (e.g. SMS) services, 3G networks offer advanced voice services and much higher speed data and multimedia services.

The new generation of mobile services (3G) has shown significant increase in adoption rates over the last few years. By the end of second quarter of 2007, 8% of the total mobile connections in Europe were 3G connections.¹⁶ The number is forecast to double by June 2008. 3G (WCDMA /HSPA) networks have been deployed to provide enhanced and more sophisticated services with 72 networks being already in service, 12 in deployment and 28 planned.

2.5 The need for continuous base stations deployment

Base stations are installed to provide geographic coverage and additional network capacity where needed. Fewer are needed in less populated and rural areas, more in urban areas.

The introduction of new mobile services (e.g. 3G) requires additional, technology-specific base stations. Operators may be required, as a condition of their licence, to install base stations nationally to meet government or regulatory coverage targets, and they are increasingly required to support increasing demand for concurrent calls as a base station can only carry a certain number of calls whilst providing the required service quality.

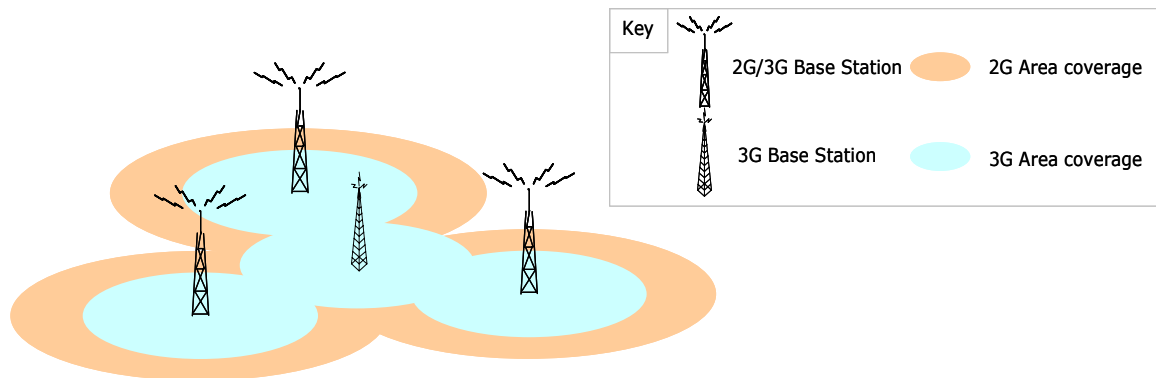
In general, 3G networks require more base stations in order to cover the same geographical area as the 2G networks (Figure 2.3). 3G networks in Europe currently operate at higher radio frequencies which result in radio signals travelling shorter distances than in 2G networks.

The European Commission has agreed that the GSM 900MHz and GSM 1800MHz bands will be approved for 3G(UMTS)900/1800 use¹⁷, and programmes are underway to achieve this end. If implemented by operators, this should result in fewer base stations than would be needed otherwise. 3G networks are deployed in the same areas where 2G networks exist and are able to use some of the existing 2G cell-sites and facilities.

¹⁶ Source: Ovum research

¹⁷ [http://www.ipex.eu/ipex/webdav/site/myjahiasite/groups/CentralSupport/public/2007-3/COM_2007_0367/COM_COM\(2007\)0367_EN.pdf](http://www.ipex.eu/ipex/webdav/site/myjahiasite/groups/CentralSupport/public/2007-3/COM_2007_0367/COM_COM(2007)0367_EN.pdf)

Figure 2.3: Base Stations and 3G/2G cell coverage areas¹⁸



Source: Ovum

The maximum peak power transmitted from GSM mobile phones is 2 Watt (900 MHz) or 1 Watt (1800 MHz). In GSM networks, mobile phones do not transmit constantly, but in certain time intervals. This technique results in a significant reduction of the average power transmitted from the mobile phones, which does not exceed the 1/8 of the maximum values i.e. 0.25 W or 0.125 W, respectively. These values are further reduced by adaptive power control and discontinuous transmission mechanisms. The power transmitted by GSM/3G(UMTS) mobile phones is constantly monitored and adjusted to minimise energy consumption and improve network quality (power transmissions beyond certain limits may result in poorer quality due to interference issues). This base station control may result in handset power being reduced significantly of the maximum allowed when the handset is close to the base station.

The success of cellular telephony has resulted in increasing numbers of radio base stations to provide the capacity and geographical coverage demanded. As the deployment of more base stations reduces the average distance between users and the nearest base station, the average power transmitted by handsets has also been reduced. There is therefore a synergy between the commercial requirement to extend capacity to maintain a high quality of service and a desire to reduce the average power from handsets.

2.6 GSM Europe's activities

GSM Europe (GSME)¹⁹ is the European interest group of the GSM Association (GSMA)²⁰, the premier global body behind the world's leading wireless communications standard. GSM Europe represents around 150 operators in 50 countries/areas in Europe, serving around 600 million subscribers. The GSMA is responsible for the development, deployment and evolution of the GSM standard for digital wireless communications and for the promotion of the GSM family of technologies.

¹⁸ The figure is presented for illustrative purposes only and is not scaled to show actual cell sizes

¹⁹ <http://www.gsmeurope.org>

²⁰ <http://www.gsmworld.com>

GSM Europe is the public face of European mobile operators and the key representative forum for the European wireless industry. It seeks to enhance and protect investments in network infrastructure and aims to drive innovation, growth and expand consumer choice. GSM Europe seeks to ensure that the benefits of mobile services are understood, showing how they have enhanced the lives of citizens and brought social and economic benefits to individuals, businesses and nations. GSM Europe will endeavour to leverage the economic interest that the mobile industry represents in Europe.

In 2006 GSM Europe published a Health and Environment Position Statement²¹. The key elements of this Statement are:

"In recent years, concerns have been raised about alleged adverse health effects from the operation of mobile telecommunications technology. This is despite independent expert reports across Europe [Stewart²² and AGNIR²³ (UK), Zmirou²⁴ (France), Health Council²⁵ (Netherlands), the Radiation Protection Authority²⁶ (Sweden), Independent Expert Committee²⁷ (Spain), other major scientific reviews and advisory bodies around the world continuing to conclude that, based on the current weight of scientific evidence, there are no known adverse health effects from exposures below international guidelines. The reports do however recommend that research continue.

The public's health concerns have focused primarily on the community impact of base station developments. The continual growth and reconfiguration of base stations are essential to extend service coverage, enhance call quality and increase network capacity. It is often not understood that base stations must be located near to where phones are used and, because of the limited number of radio channels available to each operator, additional base stations must be installed as the usage increases. In response to health concerns some local authorities and national governments have imposed more restrictive, arbitrary, rules on the siting of mobile phone base stations. This causes problems for operators in responding to the needs of their millions of customers, and undermines the competitive edge that Europe has and wants to retain through the swift uptake and development of this technology.

Policy on base station siting and related health concerns must be based on substantiated scientific evidence and provide a framework to support GSM, 3G and future services across Europe.

Implementing arbitrary levels that are lower than the international public exposure guidelines [EU Council Recommendation of 12 July 1999 (Reference 1999/519/EC)] undermines the scientific basis of current standards, creates further public confusion and increases public concern."

²¹ http://www.gsmworld.com/gsm europe/documents/mobile_comms_matters_2006.pdf

²² UK Independent Expert Group (2000): <http://www.iegmp.org.uk>

²³ NRPB Advisory Group on Non-Ionising Radiation (2003):
http://www.nrp.org/publications/documents_of_nrp/abstracts/absd14-2.htm

²⁴ French Health General Directorate (2000): <http://www.sante.gouv.fr/>

²⁵ Health Council of the Netherlands, (2004): <http://www.gr.nl/pdf.php?ID=886>

²⁶ Swedish Radiation Protection Authority-SSI (2003): http://www.ssi.se/english/english_news.html

²⁷ Independent Expert Committee (2001): <http://www.msc.es/salud/ambiental>

In 2001, GSM Europe members adopted the *Recommendation on Network Rollout Good Practice*²⁸ aimed at encouraging dialogue and consultation with key stakeholders interested in the deployment of mobile telecommunication networks. Key elements of the mobile telecommunications industry recommended good practice include:

Figure 2.4: GSM Europe Good practice Recommendations

Rec. #1	Improving the dialogue with local authorities and other key stakeholders in order to increase understanding of network infrastructure requirements and local planning frameworks. The consultation process will take into account planning, environmental and community issues.
Rec. #2	Considering site sharing with other radio installations or existing structures, where technically feasible and in line with competition law and licensing conditions, when decisions are being made on the most environmentally appropriate radio base station solution.
Rec. #3	Sensitive siting and design, which reduces visual intrusion and can help allay public concerns. The industry recognises that the environmental impact of radio base station developments should be kept to a minimum.
Rec. #4	Providing information to regulatory and planning authorities on mobile telecommunications technological developments. The industry believes that the provision of technological information is an effective means of raising awareness and understanding of the issues confronting the industry.
Rec. #5	Ensuring all existing and new radio base stations comply with national exposure guidelines based on the public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), as expressed in EU Council recommendation of 12 July 1999 (Reference 1999/519/EC) on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). The industry supports exposure guidelines, such as ICNIRP, which are based on sound scientific evidence and are subject to on-going expert review.
Rec. #6	Providing a written declaration that radio base stations are designed to comply with national or European exposure guidelines. A signed declaration of compliance with the relevant guidelines supports openness and provides confidence to local communities that radio base stations are being operated safely.
Rec. #7	Implementing a clear process to respond to complaints and enquiries about radio base stations. The industry recognises that there has often been some frustration regarding the information provided when enquiries are received on radio base station sites and that the quality of the information provided to the public needs to be of a high standard.
Rec. #8	Supporting quality research programmes at the EU and Member State level based on the WHO research agenda that will provide the basis for on-going review of established guidelines. Expert reviews in a number of EU states have concluded that

²⁸http://www.gsmworld.com/gsm europe/documents/health/recommendation_network_rollout_good_practice.pdf

	there is no convincing independent scientific research of a link between public exposure to the low level radio signals used by mobile telecommunications systems and adverse human health effects. However, the industry welcomes on-going, independent, quality research programmes in order that policy can be based on substantiated scientific evidence and criteria.
Rec. #9	Using clear and consistent supporting documentation when exchanging information with regulatory and planning authorities. The industry recognises that it is often confusing when presented with similar information in varying formats and therefore documentation will aim to follow defined formats.

Source: GSM Europe

3. Implementation review of GSM Europe Recommendations

3.1 Background

Mobile network infrastructure and the adoption of mobile services have a direct impact to national economies and social welfare. In order to meet licensing conditions mobile operators are required to install base stations across the country so that every user is able to benefit from the use of mobile services.

The installation of base station facilities necessary for network deployment has increased the public concern toward the alleged health impact of radio signals and other environmental concerns. The mobile industry recognises that public fears should be addressed as a matter of principle and in an open and transparent manner.

In 2001, GSM Europe and the mobile telecommunications industry in Europe adopted a self-regulatory framework. The *Recommendation on Network Rollout Good Practice*²⁹ aimed to encourage dialogue and consultation with key stakeholders interested in the deployment of mobile telecommunication networks.

In 2003 the GSME Health and Environment workgroup³⁰ published the *Implementation Report Into good Practice Recommendations for Network Rollout* to provide an overview of: the achievement in implementation of the good practice recommendations; the effectiveness of the good practice recommendations and to identify the remaining issues for on-going delivery of the good practice recommendations.

As four years have elapsed since the last report was published, an updated report on the Implementation of GSM Europe Recommendations is required.

3.2 Survey participants

The survey was addressed to all mobile operators in EU Member States (EU-27) and Switzerland and mobile operators' trade associations in some countries. Fifty-two (52) mobile operators and seven (7) trade associations have participated to the survey. In 17 countries, at least two operators have provided responses.

The map below shows GSM Europe country members. The map also presents the countries participated in the survey.

²⁹http://www.gsmworld.com/gsm europe/documents/health/recommendation_network_rollout_good_practice.pdf

³⁰ http://www.gsmworld.com/gsm europe/work_groups/health.shtml

Figure 3.1: GSM Europe members and survey participants (countries)



Source: Ovum for GSME Study

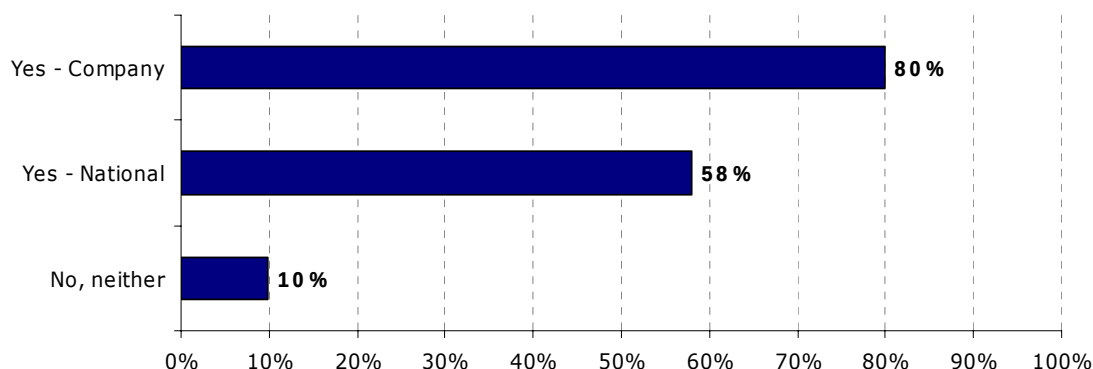
Each one of the charts in the following sections shows the number of responses (n) for the related survey question. For some of the questions multiple answers were possible (as indicated in bar charts). Pie charts indicate single-response questions.

3.3 General conclusions across the EU

The main conclusions of the survey of mobile operators and trade associations are:

- There is strong support for the GSME Recommendations as shown below. The industry recognises public concerns and takes actions to mitigate these concerns, e.g. establishing formal processes for information provision to the public and the authorities, implementing site sharing and using alternative designs to minimise the visual impact of sites. The early adoption of the GSME Recommendations has served as a catalyst for similar policies in several countries and multi-national corporate groups.

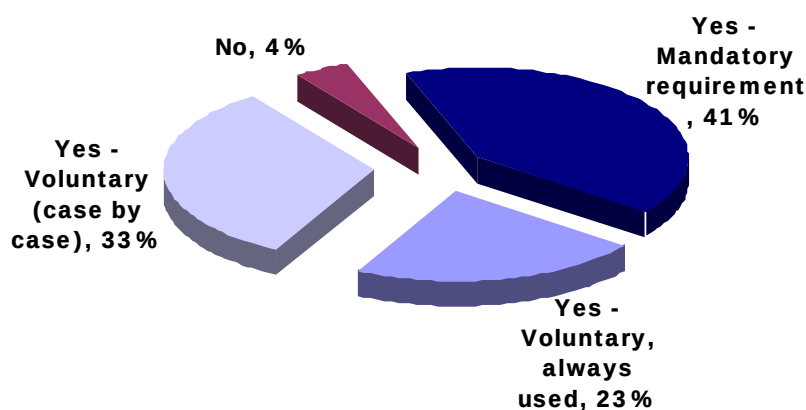
Figure 3.2: Do you have a formal company or national policy in respect of good practice for network rollout? (Multiple responses possible)



Source: Ovum for GSME Study (n=50)

- For 96% of the operators, processes are in place to facilitate information exchange between the industry and key stakeholders, a group which includes the public, local authorities, national governments and agencies, and regulatory bodies. In 41% of the cases, these processes are a mandatory requirement. Voluntary initiatives by operators exceed 50% of the cases.

Figure 3.3: Do you have a formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans?



Source: Ovum for GSME Study (n=49)

- GSM Europe members continue to support independent research programs at EU and member state level. All operators contribute to GSMA programmes.
- The approach to implementing the GSME recommendations varies between countries for a number of reasons:

- o the operator's network rollout policy may need to comply with national regulatory requirements or a national policy for network rollout good practice. National policies do however largely reflect GSM Europe Recommendations
- o the level of public concern about EMF issues may be influenced by particular interest groups and the media. Operators' actions to communicate with the public and other stakeholders will be influenced by the level of public concern, and therefore vary between countries. There are cases where the industry is proactive and operators follow policies similar to GSM Europe Recommendations in markets with moderate or low levels of concern
- o companies with multi-national operations may have network rollout guidelines and policies which are followed by all group members
- o a national trade association may coordinate national activity and help facilitate EMF-related information flow to the local authorities and other key stakeholders. They also help to handle enquiries from the public with industry-wide coordination
- o the requirements provided by national governments and agencies, and their advice to the public vary, (e.g. additional precautionary measures) resulting in different needs for communications by the operator. Operators' experience and research indicates that such measures increase public concern³¹
- Public concern is mainly expressed as related to possible health issues; environmental and aesthetic concerns appear to be at a lower level with technology issues being of least or no concern. Operators report that significant complaints/ enquiries appear from only 7% of the sites which may suggest that complaints are primarily local. The following two figures show that in the great majority of the cases public concern remains stable over the last 18-24 months, across the various types of complaints.

Figure 3.4: Trends in the level of concern the public has in each complaint category

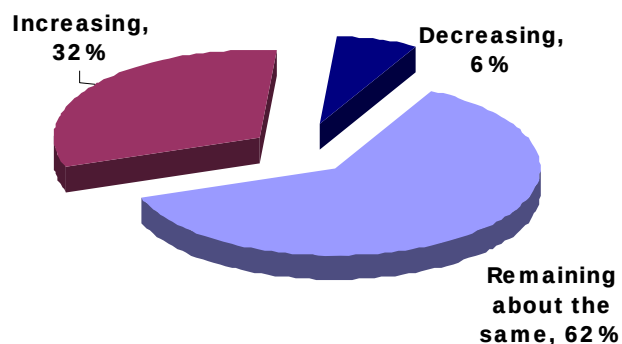
	Increased	Decreased	No change
Health	39%	8%	53 %
Environment	28%	5%	67 %
Aesthetic	19%	6%	75 %
Technology	3%	14%	83 %
Other	33%	0%	67 %

Source: Ovum for GSME Study, as reported from operators' customers (n=39)

³¹ Wiedemann et al, (2006). The Impacts of Precautionary Measures and the Disclosure of Scientific Uncertainty on EMF Risk Perception and Trust. *Journal of Risk Research*, 9(4), pp. 361 - 372.

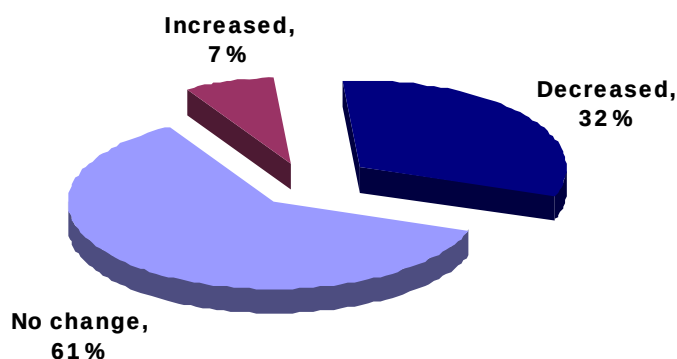
The level of the "Other" category in the Figure above is mainly driven from concerns over potential impacts on property price due to installations of base stations in an area.

Figure 3.5: What is the trend in the overall level of complaints/ concerns/ enquiries related to network rollout, over the last 18-24 months?



Source: Ovum for GSME Study, as reported from operators' customers (n=47)

Figure 3.6: What effect do you think your activities related to GSM Europe Recommendations have had on complaints/ enquiries?



Source: Ovum for GSME Study (n=44)

- As shown in the previous two charts, there is no evidence for a general increase in public concern in the surveyed countries; 68% respond that the level of concern remained about the same over the last 18 to 24 months or actually decreased. 32% of operators responded that public concern, based on their experience, has increased during this period.
- 93% of operators state that their activities related to GSM Europe Recommendations have contributed to keep the level of complaints and enquiries stable or even decreased them. This result may suggest that GSM Europe Recommendations is a communication and implementation tool which when utilised by the industry may control or lower public concerns.

3.4 The impact of GSM Europe Recommendations

The paragraphs below present the survey findings regarding each one of the GSM Europe Recommendations. Key elements of the mobile telecommunications industry recommended good practice are presented at the beginning of each of the following paragraphs:

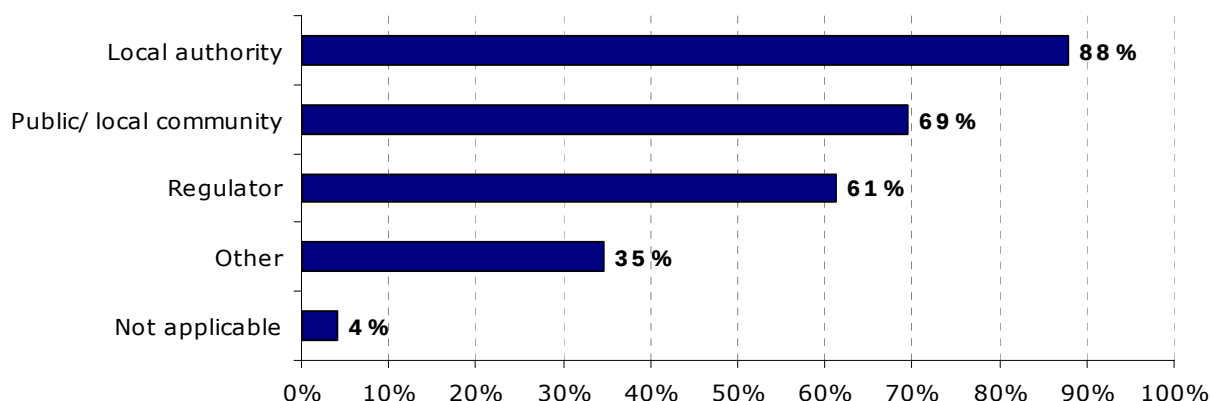
Recommendations 1 & 9

Improving the dialogue with local authorities and other key stakeholders in order to increase understanding of network infrastructure requirements and local planning frameworks. The consultation process will take into account planning, environmental and community issues.

Using clear and consistent supporting documentation when exchanging information with regulatory and planning authorities. The industry recognises that it is often confusing when presented with similar information in varying formats and therefore documentation will aim to follow defined formats.

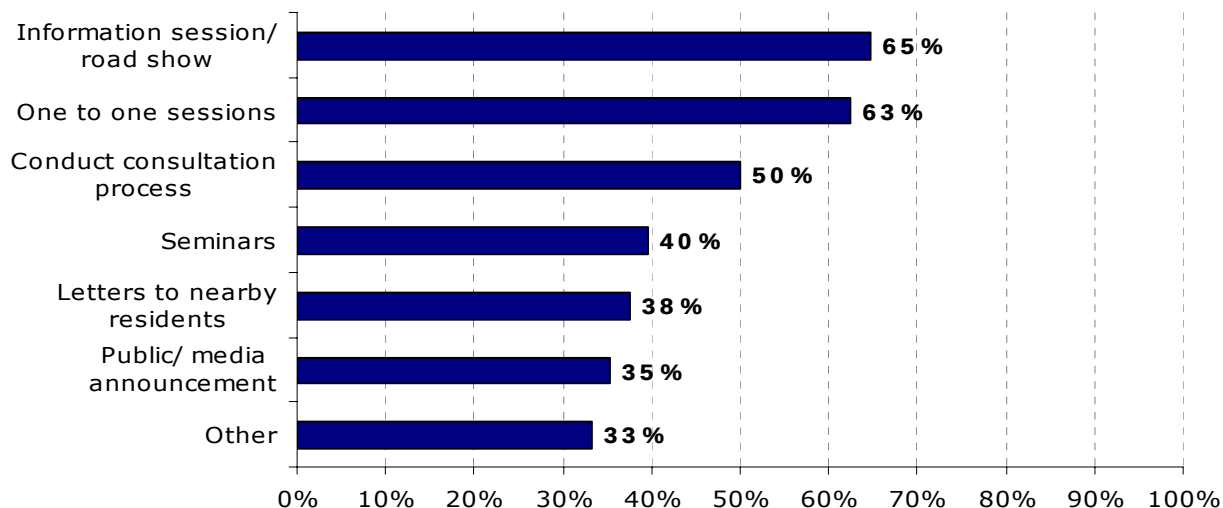
Operators use various methods to inform key stakeholders, primarily local authorities, public or local communities and the regulator. Other interest groups include media, health agencies, other mobile operators, landlords, politicians and key-opinion leaders.

