



## White Paper Regarding Access to Mobile Numbering Resources for “Over-the-Top” Mobile Service Providers.

### 1. Executive Summary

1. Competition by innovative ‘over-the-top’ mobile service providers can be a key instrument to increase the competitive constraints on European mobile network operators (MNOs) and improve market conditions to the benefit of end users. This is particularly true in Europe’s mature mobile markets which are often characterized by an oligopolistic market structure and high service rates, in particular for transnational services.
2. In an attempt to find a structural and durable solution to the high cost of using mobile devices whilst travelling in the EU, on 28 March 2012 members of the European Parliament and representatives of the Council and the European Commission reached a preliminary deal on new EU Roaming rules<sup>2</sup>, following the European Commission’s proposal of last year<sup>3</sup>. This is good news for the European citizen and companies, but it remains to be seen whether that will be enough.
3. In order to be able to effectively compete with MNOs and offer full PSTN connectivity to end users, the providers of innovative ‘over-the-top’ mobile services need access to mobile numbering resources.
4. However, several EU Member States are only granting mobile numbers to operators controlling mobile spectrum and/or to operators or service providers offering mobile services on the basis of a contractual arrangement with an MNO, such as MVNOs. Since ‘over-the-top’ mobile service providers do need access to mobile numbers and do not necessarily have a similar direct contractual relationship with MNOs, they are therefore precluded from access to mobile numbers.
5. This paper shows that EU Member States following this approach are not complying with the requirements of the European Regulatory Framework and that they are therefore infringing EU law. Their approach hampers much needed competition in the mobile arena and prevents the launch of innovative pan European services to the detriment of end users.

### 2. Need for Increased Competition in Mobile Markets and Importance for “Over-the-Top” Service Providers in this Context.

6. Two decades after the launch of the first digital cellular networks in Europe, the European mobile markets are now mature markets typically characterized by high barriers to entry and an oligopolistic market structure. These market characteristics lead to high service rates, in particular for transnational services such as international roaming.
7. Attempts to increase the level of competition by fostering the development of MVNOs have only been partially successful and in many markets, MVNO growth is now stagnating.

---

<sup>1</sup> i.e. over the subscribers’ mobile broadband connection.

<sup>2</sup> The preliminary deal can be found on the following link:  
<http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/227>.

<sup>3</sup> The Commission’s proposal can be found on the following hyperlink:  
<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/835>.

8. In an attempt to find a structural and durable solution to the high cost of using mobile devices whilst travelling in the EU, on 28 March 2012 members of the European Parliament and representatives of the Council and the European Commission reached a preliminary deal on new EU Roaming rules, following the European Commission's proposal of last year<sup>4</sup>. The European Parliament is expected to approve this agreement in May 2012 and the Council in June, paving the way for the new rules to enter into force on 1st July 2012.

9. The rules are intended to create more competition in the roaming market. In the meantime they impose new safeguard limits on consumer prices, including a new price cap for data roaming, which will progressively bring prices down from current high levels until the benefits of competition have fully kicked in<sup>5</sup>.

10. With the increased penetration of mobile data connectivity, innovative "Over-the-Top" services have now become a realistic additional source of increased competition for MNOs. However, providers of innovative services need access to mobile numbering resources in order to enable them to offer services that can truly and effectively compete with established MNOs.

---

<sup>4</sup> Cfr. The Commission's proposal [IP/11/835](http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/835), can be found on the following hyperlink: <sup>2</sup> The preliminary deal can be found on the following link: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/835>.

<sup>5</sup> Key highlights of the preliminary deal arrangement are, according to the Commission's press release, the following:

**1. Competition will deliver cheaper roaming.**

From 1 July 2014, customers will have the option to shop around for the best deal and sign up for a separate mobile contract for roaming, which may be different from their domestic mobile provider, whilst keeping the same phone number. Each time the customer crosses a border, his or her phone will switch to the network of the roaming provider which they have chosen, without any further action on their part. Customers will also have the option to directly select a local mobile network for data roaming in the country they are visiting (more details below). As from 1st July 2012, virtual mobile operators and resellers, who do not have their own networks will immediately have the right to access other operators' networks at regulated wholesale prices in order to provide roaming services (together with national services) to their customers. This will already create more competition between operators, and so increase the incentives for them to offer customers more attractive roaming prices and services.

**2. Data roaming:**

Choose your network before or while you roam. Competitive data roaming offers will also be opened up by the new EU Roaming rules by introducing new ways of using your smartphone, netbook or tablet while travelling abroad. From July 2014, mobile operators in visited countries will have the possibility to directly offer data roaming services on their own networks to travellers, which consumers can select either in advance or on the spot. Mobile network operators in visited countries will have an incentive to offer such services at rates close to national prices, on the basis of their own low national network costs. As people's mobile data use intensifies, and they want to use their devices anywhere, any time, many travellers are likely to find this WiFi-like option very attractive.

**3. Until then... cheaper roaming through price caps.**

Until competition has driven retail prices down, the EU's Roaming rules will progressively lower current retail price caps on voice and texting (SMS) services and introduce a new retail price cap for mobile data services. These caps will operate as a safeguard for consumers until 30 June 2017. The regulated price caps will progressively go down so that by 1 July 2014, roaming consumers will be paying no more than 19 cents per minute to make a call, a maximum 5 cents per minute to receive a call, maximum 6 cents to send a text message and maximum 20 cents per Megabyte (MB) to download data or browse the Internet whilst travelling abroad (charged per Kilobyte used).

**4. Bill shock:**

Better information when travelling outside the EU. Under the new rules, consumers will also receive information about roaming charges when they travel to countries outside the EU, which will help them to more easily avoid "bill shocks" when using their smart device abroad. The new rules will provide for the extension of the alert system currently in place within the EU. As from 1st July 2012, people travelling outside the EU will get a warning text message, email or pop-up window when they are nearing €50 of data downloads, or their pre-agreed level. Consumers will have to confirm they are happy to go over this level in order to continue their data roaming.