Figure 3.7: Who are the main stakeholders in information provision processes? (Multiple responses possible)



Source: Ovum for GSME Study (n=49)

Figure 3.8: How do you facilitate the information flow? (Multiple responses possible)

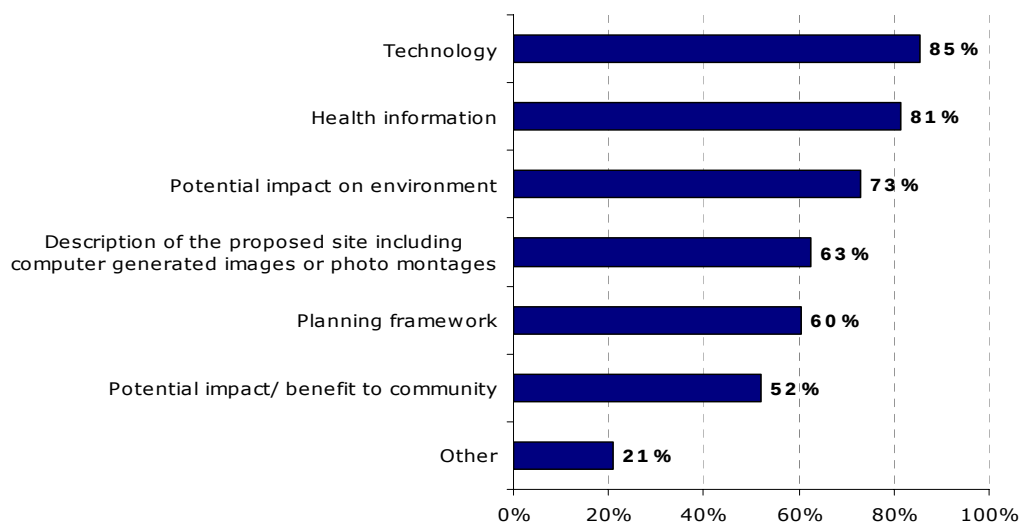


Source: Ovum for GSME Study (n=48)

Other means, apart from the ones shown in the chart below, include on-line consultation tools, brochures for the public and employees, EMF portals, general PR activities and public engagement programmes. A general technique is not able to satisfy different stakeholder's requirements and address all the different issues. Operators therefore use many methods to meet stakeholders' requirements as indicated in the chart above.

To satisfy the interests of stakeholders, operators emphasize technology and health related information in their communications. 81% of the survey participants provide both types of information.

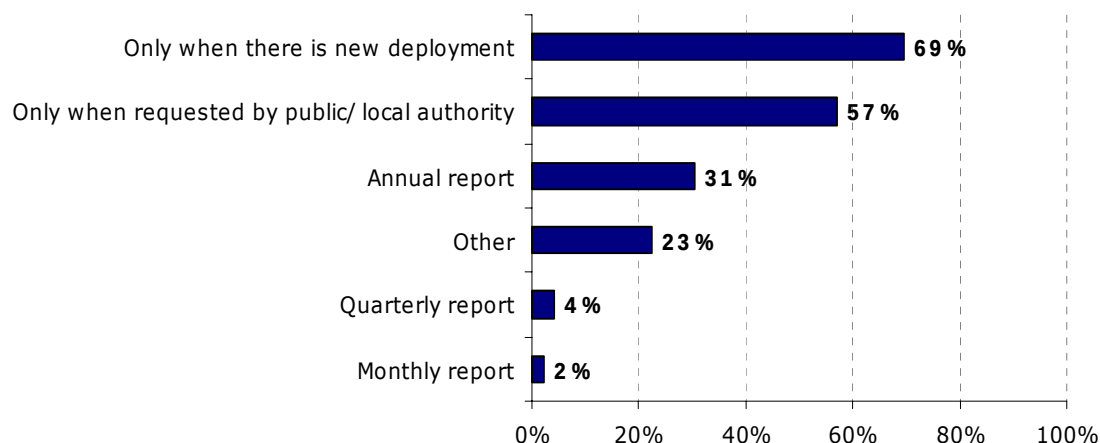
Figure 3.9: What type of information is provided? (Multiple responses possible)



Source: Ovum for GSME Study (n=48)

This information is mainly provided by the operator when there is a new deployment and when it is requested, but also in annual reports. A varying format depending on project and persons involved is used in half of the cases.

Figure 3.10: How frequently do you provide information to local authorities or other regulatory body? (Multiple responses possible)

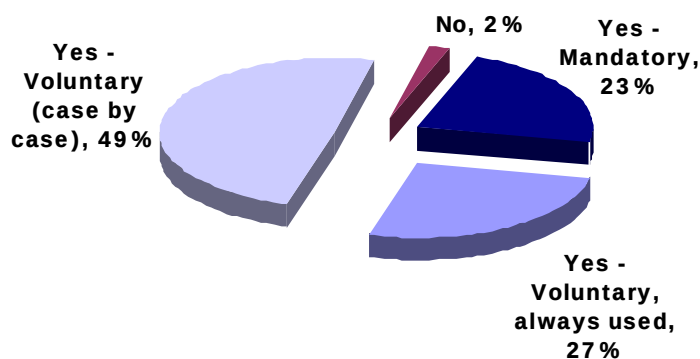


Source: Ovum for GSME Study (n=49)

Around 40% of the respondents have auditing processes in place in order to assess the effectiveness of the information exchange. For 23% of respondents the audit process is voluntary and for 15% it is a mandatory requirement. For more than 60% of respondents there is no reporting on the effectiveness of information exchange activities and this is an area for potential increased attention.

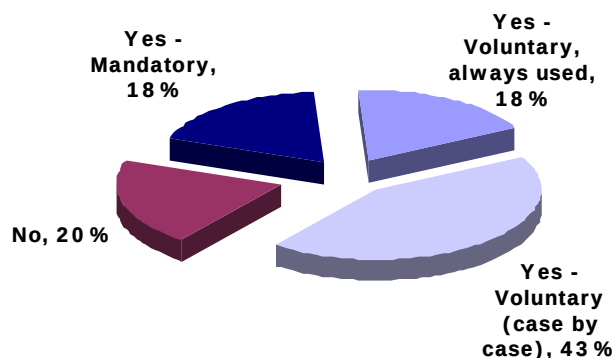
The survey indicates that operators proactively inform the public about their requirements to install more antennas and sites categorisation. In over 75% and 60% of the cases respectively, this is part of a voluntary programme.

Figure 3.11: Have you communicated the need to install more network antennas to the public?



Source: Ovum for GSME Study (n=49)

Figure 3.12: Do you conduct a consultation programme or involve local communities in the categorisation of the sites³²?



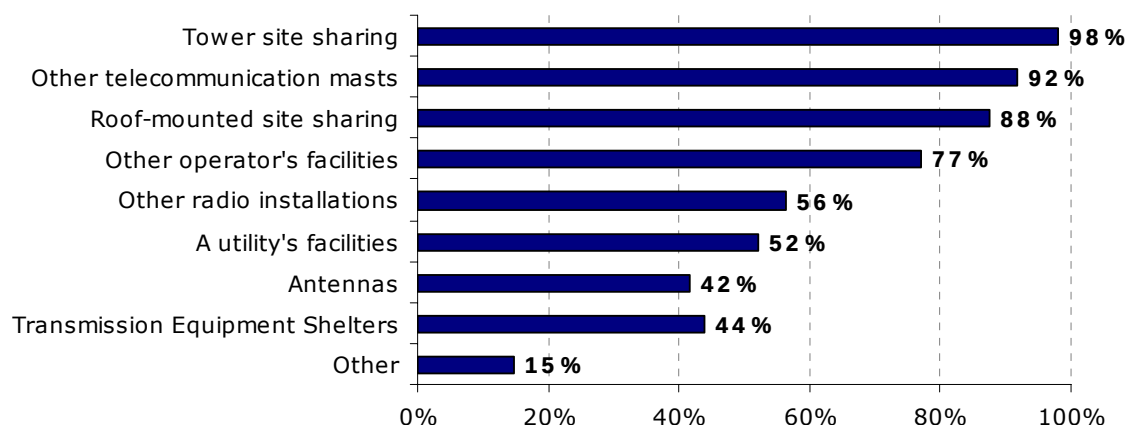
Source: Ovum for GSME Study (n=49)

Recommendation 2

Considering site sharing with other radio installations or existing structures, where technically feasible and in line with competition law and licensing conditions, when decisions are being made on the most environmentally appropriate radio base station solution.

All operators share infrastructure for base stations, with more than 5 types of infrastructure being shared on average by an operator. Details are shown in the following figure.

Figure 3.13: With what types of infrastructure do you have site sharing? (Multiple responses possible)



Source: Ovum for GSME Study (n=48)

³² Site categorisation is used in some countries to assess the level of consultation required. It is not a measure of whether a site should or should not be progressed.

The survey results show that 83% of 3G operators (with 2G operations) share sites with their current 2G facilities/sites and 45% of these operators share between 90% and 100% of their 3G sites with 2G sites. On average, 81% of 3G sites are shared with 2G sites.

Site sharing is implemented with established processes. These processes enhance cooperation between operators, reduce time requirements and increase the effectiveness of site sharing procedures. 85% of survey respondents have formal processes for site sharing.

All operators expect to maintain or increase (78% of operators) their site sharing over the next 5 years.

Operators report that landscape preservation (74% of operators) and environmental concerns (73% of operators) are very important/ important considerations for site sharing. For 89% of operators, cost saving is the most important reason for the increasing trend in site sharing. In many cases, site sharing is implemented by operators as a requirement by local authorities, licensing conditions or national competition laws.

Figure 3.14: Reasons and degree of importance for site sharing

	Very important/ Important	Neutral	Not important	Not Applicable
Cost saving	89 %	9%	0%	2%
Landscape preservation	74 %	19%	5%	2%
Environmental concern	73 %	23%	2%	2%
Required by local authority	70%	16%	2%	11%
Required by licensing conditions	20%	25%	7%	48%
Required by competition law	14%	19%	12%	55%

Source: Ovum for GSME Study (n=47)

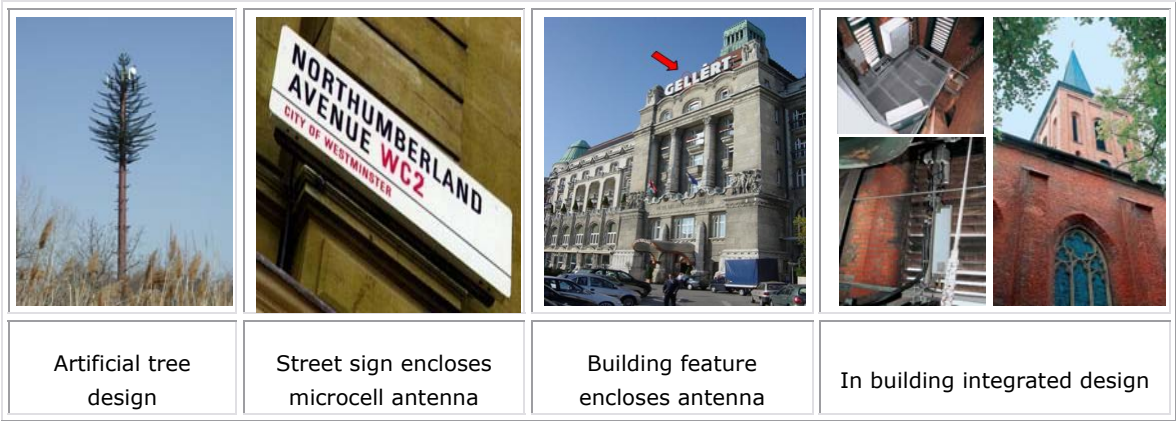
Recommendation 3

Sensitive siting and design, which reduces visual intrusion and can help allay public concerns. The industry recognises that the environmental impact of radio base station developments should be kept to a minimum.

The use of alternative design and installations to reduce the visual impact of sites is a key element of operators' network rollout policies and the great majority of operators (94%) use such techniques.

Examples include chimneys, artificial trees, advertising signs, architectural building features, church windows, inside church towers, grain silos and antenna painted to match a building facade.

Figure 3.15: Examples of alternative design



Source: Operators, Ovum for GSME Study

Camouflaged design is generally implemented only if required by authorities (e.g. listed buildings) as the public may accuse operators of “hiding” antennas to lower health concerns. It is important to note that some installations, e.g., camouflaged trees may be significantly more expensive than conventional masts. In 40% of the cases, the integration of antennas with existing landscape and infrastructure is implemented following specific design guidelines (per operator or national).

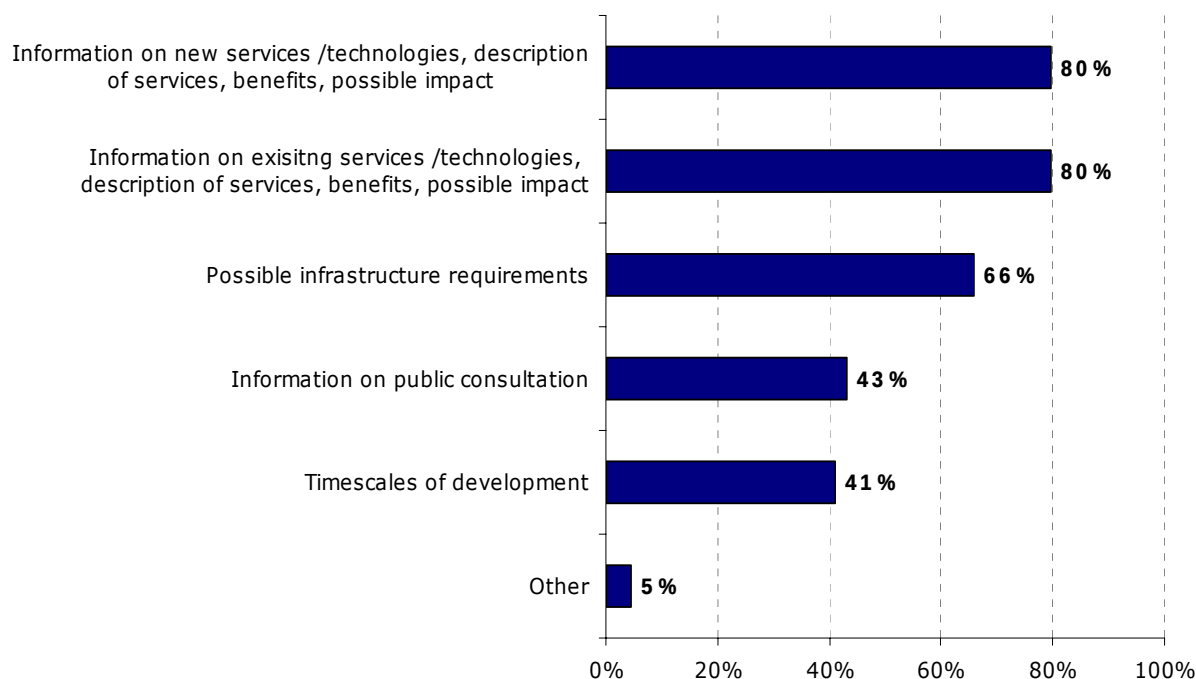
In general, there are planning exemptions for antenna sizes or power emissions.

Recommendation 4

Providing information to regulatory and planning authorities on mobile telecommunications technological developments. The industry believes that the provision of technological information is an effective means of raising awareness and understanding of the issues confronting the industry.

Operators provide a range of technology related information to interested parties. In 80% of the cases operators provide detailed information not only about the technology that mobile services are using and the evolution of mobile communications, but also an assessment of the potential impact and benefits to the community. The following figure summarises the information provided by the operators to regulatory and planning authorities.

Figure 3.16: What kind of information do you provide to regulatory and planning authorities on mobile telecommunications technological developments? (Multiple responses possible)



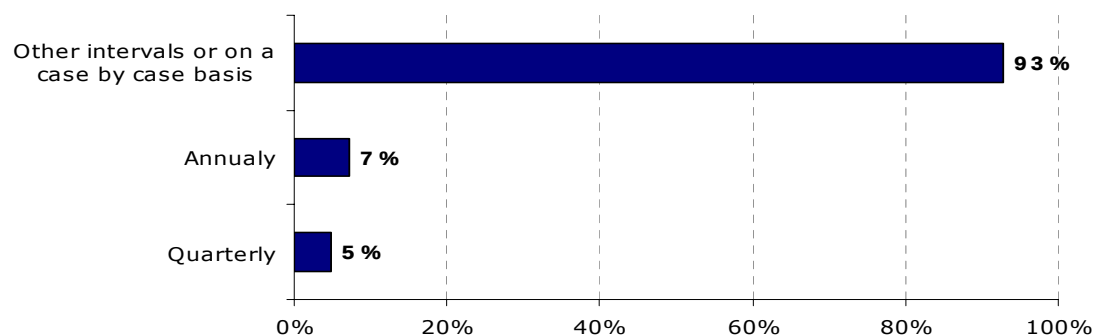
Source: Ovum for GSME Study (n=44)

85% of operators hold educational sessions with local authorities to explain how the technology works or to provide information on why particular sites locations are selected.

The feedback from interested parties is positive in the main and sessions are well appreciated. In the great majority of the cases, local authorities find the interaction informative. Very rarely it has a negative impact.

These sessions are held at varying intervals. In most cases regulatory and planning authorities are contacted as needed to discuss specific cases (e.g. when there is a new development).

Figure 3.17: How often do you hold educational sessions? (Multiple responses possible)



Source: Ovum for GSME Study (n=41)

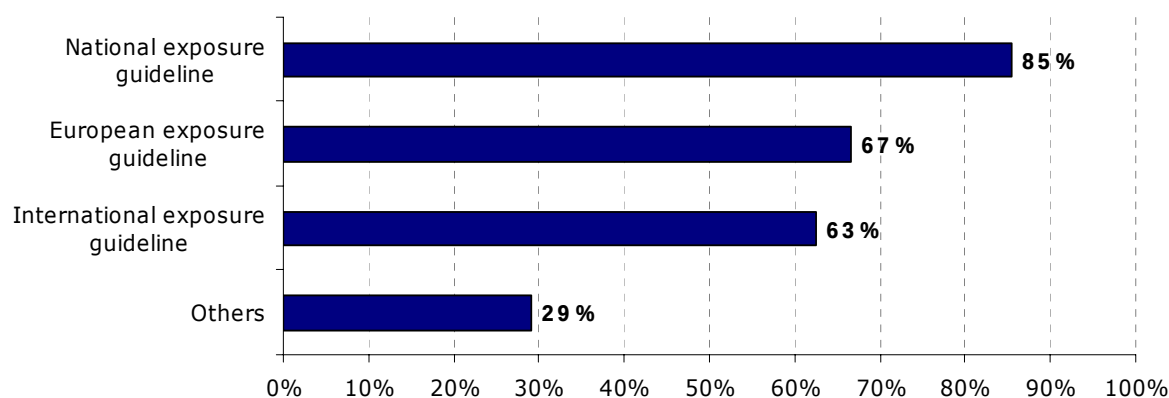
More than half of the operators have started discussions and consultations for deploying 3G networks using lower frequencies (900 MHz). Such implementation should result in a reduced number of base stations required, particularly in rural areas, to cover a certain geographical area with 3G services, compared with the current 3G deployments in higher frequencies.

Recommendation 5

Ensuring all existing and new radio base stations comply with national exposure guidelines based on the public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), as expressed in EU Council recommendation of 12 July 1999 (Reference 1999/519/EC) on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). The industry supports exposure guidelines, such as ICNIRP, which are based on sound scientific evidence and are subject to on-going expert review.

All operators report that existing and new base stations comply with national, European or international (ICNIRP³³) limits. Some national exposure limits tend to be stricter than the EU Council Recommendation and ICNIRP guidelines. Detailed information can be found in Annex I of the report, where RF exposure limits for each country are presented.

Figure 3.18: What kind of public EMF³⁴ exposure guidelines do existing and new radio base stations comply with? (Multiple responses possible)



Source: Ovum for GSME Study (n=48)

Recommendation 6

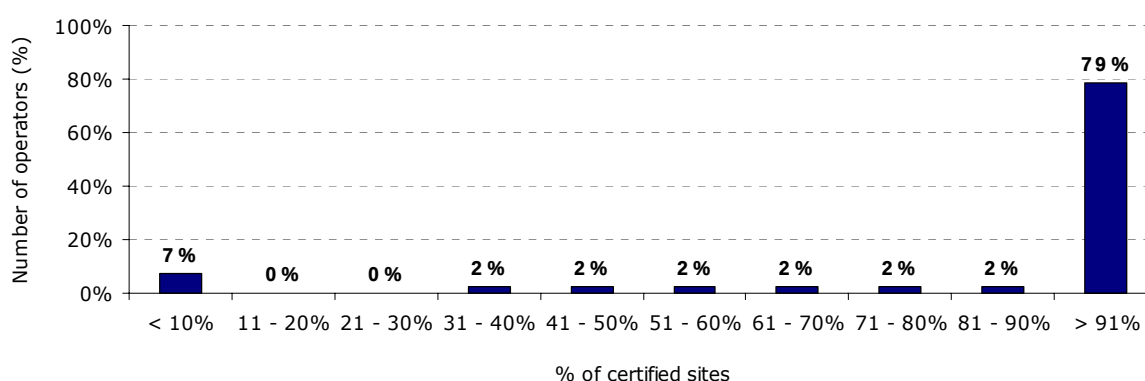
Providing a written declaration that radio base stations are designed to comply with national or European exposure guidelines. A signed declaration of compliance with the relevant guidelines supports openness and provides confidence to local communities that radio base stations are being operated safely.

³³ ICNIRP: International Commission on Non-Ionizing Radiation Protection (<http://www.icnirp.de>)

³⁴ EMF: Electro-Magnetic Field

Many operators (73%) report that 100% of their operational sites are certified and a written declaration is available. 79% of the operators report to have more than 90% certified sites. Sites are certified by an official governmental agency, the regulator or through an industry self-certification process. All certifications are referred to exposure limits that the operator's country has adopted.

Figure 3.19: What percentage of your sites is certified?

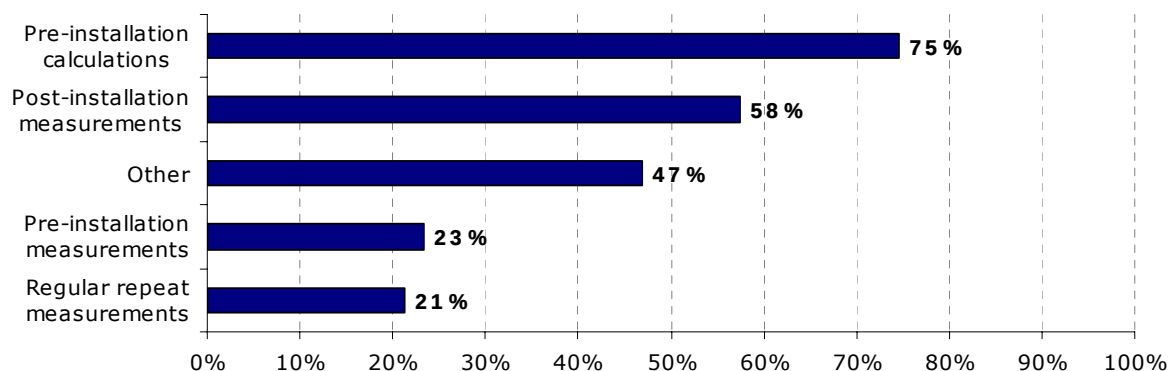


Source: Ovum for GSME Study (n=42)

In almost all of the cases (96%), operators report that they have policies for their own employees when they are accessing areas close to antennas. Guidelines for third parties e.g. painters or construction workers working in or around the antennas are provided in 83% of the cases. Such measures include safety distances, use of radio frequency hazard monitors and power shut down procedures.

All operators perform pre-installation measurements or pre-installation calculations prior to commissioning a site. Other operators perform also post-installation RF exposure measurements.

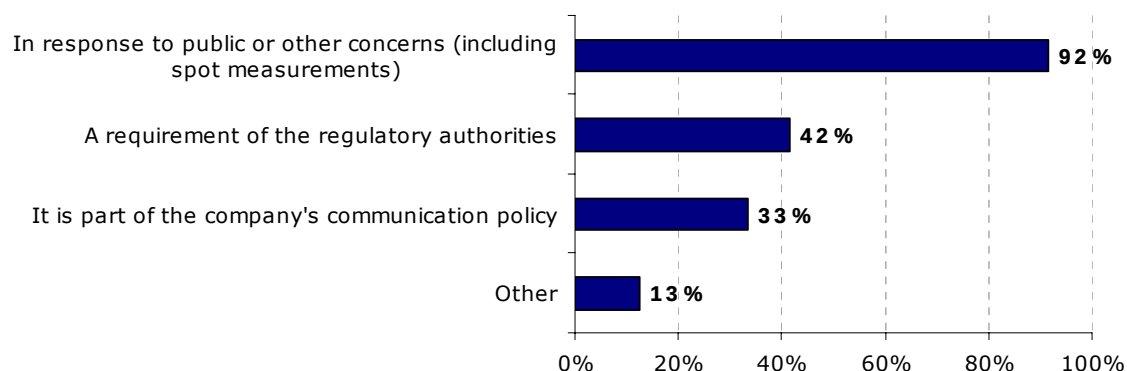
Figure 3.20: Which of the following do you have to do to commission of a new site? (Multiple responses possible)



Source: Ovum for GSME Study (n=47)

The main reason for in situ (local) site measurements is to respond to specific concerns of the public or others. This is clearly shown in the following chart.