### 3. Examples of Services Requiring Access to Mobile Numbering Resources

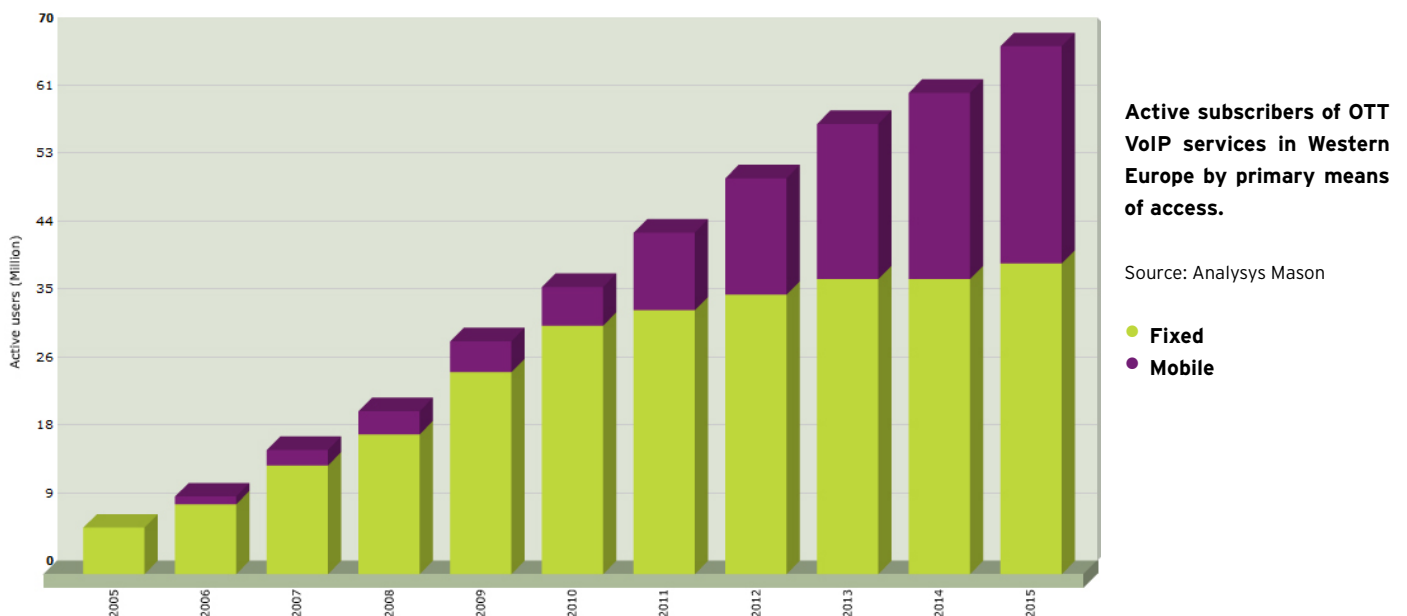
#### 3.1. Mobile VoIP

##### 3.1.1. The Rise of Mobile VoIP

11. The use of “over-the-top” (OTT) VoIP and telephone over Internet connections has been around for some time now. In Western Europe, the number of fixed VoIP line is estimated conservatively at around 35 million. However, market demand increasingly originates from mobile users, and players such as Fring, Google and Skype are getting traction with their VoIP applications for mobile devices and smart phones.

12. There are several reasons why mobile access offers a better fit for OTT VoIP services than fixed lines: embedded device intelligence, pricing, integration with other appliances and greater segmentation. Smartphones give consumers significant computing power along with the hardware to support advanced acoustics - and a portable computer-phone is a great solution to the ergonomic restrictions of the PC. Smart phones are capable of sending and receiving email, browsing the web, allowing a user to watch TV, accessing various applications and tools, consulting information shared between users in the cloud, and play games. Mobile device manufacturers exploit more powerful processors, better batteries and less costly memory to meet user needs for ever-more ‘power in their pocket’.

13. As far as pricing is concerned, significant arbitrage opportunities occur, particularly for international calls/roaming which are still expensive when using a traditional mobile telephony service. According to a study conducted by Infonetics released in June 2011, the mobile broadband subscribers surpassed the wireline broadband subscribers in 2010 (558 million vs. 500 million)<sup>6</sup>. Hence, analysts expect that the growth of VoIP over the next 3-4 years will mainly be driven by the broad adoption of mobile VoIP services and will result in an active user base of approximately 30 million users in Western Europe by the end of 2015.



<sup>6</sup> <http://www.marketwire.com/press-release/infonetics-research-mobile-broadband-subscribers-overtake-fixed-broadband-1523962.htm>.



14. Juniper research predicts that mobile VoIP users will exceed 100 million by the end of 2012 and InStat projects 288 million subscribers by 2013<sup>7</sup>. The rise of VoIP is to the benefit of the end-user as it will drive down the price of mobile voice communications. The emergence of flat rate mobile data pricing, positive growth of smartphone shipments, and high-speed mobile broadband availability has spurred the adoption rate of mobile VoIP," says Frost & Sullivan Senior Industry Analyst Saverio Romeo<sup>8</sup>. Significant traction in the application space, primarily driven by the success of the iPhone, has resulted in several smartphone vendors making provisions in their applications stores for users to download and use third-party VoIP clients over both WiFi and cellular broadband networks.

15. Moreover, smart phones are causing behavioral changes among consumers; users are increasingly updating their status on Facebook through their mobile device, triggering further adoption of mobile VoIP once several network communities, user forums and online buying & selling communities all support VoIP over their mainstream applications.

### 3.1.2. VoIP in Mobile Devices

16. Mobile VoIP differs from circuit switched mobile telephony in that a dedicated end-to-end connection between two carriers does not need to be established. With VoIP, in simple terms, the voice call is fragmented into packets at the call initiators end, transferred over the internet, and reassembled at the call destination.

Since no dedicated end-to-end link is required for the duration of the call, mobile VoIP may render obsolete the interconnection and roaming agreements that mobile operators around the world have forged with one another, thereby resulting in a far cheaper mode of voice carriage for the end user.

17. There are several methodologies by which a mobile handset can be integrated into a VoIP network.

Today several mobile vendors offer the capability to use a soft switch (gateway) to bridge Session Initiation Protocol (SIP) and Real-time Transport Protocol (RTP) into the mobile network's *SS7* infrastructure. In this implementation, the mobile handset continues to operate as it always has (as a GSM or CDMA based device), but now it can be controlled by a SIP application server which can now provide advanced SIP based services to it.

Another implementation, which is more relevant for this paper, turns the mobile device into a standard SIP client, which then uses a data network to send and receive SIP messaging, and to send and receive RTP for the voice path. This methodology of turning a mobile handset into a standard SIP client requires that the mobile handset supports, at minimum, high speed IP communications. In this application, standard VoIP protocols (typically SIP) are used over any broadband IP-capable wireless network connection such as EVDO rev A (symmetrical high speed), HSDPA, WiFi, or WiMAX.

Mobile dialers, as they are termed, enable cell phones to be turned into VoIP enabled devices to exploit and expose the voice over 3G (Vo3G) or voice over wifi networks (vowlan) functionalities of the phone. Today, many service providers make available Mobile Dialers for various Smartphone/PDA platforms, including Fring, Jajah, Rebtel, Tru and Skype.

18. There is however one key component missing to allow mobile users from the traditional mobile networks to communicate with users in the IP world; and that is a telephone number. The use of mobile numbers is essential to allow mobile VoIP service providers to offer PSTN connectivity.

<sup>7</sup> <https://talkfree.com/datasheets/mobileGrowth.pdf>, page 18.

<sup>8</sup> <http://www.frost.com/prod/servlet/press-release.pag?docid=202264428>.



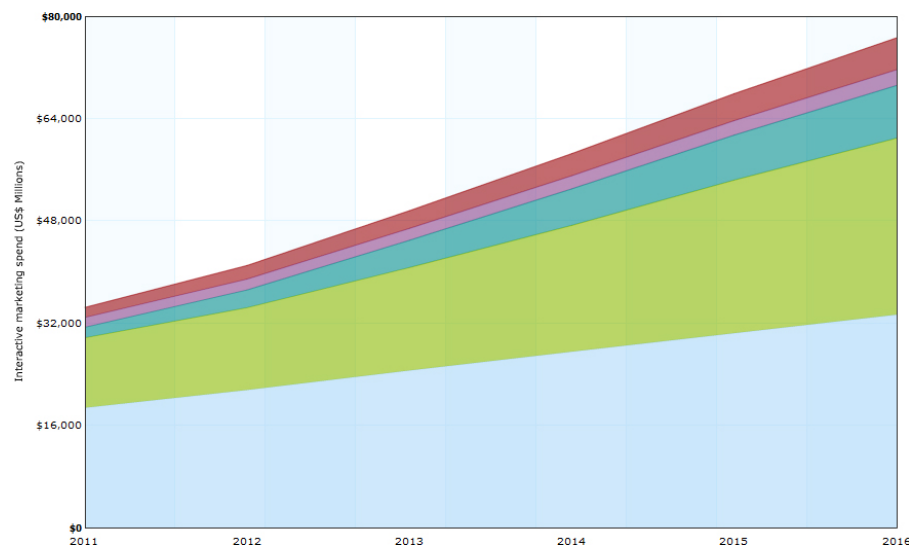
## 3.2. SMS

### 3.2.1. Growth in SMS traffic

19. SMS is one of the most important communication media requiring an increased interaction by the user. Text messages can be used to interact with automated systems such as ordering products and services for mobile phones or participating in contests. Advertisers and service providers use direct text marketing to notify mobile phone users about promotions, payment due dates and other notifications that can usually be sent by post, e-mail or voicemail.