Figure 3.21: For which of the following reasons do you measure sites? (Multiple responses possible)



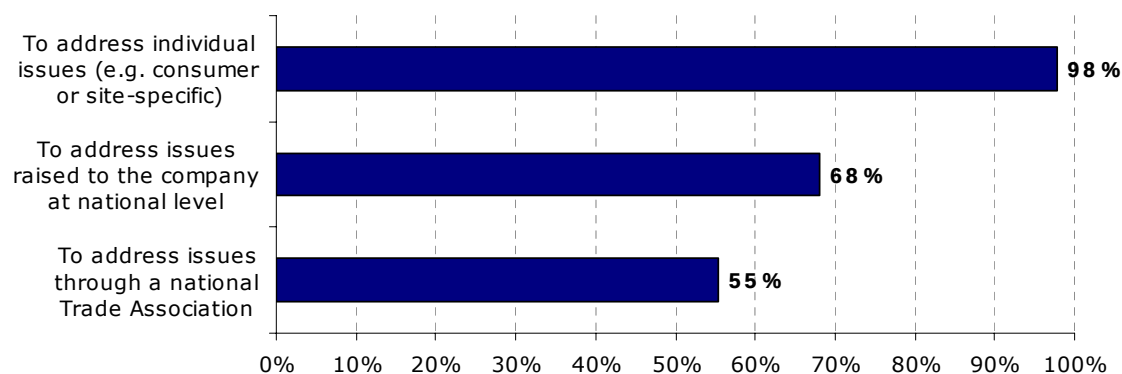
Source: Ovum for GSME Study (n=48)

Recommendation 7

Implementing a clear process to respond to complaints and enquiries about radio base stations. The industry recognises that there has often been some frustration regarding the information provided when enquiries are received on radio base station sites and that the quality of the information provided to the public needs to be of a high standard.

Operators take special care of complaints and enquiries about base station planning and EMF issues. Almost all operators (98%) responded that processes have been established to address individual issues (e.g. consumer or site-specific). A high percentage of operators address EMF complaints and enquiries at a national level or through a national trade association (where such an association exists).

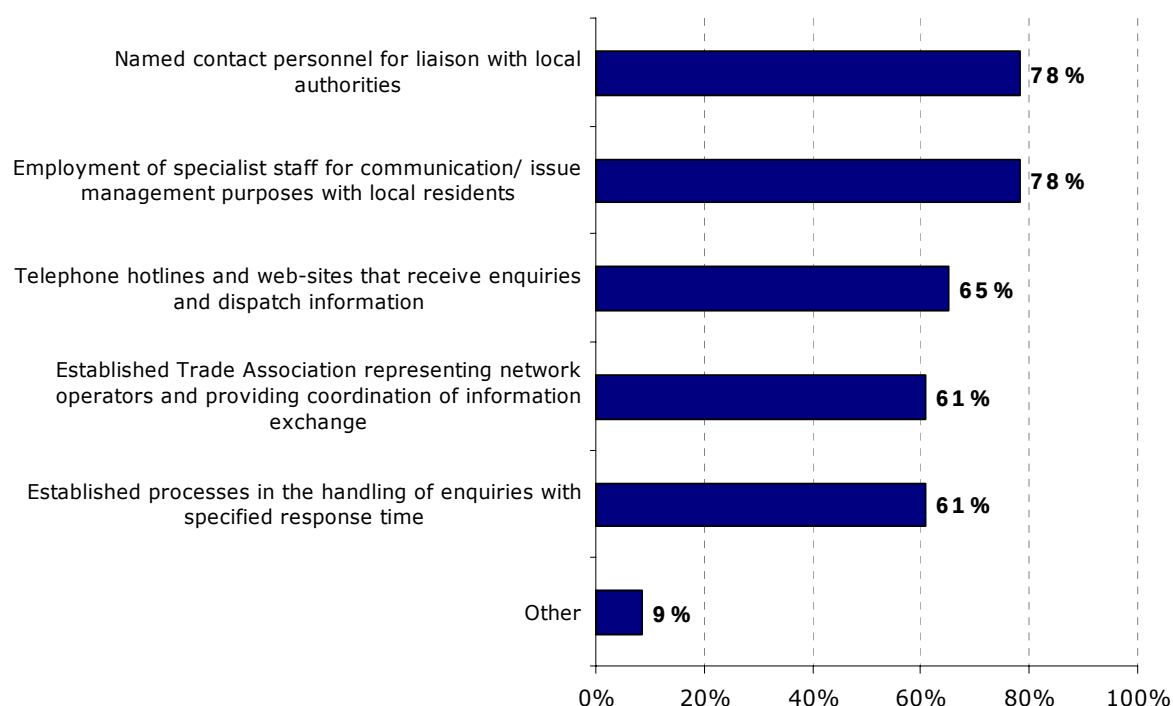
Figure 3.22: What processes do you have in place for handling complaints and enquiries about base station planning and EMF issues? (Multiple responses possible)



Source: Ovum for GSME Study (n=47)

In most cases, the liaison processes with local residents and authorities are managed by specialist staff or named contact personnel. Other methods have also been implemented as shown in the figure below, with the most common one being telephone hotlines and web-sites that receive enquiries and dispatch information.

Figure 3.23: What are the methods used to manage complaints and enquiries? (Multiple responses possible)



Source: Ovum for GSME Study (n=46)

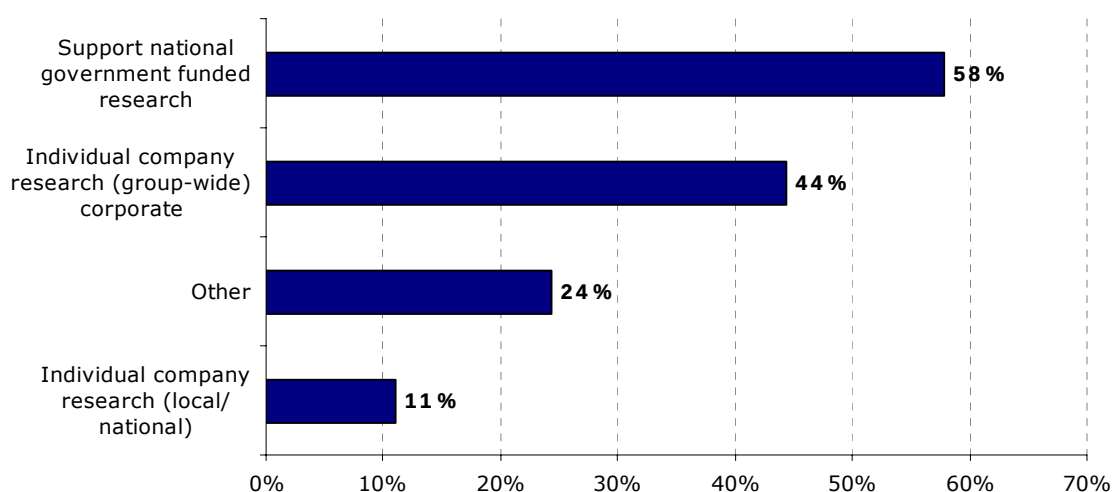
Recommendation 8

Supporting quality research programmes at the EU and Member State level based on the WHO research agenda that will provide the basis for on-going review of established guidelines. Expert reviews in a number of EU states have concluded that there is no convincing independent scientific research of a link between public exposure to the low level radio signals used by mobile telecommunications systems and adverse human health effects. However, the industry welcomes on-going, independent, quality research programmes in order that policy can be based on substantiated scientific evidence and criteria.

The industry actively supports independent research programmes in the areas of mobile technologies, health, environment and social concerns. More than 80% of the operators state

that they participate in research programmes. These include GSMA programmes³⁵ and initiatives, national studies (either in a government or corporate level) and international studies. Indicative areas that these projects address are: *in vitro* studies on biological effects, epidemiology, dosimetry and field simulations, risk communication and risk evaluation, proximity of base stations and alleged health hazards, children issues, body implants, cognitive issues, blood circulation, ear-balance function, and others.

Figure 3.24: In which of the following types of research studies do you participate? (Multiple responses possible)



Source: Ovum for GSME Study (n=45)

It is a common policy across the operators' community to make the outcomes of their research studies available to the public, regulatory and local authorities in order that general awareness can be raised. The results are published in the scientific literature and communicated in seminars and industry meetings, through portals, press releases, brochures and communication letters.

3.5 General conclusions

The following section outlines a number of conclusions derived from the analysis of the survey data and operators' responses. The aim of the conclusions is to propel processes and procedures and increase the effectiveness of operators' actions.

1. It is crucial for the mobile industry to closely monitor and audit these processes in order to be regularly reassured that informative programmes and other initiatives have the results anticipated by the industry. It is reported that despite operators' efforts and actions, public and local authorities are not always receptive to accept the points presented in these programmes due to lack of trust in the accuracy of and credibility in

³⁵ All GSMA members contribute to the budget that supports the GSMA funded research programme. The 80% response rate indicates that not all respondents are aware of this fact and suggests the need for additional communication towards GSMA members.

the information provided. Governments on national, regional and local level therefore play a role in trusted and science-based communications. It is important that trust in these communications is established with the recipients.

2. Risk communication activities must address public concern. The industry is working to provide community-specific information (e.g. to discuss particular base station deployments and the benefits to the community where the deployment takes place) and to help address local concerns through frequent interaction with interested stakeholders. The level activity should be proportional to the level of public concern.
3. It is important that national research programmes include open publication of the outcomes of such studies as part of the information exchange processes. The conclusions of these studies may also be used to inform government and operator EMF policies. There is a need for better communication by governments to interested stakeholders of the results and their interpretation. To avoid unnecessary duplication by national research programmes, it is recommended that these are based on the WHO³⁶ research agenda and are co-ordinate at international and EU levels.
4. It is reported that public concern increases during early phase of network rollout and when there is media coverage (e.g. newspaper articles etc.) claiming unsubstantiated health risks. The involvement of national governments with specialised communication programmes and in conjunction with the mobile industry can help facilitate public access to updated information regarding EMF developments. Such programmes should be targeted to address local issues and match the level of concern in that country. They should be designed to fill the communication gap, minimise unnecessary concerns and ambiguous messages, and build the confidence of public and local communities.

³⁶ World Health Organization, International EMF Project (www.who.int/peh-emf/)

4. Research support

4.1 Background

The use of mobile phones has increased substantially in recent years. This has been paralleled by concern about possible effects on health due to exposure to the electromagnetic fields produced by the phones and base stations. A recent survey³⁷ conducted by the European Commission shows varying levels of concerns among European citizens of different Member States, regarding potential health risks from the operation of mobile technologies. Overall the survey indicates that Europeans are divided in their concerns about the potential health risks of EMF: 14 % not at all concerned, 35% not very concerned, 35% fairly concerned and 13% very concerned. The citizens feel also that national public authorities could do more in regard to potential health risks of EMF and communication with the public.³⁸ The survey also reported that mobile communications masts are one of main sources of concern about electromagnetic field exposures but that EMF rates overall low in comparison to other environmental agents.

4.2 Current status: European Commission - EU

The European Commission (EC) actively supports initiatives which monitor the potential health effects of EMF. These actions include the funding of research, publishing information and contributing to the establishment of a legal framework for the protection of workers and citizens.

At EU level, the Council Recommendation of 12 July 1999 (1999/519/EC)³⁹, which limits the exposure of the general public to electromagnetic fields (0 Hz - 300 GHz) establishes a framework of minimum restrictions and reference levels. The Recommendation is based on the guidelines⁴⁰ of the International Commission on Non Ionizing Radiation Protection (ICNIRP)⁴¹ as endorsed by the Scientific Steering Committee advising the European Commission in 1998⁴², the Scientific Committee on Toxicity, Ecotoxicity and the Environment (CSTEE) in 2001⁴³ and further confirmed in the recent opinion of the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) on 29 March 2007⁴⁴. In relation to radiofrequency fields the SCENIHR opinion states:

"Since the adoption of the 2001 opinion extensive research has been conducted regarding possible health effects of exposure to low intensity RF fields, including epidemiologic, in vivo, and in vitro research. In conclusion, no health effect has been consistently demonstrated at exposure levels below the limits of ICNIRP (International Committee on Non Ionising Radiation

³⁷ http://ec.europa.eu/public_opinion/archives/ebs/ebs_272a_en.pdf

³⁸ http://ec.europa.eu/health/ph_determinants/environment/EMF/emf_en.htm

³⁹ http://ec.europa.eu/enterprise/electr_equipment/lv/rec519.pdf

⁴⁰ <http://www.icnirp.de/documents/emfgdl.pdf>

⁴¹ <http://www.icnirp.de>

⁴² http://ec.europa.eu/food/fs/sc/ssc/out19_en.html

⁴³ http://ec.europa.eu/health/ph_risk/committees/sct/documents/out128_en.pdf

⁴⁴ http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_007.pdf

Protection) established in 1998. However, the data base for evaluation remains limited especially for long-term low-level exposure."

On the basis of this conclusion, the SCENIHR makes a number of recommendations for further research. It is the task of the authorities in Member States to ensure that adequate health protection measures are in place. When reference levels are exceeded, it is recommended that national authorities carry out an assessment of the exposure situation and take appropriate follow-up actions, such as informing the public, exposed changes in the installation or design of the source of radiation or in the way it is operated⁴⁵. The Commission prepared a report on the implementation of the Council Recommendation for public exposures in 2002 and will provide a report update in 2008.

Further EC legislation includes the Directive on radio and telecommunications terminal equipment (1999/5/EC)⁴⁶ and worker safety (2004/40/EC)⁴⁷, which is known as the Physical Agents (EMF) Directive. The European Union adopted the Physical Agents (EMF) Directive to limit occupational exposure to electromagnetic fields from all sources. It is applicable to all employers in the EU and it must be incorporated into domestic laws across EU by 30th April 2008. The Directive states:

- a risk assessment is required for each employer
- the employer assumes responsibility for employees' health and safety
- appropriate training and relevant information shall be provided to the employees by the employer
- The employee is entitled to a medical examination, in cases where over exposure is identified.

One current major activity is an EC funded project, EMF-NET, which will review the body of existing research in order to provide clear summary information to policy makers regarding public and worker exposures to electromagnetic fields.⁴⁸ The parties involved in the study include representatives of all the major research groupings in Europe, public health agencies and industry stakeholders such as GSMA.

The following table provides a summary of some of the major global research programmes related to EMF issues based on data collected by the GSMA⁴⁹.

⁴⁵ Source: European Commission (EC), http://europa.eu.int/comm/health/ph_determinants/environment/EMF/emf_en.htm

⁴⁶ <http://ec.europa.eu/enterprise/rtte/dir99-5.htm>

⁴⁷ Source: European Commission (EC), http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_159/l_15920040430en00010026.pdf

⁴⁸ <http://web.jrc.ec.europa.eu/emf-net/>

⁴⁹ <http://www.gsmworld.com/health/programs/index.shtml>

Figure 4.1: Major Health Research Programmes Related to EMF issues

Program	Start	End	Budget (€Million)	Scope
Australia	2004	2009	€1.6	Biological, epidemiological and dosimetry studies. Public information dissemination also a high priority.
Denmark	2004	2008	€4.0	Epidemiological and biological studies, reproduction, risk perception and human provocation studies.
European Commission	2004	2007	€11.5 ^a	Epidemiological, biological and cellular studies of cancer and non-cancer endpoints. Policy advice and science evaluations.
Finland	2004	2007	€1.5 ^b	Biological studies, possible effects on children and passive metallic human implants.
France	2007	2012	€1.8 ^c	Epidemiological studies of children, assessment of new technologies and risk communication.
Germany	2002	2008	€17.0 ^d	Mechanisms of action, effects on animals and humans, determination of the exposure and risk communication.
GSM Association	2000	On-going	€10.0 ^e	Epidemiological, biological and cellular studies of cancer and non-cancer endpoints. Technology and standards evolution, risk perception.
Netherlands	2006	2014	€16.6	Sociological and epidemiological research, biological studies and technological exposure assessments.
Switzerland	2007	2011	€5.0	Exposure assessment, human epidemiological and experimental studies, cellular biology and risk communication.
United Kingdom	2001	2007	€10.1 ^f	Effects on brain function, exposure to pulsed signals, cellular changes psychological and sociological studies, epidemiology and human volunteer studies.
USA	2007	2011	€15.5	Series of studies designed to characterize the toxicity and potential carcinogenicity of long-term exposure to the RF energy.

Notes: Except where noted, all funds are from government sources. Currency conversions at prevailing exchange rates.

^a additional funds from national authorities and industry for some projects.

^b 60 % Finnish Government)

^c 50 % state-funded and 50 % industry founding members.

^d equally shared by government and the network operators.

^e additional funds from national authorities and other industry for some projects.

^f funds from both government and industry.

Source: GSM Association (2007)⁵⁰

4.3 The involvement of GSM Europe and GSMA

⁵⁰ <http://www.gsmworld.com/health/programs/index.shtml>

The GSMA in partnership with the Mobile Manufacturers Forum (MMF) and various national authorities commenced a research programme in 2000 to address WHO identified research priorities. The studies are reported in the open peer-reviewed scientific literature and the outputs will contribute to the planned WHO health risk assessments of radiofrequency (RF) fields.

A key requirement for the GSMA of supporting research has been to ensure that the researchers are responsible for the scientific integrity of the studies with a requirement for open publication of the findings. For many studies the GSMA contributes partial funding in partnership with public health agencies and upon the recommendation of independent experts who monitor the scientific progress. These mechanisms provide milestone and budget accountability without compromising the scientific independence of the research. All biological studies are subject to the ethics procedures of the research institution.⁵¹ The WHO database⁵² indicates that there are 28 projects in which GSMA acts as a funding agency. The majority (25) of these studies are related to mobile signals. Further information on GSMA supported research studies can be found at the GSMA's web site⁵³.

4.4 International Research

4.4.1 World Health Organization

WHO initiatives

The WHO, through the International EMF Project (setup in 1996)⁵⁴, has established a programme to monitor the EMF scientific literature: to evaluate the health effects from exposure to EMF; to provide advice about possible EMF hazards and to identify suitable mitigation measures. Following extensive international reviews, the International EMF Project has promoted research to fill gaps in knowledge. In response national governments and research institutes have funded over \$250 million of EMF research over the past 10 years. By June 2007, the WHO International EMF Project included 678 studies related to mobile phone signals.

Extensive research has been conducted into possible health effects of exposure to many parts of the frequency spectrum. This survey shows that the mobile industry is a significant contributor to national and international research programs. The consensus of all reviews conducted so far indicates that exposures below the limits recommended in the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998) EMF guidelines, covering the full frequency range from 0 - 300 GHz, do not produce any known adverse health effects. However, there are gaps in knowledge that still need to be filled in order that better health risk assessments can be made.

The International Agency for Research on Cancer (IARC), a specialised WHO agency, is intending to conduct a review of cancer risk from RF fields in 2008-2009 and the International EMF Project

⁵¹ Source: GSMA

⁵² <http://www.who.int/peh-emf/research/database/emfstudies/>

⁵³ <http://www.gsmworld.com/health/programs/gsmaresearch.shtml>

⁵⁴ <http://www.who.int/peh-emf/research/database/emfstudies/>

will undertake an overall health risk assessment for RF fields in 2009-2010.⁵⁵

Protection standards

International exposure guidelines have been developed to provide protection against established effects from RF fields by the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998)⁵⁶ and the Institute of Electrical and Electronic Engineers (IEEE, 2005). The ICNIRP guidelines form the basis for European recommendations and directives and are widely used around the world.⁵⁷

WHO conclusions

WHO concludes that while no adverse health effects are expected from exposure to RF fields from base stations and wireless networks, research is still being promoted by WHO to determine whether there are any possible health consequences from the higher RF exposures from mobile phones. Specifically for wireless networks the WHO states:

*"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."*⁵⁸

4.4.2 Precautionary policies

As more research data becomes available, the likelihood that exposure to electromagnetic fields constitutes a serious health hazard reduces; nevertheless, some uncertainty remains. The public debate over electromagnetic fields focuses on the potential detriments of electromagnetic fields but often ignores the benefits associated with electromagnetic field technology.

Since there are still gaps in knowledge, continued research and better analysis of health risks is needed. Moreover, without scientifically recognised adverse effects on health, it is not possible to produce evidence-based recommendations. Therefore, the WHO states⁵⁹:

"One of the objectives of the International EMF Project is to help national authorities weigh the benefits of using electromagnetic field technologies against the possibility that a health risk might be discovered. Furthermore, the WHO will issue recommendations on protective measures, if they may be needed. It will take some years for the required research to be completed, evaluated and published. In the meantime, the World Health Organization has issued a series of recommendations:

- *Strict adherence to existing national or international safety standards: such standards, based on current knowledge, are developed to protect everyone in the population with a large safety factor.*
- *Simple protective measures: barriers around strong electromagnetic field sources help*

⁵⁵ <http://www.gsmworld.com/health/programs/sciencemilestones.shtml>

⁵⁶ <http://www.icnirp.org/documents/emfgdl.pdf>

⁵⁷ <http://www.who.int/docstore/peh-emf/EMFStandards/who-0102/Worldmap5.htm>

⁵⁸ Source: WHO (2006) – Fact Sheet No 304

⁵⁹ <http://www.who.int/peh-emf/about/WhatisEMF/en/index5.html>

preclude unauthorized access to areas where exposure limits may be exceeded.

- *Consultation with local authorities and the public in siting new power lines or mobile phone base stations: siting decisions are often required to take into account aesthetics and public sensitivities. Open communication during the planning stages can help create public understanding and greater acceptance of a new facility.*
- *Communication: an effective system of health information and communication among scientists, governments, industry and the public can help raise general awareness of programmes dealing with exposure to electromagnetic fields and reduce any mistrust and fears."*

4.4.3 Other reports

Other recent expert reviews and independent reports are presented in the figure below and a much longer list is available from the GSMA website⁶⁰.

⁶⁰ <http://www.gsmworld.com/health/links/independent.shtml>

Figure 4.2: Indicative list of recent expert reviews and independent reports

Funding Source	Title	Year of completion	Link
Mobile Telecommunications & Health Research Programme		2007	http://www.mthr.org.uk/documents/MTHR_report_2007.pdf
SCENIHR report	Possible effects of Electromagnetic Fields (EMF) on Human Health, Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR),	21 March 2007	http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/scenihhr_opinions_en.htm
Swiss Research Foundation on Mobile		2007	http://www.mobile-research.ethz.ch/var/jb2006.pdf
Swedish Radiation Protection Authority's Independent Expert Group		2007	http://www.ssi.se/ssi_rapporter/pdf/ssi_rapp_2007_4.pdf
Health Council of the Netherlands Electromagnetic Fields	Research on UMTS and DETC systems	2007	http://www.healthcouncil.nl/pdf.php?ID=1505&p=1
Institute of Engineering and Technology	Position Statement on the Possible Health Effects of Mobile Phones and Electricity Distribution	2006	http://www.theiet.org/publicaffairs/bepag/POSTAT02final.pdf
Rapport du groupe d'experts, l'Agence Française de Sécurité Sanitaire Environnementale	Téléphonie mobile et santé	April 2005	http://www.sante.gouv.fr/htm/dossiers/telephon_mobil/rapports.htm
Royal Society of Canada's (RSC) Expert Panel	Potential health risks of radio frequency fields from wireless telecommunication devices	2004	http://www.rsc.ca/files/publications/expert_panels/RF/expert_panel_radiofrequency_update2.pdf

Source: Ovum, GSMA, Trade Associations' websites

Annex I - Country profiles

The following section summarises the findings of the survey. For each EU country (including Switzerland) two sections are included:

- the first section provides an overview of the actions taken by GSM Europe members towards the implementation of GSME Recommendations for Network Rollout (see Section 2.6 or Annex III)
- the second section provides a summary of: the level of public concern for network rollouts⁶¹; codes of practice and audit processes, voluntary actions from MNOs (over and above GSME Recommendations); government actions; and the exposure guidelines followed in each country.

Data collection

The collection of the data was facilitated via an on-line survey tool. Ovum Consulting, in conjunction with GSM Europe, developed a questionnaire of 70 questions. The objectives were to gather information, with supporting commentary and background evidence on actions taken by GSM Europe members for the implementation of GSM Europe Recommendations for Network Rollout, together with additional data on other governmental or national actions. Data regarding Base Station Planning Procedures applicable to each country were also gathered. Participants were able to provide open-response answers (text based) and attachments where applicable, in order to address specific issues in their respective markets in more detail. The survey was undertaken during August-September 2007.

The structure and quality of the data gathered were based on receiving relevant, updated and accurate data from GSM Europe members. The information provided was sourced from each GSM Europe member related to:

- national and company network rollout policies, implementation and frequency of consultation programmes and information provision procedures
- policies of regulatory/government authorities
- monitoring and internal auditing processes, management and processes of handling public complaints/ enquiries
- information on the level and categorization of public concern
- data on site sharing and use of environmentally friendly base station design techniques; data on base station compliance
- national RF exposure legislation and guidelines
- support of scientific, national and international, research; and other data affecting implementation.

⁶¹ The level of public concern of this survey is according to the number and type of complaints/ enquiries mobile operators receive from their customers.