20. Indeed, one of the elements that significantly enriched marketing communications the last 5 years is the addition of interactivity. While until a couple of years ago the only form of live interaction between the advertiser and his target audience was a voice call, nowadays people can respond to advertisements by SMS, email or social media.

21. SMS traffic has grown and is still growing at fast pace, mainly triggered by the success of push SMS. For instance in the UK, the total number of SMS and MMS messages sent in Q1 2011 was 36.9 billion, 22.7% higher than in Q1 2010<sup>9</sup>.



**Forecast: US Interactive Marketing Spend, 2011 to 2016**

Source: Forrester Research Interactive Marketing Forecasts, 2011 to 2016 (US)

- Social Media
- Email Marketing
- Mobile Marketing
- Display Advertising
- Search Marketing

	2011	2012	2013	2014	2015	2016	CAGR
Social Media	\$1,590	\$2,119	\$2,760	\$3,453	\$4,217	\$4,995	26%
Email Marketing	\$1,510	\$1,694	\$1,875	\$2,066	\$2,262	\$2,468	10%
Mobile Marketing	\$1,652	\$2,777	\$4,238	\$5,697	\$7,057	\$8,237	38%
Display Advertising	\$10,949	\$12,860	\$16,085	\$19,783	\$23,919	\$27,600	20%
Search Advertising	\$18,756	\$21,553	\$24,613	\$27,515	\$30,433	\$33,319	12%
<b>Total</b>	<b>\$34,457</b>	<b>\$41,003</b>	<b>\$49,571</b>	<b>\$58,514</b>	<b>\$67,888</b>	<b>\$76,619</b>	<b>17%</b>
% of all ad spend	19%	21%	25%	29%	32%	35%	

<sup>9</sup> Cfr the Ofcom consultation document: <http://stakeholders.ofcom.org.uk/binaries/research/cmr/q12011.pdf>



22. The growth in SMS traffic is in particular triggered by mobile marketing. Mobile marketing is a set of practices that enables organizations to communicate and engage with their audience in an interactive and relevant manner through any mobile device or network. Mobile marketing is expected to grow by 38% per year over the next 5 years. According to consumer research by [The MMA and Lightspeed Research](#) (October 2010)<sup>10</sup>, in the UK, France and Germany, 45 per cent of consumers (especially younger people) noticed mobile advertising and of these, 29 per cent responded to it. Of those that responded to the ads, in Germany 49 per cent, UK 47 per cent and in France 22 per cent went on to make a purchase.

23. The usage of push SMS for mobile marketing purposes offers the following benefits:

- Saves scarce resources on a mobile terminal including processing and battery power;
- Opens possibilities for mobile marketing with low budget;
- Enables multimedia content transmitting within normal SMS messages;
- Provides automatic push-enabled application starting when new content is available;
- Push SMS offers management solutions to clients on a daily basis.

24. Other applications with increased interaction by the user through SMS include:

- Marketing campaign tracking and analysis: SMS interaction as a way to track success of non-online advertising campaigns requires a different mobile phone number on each point of advertising;
- Mobile couponing: consumers have their mobile phone on them when shopping. An SMS could be used as a mobile coupon with the mobile phone number identifying the product;
- Tracking & tracing: track the status of your UPS package by SMS: the combination between originating and destination phone number identify the right package;
- Mobile authentication: The combination between originating and destination phone number as a unique key for authentication to a certain application;
- Low cost interactive apps: SMS interaction for healthcare or public sector services.

### 3.2.2. Today's Solutions for Inbound SMS Have Limitations

25. Depending on the country, there are two types of numbers that can be used for inbound SMS services and applications: fixed numbers and short numbers.

26. Fixed numbers often do not technically support the routing of SMS messages. Only a limited percentage of the fixed telephone devices is capable of sending and receiving text messages. In addition, most people do not associate fixed phone numbers with texting, hence the success of inbound SMS campaigns using fixed numbers would be limited.

27. A second alternative available is short numbers. To date, they are the only SIM-less mobile phone numbers available in most countries. Short number, however, have various limitations. Firstly, the access to short numbers from international networks is fairly limited to non-existing, whilst an increasing number of users want to access services and information from abroad. In addition, such kind of numbers are network dependent, meaning that they only work on the network of the MNO to which the short number is allocated. Secondly, access is often too expensive for applications requiring the service to be free or affordable, such as advertising campaigns, business applications or public services. Thirdly, short numbers are rare and their use is often limited in time. Some applications require high volumes of numbers (advertising) or need phone numbers to be assigned exclusively for a long term. And lastly, in most cases, short numbers only support SMS and they do not allow voice.

<sup>10</sup> See <http://www.lightspeedresearch.com/press-releases/29-of-european-mobile-consumers-respond-to-mobile-adverts-they-see>.



### 3.2.3. Inbound SMS Services Require E.164 Numbers

28. Regular E.164 mobile phone numbers may overcome the inconveniences of fixed numbers and short numbers as described above. E.164 are less scarce, they are not network dependent (moreover, they can be ported from one network provider to another) and, by definition, access from abroad poses no problems. In addition, texting to these numbers cost the same as texting to any other number.

## 4. Access Issues with Respect to Access to Mobile Numbering Capacity for Innovative Services

### 4.1. Introduction

29. A number of EU Member States are reserving the allocation of mobile numbers, to operators controlling mobile spectrum (MNOs) and/or to operators or service providers offering mobile services on the basis of a contractual arrangement with an MNO, such as MVNOs. As explained above, such approach precludes providers offering mobile services “over the top” from effectively competing with the MNOs. Only phone numbers for mobile services can universally be reached from all national and international networks, and only such phone numbers enable the problem-free inter-network and billable reception of voice, SMS and MMS.

### 4.2. Relevant Provisions in the Regulatory Framework

30. Article 10 of the Framework Directive provides the following:

“1. Member States shall ensure **that adequate numbers and numbering ranges are provided for all publicly available electronic communications services**. National regulatory authorities shall establish **objective, transparent and non-discriminatory procedures for granting rights of use for national numbering resources**.

2. National regulatory authorities shall ensure that national numbering plans and procedures are applied in a manner that gives **equal treatment to all providers of publicly available electronic communications services**.”

31. Article 5(2) of the Authorization Directive provides that:

“(…) the rights of use for radio frequencies and numbers shall be granted through **open, objective, transparent, non-discriminatory and proportionate procedures**.”

32. Article 6(1) of the Authorization Directive provides that:

“(…) rights of use for numbers may be subject only to the conditions listed in the Annex. Such conditions shall be **non-discriminatory, proportionate and transparent** (…)”

33. The relevant conditions listed in section C of the Annex are the following:

“1. **Designation of service for which the number shall be used**, including any requirements linked to the provision of that service and, for the avoidance of doubt, tariff principles and maximum prices that can apply in the specific number range for the purposes of ensuring consumer protection in accordance with Article 8(4)(b) of Directive 2002/21/EC (Framework Directive).’.

2. Effective and efficient use of numbers in conformity with Directive 2002/21/EC (Framework Directive).

3. Number portability requirements in conformity with Directive 2002/22/EC (Universal Service Directive). (…)”



34. Finally, the general objectives of the Regulatory Framework, as expressed in article 8 of the Framework Directive, should be kept in mind. National regulatory authorities should promote competition in the provision of electronic communications networks and services by inter alia:

- « (a) ensuring that users, including disabled users, derive maximum benefit in terms of **choice, price, and quality**;
- (b) ensuring that there is **no distortion or restriction of competition** in the electronic communications sector;
- (c) encouraging efficient investment in infrastructure, and **promoting innovation**; and
- (d) encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources. »

35. The national regulatory authorities must also contribute to the development of the internal market by inter alia:

- « (a) **removing remaining obstacles to the provision of electronic communications** networks, associated facilities and **services** and electronic communications services at **European level**;
- (b) encouraging the establishment and development of trans-European networks and the **interoperability of pan European services; and end-to-end connectivity**,
- (c) ensuring that, in similar circumstances, there is **no discrimination** in the treatment of undertakings providing electronic communications networks and services; »