I.1 Austria

I.1.1 Implementation of GSME Recommendations

Rec. #1 & 9	Austrian operators have formal processes in place to communicate information to the local authority/ the public on current and future network deployment plans. The operators also: communicates the need to install more network antennas to the public; provide detailed technical and supporting deployment justifications with each application to the local authority or other regulatory body; have a consultation programme or involvement with local communities regarding the categorisation of proposed sites; hold information sessions/ road shows and one to one sessions with stakeholders. Twice a year (or when there is a new development/ request from the public) and for each new base station the operators provide a brochure on health and technology issues and a standard technical information sheet. The "Dialogue Handbook Mobile Communication" ⁶² brochure is provided regularly to communities and the operators have implemented a monitoring and documentation system to help manage the information exchange process, the results of which are published. The Austrian trade association (Forum Mobilkommunikation, FMK) has conducted a survey concerning the Agreement concluded with the Association of Austrian Local Authorities.
Rec. #2	Operators reported that they share infrastructure with other operators' facilities: tower sites; roof-mounted sites; other telecommunication masts and utilities' facilities. The percentage of shared sites has reached 50% and 75% of 3G sites are shared with 2G sites. Cost saving and environmental concerns are the main reasons for site sharing.
Rec. #3	Operators make use of alternative designs to minimise the visual impact of sites, e.g. artificial chimneys, artificial church windows, advertising signs, "designed" masts (e.g. from stainless steel). It is important to note that "artificial tree" designs are not well accepted by local authorities or the public. Camouflaged design is implemented only if required by authorities (e.g. listed buildings), since there are cases where the public has accused operators of "hiding" antennas to lower health concerns.
Rec. #4	Educational sessions have been held to explain to the local authorities how technology works and the reasons for sites to be established in specific locations. These sessions are well received by the audience (e.g. city council members). One operator reported that it is considering the deployment of a 3G network operating at a lower frequency ranges which will allow the reduction of the total number of sites required.
Rec. #5	All operators reported base station compliance with European exposure guidelines.
Rec. #6	100% of operators' sites are certified and there are processes to ensure compliance with the EU Directive recommendations for occupational exposures. Companies have policies for its own employees when accessing areas close to antennas and provide guidelines for third parties e.g. painters or construction workers working in or around antennas. Monitoring and measuring the RF exposure in public areas is performed on a case by case basis in response to public concerns.

⁶² http://www.la-umwelt.de/Dialoghandbuch_Mobilfunk.pdf

Rec. #7	Operators have procedures at three levels: to address issues raised at the national level; to address issues through the FMK and to address individual issues (e.g. consumer or site-specific). Concerns and enquiries are handled by specialist communications staff managing issues with local residents. There are named contact personnel for liaison with local authorities. Telephone hotlines and websites are used to receive enquiries and dispatch information and the FMK (representing all network operators) coordinates the exchange of information. The response times of these procedures are monitored.
Rec. #8	The operators support national studies and GSMA programmes and initiatives, the results from which are disseminated by the FMK through press releases - to advertise results, promote public awareness and inform authorities.

I.1.2 Country overview

Level of concern	It is reported that the high level of concern (for health, aesthetic and technology matters) in Austria has remained the same over the last 18-24 months and GSME Recommendations have not necessarily led to a reduction of complaints. Concerns have also been raised about reductions in property value (with ongoing lawsuits).
Codes of practice & Audit process	All Austrian operators report: 1) that voluntary agreements with the Association of Austrian Communities have been in place since 2001. These cover the provision by operators of technical information to the local community (Mayors) prior to site installation. The community has a say in the way that information is provided. 2) Mobile Phone Charters are in effect in three Austrian provinces. These Charters cover the provision of planning information and the participation of communities in the planning process.
Voluntary actions from MNOs	The following information is also provided for each new base station: a basic brochure on health and technology issues; a standard technical information sheet. The "Dialogue Handbook Mobile Communication" brochure is provided regularly to communities. In some cases, operators provide information annually to communities, which are affected by planned sites and offer to discussions. This offer is rarely taken up, especially in communities with known health fears.
Government /Other actions	The government provides precautionary advice regarding the use of mobile phones (e.g. to reduce call time and advice for mobile use by children).
Exposure guidelines	EU Recommendation (legislation) – Ref: ÖVE/ÖNORM 8850 (01/02/2006). The exposure limits are harmonized with the values proposed by ICNIRP. An Austrian technical standard ÖNORM is not legally binding, but defines the state of the art and experts use them in administrative proceedings and they can be imposed by official notifications.

I.2 Belgium

I.2.1 Implementation of GSME Recommendations

Rec. #1 & 9	Operators report that there is a national policy covering good practice for network rollout and one operator makes reference to the GSME Recommendations for network deployment. There are national mandatory requirements: to communicate the need to install more network antennas to the public; to provide detailed technical and supporting deployment justifications with each application to the local authority or other regulatory body; to have a monitoring and documentation system for information exchange process in place; to audit and publish results of the monitoring of the information exchange process. The main stakeholders are local authorities, the regulator, the public and local communities, to whom information flow is facilitated by a regulated consultation processes. A nation-wide format is used by every operator and the information includes: details of the planned site; potential impact to the environment; health and technology information, and photo montages. The information is publicly available on regulator's site ⁶³ .
Rec. #2	Operators share sites with other operators' facilities, tower and roof-mounted sites, other telecommunications masts and antennas, and utilities' facilities. In Belgium, operators have established RISS (Radio Infrastructure Site Sharing) association, which is managed in conjunction with the Regulator. This helps optimise the sharing of sites and manage problems arising with different authorities. The main reasons for site sharing are the requirements imposed by local authorities and environmental and landscape preservation. There is a formal administration process for site sharing and site sharing is expected to remain at least at the same level over the next five years or probably increase.
Rec. #3	Alternative designs to reduce visual impact are used by operators and relevant guidelines are in place. Building permit regulations require a review of the visual impact of every installation. Building permit procedure exemptions vary by region, with some exemptions for micro-sites and additions to existing sites.
Rec. #4	Respondent(s) provide information on existing and new services and technologies, in which services, benefits, possible impact, infrastructure requirements, timescales of development and public consultation information are detailed. The regulator and regional authorities are closely involved in the process and are aware of the evolutionary processes in the mobile industry. Educational sessions are held on a case-by-case basis in response to specific requests from a municipality. Despite these sessions, feedback shows that the public concern remains high.
Rec. #5	Operators report that base stations comply with national and European exposure limits.
Rec. #6	Operators report that 100% of sites are certified. They have policies for their own employees when accessing areas close to antennas and provide guidelines for third parties e.g. painters or construction workers working in or around antennas. One operator reported that pre-installation calculations and measurements, and regular

⁶³ <http://www.ibpt.be/Home.aspx?levelID=1&lang=en>

	post-installation measurements are carried out when commissioning a new site, to ensure compliance with the regulator's limits. RF measurement monitoring is performed by the regulator and by the operator on a case-by-case basis.
Rec. #7	Operators have processes in place to address issues raised at the national level, those raised through the national trade association (GSM Operator's Forum, GOF) and individual issues. The processes are managed by specialist staff, being responsible for the communication with local residents. There are telephone hotlines, named contact personnel who liaise with local authorities and websites that receive enquiries and dispatch information. The GOF coordinates the exchange of information. The response times to public complaints and enquiries are monitored.
Rec. #8	Operators support national government studies, individual company research and corporate (group-wide) research and participate in university think tanks. The results of the studies are published and often used to help inform municipalities and the general public about that a particular request for building permission is free of health issues.

I.2.2 Country overview

Level of concern	It is reported that the level of concern in Belgium has increased over the last 18-24 months with health and environmental issues at a high level, and aesthetics being a medium level concern. Operators report that there are delays in obtaining building permissions due to increasing health concerns from the public. Belgian operators have three kinds of building permit legislation in Belgium, each in a different language.
Codes of practice & Audit process	A combination of mandatory requirements and national policies apply.
Voluntary actions from MNOs	One operator highlighted that when dealing with local authorities there are compromises needed. Good coverage is a requirement, but if there are requests for tougher limits by local authorities for the antenna electric field strength levels (3V/m) then this will result in more sites, which creates additional visual and environmental impact – issues which the public dislike, whilst still complaining when they have poor service quality.
Government /Other actions	The government takes precautionary actions beyond power limit guidelines and provides precautionary advice for the use of mobile phones (e.g. reducing call time, advice for mobile usage by children)
Exposure guidelines	EU Recommendation (legislation, stricter limits for mobile frequencies) – Ref: Royal Decree 10/08/2005

I.3 Bulgaria

I.3.1 Implementation of GSME Recommendations

Rec. #1 & 9	Respondent(s) have a policy for good practice for network rollout. Information is provided on a voluntary basis to the local authority and the public on current and future network deployment plans as well as on the need to install new base stations. There is a mandatory requirement to provide detailed technical and supporting deployment justifications with each site application to the local authority or other regulatory body for all operators. Other information provided includes: an assessment of the environmental impact; potential impact/ benefit to the community; health related info and a description of the proposed site including computer generated images or photo montages. A company standard format is used in some cases. Information flow to stakeholders is facilitated through educational sessions and road shows, letters to nearby residents and one to one sessions, mainly when there is a new deployment, but also on request from the public.
Rec. #2	Various site sharing methods are used: with other operators' facilities, tower sites, transmission equipment shelters, other telecommunication masts and radio installations. 100% of 3G sites are shared with 2G sites. It is believed that site sharing will increase over the next five years.
Rec. #3	Alternative designs to minimise visual impact of network deployments are used.
Rec. #4	Respondent(s) provide information on existing and new services and technologies, in which services, benefits, possible impact and data for public consultation are detailed. The use of lower frequency bands to reduce the number of sites required for 3G services is at an early stage of consideration.
Rec. #5	Respondent(s) reported base station compliance with national and ICNIRP exposure limits.
Rec. #6	100% of sites are reported certified. Policies for company employees accessing areas close to antennas are in place. One operator performs pre-installation calculations, monitors and measures the RF exposure in public areas from sites when they become operational (regulatory requirement).
Rec. #7	Respondent(s) report having processes in place, with specified response times, to address individual issues (e.g. consumer or site-specific), mainly through named contact personnel for liaison with local authorities.
Rec. #8	GSMA programmes and initiatives are supported by the operator.

I.3.2 Country overview

Level of concern	It is reported that the level of concern in Bulgaria has increased over the last 18-24 months with health issues at a higher level, and environmental/ aesthetic issues being of increasing concern. It is reported that base station permission procedures have become stricter as more public agencies are getting involved into the permission process.
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Codes of practice & Audit process	One operator is in the early phases of developing and implementing a corporate (group-wide) EMF policy.
Voluntary actions from MNOs	Information flow is facilitated through educational sessions and road shows, letters to nearby residents and one to one sessions, mainly when there is a new deployment or upon request by the public.
Government /Other actions	The government has implemented precautionary actions beyond limit guidelines (e.g. exclusion zones for masts, in-site measurement programmes) together with the provision of precautionary advice for the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).
Exposure guidelines	There are national guidelines which are not based on ICNIRP: a. General public: Reference Levels: 0.1W/m² (0.3 – 30 GHz) – Ref: No.9 (14/03/1991), MPEs for Electromagnetic Radiation in Residential Areas and for Determining Safety Zones Around Electromagnetic Sources, Governmental News No.35/1991.; No.7, Gov. News No.46/1992 – Hygienic Requirements for Health Protection of the Residential Areas.; BNS 14525-90, Radiofrequency Electromagnetic Fields. Permissible Levels and Control Requirements. b. Occupational: Reference Levels: 10W/m² (300 MHz – 300 GHz) – Ref: No.7, Gov. News No.88/1999 for the Minimal Requirements for Healthy and Safety Work Conditions

I.4 Cyprus

I.4.1 Implementation of GSME Recommendations

Rec.#1 & 9	Respondent(s) have adopted a company policy for good practice for network rollout, making reference to GSM Europe Recommendations. A formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans is a mandatory requirement, while the need to install more base stations is communicated voluntarily on a case by case basis. A consultation programme is also conducted on a voluntary basis, where local communities are involved in the categorisation of proposed sites. A monitoring and documentation system for information exchange process has been implemented. The local authority and the community are the main stakeholders of the information exchange process, which is facilitated through information session/ road shows, seminars, public/ media announcements and one to one sessions. Information is provided on the planning framework, the potential impact on the environment and the community, technology and health information together with photo montages of the proposed sites. The information is provided when there is a new development or upon request from the public.
Rec. #2	Respondent(s) share sites with other operators' and broadcasting companies' facilities,

	tower and roof-mounted sites, transmission equipment shelters and other telecommunication masts. All 3G sites are shared with 2G sites. A formal process is in place for administrating site sharing. Site sharing is expected will increase over the next five years.
Rec. #3	The operator reports making use of alternative designs.
Rec. #4	It is reported that information on possible infrastructure requirements is provided, while technical operating information on the construction of each site is also provided voluntarily to the local authority. Detailed technical and supporting deployment justifications with each application to gain authorisation from local authority or other regulatory body are also made available.
Rec. #5	Respondent(s) report base station compliance with national exposure guidelines.
Rec. #6	All sites are reported to be certified. The operator has processes in place for its own employees when accessing areas close to antennas. Third parties e.g. painters or construction workers are also given guidelines when working in or around antennas. EMF measurements are carried out for all the base stations twice a year. This is not only due to a requirement from the regulator applying to all operators, but also to address public concerns. Regular measurements are also part of the company's communication policy.
Rec. #7	There are processes in place to address individual issues (e.g. consumer or site-specific enquiries). Complaints/ enquiries are handled by specialist staff, communicating and managing these processes with local residents.
Rec. #8	Survey participant(s) report that support GSMA / GSM Europe programmes and initiatives. The EU and WHO research and guidelines are monitored. The operator makes research results available to public, promotes awareness of results and informs authorities/public of the WHO and EU research agendas.

I.4.2 Country overview

Level of concern	It is reported that the level of public concern has increased over the last 18-24 months. Health related concerns are in high level and environmental/ aesthetic concerns are in medium levels.
Codes of practice & Audit process	An operator uses GSM Europe Recommendations as a reference.
Voluntary actions from MNOs	There is an ongoing process of preparing an explanatory book on EMF issues, and plans to increase interaction and meetings with local mayors in the near future.

Government /Other actions	Since 2004, base station compliance is included in the National Radiocommunications (Authorizations) Regulations. ⁶⁴
Exposure guidelines	EU Recommendation – Ref: National Radio-communications (Authorizations) Regulations of 2004

I.5 Czech Republic

I.5.1 Implementation of GSME Recommendations

Rec. #1 & 9	Operators report that they have formal company policies for good practice for network rollout. A formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans together with the need to install more network antennas to the public is followed on a case by case basis. Detailed technical and supporting deployment justifications with each application and technical operating information on the construction of each site to gain authorisation from local authority or other regulatory body is a mandatory requirement. Other information provided includes planning framework, potential impact to the environment and benefit to the community, technology and health information. Description of the proposed site including computer generated images or photo montages are also made available. A monitoring and documentation system for information exchange process is also required by operators. No auditing of this process is performed. The public or local community is also involved in the process. The information is provided when there is a new development or when it is requested by public/ community, and is provided by consultation processes, information sessions/ road shows and one to one sessions. The format of the information varies depending on the project and the persons involved. The general feedback is that information provided is considered as explanatory, understandable and sufficient for the purpose.
Rec. #2	All operators report site sharing with existing infrastructure (tower and roof-mounted sites, transmissions equipment shelters, antennas and other telecommunications masts. 3G sites are shared in almost 100% with 2G sites. Site sharing in the Czech Republic is comparable low, but it is believed that will increase over the next five years. The main reason for site sharing is cost saving, but environmental and landscape preservation are also considered important by operators.
Rec. #3	All operators report the use of alternative design to reduce visual intrusion. Examples include artificial pine trees, artificial chimneys, special designs at gas stations and special designs on historic buildings.
Rec. #4	All operators provide information on new services/technologies: a description of services, benefits and possible impact. In some cases educational sessions are held to explain to the local authority how the technology works or why the sites have to be established in the specified locations. It is reported that, regarding EMF impact,

⁶⁴ http://www.gsmworld.com/gsm europe/events/hes_seminar2/mobile_comms_matters.pdf

	operators are successful in providing explanations in more than 80% of cases. Generally, information provided is considered as sufficiently explanatory and understandable. The deployment of 3G networks in lower frequencies (potentially resulting in fewer sites) is in early discussions with the regulator.
Rec. #5	All operators report base station compliance with European exposure guidelines.
Rec. #6	All operators report 100% certified sites. Processes are in place by all operators to ensure compliance with the EU Directive recommendation for occupational exposures together with policies for their own workers when accessing areas close to antennas (e.g. on each site there is list of operational rules which specifies safe distances for workers at which the limits are not exceeded). Operators also provide guidelines for third parties e.g. painters or construction workers working in or around antennas. Pre-installation calculations are always submitted and Post-installation measurements are performed on a case by case basis.
Rec. #7	All operators have processes in place to address individual issues (e.g. consumer or site-specific). Operators have established EMF teams which response immediately or within 24h by personal contact or by written explanation when requested. Other means of response include telephone hotlines and web-sites that receive enquiries and dispatch information and a special interactive presentation which contains more than 30 topics (created on the basis of frequently asked questions).
Rec. #8	Operators support corporate (group-wide) research studies. One of the operators also supports GSMA initiatives and programmes. It is reported that results from this research are very helpful to argument discussions with the public. If there is negative public reaction to Internet articles (usually sensational) then operators make use of arguments based on scientific studies.

1.5.2 Country overview

Level of concern	The level of concern in Czech Republic has been generally stable over the last 18-24 months. Health and Environmental concerns are at a low level. Aesthetic concerns are in medium level. The implementation of GSME Recommendations has not necessarily reduced the level of complaints. Operators report that recently there are public claims that the price of real estate will much lower if there is a base station on or near it. There are also cases where landlords are requesting increasing rent for lease contracts.
Codes of practice & Audit process	Operators provide the regulatory and planning authorities information requested by law. It includes information necessary for obtaining building permission (e.g. technical documentation, hygienic calculation, and statements of all respective authorities). If information beyond the legal requirement is required, operators provide this also. Some operators use a brochure to provide general information (explaining GSM principles, network building methods and other related issues). Operators use a special interactive presentation which contains more than 30 topics (created on the basis of frequently asked questions) and other supporting material.
Voluntary	Operators have adopted a corporate (group-wide) approach to EMF policy. These

actions from MNOs	policies are a voluntary commitment to transparency, information provision, consultation and participation. All operators provide an "Overall Conception of All Base Stations in Protected Areas" which covers a 5 year planning period and includes base stations already built by all operators. Protected Areas represent about 13% of the Czech Republic area. There are regular meetings with authorities from Protected Areas where the base stations in question are reviewed and an acceptable means of deployment are considered whilst ensuring minimal impact on the environment.
Government /Other actions	Information related to actions regarding EMF activities can be found at WHO's web site. ⁶⁵
Exposure guidelines	EU Recommendation (legislation) – Ref: Governmental Decree No 480/2000, Public and Occupational

I.6 Denmark

I.6.1 Implementation of GSME Recommendations

I.6.2 Country overview

Government /Other actions	Information related to actions regarding EMF activities can be found at WHO's web site. ⁶⁶
Exposure guidelines	EU Recommendation (no known plans for legislation) - Ref: Labour Inspectorate follows the ICNIRP recommendations when evaluating exposure, Public and Occupational

I.7 Estonia

I.7.1 Implementation of GSME Recommendations

I.7.2 Country overview

Exposure guidelines	EU Recommendation (legislation), Public Regulation of the Government of Estonia on occupational health and safety limits – Ref: 86/188/EEC (22/01/2002), Occupational
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I.8 Finland

I.8.1 Implementation of GSME Recommendations

⁶⁵ <http://www.who.int/peh-emf/project/mapnatreps/czechrepublic/en/index.html>

⁶⁶ <http://www.who.int/peh-emf/project/mapnatreps/denmark/en/index.html>

Rec. #1 & 9	In Finland, operators have company policies for good practice for network rollout, following the procedures given by the Finnish Telecommunication Authority. Operators communicate and provide information to the local authority/ the public on current and future network deployment plans on a case by case basis. They also communicate the need to install more network antennas to the public. Detailed technical and supporting deployment justifications with each application to gain authorisation is provided to the local authority or other regulatory body. Consultation programmes or involvement of local communities in the categorisation of proposed sites take place. Information flow is also facilitated by information sessions/ road shows, public/ media announcements and one to one sessions. Other information includes planning framework, potential impact on environment / benefit to community, technology and health information. Computerised images or photo montages are also produced. The information format varies depending on the project and the person involved and is provided when requested by the public.
Rec. #2	Respondent(s) reported site sharing with other operators' facilities, tower and roof-mounted sites, other telecommunications masts, radio installations and utilities' facilities. Formal administration processes are followed for site sharing. All 3G sites are shared with 2G sites. Cost saving, environmental concerns and landscape preservation are the main reasons. It is reported that site sharing will increase over the next five years.
Rec. #3	It is reported that alternative designs are implemented to reduce visual impact of sites (e.g. painted antennas to match background colour, installation inside church towers), following specific guidelines.
Rec. #4	Respondent(s) provide information on existing and new services/technologies: description of services, benefits, possible impact, possible infrastructure requirements and public consultation information. Educational sessions to explain to the local authority how the technology works or why the sites have to be established in the specified locations are held on a case by case basis. Feedback is usually good. An operator is considering the use of lower frequency bands to reduce the number of 3G sites required.
Rec. #5	Respondent(s) report base station compliance with European exposure guideline.
Rec. #6	All operators' sites are certified. There are processes to ensure compliance with the EU Directive recommendation for occupational exposures; policies for company employees accessing areas close to antennas (e.g. safety distances, power-switch off, written material) and specific guidance is given to third party workers on a case by case basis. RF measurements are performed in response to the concerns of the public, or others (including spot measurements).
Rec. #7	Respondent(s) have processes in place to address issues raised to the company at a national level, to address issues through a national Trade Association and to address individual issues (e.g. consumer or site-specific). Processes are handled by specialist staff for managing and communicating issues with local residents, there are telephone hotlines and web-sites that receive enquiries and dispatch information, and the established Trade Association representing network operators coordinates information

	exchange. The processes and the response times are monitored.
Rec. #8	National government research and GSMA programmes and initiatives are supported by operators. Respondent(s) promote the awareness of the results and make use of them in contacts with stakeholders, the public and authorities.

I.8.2 Country overview

Level of concern	The level of concern has increased over the last 18-24 months, although one operator reports that GSME Recommendations have reduced the number of complaints/ enquiries over the last two years. Health and environmental concerns are at a low level, but with an increasing trend. Aesthetic and technology concerns are at a medium/ low level.
Codes of practice & Audit process	Operators report that the public is mainly concerned about the effects of base stations to children, subjective symptoms and cancer fears. Public concerns are slowly increasing in some areas, decreasing in some others.
Voluntary actions from MNOs	The National EMF Research Program HERMO includes research into children's issues, body implants, cognitive issues, blood circulation, ear-balance function etc.
Government /Other actions	Project HERMO is budgeted at €1.5 million, with 60% funding from the Finnish government. ⁶⁷
Exposure guidelines	EU Recommendation (legislation) – Ref: Decree on the limitation of exposure of the public to non-ionizing radiation 294/2002, based on the Law on radiation protection 592/1991, 43

I.9 France

I.9.1 Implementation of GSME Recommendations

Rec.#1 & 9	All operators report a national policy for network rollout good practice. Operators always follow a formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans. The need to install more network antennas is communicated to the public on a case by case basis. Information on health and technology issues is also provided. A description of the proposed site including computer generated images or photo montages is also made available. This information is provided when there is a new deployment or when requested by the public. Operators conduct consultation programmes or involve local communities in the categorisation of proposed sites and provide technical operating information on the construction of each site to the local authority. Operators also have in place a non-audited monitoring and documentation system for information exchange. Information flow is mainly facilitated by sessions and road shows. A nation-wide information format
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⁶⁷ <http://www.gsmworld.com/health/programs/finland.shtml>

	is used by every operator in the country.
Rec. #2	Operators report site sharing with other operators' facilities, tower and roof-mounted sites and other telecommunications masts. Cost saving, environmental and landscape preservation are the main reasons. It is reported that site sharing will increase over the next five years.
Rec. #3	Operators report the use of alternative designs to minimise visual impact, following the French Mobile Phone Operators environmental guidelines: "Antenna deployment environmental harmonisation guide".
Rec. #4	Operators provide information on existing and new services/technologies: description of services, benefits, possible impact, possible infrastructure requirements and public consultation information. When it is requested by the local authority, education sessions are held to explain how the technology works or why the sites have to be established in the specified locations. The sessions are generally appreciated with local authorities able to respond to public enquiries about radio-communication infrastructure.
Rec. #5	Operators report base station compliance with European exposure limits.
Rec. #6	Operators have implemented policies for company employees accessing areas close to antennas (e.g. internal safety guidelines, compliance boundaries, charts and pictograms). Safety information is also provided to the landlord. Operators perform pre-installation calculations, and after the commissioning of a site, exposure measurements are performed when required by local town or county charter. Site measurements are performed as required by the operator's communication policy and as a commitment to residents who live or work near the base station.
Rec. #7	Operators have processes in place to address issues raised to the company at a national level, which are addressed through the national Trade Association (Association française des opérateurs mobiles, AFOM) and to address individual issues (e.g. consumer or site-specific). The Guide for Good Practice between Mayors and Operators states that operators should organise public meetings to answer any concerns about health and environmental issues. Operators are required to answer enquiries from the public or organisations within one month and they employ specialist staff to manage communications with local residents. Complaints and enquiries are also handled by AFOM representing network operators and the association coordinates the exchange of information.
Rec. #8	Operators support national government research studies: in January 2005, a governmental decree established a public utility body called the 'health and radio frequencies Foundation' (Fondation santé et radiofréquences). The Foundation was set up to carry out independent research into radiofrequencies and health effects, with financial participation of operators and manufacturers. Projects selected by this Foundation are aligned with the WHO research agenda.