### 4.3. Principles Derived from these Provisions

36. In light of these provisions, it is clear that the procedures for granting rights of use of numbering resources must be open, objective, transparent and non-discriminatory. In addition, the conditions for the grant of rights of use of numbering resources must:

- ensure that adequate numbering ranges are available for all publicly available electronic communications services;
- ensure equal treatment of all providers of publicly available electronic communications services;
- be non-discriminatory, proportionate and transparent;
- promote competition, innovation, consumer choice and the development and interoperability of pan European services;
- only relate to one of the requirements explicitly listed in Section C of the Annex to the Authorization Directive, such as (i) the designation of the type of service, (ii) effective and efficient use of numbers and (iii) number portability requirements, ...

### 4.4. Application in Practice

37. The requirement in certain EU Member States that beneficiaries of mobile numbering resources own mobile spectrum or have an agreement with an MNO is inconsistent with the EU legal framework on following grounds:

- It operates an unjustified discrimination between providers of mobile services depending on the technical configuration they use (i.e. direct use of the mobile network versus OTT). In the current technological environment, there is no objective justification for limiting access to mobile numbering resources to MNOs or players who have a direct contractual relationship with an MNO. This is confirmed by the fact that certain MNOs are themselves offering services using mobile numbers notwithstanding the fact that these services are not based on their wireless network (and, hence, usage of their licensed spectrum)<sup>11</sup>.

<sup>11</sup> T Mobile is offering specific services via mobile phone numbers which, however, do not give access to the radio-based T-Mobile network. The T-Mobile service "Alarm-Ruf" (alarm call) uses phone numbers belonging to phone number blocks allocated to T-Mobile (0171-Alarm [= 25267] + group number) to access from all existing mobile phone and fixed line networks a platform which enables the recording, management, listening and forwarding of alarm messages.



- It is inconsistent with the objective that regulation of the electronic communications sector should be technologically neutral (see for example paragraph 18 of the preamble of the Framework Directive).be non-discriminatory, proportionate and transparent;
- It imposes a condition that is not listed in section C of the Annex to the Authorization Directive. Section C allows Member States to designate the services for which the numbers shall be used. Obviously, Member States can reserve numbers for mobile services. However, as explained above, in the current technological environment, mobile services do not require a direct relationship with a spectrum owner. Such requirement is discriminatory (see first bullet above) and/or goes beyond what is necessary to ensure that the numbers concerned will only be used for mobile services. Accordingly, it is disproportionate.
- It impedes the offer of innovative mobile services and, accordingly:
  - It does not allow to ensure that adequate numbering ranges are available for all publicly available electronic communications services.
  - It distorts competition, reduces consumer choice and the development of certain pan-European services.

#### 4.5. Conclusion

38. EU Member States reserving the allocation of mobile numbers to operators controlling mobile spectrum (MNOs) and/or to operators or service providers offering mobile services on the basis of a contractual arrangement with an MNO, are not complying with the requirements of the European Regulatory Framework. They are therefore infringing EU law.

#### 4.6. About Voxbone

39. Voxbone is a service provider offering VoIP services through local, national and toll free phone numbers from 50 countries to businesses and communication service providers from around the globe. Amongst its 700 customers, Voxbone serves a large number of global Internet telephony service providers, such as Skype, Rebtel, Tru, Mobivox and Deltathree. These service providers make use of phone numbers in many countries in order to make their VoIP services locally reachable from traditional fixed and mobile telephony networks (or other VoIP networks). Instead of dealing with local regulators and network operators in every single country, they choose to work with a global service provider such as Voxbone for simplicity and efficiency reasons ("one stop shop" model).

Brussels, 16 April 2012

Contact: Erik De Herdt,

Telephone: +32 2 808 00 22,

Email: [erik@voxbone.com](mailto:erik@voxbone.com).