I.9.2 Country overview

Level of concern	It is reported that the level of concern has remained the same over the last 18-24 months. Health and environmental concerns are at a high level. Aesthetic concerns are
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	at a medium level. Operators report that the mixture of existing 2G signals with new signals from 3G or other wireless equipment (e.g. Wi-Fi) is a growing concern.
Codes of practice & Audit process	Operators in France follow a good practice guide (Guide des Bonnes Pratiques, GBP)⁶⁸, which includes environmental guidelines and has been agreed between the Mayors and operators. The documents (published in 2004) are available on the French mobile operators' association website. A survey of 400 Mayors carried out after one year's use of the Guide of Best Practice, is available on AFOM's website⁶⁹. The deployment of base stations follows emission permits delivered by ANFR (National Frequencies Agency) and urban planning code. Operators provide Key Performance Indicators (KPIs) to AFOM, with regard to network rollout.
Voluntary actions from MNOs	The French Health and Radiofrequencies Foundation was created to encourage research efforts to study the effects of RF electromagnetic waves on humans, as well as provide information on this subject to the public, governments, doctors, professionals and others. Its budget is €1.8 million (half of the Foundation's budget is State-funded, and half is provided by industry).⁷⁰
Government /Other actions	Government provides precautionary advice for the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).
Exposure guidelines	EU Recommendation (no known plans for legislation) – Ref: Decree No.2003-961 (08/10/2003), regarding the conformity assessment of mobile terminals + Decree N° 2002-775 (05/03/2002) regarding base stations and fixed radio terminals; UTE C 99-111 - Recommendation concerning exposure of workers to electromagnetic fields), Occupational.

I.10 Germany

I.10.1 Implementation of GSME Recommendations

Rec.#1 & 9	All mobile operators obligated to communicate and provide information to local authorities on current and future network deployment plans, including detailed technical and planning frameworks and the potential impact to the environment, and health information. In some cases computer generated images are also available. Operators are also required to provide information for new antenna installations, and consultation programmes are conducted with local communities. Information may be provided annually; when there is a need for new development or when it is requested by a public or local authority. Other communications include information sessions/ road shows, seminars, public/ media announcements and one to one sessions, if required. The Agreement between the Central Municipal Organizations and the operators provides a
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⁶⁸ http://www.amf.asso.fr/documents/document.asp?ID_DOC=7311&REF_SPA=01&ref_arbo=139

⁶⁹ http://www.afom.fr/v4/FILE_DOWNLOAD.php?doc_ID=693&mode=directOpen

⁷⁰ <http://www.gsmworld.com/health/programs/france.shtml>

	basis for communications and there is a data base operated by the Federal Network Agency. The information exchange process is usually based on a standard company format or national-wide procedure, it is audited and the results are published ⁷¹ .
Rec. #2	All four operators share sites with existing infrastructure (tower/ roof mounted site, other operator's site, other telecommunications mast or radio installation). Site sharing is required by local authorities. Other reasons for site sharing are landscape preservation, environmental concerns and cost saving.
Rec. #3	Operators in Germany make use of alternative designs on a case-by-case basis to reduce the visual impact of the sites, and there are planning exemptions on most antennas (a formal planning permission is required for antennas above 10m).
Rec. #4	Mobile operators inform the planning and regulatory authorities about technological developments in mobile telecommunications (existing and new services, benefits, and possible impact; infrastructure and timescale requirements) and undertake public consultation. Educational sessions are held with local authorities to provide site justification in parallel with network rollout or during planning/ coordinating meetings. Responses from the authorities are perceived as positive.
Rec. #5	All operators report base station compliance with national and EU exposure guidelines.
Rec. #6	All sites across all operators are certified and formal processes are in place to ensure compliance with the EU Directive for occupational exposure. Site measurements are performed as part of each company's communication policy or in response to concerns from the public or others. All operators have policies for their own employees when accessing areas close to antennas. Guidelines are provided to third parties working in or around the antennas.
Rec. #7	All operators have processes in place in order to address issues raised: to an operator at the national level; through the national mobile information centre IZMF and as individual cases (consumer or site-specific). Specialist staff is assigned to manage communications with local residents. There are named contact personnel (e.g. a local authority contact partner) for liaison with local authorities and enquiries can be submitted via web-sites or on telephone hotlines. Brochures, web information and

⁷¹ Extract from the Common press releases of the Federal Environment Ministry and the Federal Ministry of Economics 31.03.2005 – English translation: "According to the auditors, communication and participation between Mobile Operating Companies (MOCs) and municipalities on the basis of the self-commitment is in principle working well."

Extract from Annual report concerning compliance with the voluntary commitment on the part of the mobile telecommunications network operators - 2004 (page 4, 2nd paragraph): "The most important result is that the overall situation regarding information, cooperation and participation compared to 2002 has clearly relaxed and improved. Overall, communication and participation on the basis of the voluntary commitment and the inter-association agreement function well. However, in isolated cases as well as regarding details problems continue to exist."

Extract from Common press releases of the Federal Environment Ministry and the Federal Ministry of Economics 18.03.2003 – English translation: "Significant improvement of the co-operation between mobile network operators and municipalities."

	proactive information campaigns are conducted for local authorities, schools, medical professionals and parents. IZMF, representing network operators, coordinates the exchange of information. In some cases established processes are in place to monitor response times to enquiries. It is reported that actions taken by operators have in general reduced the number of EMF complaints/ enquiries.
Rec. #8	All operators support national research studies. GSMA programmes and initiatives are also supported. Dissemination of results to relevant stakeholders and the public is an integral part of the research programme. The Research Association for Radio Applications publishes a quarterly newsletter and a weekly e-mail newsletter. Each operator made a proportionate contribution to the research with a total sum of €8.5 million allocated for the period from 2002 to 2005. They are prepared to further support research as recommended by the relevant expert panels

I.10.2 Country overview

Level of concern	Over the last 18-24 months the level of concern related to network rollout has remained the same. In Germany, health and aesthetic concerns are at a medium level, and environmental concerns are at a medium/ low level. Operators' activities related to GSME Recommendations have led to an overall reduction in the level of complaints and enquiries. The most frequent concerns are related to general health and the established processes for dialogue with local authorities have helped to reduce concerns. The situation has improved since voluntary communications measures were implemented.
Codes of practice & Audit process	The basics of the information exchange between operators and communities are laid down in two documents: - "Agreement on Exchanging Information and Involving Local Communities with Regard to expanding Mobile Radio Networks between the "Central Municipal Organizations" and the "Mobile Radio Network Operators" - "Measures for improving safety and consumer, environmental and health protection, information and confidence-building measures in setting up Mobile Radio Networks" All elements of the GSME Recommendations are included in the network rollout good practice in Germany although not specifically referenced. The second document also provides consumer information on Specific Absorption Rate (SAR), research funding and independent field monitoring. These documents demonstrate industry commitments to meet mandatory requirements which are supported with annual reports to the government. The mobile radio operators report to the German government at least annually.
Voluntary actions from MNOs	Each of the mobile radio network operators provides a proportion of the funds to support the registration scheme for high-frequency electro-magnetic emissions within the government's Existing Measurement Programme. Prior to 2 January 2005 when they were merged, there were separate databases to track municipal locations and also a separate public EMF database. In the future there is

	an intention to include test measurements from federal states those of the Federal Network Agency. In co-operation with the ministries for the environment of federal states, the Federal Network Agency has drawn up an implementation plan for the realisation of the Monitoring Programme with 12 monitors, which started on 19 March 2007. Currently 10 monitoring systems are in operation. All measurement results are available on the Agency's web site. The monitoring systems send their data via GPRS to the Agency. The results of the measurements are updated on the web page once per hour.
Government /Other actions	Precautionary measures of the Federal Government in the area of mobile communication⁷²: - Provision of precautionary advice for the use of mobile phones (e.g. reducing call time, advice for mobile usage by children) - Retention of the current threshold limits - Intensification of scientific research - Creation of a database of the authorized locations of mobile communication antennas - Information to the public on the current state of scientific knowledge - Self-commitment and monitoring
Exposure guidelines	EU Recommendation – Ref: 26th BImSchV (16/12/1996), Ordinance for implementing the Federal Emission Control Act; Ordinance on Electromagnetic Fields, Public and Occupational

I.11 Greece

I.11.1 Implementation of GSME Recommendations

Rec.#1 & 9	Operators have formal company policies for good practice for network rollout, which refer to the GSME Recommendations, and operators communicate the need to install more network antennas to the public. It is a mandatory requirement for operators to provide detailed technical and supporting deployment justifications with each application to the local authorities or other regulatory body. Operators in Greece are obligated to provide: a technical evaluation study for each new or upgraded base station (including technical calculations, plans of the construction, etc); environment impact studies for each new or upgraded base station (including technical calculations, plans of the construction and of the surrounding areas to a radius of 300m, updated information on health issues, WHO statements, etc.). These studies are based on the requirements of the regulatory framework (national licensing process). Information on the potential impact on the environment/ community and health information are also made available. In some cases consultation programmes are
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⁷² Source: Federal Chancellery (2001)

	conducted and local communities involved in the categorisation of proposed sites. Operators have monitoring and documentation systems processes in place. Information is provided either: annually; when there is a new deployment or when it is requested by a public or local authority.
Rec. #2	Operators share sites with other operators' facilities, tower and roof-mounted sites, transmission equipment shelters, antennas, other telecommunications masts and radio installations and utility facilities. 100% of 3G sites share facilities with 2G sites. Cost saving and in some cases landscape preservation are the main reasons for site sharing. Site sharing is expected to increase over the next five years.
Rec. #3	Operators use alternative designs to reduce a site's visual impact.
Rec. #4	Operators provide information on existing and new services/technologies: description of services, benefits and possible impact. In some cases, operators provide details of the possible infrastructure requirements, the timescales of the development and other public consultation information. Operators conduct educational sessions as needed, to explain to the local authority about technology developments and the reasons for sites being required in specific locations. The responses to these sessions depend on the audience but are positive or neutral. It is rare for presentations and meetings to have a negative impact, although in some cases there is no public interest. Many discussions have taken place with the regulators regarding the 900 MHz spectrum re-farming for 3G, which may reduce the number of sites required because of the technical characteristics of operations in the 900 MHz band - decisions will be in line with EU recommendations. Operators meet electromagnetic exposure compliance requirements.
Rec. #5	Operators report base station compliance with National exposure limits. These are stricter than ICNIRP. Even though ICNIRP guidelines are adopted there are additional safety factors, e.g. for the general public the Greek limits are set at 70% of the EU/ICNIRP limits. For areas within 300m of "sensitive buildings" such as schools and hospitals, the base station network should comply with a limit which is 60% of the EU/ICNIRP guideline.
Rec. #6	All sites are reported as certified. There are policies for company employees when accessing areas close to antennas and guidelines for third parties e.g. painters or construction workers working in or around antennas via the subcontractor. One operator reports monitoring/measuring the RF exposure in public areas. This may be done ad-hoc, upon request and sometimes voluntarily for a sample of base stations. Site measurements are part of the company's communications policy and are performed in response to public concern. The operator's policy for occupational exposure safety addresses the requirements of the EU recommendation.
Rec. #7	Operators have processes to address issues raised to the company at the national level and also to address individual issues (e.g. consumer or site-specific). These processes are handled by specialist staff to contact local residents and named contact personnel for liaison with local authorities. There are also telephone hotlines and web-sites that receive enquiries and dispatch information. Response times are in some case monitored.
Rec. #8	Operators support GSMA programmes and initiatives. Research progress and results are

	provided to authorities/public together with any further detailed information requested.
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I.11.2 Country overview

Level of concern	The level of concern remains high over the past 18-24 months and operators report that GSME Recommendations have not necessarily reduced the level of complaints or enquiries. Health related concerns are reported as increasing over the last two years and being at a high level. Environmental, aesthetic and technology concerns are at a medium level. Operators report difficulties in implementing sites due to public protests, which sometimes require police intervention.
Codes of practice & Audit process	As part of its corporate (group-wide) policy, one operator has adopted the "Responsible Network Deployment Guidelines Policy", which addresses all elements of the GSM Europe Good Practice Recommendation on Network Rollout.
Voluntary actions from MNOs	One operator reports that it has implemented the "EMF transparency" programme; Information about EMF measurements is provided to the public by independent authorities (e.g. universities).
Government /Other actions	The Greek government implements precautionary actions (e.g. exclusion zones for masts, in-site measurement programmes) which are beyond those included in guidelines. The Greek Regulatory Authority has organised several workshops on mobile technology and EMF issues to inform the public.
Exposure guidelines	EU Recommendation (legislation) with additional safety parameters – Ref: Law No 3431, Act No.13/A/3-2-2006 "About electronic communications and other provisions"

I.12 Hungary

I.12.1 Implementation of GSME Recommendations

Rec.#1 & 9	All operators have a formal company policy for good practice for network rollout. Voluntary processes have been established to communicate information to the local authorities and the public on current and future network deployment plans. The need to install more network antennas is communicated to the public on a case by case basis. When site permission is required by the National Construction Constitution or by local decrees, operators provide detailed technical and supporting deployment justifications with each application to the local authority or other regulatory body. The information is also provided to the public or local community and the National Public Health and Medical Officer Service (ÁNTSZ) is also informed. Consultation programmes provided as needed, on a case-by-case basis. Operators also provide information through information sessions/ road shows, public/ media announcements, letters to nearby residents, the national EMF portal and with an informative leaflet which covers issues such as: network building; technical and legal background; responsible authorities;
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	potential impact to environment/ community; 3G technology; FAQ about sites; emissions and power; the WHO position; photo montages and information forums. A format used depends on the project and personnel involved. No auditing process in place for monitoring the information exchange process and although in general the perception is good, feedback is not always provided.
Rec. #2	Operators report site sharing with existing infrastructure (other operators' facilities, tower and roof-mounted sites, antennas and other telecommunications masts and utilities' facilities e.g. water-towers, churches, silos). A formal administration process for site sharing has been implemented and on average, more than 50% of sites are shared. This percentage is expected to increase over the next five years. Co-location with other operators' infrastructure is around 40% and 95% of 3G sites are shared with 2G sites. Cost saving and environmental concerns are the most important reasons for site sharing.
Rec. #3	Alternative designs are implemented in Hungary, although there are no specific guidelines. Examples include artificial trees, advertising signs and hidden antennas.
Rec. #4	Operators provide information on existing services/technologies: description of services, benefits and the possible impact. The operators have to purchase a software platform which enables them to submit detailed data (e.g. antenna data, cell data, frequency/power/bandwidth data and post-installation changes) to the regulator. Educational sessions are conducted to explain to the local authority how the technology works or why the sites have to be established in the specified locations. The feedback from participants to these sessions is variable. Some industry players are already considering the deployment of 3G in lower frequencies, although in this case, a regulatory decision will be required.
Rec. #5	Respondent(s) reported base station compliance with national and European exposure guidelines.
Rec. #6	The regulator requires sites to be measured. Pre-installation calculations and post-installation measurements are performed. Operators report monitoring and measuring the RF exposure in public areas from their sites when first commissioned and, in some cases, at regular intervals subsequently. An independent body is responsible for site sample selection. Measurements are performed to meet regulatory requirements and in response to public or other concerns. On average, more than 60% of sites are certified. Operators have processes to ensure compliance with the EU Directive recommendation for occupational exposures and policies for company employees accessing areas close to antennas.
Rec. #7	Operators have employed specialist staff to manage communications with local residents. Telephone hotlines and web-sites have also been established to receive enquiries and dispatch information. Operators have processes to handle complaints at individual level (e.g. customer or site specific) and response times are sometimes monitored.
Rec. #8	The operators support corporate (group-wide) and national research studies. Results of the research studies are made available to the public via operator's web sites, the Hungarian EMF-portal and books.

I.12.2 Country overview

Level of concern	The level of concern in Hungary has remained at the same level over the last 18-24 months. GSME Recommendations have possibly led to fewer complaints. Health issues are at a medium level, while environmental, aesthetic and technology issues are at a low level.
Codes of practice & Audit process	Operators report that EMF concerns may lead to property devaluation and, due to political interest and increasing reactions from green activist, local regulation gets stricter. It is also reported that site deployment in most districts of Budapest is practically impossible because of local decrees.
Voluntary actions from MNOs	One operator reports auditing building sites including site signage.
Government /Other actions	In some cases operators mark their sites to warn workers and the public and joint activity has started with other operators to implement a workers directive in Hungary.
Exposure guidelines	The government implements precautionary actions in addition to the limit guidelines.

I.13 Ireland

I.13.1 Implementation of GSME Recommendations

Rec. #1 & 9	All operators report having formal company policies in respect of good practice for network rollout. Processes to communicate and provide information to the local authority/ the public on current and future network deployment plans have been established and the need to install more network antennas is communicated to the public. Detailed technical and supporting deployment justifications are provided with each application to the local authority or other regulatory body. Other information provided includes the planning framework, potential impact to the environment/ community, technology and health information. Site images and photo montages are also made available. Operators conduct consultation programmes or involve local communities in the categorisation of proposed sites. In some cases a monitoring system for auditing the information exchange process is used. Stakeholders include the regulator and the local authorities, the public, local communities and the media. Information flow is facilitated through one to one sessions. In most cases a company's standard format is used, although sometimes the information layout is adjusted to the requirements of the people involved. Information is provided when there is a new deployment or when it is requested by public. It is reported that stakeholders find the information very useful.
Rec. #2	Operators share sites with other operators' sites, tower and roof-mounted sites, other telecommunication masts and radio installations or utilities' facilities. In Ireland, utility companies share their site and facilities with all mobile operators and with the police services. It is reported that more than 70% of the sites are shared, while 3G/2G sharing

	reaches 75%. Formal processes to administer site sharing are in place and operators expect that site sharing will increase over the next five years.
Rec. #3	Operators use alternative designs and coloured installations to reduce the visual impact of sites. Examples include chimneys, trees, architectural building features, grain silos, advertising signs and antenna painted to match a building façade. In some cases operators follow local authority planning permission requirements which may include conditions on visual design.
Rec. #4	Operators provide information on existing services/technologies: description of services, benefits and possible impact. In some cases information on new services and possible infrastructure requirements is also provided and education sessions are conducted to explain to the local authority how the technology works or why the sites have to be established in the specified locations. Sessions are conducted quarterly or when required. It is reported that councils find these sessions very informative. Operators are considering 3G deployments in lower frequencies which may reduce the number of base station sites required and therefore rollout cost and time.
Rec. #5	Operators report base station compliance with European exposure limits. Emission tests are carried out by operators as per the regulator's standard for each new site.
Rec. #6	On average, more than 50% of sites are certified with processes in place to ensure compliance with the EU Directive recommendations for occupational exposures. There are also policies for company employees accessing areas close to antennas (e.g. safe systems of work, personal monitors, audits, measurements on site) and guidelines for third party workers (e.g. safe systems of work provided to landlords; processes which require the power down of equipment while third parties may be in a specific area). Pre-installation calculations and post-installation measurements are performed. Operators report monitoring and measuring the RF exposure in public areas from sites when first commissioned and at regular intervals subsequently. This may be due to regulatory requirement or to respond to public concerns. One operator reports that sites are measured at the closest point of public access.
Rec. #7	Operators have processes to address issues raised to the company at the national level and also to address individual issues (e.g. consumer or site-specific). In some cases responses are provided via the Irish Cellular Industry Association (ICIA). Named contact personnel are responsible for liaison with local authorities. Complaints are handled by EMF trained staff and manager with corporate responsibility. Complaints are dealt with by telephone call/ email or meeting with the people involved with the complaint or query. Response times are monitored. In some cases, a site acquisition and PR team coordinates all responses to the public.
Rec. #8	Operators support national government research and the GSMA's programmes and initiatives. Research results are made available to the staff. FAQ documents are updated and used with local authorities and public. In other cases, the results are shared through Industry associates.

I.13.2 Country overview

Level of	There has been a small increase in the level of concern over the last 18-24 months.
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concern	GSM Europe Recommendations have not necessarily led to the reduction of the complaints. Health-related concerns are at a high level with an increasing trend. Operators report that people do not want the installation near where they live. People object at the planning and installation stages, although the situation is improving.
Codes of practice & Audit process	The EMF subgroup of ICIA has developed the "10 Commitments" ⁷³ document, which has been agreed by all the operators in Ireland.
Voluntary actions from MNOs	All operators take part in industry groups to try and address EMF issues directly and consistently with the public and government. There are also landlord surveys conducted for monitoring/ auditing purposes.
Government /Other actions	The government implements precautionary actions (e.g. exclusion zones for masts, in-site measurement programmes) beyond the limit guidelines and provides precautionary advice on the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).
Exposure guidelines	EU Recommendation (Government plans to incorporate, time scale not yet determined) – Ref: Planning and Development Act November 2001, Telecommunications Law

I.14 Italy

I.14.1 Implementation of GSME Recommendations

Rec. #1 & 9	All operators are required to establish formal processes for communication and information provision to the local authorities/ public on current and future network deployment plans. Mandatory detailed technical and supporting deployment justifications are provided with each application to the local authority or other regulatory body. Other information provided includes the planning framework, the potential impact on the environment, the potential impact/ benefit to the community, and technology and health information. Computer-generated images or photo montages are sometimes made available. Operators also conduct consultation programmes or involve local authorities for site deployment. Other means of communication include information sessions/ road shows, seminars, public/ media announcements, one to one sessions and participation in public hearings when invited by local authorities. Information is usually provided in cases of new deployments or when requested by the public/ authority. All operators have established monitoring and documentation system for their information exchange processes.
Rec. #2	All operators share sites and expect an increasing trend over the next five years. A formal site sharing administration process is already in place. The majority of sharing includes other operators' facilities, tower site sharing, roof-mounted site sharing, other telecommunication masts or radio installations. Although cost saving is the main reason

⁷³ <http://www.icia.ie>

	for site-sharing, environmental concerns and landscape preservation are also important reasons.
Rec. #3	Operators in Italy make use of alternative design, with the majority following specific guidelines to lower the visual impact.
Rec. #4	Mobile operators inform planning and regulatory authorities of technological developments on mobile telecommunications (existing and new services, benefits, and possible impact, infrastructure and timescale requirements). Educational sessions for site justification also take place. The frequency of these sessions depends on the requirement of the local authority. The feedback from local communities and the general public is considered to be very positive. The industry and the Italian regulator have opened a consultation process for the deployment of 3G networks operating at lower frequencies, which essentially reduces the number of sites needed.
Rec. #5	Italian national exposure guidelines are stricter than ICNIRP. Continuous monitoring is sometimes required, in specific cases, by landlords, municipalities or regional environmental authorities. An EMF national monitoring network has also been deployed.
Rec. #6	All operators report 100% certified sites, with processes in place to ensure compliance with the EU Directive recommendation for occupational exposures. Before commissioning a site, operators perform pre-installation calculations and measurements, and regular post-installation measurements once the site is commissioned. Post-installation measurements are mandatory in two Italian regions, while in the other regions they are required when the EMF calculated value is higher than 50% of the applicable limit and also in response to public concerns. All operators have policies for their own employees when accessing areas close to antennas. Guidelines are provided to third parties working in or around the antennas.
Rec. #7	Operators have processes in place to address issues raised at a national and individual level. In most cases specialist staff is responsible for managing issues with local residents. Cross-functional teams (media relations, institutional relations, safety, EMF) may also handle the process to respond to individual enquiries. Response times are monitored.
Rec. #8	All operators participate in corporate (group-wide) research projects, and support government initiatives and GSMA programmes. Fondazione Ugo Bordoni (FUB), a high culture institution participated by the Minister of Communications and by the Italian mobile operators, publishes research results and organises seminars and meetings to promote awareness of the results. Operators also promote communication of the studies via conferences, web-site announcements and newsletters.

I.14.2 Country overview

Level of concern	The level of concern regarding health issues in Italy is considered high. Environmental and aesthetic issues are at a medium level with, nationally, no significant change over the last 18-24 months. However, according to data from Piemonte Regional Environmental Authority (March 2006) complaints from citizens reduced by 40%.
Codes of	All operators make reference to the GSME Recommendations on Network Rollout Good

practice & Audit process	Practice.
Voluntary actions from MNOs	In some cases specific risk assessments are made. A nationwide network for electromagnetic field monitoring has been deployed, provided by the Prime Minister Decree of March 2002 (using part of the proceeds from the 3G tender) and is led by FUB.
Government /Other actions	The government has implemented precautionary actions beyond the guideline limits. The FUB organises communication activities (BluBus, BluShuttle).
Exposure guidelines	EU Recommendation (precautionary limits) - Ref: Ministerial Decree DM381/1998; GU No.199 "Establishment of exposure limits, attention values, and quality goals to protect the population against electric, magnetic, and electromagnetic fields generated at frequencies between 100 kHz and 300 GHz", Public Ref: Decree of the President of the Council of Ministers (08/07/2003): As a cautionary measure to protect against any possible long-term effects that might be related to exposure to fields at the aforementioned frequencies, the attention values of 20 V/m. and 6V/m. are adopted in children's playgrounds, residential dwellings, school premises, and in areas where people are staying for 4 hours or more per day, as well as in outdoor annexes that may be used as residential environments, such as balconies, terraces, courtyards, but excluding roof paving.

I.15 Latvia

I.15.1 Implementation of GSME Recommendations

Rec.#1 & 9	Respondent(s) have an internal policy, which makes reference to GSME Recommendations, for good practice for network rollout. It is a mandatory requirement to communicate and provide information to the local authority/ the public on current and future network deployment plans and to provide detailed technical and supporting deployment justifications with each application to gain authorisation from local authority or other regulatory body. Information is also provided to the Public Health Agency. The need for base station installation is communicated to the public on a case by case basis. Apart from technology and health related information, the operator provides photo montages, maps, antennae data (height of placing antennae), frequency bands and powers, directions, results of calculation/estimation etc. Consultation programmes and processes to involve local communities in the categorisation of proposed sites are conducted voluntarily. Other means to facilitate information flow include road shows and seminars. Information is provided in varying formats according to need and the Public Health Agency accepts the data provided. There are also processes in place to monitor and document the information exchanges, although no auditing process has been established.
Rec. #2	Respondent(s) share sites with tower and roof-mounted sites, other telecommunication

	masts and radio installations. All 3G sites are shared with operators' 2G sites. Cost saving is the main reason driving site sharing. Environmental and landscape preservation reasons are also considered important, as site sharing is required by local authorities. Operator reports that site sharing will increase over the next five years.
Rec. #3	It is reported that alternative designs for base station installation is implemented (e.g. top of the water towers, TV and radio towers).
Rec. #4	Survey participant(s) report that provide information on existing and services/technologies: description of services, benefits, possible impact, infrastructure requirements and the timescales of development. Annual education sessions with the local authorities are held to explain how the technology works or why the sites have to be established in a specific location. The response varies: in some cases operator's efforts to educate local authorities are perceived as internal difficulties faced by the operator rather than a means of providing information exchange.
Rec. #5	Respondent(s) report base station compliance with European exposure limits.
Rec. #6	Respondent(s) report 100% of sites are certified, with policies for their own employees accessing areas close to antennas (e.g. workers have individual dosimeters with alarm levels and have been advised to switch off the equipment if the need to work in a direct beam close to an antenna). Similar guidelines are provided to third party workers (e.g. provision of information annually about the specific risks at sites during instruction in Occupational Safety & Health, OSH). Prior to commissioning a site, pre-installation calculations and regular post-installation measurements are performed (in some places, where the owners have requested).
Rec. #7	There are processes in place to address individual issues (e.g. consumer or site-specific). These issues are handled by OSH and PR personnel.
Rec. #8	GSMA programmes and initiatives on research studies are supported.

I.15.2 Country overview

Level of concern	Public concern has remained almost the same over the last 18-24 months. Health and environmental concerns are at a medium level. Aesthetic concerns are at a low level, but increasing.
Codes of practice & Audit process	An operator reports that the GSM Europe Recommendations are used as a reference for its network rollout.
Voluntary actions from MNOs	Operators cooperate with the academic society to include information about modern communication using cell-phones in university books.
Government /Other	The government provides precautionary advice on the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).

actions	
Exposure guidelines	EU Recommendation – Ref: LVS (Latvian Standard) ENV 50166 1995

I.16 Lithuania

I.16.1 Implementation of GSME Recommendations

Rec. #1 & 9	It is reported that no national policy is in place for network rollout. One operator reports that it has established processes to communicate and provide information to the local authority/ the public on its current and future network deployment plans. The need to install more network antennas is communicated to the public voluntarily on a case by case basis. The provision of detailed technical and supporting deployment justifications with each application is mandatory to gain authorisation from local authorities or other regulatory bodies. Other information provided includes an assessment on potential impact to the environment and the community, technology and health information. Consultation programmes and the involvement of local communities in the categorisation of proposed sites are voluntary activities by operator undertaken as needed. When there are new deployments or when information is requested, it is provided by means of public/ media announcements, letters to nearby neighbours and one to one sessions. Information is provided in different formats according to the requirements. There is no process to monitor the information exchange process or internal auditing of the results.
Rec. #2	Operators share sites with tower and roof-mounted sites and other telecommunication masts. Cost is the most important factor for site sharing, although local authorities may require sites to be shared. Site sharing is administered by a formal process. It is reported that site sharing will increase over the next five years.
Rec. #3	One operator makes use of alternative designs, although there is no reference to specific guidelines.
Rec. #4	Respondent(s) provide information on existing and new services/technologies: description of services, benefits, possible impact and any data required for public consultation.
Rec. #5	It is reported that base station comply with national exposure limits. Lithuanian guidelines (10uW/cm ²) which are about 30 times more stringent than European guidelines.
Rec. #6	Respondent(s) report that 100% sites are certified. Policies are in place its own employees accessing areas close to antennas (e.g. switch off or reduce power while working close to antennas). Similar policies are followed for third party workers. Prior to the commissioning of a site, the operator performs pre-installation calculations followed by post-installation measurements. Such activities are regulatory requirements and may be carried out in response to public or other concern.
Rec. #7	Operators have policies in place to address individual issues (e.g. consumer or site-

	specific). In 90% of cases, technology divisions provide info to PR department in order that they can respond to queries. In the remaining cases the issues are addressed by the technology divisions directly. These processes are monitored for response times.
Rec. #8	An operator participates in national university research programmes into radiation and EMF levels. The operator has informed the authorities and published newspaper articles to disseminate the results of the studies.

I.16.2 Country overview

Level of concern	The level of public concern is unchanged over the last 18-24 months. Health related and environmental concerns are at a low level, with an increasing trend. No concerns have been raised related to technology and aesthetic issues.
Codes of practice & Audit process	A combination of mandatory requirements and national policies apply.
Voluntary actions from MNOs	Education sessions are held to explain technologies to local authorities and why sites have to be established in specific locations. These sessions have been conducted several times, with positive effect.
Government /Other actions	The government implements precautionary actions beyond the limit guidelines (e.g. exclusion zones for masts, in-site measurement programmes).
Exposure guidelines	National (Not based on ICNIRP) a. Public - Ref: HN 81 (1998) "Base stations of mobile cellular communications" b. Public and Occupational – Ref: HN 80 (2000) "Electromagnetic field at work and at living places. Normative values and measuring requirements in 10 kHz - 300 GHz", based on EU Recommendation

I.17 Luxembourg

I.17.1 Implementation of GSME Recommendations

I.17.2 Country overview

Exposure guidelines	National (stricter limits than EU Recommendation) – Ref: "Standards regarding non-ionising radiation due to cellular mobile telephony" issued by the Environment Ministry and the Labour and Employment Ministry (http://www.senat.fr/rap/r02-052/r02-05237.html). This document was made legally binding by the decree, authorising the settlement mobile telephone networks. It applies to frequencies in the range from 10 kHz - 300 GHz and is valid for the public. The Recommendation ITM-CL 179.4 (http://www.itm.lu/securite-sante-ss/conditions-types/cl179-4.pdf) that has been issued by the Government of Luxembourg is not
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	legally binding. It applies to frequencies in the range from 10 kHz to 300 GHz, is valid for the public and also does not base on the ICNIRP limits. Luxembourg has applied stricter limits than those laid down in the Council Recommendation 1999/519/EC. The limits of the 1999/519/EC are valid for occupational exposure. No regional variations are reported regarding protection of the public against Electromagnetic fields. However, the administration communales (local administrations) have the authority to ignore the national standards or to apply stricter limits for public exposure to electromagnetic fields.
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I.18 Malta

I.18.1 Implementation of GSME Recommendations

Rec. #1 & 9	In Malta, operators have processes to communicate and provide information to the local authority/ the public on current and future network deployment plans. Operators also communicate the need for more antenna installations and technical and supporting deployment justifications with each application to the local authority or other regulatory body. Technical operating information on the construction of each site is mainly provided to the regulator. Other information includes the description of the proposed site including computer generated images or photo montages. The format and the frequency of the information provided varies according to the project or persons involved.
Rec. #2	Respondent(s) share sites in various ways: tower and roof-mounted site-sharing and utility's facility sharing. Site sharing varies across the operators, but may reach 30%, while all 3G sites are shared with 2G sites. It is reported that site sharing is expected to remain at about the same over the next five years and probably increase.
Rec. #3	In Malta, alternative designs are used to reduce visual intrusion.
Rec. #4	Information on public consultation is provided and in some case education sessions are conducted with the local authority to explain how the technology works or why the sites have to be established in the specified locations. Feedback is generally very good.
Rec. #5	Operators report base station compliance with national exposure limits.
Rec. #6	On average, 90% of sites across the operators are certified. Processes to ensure compliance with the EU Directive for occupational exposures are in place. Operators have policies for own employees accessing areas close to antennas. Post-measurements following site commissioning are also performed, as a regulatory requirement and in response to public concerns.
Rec. #7	Operators have established procedures to address individual EMF related complaints/enquiries (e.g. consumer or site-specific) and there are named contact personnel for liaison with local authorities. In some cases telephone hotlines and web-sites that receive enquiries and dispatch information are used.
Rec. #8	One operator supports national government research studies. Interested individuals are

	informed of the research results.
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I.18.2 Country overview

Level of concern	The level of concern regarding network rollout over the last 18-24 months has remained the same. Health issues are a high concern, which have increased over the period. Environmental and aesthetic concerns are of medium/ low level. The operator reports that actions taken under the GSME Recommendations have led to the reduction in the number of the complaints. Other concerns include property value reduction for the neighbouring dwellings.
Codes of practice & Audit process	One operator makes reference to GSM Europe Recommendations and in other cases, a combination of mandatory requirements and national policies apply. The regulator, periodically, carries out audits and publishes the results.
Voluntary actions from MNOs	Direct engagement with interested parties. Discussions with Malta Environment and Planning Authority (MEPA) to simplify process of the review for planning applications.
Government /Other actions	During 2006 over 80 sites were audited by the regulator and these included GSM900, GSM1800 and 3G base stations. The regulator also audited broadcasting transmitters and other sources of EMF such as microwave links and public land mobile transmitters. The results are available on the regulator's web site. ⁷⁴ The regulator liaises annually with media to publicise its EMF audit results.
Exposure guidelines	EU Recommendation (no legislation) – Ref: Report on Recommendations for limiting human exposure to time-varying electric, magnetic and electromagnetic fields in the frequency range from 0 Hz to 300 GHz (25/08/2000)

I.19 The Netherlands

I.19.1 Implementation of GSME Recommendations

Rec.#1 & 9	All operators report having a formal company and national policy for good practice for network rollout. All network operators provide information for new antenna installation. In most cases detailed technical and supporting deployment justifications are provided with each application to the local authority or other regulatory body. The application is complemented with consultation programmes and the involvement of local communities. Information exchange between stakeholders (local authority, regulator, public community, national antenna bureau) is part of the national antenna policy (National Antenna Covenant). The whole framework of the Antenna Covenant is audited once a year by an independent party. A monitoring and documentation system for the information exchange process is in place by all operators and audited results are published. The results of the auditing of this process are published. Information flow is
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⁷⁴ <http://www.mca.org.mt/infocentre/openemf.asp>

	facilitated via consultation processes, sessions/ road shows (where health issues are addressed), seminars, one to one communication and letters to nearby residents. Information provided includes details of the planning framework, potential impact to the environment and impact/ benefit for the community, technology and health related. Photo montages are also made available.
Rec. #2	All operators report site sharing with other operators' facilities, tower site sharing, roof-mounted site sharing other telecommunication masts, radio installations and utility facilities. A formal administration procedure is in place. On average 76% of sites share with existing infrastructure. 3G site sharing is near to 85%. It is believed from the operators that these percentages will remain the same or probably increase over the next five years.
Rec. #3	Most operators report the use of alternative designs to reduce the visual impact of sites.
Rec. #4	The majority of operators provide information on existing and new services/technologies: description of services, benefits, possible infrastructure requirements, and timescales of deployment and public consultation information. All operators conduct educational sessions to explain to the local authority how the technology works or why the sites have to be deployed in specified locations. The response from the public has been positive and that the sessions are considered to be informative.
Rec. #5	All operators report base station compliance with European exposure guidelines and have processes in place to ensure compliance with EU Directive for occupational exposure. Pre-installation calculations and post-commission measurements are also performed.
Rec. #6	Measurements are performed in response to public concerns. All operators have policies for their own employees when accessing areas close to antennas and guidelines for third party workers.
Rec. #7	All operators report having processes in place to handle EMF complaints/ inquiries at a national level, through the Trade Association (MoNet) or in response to individual cases (e.g. consumer or site-specific). These processes are managed by specialist staff. Staff interacts with local residents and there are named contact personnel for liaison with local authorities. Telephone hotlines and websites are used to handle enquiries and dispatch information. MoNet, which represents network operators, provides coordination of information exchange. The response times of these processes are monitored.
Rec. #8	Operators participate in group-wide corporate research and governmental research projects. They also support GSMA programmes and initiatives. Research studies are communicated to the public by operators or national authorities.

I.19.2 Country overview

Level of concern	The level of concern related to network rollout in the Netherlands has remained the same over the last 18-24 months. Health concerns are at a high/ medium level. Environmental and aesthetic concerns are at a stable medium/ low level. It is reported
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	that operators' activities related to GSME Recommendations have reduced the number of complaints and enquiries overall. There are also 3G-specific concerns and concerns about long term exposure.
Codes of practice & Audit process	The National Antenna Covenant ⁷⁵ framework is audited once a year by an independent party and a report is sent to the national parliament. The performance of operators has been good over the years. One operator makes reference to GSM Europe Recommendations.
Voluntary actions from MNOs	Operators offer education sessions. The course is called PATO and is open to municipality officials.
Government /Other actions	National government and technical universities participate in the PATO course (see above). Further information can be found at http://www.gr.nl/ .
Exposure guidelines	EU Recommendation (no plans for legislation) – Ref: Letter of the Ministry of Housing, Spatial Planning and the Environment on overhead power lines (03/10/2005), Public

I.20 Poland

I.20.1 Implementation of GSME Recommendations

Rec. #1 & 9	Respondent(s) have a formal company and national policy for good practice for network rollout, which makes reference to GSME Recommendations. It is a mandatory requirement to have formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans and explain to the public the need to install more network antennas. Detailed technical and supporting deployment justifications are provided with each application to a local authority or other regulatory body. Other information provided includes the potential impact on the environment, impact/ benefit to community and health related information. Letters to nearby residents are distributed to facilitate information flow. The information format varies depending on the project and the people involved. In general information is provided when there is a new deployment or when it is requested by the public or by a local authority. A monitoring and documentation process for the exchange of information is in place, although the process is not audited.
Rec. #2	Site sharing is implemented with other operators' facilities, tower site and roof-mounted sites, transmission equipment shelters, antennas, other telecommunications masts and radio installations. More than 85% of 3G sites are shared with 2G sites. The main reasons for site-sharing are cost saving and landscape preservation. A formal process is in place to facilitate the administration of site sharing. Respondent(s) report that the percentage of shared sites will increase over the next five years.
Rec. #3	Operator(s) report use of alternative designs.

⁷⁵ <http://www.antennebureau.nl/>

Rec. #4	Annual educational sessions are contacted to explain to the local authority how the technology works or why the sites have to be established in specific locations.
Rec. #5	Respondent(s) report base station compliance with National exposure limits (which are stricter than ICNIRP exposure limits). Processes have been established to ensure compliance with the EU Directive for occupational exposures.
Rec. #6	100% of sites are certified. Policies for the company's own employees accessing areas close to antennas are in place and guidelines for third parties e.g. painters or construction workers working in or around antennas are provided (e.g. code of conduct for subcontractor). Pre-installation calculations and post-installation measurements are performed. Operator(s) monitor/ measure the RF exposure in public areas when sites are first commissioned and at regular intervals subsequently in accordance with legal requirements.
Rec. #7	Company procedures for handling complaints and enquiries are established. Specialist staff is responsible for communication and managing issues with local residents.
Rec. #8	Corporate (group-wide) research programmes are supported. The studies conclusions are presented in meetings with local residents.

I.20.2 Country overview

Level of concern	It is reported that the level of concern has increased over the last 18-24 months. Health concerns are at a high level. Environmental and aesthetic concerns are in medium level. Other concerns reported include a drop in property values.
Codes of practice & Audit process	An operator makes reference to the GSM Europe Recommendations.
Voluntary actions from MNOs	Consultation programmes are conducted on a case by case basis and local communities may be involved in the categorisation of proposed sites.
Government /Other actions	There are agreed national procedures with requirements for deploying base stations which are required by national law.
Exposure guidelines	National (Law, not based on ICNIRP) a. Ref: Ordinance of the Polish Ministry of Labour and Social Policy (29/11/2002), Journal of Law No 217/2002 para 1833, Occupational b. Ref: Ordinance of Ministry of Environment (30/10/2003); Official Journal No 192/2003, pos. 1883– Public & Environmental

I.21 Portugal

I.21.1 Implementation of GSME Recommendations

Rec. #1 & 9	Respondent(s) reported having a formal company policy for good practice for network rollout, which refers to GSME Recommendations. It is mandatory to communicate and provide information to the local authority/ the public on current and future network deployment plans. The operators always communicate to the public the need to install more network antennas. Detailed technical and supporting deployment justifications are provided with each application to gain authorisation from the local authority or other regulatory body, which are mandatory requirements. In some cases the operator conducts consultation programmes or involves local communities in the categorisation of proposed sites. It is also required for the operator to have a monitoring and documentation system for information exchange processes, which is audited on a voluntary basis. As well as local authorities and communities and the regulator, landlords are also involved in the information exchange process. Information flow is facilitated by sessions/ road shows and seminars, letters and one to one sessions. The information is provided in the company's standard format, on an annual basis or when it is requested by a public or local authority or when there is a new deployment. Information includes details of the planning framework, the potential impact on environment/ benefit to community, technology and health information, and a description of the proposed site including computer generated images or photo montages.
Rec. #2	Operator(s) share sites with other operators' facilities, tower and roof-mounted sites, antennas and other telecommunications masts. 90% of 3G sites are shared with 2G sites. A formal administration process for site sharing is in place. Site sharing is implemented to achieve cost savings, to meet regulatory and licensing requirements, and also to address concerns regarding environmental and landscape preservation. It is reported that site sharing will increase over the next five years.
Rec. #3	Operator(s) report the use of alternative designs and that it follows specific guidelines in line with corporate (group-wide) network deployment policies.
Rec. #4	Respondent(s) provide information on existing and new services/technologies: description of services, benefits, possible impact and public consultation information. Educational sessions are held, when required, to explain to the local authority how technology works or why sites have to be established in specific locations. The information provided is generally appreciated by the recipients. An operator is considering the deployment of 3G in 900 MHz to reduce the required number of sites.
Rec. #5	Respondent(s) report base station compliance with European exposure limits.
Rec. #6	It is reported that 60% of sites are certified. Processes are in place to ensure compliance with the EU Directive for occupational exposure. Policies have been implemented for the company's own employees when accessing areas close to antennas and guidelines are provided for third parties e.g. painters or construction workers working in or around antennas. Regular RF exposure measurements are performed as part of company's communication policy and to comply with regulatory requirements.

	Measurements are also performed in response to public concerns.
Rec. #7	There are processes in place to address issues raised to the company at a national level and to address individual issues (e.g. consumer or site-specific). Operator(s) employ specialist staff to manage complaints and cooperate with local residents. Named contact personnel are available for liaison with local authorities. Telephone hotlines and web-sites that receive enquiries and dispatch information are in place.
Rec. #8	There are cases where operators support corporate (group-wide) research studies. Respondent(s) also sponsor the Independent EMF Monitoring - Project monIT which was developed by the Telecommunications Institute. This project aims to provide the general public with all the relevant information about levels of exposure to electromagnetic fields, in particular those generated by telecommunications antennas. In addition to publishing the results of systematic monitoring at various public places around Portugal and specific technical information, Project monIT provides a range of scientifically accurate information on its website about electromagnetic fields emitted by mobile telecommunications systems, written in plain language.

I.21.2 Country overview

Level of concern	It is reported that the level of concern has been stable over the last 18-24 months, although it is characterised as being very variable and dependant on particular network rollouts. Media coverage on EMF issues may also impact the level of public concern. An operator reports that the implementation of GSME Recommendations has reduced the number of complaints. Health and environmental concerns are at a medium level. It is reported that level of concern increases when there is negative media coverage on EMF.
Codes of practice & Audit process	Operators make use of the "Code of Conduct and Good Practice for the installation of the equipment which generates electromagnetic fields". ⁷⁶ . For one of the operators in Portugal, a corporate (group-wide) auditing survey was conducted.
Voluntary actions from MNOs	One operator organises seminars in local municipalities to inform interested parties about the results of remote EMF measurements in the municipality. An independent Field Monitoring Project - Project Monit is also sponsored. The project aims to provide the general public with all the relevant information about levels of exposure to electromagnetic fields - leaflets and brochures are available.
Government /Other actions	The government provides precautionary advice on the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).
Exposure guidelines	EU Recommendation (legislation) – Ref: Portaria No.1421/2004 (23/11/2004)

⁷⁶ <http://www.anacom.pt/template20.jsp?categoryId=40989&contentId=59099>

I.22 Romania

I.22.1 Implementation of GSME Recommendations

Rec. #1 & 9	Operators in Romania have processes in place to communicate and provide information to the local authority/ the public on current and future network deployment plans. In some cases GSME Recommendations are used as reference. The need to install more network antennas is communicated to the public on a case by case basis. It is a mandatory requirement to provide technical operating information on the construction of each site to the local authority. Details of the planning framework, the potential impact on the environment/ benefit to the community, health information and a description of the proposed site, including computer generated images or photo montages, are also made available. Stakeholders include the regulator, the public and the local community. Information flow is facilitated with consultation processes, information sessions/ road shows, public/ media announcements and one to one sessions. Other means include EMF hotlines, brochures for the public, files with specific information for landlords, brochures for employees and reports to public health offices. A company standard format is used in some cases. There are cases where the information is provided on a monthly basis or when there is a new deployment or when it is requested by the public. Feedback is rather positive, as regulators are satisfied and so are most of the local authorities.
Rec. #2	All operators share sites with other operators' facilities, tower and roof-mounted sites, transmission equipment shelters, antennas and other telecommunication masts. 90% - 100% of 3G sites share with 2G sites. Cost saving is the main reason for site sharing. A formal process is in place to administer the site sharing process. All operators report that site sharing is expected to increase over the next five years.
Rec. #3	All operators report the use of alternative designs. Examples mainly include artificial trees and antennas integrated with building architecture. In some cases specific guidelines are followed (e.g. use of smaller antennas if possible; use of closets for equipment on the last floor rather than cabinets on roof top, use of existing poles, etc.).
Rec. #4	Operators provide information on existing and new services/technologies: description of services, benefits, possible impact. In some cases additional information is also made available such as possible infrastructure requirements and timescales of development. One operator also reports that, twice a year, education sessions are conducted to explain to the local authorities how the technology works or why the sites have to be established in specific locations. These sessions receive relatively positive feedback. All operators are considering the deployment of 3G in lower frequency bands to reduce the requirements for base stations.
Rec. #5	All operators report base station compliance with European exposure limits.
Rec. #6	All operators report 100% certified sites, with processes in place to ensure compliance with the EU Directive for occupational exposures. They have policies for their own employees when accessing areas close to antennas. In some cases guidelines for third parties e.g. painters or construction workers working in or around antennas are provided. Operators perform pre-installation calculations or post-installation

	measurements in response to the concerns of the public or others.
Rec. #7	All operators have internal processes to address individual issues (e.g. consumer or site-specific). For example, one operator provides an official response which includes EMF related information, a government published brochure on EMF and mobile telephony, the WHO Fact Sheet No. 304/2006 and offers to make field measurements through a third party. There are named contact personnel for liaison with local authorities and telephone hotlines and web-sites that receive enquiries and dispatch information. In some cases specialist staff is employed to manage issues and communications with local residents. Response times are monitored internally.
Rec. #8	Operators support company (group-wide corporate) research. GSMA programmes and initiatives are also supported by some operators. Operators make independent research results, published in peer-reviewed scientific publications, available to the public through media announcements.

I.22.2 Country overview

Level of concern	The overall level of concern in Romania is lower than it was when it peaked, two years ago. At that time there was a lot of negative media coverage. Over the last 6 to 9 months negative media articles have reduced and very few sites have been rejected/delayed as a result of people's concern on EMF issues. Central media, central authorities as well as the majority of local authorities are well informed reducing the risk of increasing concern. GSM Europe Recommendations have not necessarily reduced the level of complaints. The main concerns are health-related. Environmental, aesthetic and technology concerns are either non-existent or at low levels. Operators encounter opposition from the general public in some cases and the local authorities where the public opinion is strong enough to put pressure on them. Most of the complaints are caused by the fact that people draw their information from newspaper articles and hearsay and are reluctant to acknowledge information provided by operators, as they consider that operators influence the research or the public health offices. People are very unresponsive to any information provided by the operators (using objective sources) and prefer to trust the media or hearsay. It is reported also that EMF concerns are relatively less in locations where base stations are already installed, however there has been a sharp increase over the last year, following several newspaper articles and TV shows that stated that GSM antennas cause cancer and numerous health problems.
Codes of practice & Audit process	One operator makes reference to GSM Europe Recommendations.
Voluntary actions from MNOs	Operators participate in public conferences and round tables on EMF and mobile telephony and they provide media announcements when new research is published. One operator has issued two brochures with information about EMF: one official brochure for the general public; the other for internal use. The operator deals with each individual complaint or inquiry and an EMF hotline has been set-up to deal with questions. Base

	station sites are marked with EMF specific signs. The operator has a company EMF policy which deals with internal and external communication, base station site compliance, terminal compliance, management and reporting. Meetings are planned with local authorities to inform them on research in this domain and on the future development of the network in their area. There are coordinated actions with other operators and the national regulator to move towards a country-wide EMF measurement campaign from which the results will be published on a government's website. The operators' intention is to increase the available information sources in shops and websites and educate all employees that make direct contact with customers.
Government /Other actions	The government publishes a brochure on EMF and mobile telephony.
Exposure guidelines	EU Recommendation – Ref: Ordinance No.1193 (29/09/2006); No.895 (03/11/2006)

I.23 Slovakia

I.23.1 Implementation of GSME Recommendations

Rec.#1 & 9	Operators communicate the need to install more network antennas to the public. It is a mandatory requirement to provide detailed technical and supporting deployment justifications with each application to local authorities or other regulatory bodies. Operators conduct consultation programmes or involve local communities in the categorisation of proposed sites. In some cases operators monitor the information exchange process but auditing is not performed. The main stakeholders include local authorities, the regulator, public or local community, owners and neighbours of a building or land where the site is to be built. The process is facilitated by public/ media announcements, one to one sessions and letters to nearby neighbours. The format of the information varies depending on project and persons involved. Common information includes technology and health information together with descriptions of the proposed sites including computer generated images or photomontages. Some operators provide details of the planning framework and an assessment of potential impact to the community and the environment. Information is provided only for a new development.
Rec. #2	All operators report tower site sharing and occasionally sharing with other telecommunications masts, antennas and utility's facilities, mainly for cost saving reasons. All 3G sites are shared with 2G sites. It is reported that site sharing will increase over the next five years.
Rec. #3	All operators report use of alternative designs to minimise visual impact. One operator follows an internal procedure (ISO-14001) to reduce visual impact by means of coloured installations, masking, reduced number of antennas by using dual or tri-band antennas.
Rec. #4	Operators provide information on existing and new services/technologies: description of services, benefits, and possible impact and infrastructure requirements. In some cases educational sessions are held to explain to the local authority how the technology works

	or why the sites have to be established in the specified locations. Feedback is that some sites are controversial, some of them are accepted, but there are cases where part of a local community is strongly against any position or information.
Rec. #5	All operators report base station compliance with national exposure limits.
Rec. #6	All operators report 100% certified sites. In most cases operators perform pre-installation calculations and measurements and post-installation measurements. All operators monitor and measure RF exposure from their sites in public areas. In addition to these obligatory measurements, operators also undertake measurements when requested by the community living near to sites.
Rec. #7	Processes are in place to address individual issues (e.g. consumer or site-specific). Operators, depending on the type of complaint/ enquiry, may send information, conduct educational sessions, provide explanations or perform additional measurements. The management of the process is handled by named contact personnel who liaise with local authorities. Specialist staff is employed to communicate and manage issues with local residents. Some operators have telephone hotlines and web-sites that receive enquiries and dispatch information.
Rec. #8	No research studies have been initiated: hence there is no support from operators.

1.23.2 Country overview

Level of concern	It is reported that the level of concern has remained about the same over the last 18-24 months. GSME Recommendations have not necessarily led to the reduction of the complaints. Health concerns are at a high/ medium level and have probably increased during the period. Environmental and aesthetic concerns are at a medium/ low level with no significant change over the last two years. No major concerns regarding technology. It is also reported that in some cases communication with public is difficult, as local communities are not willing to participate in discussions.
Codes of practice & Audit process	A combination of mandatory requirements and national policies apply.
Voluntary actions from MNOs	In some cases, operators provide WHO documents translated into Slovak with the format depending on the type of project (slide presentation and software model of EMF simulation). Other information includes details of EMF, Specific Absorption Rate (SAR). This information is available on web sites, via hot line, points of sales and touch screens. Occasionally, upon a special request, additional shielding/grounding is implemented or EMF measurements are conducted.
Government /Other actions	EMF levels at sites are measured by an independent body (State office for public health) after installation and then after every three year as required by law.

Exposure guidelines	EU Recommendation – Ref: Decree No 123/1993 (Coll.) on the protection of health from the harmful effects of electromagnetic fields, Public & Occupational
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I.24 Slovenia

I.24.1 Implementation of GSME Recommendations

Rec. #1 & 9	Respondent(s) follow a national policy for good practice for network rollout. On a voluntary basis, operator(s) provide information to the local authority/ the public on current and future network deployment plans. Operator(s) also conduct consultation programmes or involves local communities in the categorisation of proposed sites. The need to install more base stations is communicated on a case by case basis. Educational sessions to explain to the local authority how the technology works or why the sites have to be established in specific locations are conducted at regular intervals upon request by local communities. Detailed technical and supporting deployment justifications with each application to gain authorisation from the local authority or other regulatory body is a mandatory requirement. The information is also provided to the Ministry of Environment and Spatial Planning. Other information provided includes details of the planning framework and a description of the proposed site including computer generated images or photomontages. In order to facilitate the information flow, operator(s) usually holds one to one sessions.
Rec. #2	Operator(s) share sites with tower and roof-mounted sites, other telecommunication masts and radio installations, following specific site-sharing administration processes. It is believed that site sharing will increase over the next five years.
Rec. #3	Respondent(s) report making use of alternative designs (e.g. artificial trees, advertising signs) and coloured installations to reduce the visual impact of sites.
Rec. #4	Information on existing and new services/technologies is provided: description of services, benefits, possible impact. The operator is considering the deployment of its 3G network at lower frequencies (resulting in fewer base stations), although there are regulatory and technical issues to be addressed.
Rec. #5	Respondent(s) report base station compliance with national guideline limits.
Rec. #6	100% of sites are certified. Processes are in place to ensure compliance with the EU Directive for occupational exposures. Pre-installation calculations and post-installation measurements are performed. This is a regulatory requirement and operator(s) also perform spot-measurements in response to public or other concerns.
Rec. #7	There are processes in place to address individual issues (e.g. consumer or site-specific). A PR team and network employees prepare case by case answers.
Rec. #8	GSMA programmes and initiatives and corporate (group-wide) projects are supported. Project Forum EMS publishes brochures and a magazine informing the public about the operation of base stations, effects on environment and health related concerns. The results of these programmes are used as feedback for internal planning and roll-out

	processes.
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I.24.2 Country overview

Level of concern	It is reported that the level of concern has been stable over the last 18-24 months. Health related concerns are at a high level with an increasing trend. Environmental and aesthetic enquiries are at a low/ medium level and stable. One of the issues that operators are facing during network deployment is public concern regarding the vicinity of base station. In general, the public is against the deployment of base stations (cited by operators as NIMBY⁷⁷ and NIMET⁷⁸ effects).
Codes of practice & Audit process	A combination of mandatory requirements and national policies apply. The EMS forum in Slovenia provides EMR measurements free of charge to local municipalities.
Voluntary actions from MNOs	An operator has recommended that a centralised register of all EU registered and authorised EMR consultants and organisations providing EMR measurements should be published. In general the operator follows corporate activities (group-wide) and programmes.
Government /Other actions	Actions in Slovenia are coordinated by a national agency for telecommunications (APEK) and non government organization (forum EMS). The government implements precautionary actions beyond limit guidelines (e.g. exclusion zones for masts, in-situ measurement programmes) and provides precautionary advice on the use of mobile phones (e.g. reducing call time, advice for mobile usage by children).
Exposure guidelines	National (stricter limits than EU Recommendation) - Ref: Decree on electromagnetic radiation in natural and living environment (OG 70/96), for natural and living environment; Regulations "SIST ENV 50166-1, Human exposure to electromagnetic fields Low-frequency (0 Hz to 10 kHz)" and "SIST ENV 50166-2, Human exposure to electromagnetic fields High-frequency (10 Hz to 300 GHz)", for workplaces. The limits are below those of the Recommendation 1999/519/EC (and, because the decree is valid only for the public, also below ICNIRP).

I.25 Spain

I.25.1 Implementation of GSME Recommendations

Rec.#1 & 9	Operators report that formal policies, at a company and national level for good practice for network rollout are in place. Operators communicate and provide information to the local authority/ the public on current and future network deployment plans. Detailed technical and supporting deployment justifications with each application to gain authorisation from local authority or other regulatory body are always provided.
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⁷⁷ NIMBY: Not In My Back Yard

⁷⁸ NIMET: Not In My Election Time

	Operators conduct consultation programmes or involve local communities in the categorisation of proposed sites. Other information provided includes details of the planning framework, potential impact to the environment/ community, technology and health information. There is some audited monitoring and documentation of the information exchange process. The main stakeholders of the information exchange are the local authority, the regulator and the public/ local community. Information flow is facilitated via sessions/ road shows, seminars and public/ media announcements. The operator uses a company standard format to provide information annually or when there is new deployment.
Rec. #2	Operators share sites with other operators' facilities, tower and roof-mounted sites, transmissions equipment shelters, antennas, other telecommunication masts and radio installations. 65% of 3G sites share with 2G sites. Environmental concerns and landscape preservation are the main reasons for site sharing. A formal administration process is in place. It is reported that site sharing will increase over the next five years.
Rec. #3	Operators use alternative designs to minimise visual intrusion, following specific guidelines (Spanish Mobile Phone companies' responsible deployment code).
Rec. #4	Operators provide information on existing and new services/technologies: description of services, benefits, possible impact, possible infrastructure requirements and timescales of deployment. Every two months, education sessions are held to explain to the local authority how the technology works or why the sites have to be established in the specific locations, with a very positive feedback from the audience.
Rec. #5	Operators report base station compliance with European exposure limits (in addition to local and regional requirements).
Rec. #6	Operators report that 100% of sites are certified with processes in place to ensure compliance with the EU Directive for occupational exposures. Operators also have policies for their own employees when accessing areas close to antennas and provide guidelines for third parties e.g. painters or construction workers working in or around antennas. In order to commission a site, operators perform pre-installation calculations and measurements, post-installation measurements and repeat measurements regularly. This is part of the company's communication policy and in accordance to regulatory requirements and in response to public concerns.
Rec. #7	Processes are in place to address issues raised to the operators at the national level, to address issues through the national Trade Association and to address individual issues (e.g. consumer or site-specific). The processes are managed by specialist staff. There are named contact personnel for liaison with local authorities and telephone hotlines and web-sites that receive enquiries and dispatch information. The established Trade Association representing network operators provides coordination of information exchange.
Rec. #8	One operator supports corporate (group-wide) research studies. Other operators support national level programmes and GSMA projects and initiatives. Results are provided to local authorities and to the public.

I.25.2 Country overview

Level of concern	It is reported that the level of concern in Spain is unchanged over the last 18-24 months. GSME Recommendations have not necessarily reduced the level of complaints. Health concerns are at a high level with an increasing trend. Environmental concerns are at a medium level. It is reported that base station installations on residential rooftops are becoming a big challenge for operators because landlords are afraid of possible negative health effects. There are cases where an operator has contacted the landlords of 25 buildings in order to install one base station. This situation is not expected to improve. Operators also report that the main problem to deploying a network in Spain is the lack of building permits from municipalities.
Codes of practice & Audit process	One operator carries out a survey on its network rollout policy in local communities every two years. Results are considered fairly positive. The Spanish Industry Ministry is going to develop an EMF monitoring network in Spain (in 2007).
Voluntary actions from MNOs	Operators communicate the need to install more network antennas on a voluntary basis to the public.
Government /Other actions	The government implements precautionary actions beyond limit guidelines (e.g. exclusion zones for masts, on-site measurement programmes). Some additional information can be found at http://www.todocancer.com .
Exposure guidelines	EU Recommendation – Ref: Royal Decree 1066/2001; Ministerial Order CTE/23/2002

I.26 Sweden

I.26.1 Implementation of GSME Recommendations

Rec.#1 & 9	Operators have a national policy for good practice for network rollout. All operators make reference to GSME Recommendations. A formal process to communicate and provide information to the local authority/ the public on current and future network deployment plans is followed on a case-by-case basis. Operators also communicate the need to install more network antennas to the public. Other information provided includes details of the planning framework, technology and health information and a description of the proposed site. Operators conduct a consultation programme or involve local communities in the categorisation of proposed sites, if requested computer generated images or photo montages. Information flow is facilitated by sessions/ road shows, seminars, public/ media announcements, letters to nearby residents and one to one sessions. Information is provided when there is a deployment or when it is requested by the public. Varying formats are used depending on the project.
Rec. #2	Operators share sites with other operators' facilities, tower sites, transmissions equipment shelters, other telecommunication masts and radio installations, following a formal administration process. Operators share sites, mainly, for cost saving,

	environmental and landscape preservation reasons. On average 85% of 3G sites are shared with 2G sites. All operators report that site sharing will increase over the next five years.
Rec. #3	Operators follow specific guidelines for alternative designs to reduce visual site impact (Recommendations/ Handbook from The Swedish Association of Local Authorities and Regions).
Rec. #4	It is reported that operators provide information on existing and new services/technologies: description of services, benefits, possible impact, infrastructure requirements and timescales of the deployment. Educational sessions are held upon request to explain to the local authority how the technology works or why the sites have to be established in the specified location. The feedback from these sessions is quite positive. All operators are considering deploying 3G in lower frequencies to reduce the required number of sites.
Rec. #5	Operators report base station compliance with European exposure limits.
Rec. #6	90% of operators' sites are certified. Operators report to have policies for their own employees when accessing areas close to antennas and they provide guidelines for third parties e.g. painters or construction workers working in or around antennas (e.g. a fact sheet regarding work on rooftop with base station antennas). Prior to the commissioning of a site, operators perform pre-installation calculations and measurements and post-installation measurements, mainly in response to public or other concerns.
Rec. #7	All operators address issues raised to the company at the national level, raised through the national Trade Association (Mobiltelebranschen) and individual issues (e.g. consumer or site-specific). Specialist staff is employed to manage the process. There are also named contact personnel for liaison with local authorities, telephone hotlines and web-sites that receive enquiries and dispatch information. The established Trade Association representing network operators provides coordination of information exchange.
Rec. #8	Some operators support group-wide corporate research programmes, national studies and individual projects. GSMA programmes and initiatives are also supported.

I.26.2 Country overview

Level of concern	All operators report that the level of complaints has decreased over the last 18-24 months. Operators' activities related to GSME Recommendations and less building permission applications are a main reason for this reduction. Health concerns are at a medium level with a decreasing trend. Environmental and aesthetic concerns are at a low level.
Codes of practice & Audit process	Operators have agreed the "Nine Commitments" national procedures and requirements for deploying base station facilities.

Voluntary actions from MNOs	Operators and Mobiltelebranschen together with the Swedish Radiation Protection Authority, scientists and some activist groups have participated in transparency forums and seminars.
Government /Other actions	The Swedish Radiation Protection Authority (SSI) has issued general advice on the use of mobile phones. Use of hands-free device, Keep the mobile phone away from the body and making calls then good coverage.
Exposure guidelines	EU Recommendation (no plans for legislation, apply precautionary principle) – Ref: In 2002 the Swedish Radiation Protection Authority (SSI) issued general advice on limitation of exposure of the general public to electromagnetic fields in agreement with the EU Recommendation.

I.27 Switzerland

I.27.1 Implementation of GSME Recommendations

Rec.#1 & 9	Operators have company and national policies for good practice for network rollout. The need to install more network antennas is communicated, voluntarily, to the public by the operators. A consultation process with local communities together with detailed technical and supporting deployment justifications with each application to gain authorisation from local authority or other regulatory body is a mandatory requirement. Other information provided includes details of the planning framework, potential impact to environment, technology and computer generated photo images, location data sheet including emission calculations of nearby locations of sensitive use, drawings, antenna patterns etc. In some cases, information is also provided to interest groups opposed to the antenna siting. The information flow is facilitated through consultation processes, information sessions and road shows and is provided in general for a new deployment or when requested by the public. Operators also upload operational parameters onto the regulator's database and provide a bi-monthly discrepancy report between operational and permitted data. One operator monitors the information exchange process, although the process is not audited. The feedback from the regulator is positive, whereas public reaction varies between different communities.
Rec. #2	Operators in Switzerland share sites in various ways like using other operator facilities, tower and roof-mounted sites, other telecommunication masts and radio installations, utility's facilities. One operator reports 60% site sharing in total, 30% sharing with other operators' sites (this applies to all operators) and 95% sharing between 3G/2G sites. Site sharing outside the planning areas of communities is mandatory. The main non-mandatory reason for sharing is cost saving. A formal administration process for site sharing is in place. One operator reports that site sharing will remain at about the same level over the next five years.
Rec. #3	Respondent(s) report use of alternative designs e.g. advertising signs are used for micro cells and chimneys for roof-top sites when appropriate or required by landlords. The need of monument protection (city of Berne) requires that antennas are completely integrated in rooftops, church-towers, etc. No specific guidelines are in place to reduce

	visual impact of sites.
Rec. #4	Respondent(s) provide information on existing and new services/technologies: description of services, benefits, possible impact, infrastructure requirements and timescales of development. Education sessions are held with local authorities before submission of the building permit application for a new project. The Trade Association (Forum Mobil) also conducts education sessions annually. It is reported that most of the time, local authorities are unaware of study results and are not knowledgeable on technical details. Forum Mobil provides them with information (slideshow) and access to measurements of EMF fields. Sessions are in generally well received. One operator is considering deployment of 3G at lower frequencies (resulting in fewer sites). (Note: the regulator announced that the GSM900 licenses shall be renewed next year technology neutral. All operators are considering this option in their plans. This will depend on regulatory approval.
Rec. #5	Operators report base station compliance with national exposure guidelines.
Rec. #6	One operator reports that all sites are certified and that policies for its own employees when accessing areas close to antennas have been established, together with guidelines for third parties e.g. painters or construction workers working in or around antennas (e.g. minimum distance for work on sites which are transmitting of 1.5m otherwise the site will be switched off). For commissioning a new site one operator performs pre-installation calculations and measurements and post-installation measurements. Daily compliancy checks of operational parameters with permitted values are performed. Measuring the RF exposure in public areas from sites when first commissioned and at regular intervals subsequently is an integral part of the build permit application and if 80% of the precautionary limit (4 V/m for GSM 900 or 6 V/m for GSM 1800 and UMTS 2100) is reached an on-site measurement is required by law.
Rec. #7	Processes are in place to address issues raised to the company at the national level, or via Forum Mobil and also to handle individual complaints. The process is facilitated by specialist staff, being responsible for managing issues with local residents. There are named contact personnel for liaison with local authorities, telephone hotlines and web-sites that receive enquiries and dispatch information and Forum Mobil providing coordination of information exchange.
Rec. #8	The main Swiss operators are founding members of the research foundation for mobile communications that performs independent research. One operator reports participation in corporate (group-wide) and national research programmes. Results are published via media releases and fact-sheets for local authorities and in Forum Mobil's web site.

1.27.2 Country overview

Level of concern	It is reported that the level of concern has remained the same over the last 18-24 months. GSME Recommendations have not necessarily led to reduction in complaints/enquiries. Health and environmental concerns are at a high level. Aesthetic and technology concerns are at a medium level. Other concerns include the impact on the value of real estate.
Codes of	An audit process was performed by the Trade Association. Further information can be

practice & Audit process	found at Forum Mobil's web site. ⁷⁹
Voluntary actions from MNOs	It is reported that in most of the cases, local authorities are unaware of study results and are not knowledgeable on technical details. Operators provide them with information on a slideshow and with references with EMF measurements.
Government /Other actions	It is reported that the government takes precautionary actions beyond setting limit guidelines and provides precautionary advice for the use of mobile phones.
Exposure guidelines	National (ICNIRP guidelines), Legal requirement from 01/02/2000 – Ref: Ordinance concerning protection from non-ionising radiation (NISV) (23/12/1999). At sensitive locations the emission allowed is 1% of ICNIRP limits.

I.28 United Kingdom

I.28.1 Implementation of GSME Recommendations

Rec.#1 & 9	All operators have national policies for good practice for network rollout together with a process to communicate and provide information to the local authority/ the public on current and future network deployment plans. Operators provide detailed technical and supporting deployment justifications with each application to gain authorisation from local authority or other regulatory body, while conduct consultation processes to involve local communities. The provision of technical operating information on the construction of each site to the local authority is a mandatory requirement in UK, together with a monitoring and documentation system for information exchange process. In most cases, this process is audited and the results are published. Regular surveys are also carried out by external parties on behalf of the Trade Association (Mobile Operators Association, MOA) and the operators. Other stakeholders, apart from the regulator, local authorities and communities are amenity groups and Members of the Parliament. The information is provided via information sessions/ road shows, seminars, public/ media announcements, letters to nearby residents, one to one sessions and online consultation tools. The information provided includes details of the planning framework, potential impact to the environment and the community, technology and health information. Site drawings and photo montages are available. Operators may also provide alternative/ discounted sites and ICNIRP Certificate/ letter. In the majority of the cases, the information is provided in a company's standard format, in an annual or quarterly report or when there is a new deployment.
Rec. #2	Operators in UK share sites in various ways: tower site sharing, roof-mounted site sharing, transmission equipment shelters, antennas, other telecommunication masts and radio installations, utility's facilities, lampposts and electricity pylons. Increasing site sharing over the next five years will be driven mainly by cost saving benefits,

⁷⁹ <http://www.forummobil.ch/>

	requirements from licence conditions and the regulator together with environmental and landscape preservation concerns. Site sharing is administered by formal policies.
Rec. #3	UK operators make use of alternative designs to minimise visual impact, following specific guidelines in the majority of the cases. There is also planning legislation requiring sites to be designed to least environmental impact.
Rec. #4	Operators in UK provide information on existing and new services/technologies: description of services, benefits, possible infrastructure requirements, timescales of deployment and public consultation information. All operators conduct educational sessions to explain to the local authority how the technology works or why the sites have to be deployed in specified locations. The response from the public has been positive. UK operators are also considering deployment of 3G networks in lower frequencies, which would reduce future network requirements due to improved propagation at lower frequencies.
Rec. #5	Operators report base station compliance with European exposure guidelines. UK exposure guidelines are advised by the Health Protection Agency (formerly National Radiological Protection Board). These are identical to the EU Council Recommendation for public exposure and also ICNIRP guidelines for both public and occupational exposure.
Rec. #6	All sites from reported operators are 100% certified. Radio base stations comply with the exposure limits in the EU Recommendation and the Physical Agents Directive, risk assessments and processes are in place to protect employees and third party workers who need to access areas around antennas (e.g. RF hazard signs are placed at each site, switch off procedures exist if areas where the occupational limits may be exceeded need to be accessed by workers, personal EMF exposure monitors provided). RF exposure site measurements are performed in response to public or others concerns. It is reported that other requirements in the Directive, e.g. office based staff, health surveillance are planned to be implemented by December 2007.
Rec. #7	All operators report having processes in place to handle EMF complaints/ inquiries at a national level, through MOA or individual cases (e.g. consumer or site-specific). These processes are managed by specialist staff in communication with local residents; there are named contact personnel for liaison with local authorities; telephone hotlines and web-sites that receive enquiries and dispatch information; MOA representing network operators providing coordination of information exchange. The response times of these processes are monitored.
Rec. #8	UK operators support government research and together with GSMA further programmes and initiatives. The research programme results are often used to inform an operator's policy on EMF and health. Research results or the top level/summary results are also made available to the public/other stakeholders in annual Corporate Responsibility reports. MOA directs public to research outcomes. Operators also choose to reference the WHO and other international expert reviews of the global body of science to which the research programmes contribute. In some cases operator uses a variety of alerts for all public facing staff involved in deployment, allowing staff to be better prepared for any questions they may face as part of consultation.

1.28.2 Country overview

Level of concern	In UK, the level of concern regarding network rollout has remained stable over the last 18-24 months, with health issues at a high level. Environmental and aesthetic concerns are at a medium level. Other concerns include the impact on house prices. It is reported that health and safety concerns are the main issues, but these often disguise fears of lower house prices because of the siting and appearance of the installation. The public is also concerned over siting close to schools, nurseries, playgrounds etc. Operators also report that it is more difficult to locate suitable search areas for new sites.
Codes of practice & Audit process	In 2001, MOA published its "Ten commitments to best siting practice" ("Ten Commitments") with the object of improving transparency in the process of building mobile phone networks, providing more information to the public and the 434 local authorities across the UK, and increasing the role of the public in the siting of radio base stations. All elements of GSME Recommendations are captured in the document.
Voluntary actions from MNOs	One of the Ten Commitments was "to establish professional development workshops on technological developments within telecommunications for local authority officers and elected members". Since the Ten Commitments were published, MOA has conducted over 160 such workshops across the UK, and the programme is ongoing. The need to install more network antennas is communicated to the public. In some cases operators provide information packs specifically to landlords.
Government /Other actions	Government provide precautionary advice for the use of mobile phones (e.g. reducing call time, advice for mobile usage by children). UK Government publishes the "Code of Best Practice" on Mobile Phone Network development. There is a continuous review process of the "Code of Practice" involving national and local government, industry and pressure groups. The MOA has an ongoing engagement programme with UK Members of Parliament (MPs), Members of the Scottish Parliament (MSPs), and Members of the Welsh National Assembly (AMs) to address any concerns they may raise on behalf of their constituents relating to mobile phone network development. The MOA also meets with officials and ministers in the UK Government, particularly with the Department for Communities and Local Government, the Department of Trade and Industry and the Department of Health. This engagement programme is replicated with the Scottish Executive and Welsh Assembly Government. In July 2006, the MOA arranged the first in a series of joint meetings with three UK Government ministers and Government officials with responsibility for public health, town planning and telecommunications issues. In 2006, the MOA published a newsletter for the first time. This newsletter is aimed at MPs, MSPs and AMs and provides up to date information on network development, town planning and RF health and safety issues. The newsletter is published twice yearly and future issues will also be sent to all local authority councillors in the UK.
Exposure guidelines	EU Recommendation (no legislation) - Ref: "Advice on Limiting Exposure to Electromagnetic Fields (0 - 300 GHz)"; Documents of the Health Protection Agency (formerly NRPB) vol.15 No.2 2004. Adopted "in the terms of the EU Recommendation" by letter from Government to Health Protection Agency (22/07/2004).

Annex II – Base Station Planning Permission in Europe

II.1 Cross-country analysis: Timescales

Requirements and conditions that operators face in order to be granted a permit for base station deployment vary largely from one European country to the other. Procedures can be defined at different government levels, even though generally the local authority (municipality) is the main point of referral for the process. In addition, general requirements related to regional or national levels legislation usually have to be met.

The figure in the next page summarizes timescales information contained in the countries tables presented in the remaining part of this Annex.

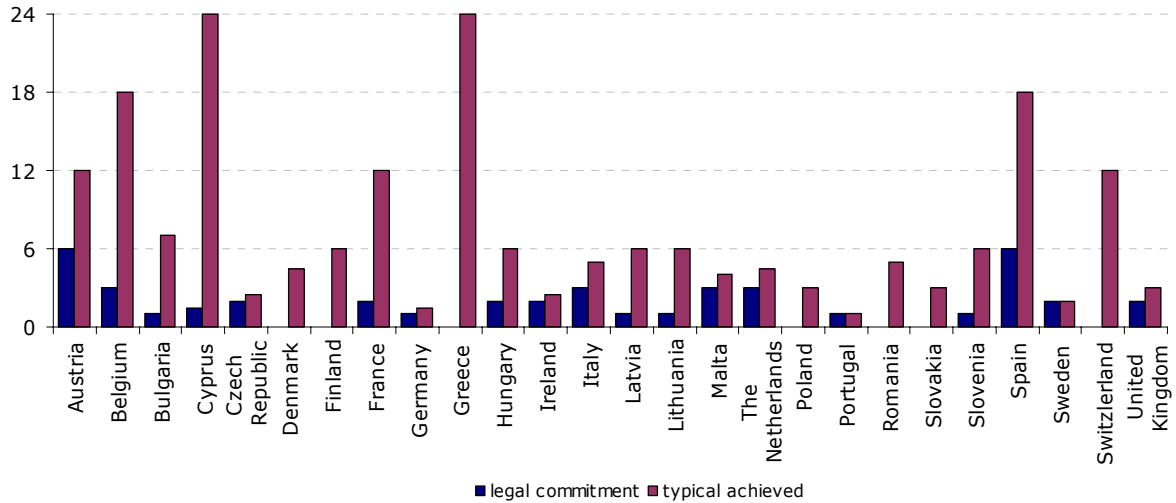
As a general observation, delays are more likely to occur in cases in which a direct authorizing intervention of the central government or of a number of bodies other than the local planning authority is required. This, according to the survey, is true for Belgium, Greece, Spain and Switzerland. Sweden is an exception, where heavy requirements are counterbalanced by the efficiency of public offices. Cyprus' case is characterized by a lack of consistent rules defining the process more than by heavy bureaucracy *per se*.

On the other hand, countries such as Italy and Portugal have implemented *tacit approval* mechanisms to avoid delays related to bureaucratic inefficiencies. In other countries with relatively short timescales for granting of permission operators may benefit from effective systems of exemptions for smaller sites and site upgrades (the Netherlands and the UK are two examples).

When comparing this data with the 2004 report commissioned by GSM Europe on the same topic⁸⁰ we notice that timescales for permission granting have not changed dramatically. The most relevant difference is represented by Czech Republic, in which the new Building Code recently issued has implemented a leaner and more effective procedure.

⁸⁰http://www.gsmworld.com/gsm europe/documents/health/base_station_planning_report_europe_170504.pdf

Figure II.1 Comparison between legal commitment and typically achieved timescales for granting planning permission on a per country basis



Source: Ovum for GSME Study

II.2 Country data

II.2.1 Austria

Planning Authority	Municipality
Requirements for planning permission	Vary according to location. Every province has its building and landscape protection laws. In addition, permissions relative to federal laws have to be obtained if relevant (ex. Protection of the woods).
Timescales for Permission	From 6 months to up to 2 years. Typically 1 year.
Appeals process	Process goes through instances by different administrative authorities – generally 3 until the Supreme Court.
Public Consultation	Not mandatory. Operators can set pre-planning meetings with local authorities and information sessions with local communities prior to site erection.
Exemptions & Existing site upgrade	Exemptions depend on provinces regulations. Upgrades need to follow the same procedure as new sites unless the original permission was taking them into account.

II.2.2 Belgium

Planning Authority	Regional administrations
Requirements for planning permission	Planning has to comply with regulations at all levels of governments (local, regional, federal). Permissions are required for telecom towers and street lampposts. A new 'radiation certificate' is also needed for all sites. It is issued from the Federal regulator and for the south of the country via the Issep.
Timescales for Permission	The average is 18 months. Individual actions can make the process last for 3 years.
Appeals process	Appeals go directly to the relevant Ministry or Council of State. The appeal process takes from 6 to 18 months.
Public Consultation	Local authorities publish notices on sites and make information available in the Town Council offices.
Exemptions & Existing site upgrade	Upgrades do not need new permits, extensions do. However, structures less than 4m higher than the highest point of the building are exempted.

II.2.3 Cyprus

Planning Authority	Municipality and Ministry of Interior's Planning and Housing Department
Requirements for planning permission	Even though the Government in 2005 has laid out new legislation to unify permissions procedures, its implementation is still pending. Requirements may vary on a case-by case basis and operators lament lack of coherency and clarity.
Timescales for Permission	The original provision of 6 weeks contained in the new legislation has remained unapplied. Typical timescales go up to 2 years.
Appeals process	Appeals go through administrative courts.
Public Consultation	Not mandatory, but requirements may vary.
Exemptions & Existing site upgrade	Upgrade applications are evaluated by the Municipality only and do not require approval from the Ministry.

II.2.4 Czech Republic

Planning Authority	Municipality's building department
Requirements for planning	Generally, a planning permission is required for new BTS. For rooftop structures a planning permission has to be granted, while

permission	for open landscape structures reporting activity to the building department is needed in addition to this planning permission.
Timescales for Permission	1 to 8 months. The legal commitment of granting permission in 2 months is respected in the majority of cases.
Appeals process	If the permission is not granted and appeal can be made within 15 days to the local administration or within 60 days to the administrative court.
Public Consultation	Citizens may submit comments only in cases when permission is needed.
Exemptions & Existing site upgrade	Upgrade is allowed without further permission if it does not involve any change in terms of construction work.

II.2.5 Denmark

Planning Authority	Municipality
Requirements for planning permission	Building permits. The applicant has to inform the National Telecom Agency about the application process.
Timescales for Permission	Generally 3 to 6 months. Worst cases up to 2 years.
Appeals process	Appeals can be made to the Ministry of Internal Affairs.
Public Consultation	The municipality has to inform the citizens impacted.
Exemptions & Existing site upgrade	Simple upgrades or sharing of sites do not require further permissions.

II.2.6 Finland

Planning Authority	Municipality. Procedure defined by the regulator (FICORA)
Requirements for planning permission	A building permit is required. An impact analysis has to be attached to the application together with an evaluation of options such as usage of existing sites. For base stations higher than 15 meters permission from the civil aviation authority is needed. Additionally, special permissions have to be granted before building permits if a town plan is not in place.
Timescales for Permission	1 to 24 months, average 6.

Appeals process	Appeals can be made within 15 days to the local administration of within 30 days to the Provincial Administrative Court. This can lead to delays of up-to 2 years.
Public Consultation	The operator has to inform the community and make information available at the local municipality offices.
Exemptions & Existing site upgrade	None

II.2.7 France

Planning Authority	Mayor
Requirements for planning permission	A building permit is needed for equipment higher than 4m and/or with a footprint greater than 1.5 x 2m. In addition, the urban planning code must be complied.
Timescales for Permission	Permissions must be granted within 2 months.
Appeals process	Appeal procedures are handled by administrative courts.
Public Consultation	A consultative process is handled by the regulator in response to complaints.
Exemptions & Existing site upgrade	None

II.2.8 Germany

Planning Authority	Local planning authorities and BnetzA
Requirements for planning permission	A site certificate from BnetzA is mandatory for all sites. This ensures compliance with exposure guidelines and other technical requirements. Permission from local planning authorities is mandatory for all installations higher than 10m. Once the site has been constructed and before it is activated emissions authorities have to be notified.
Timescales for Permission	Typically less than 6 weeks. More than one year in worst cases.
Appeals process	Legal proceedings against the local authority can take up to 3 years, but these occur in rare cases if the operator fulfils all the requirements for the process of site acquisition.
Public Consultation	A public consultation process with local communities is mandatory

	for all operators and has to start before the application for a site certificate.
Exemptions & Existing site upgrade	In several states (but not all) there are exemptions for installation with poles/masts below 10m and shelters of less than 10m ³ . Upgrades of existing sites have to follow the same process as new sites unless the compliance area of the planned installation lies completely within the compliance area of the existing installation.

II.2.9 Greece

Planning Authority	Building authorities and others setting regulations for related issues. These include: HCAA (Hellenic Civil Aviation Authority), GAEC (Greek Atomic Energy Committee), NTPC (National Telecommunications and Post Committee - Greek Regulator), Prefecture/Region (for Environmental Impact Studies - EIS), Archaeology (3 separate authorities), Forestry/Prefecture.
Requirements for planning permission	There are many steps that should be followed in order to have planning permission. These steps include addressing, among others, EMF, telecommunication, constructional and environmental issues.
Timescales for Permission	Typically between 2 and 3 years.
Appeals process	A petition for annulment may be brought against the decision of the General Secretary of the Region. The hearing of said petition takes place within one month as of its filing and the Court issues the respective decision two months thereafter. An appeal before the Supreme Administrative Court of Athens may be filed against the decisions of the aforementioned Administrative Court of Appeal and the respective hearing takes place within three months as of the filing of said appeal.
Public Consultation	No public consultation process takes place except in the context of Environment Impact Study approval.
Exemptions & Existing site upgrade	For base stations with transmission power EIRP<164 Watts the GAEC approval is not necessary. In the most micro-sites cases (EIRP<16.Watts) the licensing requirement is only a declaration of site installation specifications to NTPC. For upgrades: in case of no structural alterations only a revision of GAEC and EIS (Region) and declaration of upgrade specifications to NTPC are needed. If the upgrade involves structural alterations of site there must be a complete revision of all licenses.

II.2.10 Hungary

Planning Authority	Local civil authorities as part of the local municipalities
Requirements for planning permission	Construction permission is required for all new sites. General technical requirements are set by the National Construction Constitution.
Timescales for Permission	The authority should respond within 60 days but typically it takes 6 months to get a permit. Worst cases 2 years.
Appeals process	If the local municipality does not give permission the operators can put a request to the regional authority. At the third stage the administrative court intervenes. This may lead to a one year delay.
Public Consultation	Public consultation with local communities is not mandatory.
Exemptions & Existing site upgrade	Site upgrades must follow the same process as new sites – no exceptions.

II.2.11 Ireland

Planning Authority	Local Authorities
Requirements for planning permission	All deployment is governed under the National Planning Act. Support structures need planning permissions.
Timescales for Permission	2-3 months typically.
Appeals process	If refused by Local Authority, request can be sent to a Planning appeals board for consideration. This leads to up to 6 months of delay.
Public Consultation	Planning application must be posted on site, notice in newspapers and plans available for inspection at Local Authority Offices. Voluntary meetings with local communities may take place.
Exemptions & Existing site upgrade	Exemptions apply to upgrades involving antennas of less than 12m on existing masts and to commercial buildings where the antennas don't rise 2m above the roof.

II.2.12 Italy

Planning Authority	Municipalities (planning issues and overall responsibility for the authorization process) and Regional Environmental Authority
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	(providing advice to Municipality on the EMF impact of each Radio base Station).
Requirements for planning permission	Planning permission is required in order to construct a new site in Italy. Compliance with the national electromagnetic field exposure limits, specific urban planning and building rules are required. In addition, town planning regulations must be met if in place.
Timescales for Permission	Decree no. 259/2003 has established that if local authorities do not oppose an authorization request within 90 days, the authorization is considered to be effective.
Appeals process	Appeals decisions are assigned to regional administrative courts. In second instance the administrative court of the Lazio region intervenes. The process can be delayed of up to 3 years as a consequence.
Public Consultation	The regional environmental agency has to be consulted as part of the permission procedure.
Exemptions & Existing site upgrade	Decree n. 259/2003 has established a process for site upgrades which is very similar to the process for a new site installation. A new EMF advice has to be issued by the Regional Environmental Authority, even for changes of radio parameters only (e.g. tilt modifications, new transmitters leading to power output increase, etc.). However, sites with power below a set threshold are excluded.

II.2.13 Lithuania

Planning Authority	Local councils and NRA
Requirements for planning permission	General requirements for planning permissions include EMF pre-calculation.
Timescales for Permission	1 to 24 months. Typically 6.
Appeals process	If permission is not granted reiteration is allowed.
Public Consultation	Not mandatory.
Exemptions & Existing site upgrade	Procedure for upgrades is much leaner.

II.2.14 Malta

Planning Authority	Malta Environment and Planning Authority (MEPA)
Requirements for planning permission	Planning permission required only when proposed base station is on sensitive building or area.
Timescales for Permission	3 to 12 months. Typically 4.
Appeals process	Submission to MEPA appeals board.
Public Consultation	In cases where a planning permission is required the application will also be made public for informative purposes.
Exemptions & Existing site upgrade	No permits required for normal installations in non-sensitive sites or buildings.

II.2.15 The Netherlands

Planning Authority	Municipality
Requirements for planning permission	The National Antenna Policy sets tiers of requirements according to size of masts: full (more than 40m), light (5 to 40m). Installations shorter than 5m do not need a permit but requirements are adjusted with the involved landlords.
Timescales for Permission	Permissions with light requirements normally take 3-5 months. Full requirements permissions take 9 months to be granted.
Appeals process	Appeal processes go through civil courts and this can take up to 5 months of delay.
Public Consultation	The self-regulatory agreement of the industry with the government foresees a mandatory consultation with municipalities (at least once a year) and with tenants of residential buildings.
Exemptions & Existing site upgrade	Most upgrades are permit-free – depends on construction and environmental impact.

II.2.16 Poland

Planning Authority	Municipality or local government
Requirements for planning permission	Requirements are defined at the national level through five acts: Spatial Development Rules, Building Permission, Environmental Law, Permission for EMF emission and Permission for operation.
Timescales for	Between 6 months and 3 years. Normally 1 year.

Permission	
Appeals process	Appeals can go through 3 instances to Local, Provincial and High Courts. This leads to up to 3 years delay.
Public Consultation	The local authority has to provide information to the public. Public consultations take place as meetings but are not mandatory in most cases.
Exemptions & Existing site upgrade	Upgrades go through the same process as new sites.

II.2.17 Portugal

Planning Authority	Municipality
Requirements for planning permission	A building permission is needed for all new sites. Decree-Law 11/2003 regulates it. In all cases compliance with radiofrequency exposure limits and specific urban planning and building rules must be met. Rooftop installations on residential buildings require an authorization from owners.
Timescales for Permission	The local municipality has to clear a request in 30 days. Otherwise, tacit approval.
Appeals process	Through administrative courts. Delay up to 2 years.
Public Consultation	Not mandatory.
Exemptions & Existing site upgrade	Temporary base stations and site upgrades do not need planning permissions.

II.2.18 Romania

Planning Authority	Municipality
Requirements for planning permission	Building permit (requires lease contract and construction project), Radio Emitter Permit from National regulator and Public Health Office impact study.
Timescales for Permission	3 to 12 months. Typically 5.
Appeals process	Negotiation processes or finding new sites are generally preferred to formal appeal.
Public Consultation	Not mandatory.
Exemptions &	Upgrades go through the same process as new sites.

Existing site upgrade	
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II.2.19 Slovakia

Planning Authority	Local authorities, Telecom Office, Ministry of Health, Environmental Offices
Requirements for planning permission	Requirements at the national level are defined by the Construction Act, Electronic Communication Act, Public and Occupational Health Protection Act, Law on Nature Protection Act.
Timescales for Permission	3 to 12 months.
Appeals process	Appeals can be made to higher-level government authority.
Public Consultation	Not mandatory.
Exemptions & Existing site upgrade	If a site upgrade qualifies for a "minor construction", the process for obtaining building permit is shortened. Otherwise, there is no exemption for upgrade, and the regular construction permit process applies. In case of antenna upgrade, new power output measurement is necessary.

II.2.20 Slovenia

Planning Authority	Municipality and Ministry of Interiors
Requirements for planning permission	Base stations shall be designed fulfilling requirements contained in the National Building Code. The relevant authority to evaluate the request is the local municipality in cases for simple object such as rooftops up to 10m. The Ministry instead has to evaluate requests related to complex objects, such as new towers.
Timescales for Permission	Typically 6 months.
Appeals process	Appeals go through a standard administrative suit procedure.
Public Consultation	Local authorities evaluate on a case-by-case basis whether a public hearing with affected neighbours is mandatory.
Exemptions & Existing site upgrade	No exemptions. Existing site upgrades considered as investment maintenance. All upgrades shall comply with EMR limits.

II.2.21 Spain

Planning Authority	Municipality and Ministry of Industry
Requirements for planning permission	The agreed standard procedure requires a building permit from the local municipality and a ministerial emissions authorisation, for which a pre-construction technical report including an environmental impact assessment has to be produced.
Timescales for Permission	Administrative proceedings should be closed within 6 months according to Spanish law. However, procedures for base station planning take on average 18 months, with peaks of 3 years.
Appeals process	A first appeal can be made to the local administrative authority. In second instance the standard judicial proceeding has to be followed.
Public Consultation	A public consultation on environmental impact is required in most Autonomous Communities.
Exemptions & Existing site upgrade	No specific exemptions. For upgrades a further application has to be submitted to the Municipality and the Ministry. It is their discretion to regard is as an adaptation or a new permission request.

II.2.22 Sweden

Planning Authority	Municipality
Requirements for planning permission	Each green field base station requires a full planning permission. Compliance with regulations from the Swedish Airport Navigation Service and the Swedish Armed Forces must be met.
Timescales for Permission	Typically 2 months. Worst cases are delayed up to 2 years.
Appeals process	Different stakeholders can appeal to the next-level court (sequence: local government, county administration, Administrative Court, Administrative Court of Appeal and Supreme Administrative Court).
Public Consultation	Each municipality can decide whether to impose a consultation in whichever extent and manner.
Exemptions & Existing site upgrade	No exemptions. Upgrades do not need to comply with additional requirements.

II.2.23 Switzerland

Planning Authority	Local and/or State authority (see below)
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Requirements for planning permission	The local authority issues the build permit for base stations within the construction zone: this requires compliance with canton and federal law (construction law, environmental law, EMF regulation, nature- and country protection law). For base stations outside the construction zone an additional permit from the canton (state) is necessary. Additional permissions are necessary in sensitive zones (landscape protection zones). Further special regulations and processes are applied for base stations on power pylons, on train properties or on highways. For all build permit applications a positive statement of the environmental authority concerning compliance with the environmental law is mandatory.
Timescales for Permission	3 months to 3 years. Typically one year.
Appeals process	Each stakeholder can appeal through 4 instances (typical sequence: communal authority, canton government, canton administrative court, Swiss Federal Court).
Public Consultation	Public consultation is mandatory and information on every plan has to be provided. Each neighbour living in a distance of 300-750m (depending on power) is considered as stakeholder.
Exemptions & Existing site upgrade	Micro-cells with a total power below 6W are exempted. Upgrades need a full permitting process if direction is changed or transmission power increased.

II.2.24 United Kingdom

Planning Authority	Municipalities in England, Scotland and Wales. In Northern Ireland Central Planning Service
Requirements for planning permission	Standardised planning procedures for masts below 15m and enclosed within defined cubic limits (prior approval or permitted development). These are defined by a specific Mobile Operators Association Code of Best Practice. Full procedures are required for bigger masts or for all base stations in Northern Ireland.
Timescales for Permission	8 weeks if no opposition. 18 months in worst cases.
Appeals process	A first appeal can be presented to the same authority as original application. If refused operators can refer to the Planning Inspectorate (governmental agency). There is no third party right of appeal.
Public Consultation	Pre-consultations are carried out by operators following the Code of Best Practice. A Public consultation is mandatory only for sites requiring full procedures.

Exemptions & Existing site upgrade	Masts below 15m can go through a simplified procedure (see above). Minor upgrades are permitted for non-sensitive areas.
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Annex III – GSM Europe Health & Environment: Recommendation on Network Rollout Good Practice

GSM Europe and the mobile telecommunications industry in Europe recommends good practice in the deployment of mobile telecommunications networks and encourages dialogue and consultation with key stakeholders.

Key elements of the mobile telecommunications industry recommended good practice include:

Rec. #1	Improving the dialogue with local authorities and other key stakeholders in order to increase understanding of network infrastructure requirements and local planning frameworks. The consultation process will take into account planning, environmental and community issues.
Rec. #2	Considering site sharing with other radio installations or existing structures, where technically feasible and in line with competition law and licensing conditions, when decisions are being made on the most environmentally appropriate radio base station solution.
Rec. #3	Sensitive siting and design, which reduces visual intrusion and can help allay public concerns. The industry recognises that the environmental impact of radio base station developments should be kept to a minimum.
Rec. #4	Providing information to regulatory and planning authorities on mobile telecommunications technological developments. The industry believes that the provision of technological information is an effective means of raising awareness and understanding of the issues confronting the industry.
Rec. #5	Ensuring all existing and new radio base stations comply with national exposure guidelines based on the public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), as expressed in EU Council recommendation of 12 July 1999 (Reference 1999/519/EC) on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). The industry supports exposure guidelines, such as ICNIRP, which are based on sound scientific evidence and are subject to on-going expert review.
Rec. #6	Providing a written declaration that radio base stations are designed to comply with national or European exposure guidelines. A signed declaration of compliance with the relevant guidelines supports openness and provides confidence to local communities that radio base stations are being operated safely.
Rec. #7	Implementing a clear process to respond to complaints and enquiries about radio base stations. The industry recognises that there has often been some frustration regarding the information provided when enquiries are received on radio base station sites and that the quality of the information provided to the public needs to

	be of a high standard.
Rec. #8	Supporting quality research programmes at the EU and Member State level based on the WHO research agenda that will provide the basis for on-going review of established guidelines. Expert reviews in a number of EU states have concluded that there is no convincing independent scientific research of a link between public exposure to the low level radio signals used by mobile telecommunications systems and adverse human health effects. However, the industry welcomes on-going, independent, quality research programmes in order that policy can be based on substantiated scientific evidence and criteria.
Rec. #9	Using clear and consistent supporting documentation when exchanging information with regulatory and planning authorities. The industry recognises that it is often confusing when presented with similar information in varying formats and therefore documentation will aim to follow defined formats.



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