

Spectrum allocation and bottlenecks/competition problems

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Spectrum allocations and bottlenecks/competition problems

Introduction

Following the presentation of the Mobile Market Working Group (MM WG) report on mobile access and competition effects at the 17th ERG Plenary meeting, NPT (the Norwegian regulator) was asked to prepare a report on spectrum allocations and potential bottlenecks/competition problems. The information gathering has been taking place during the month of July and August. Detailed answers from all countries are enclosed this report. This report contains information from in total 22 countries.

Summary

- Four countries do not have licenses/frequency resources available for 2G/3G mobile networks.
- Eight countries have available (or reserved for future use) licenses/frequency resources for both 2G and 3G mobile networks.
- Three countries have available (or reserved for future use) licenses/frequency resources for 2G mobile networks only.
- Five countries have available (or reserved for future use) licenses/frequency resources for 3G mobile networks only.

Reasons why licences / frequencies remain unassigned for 2G/3G use are:

- an outcome of the approval of the merger of MNOs,
- frequencies are reserved for future use or other services/use, no interest for the license in the market,
- licenses returned to the authorities,
- pending judicial case.

In several countries 3G licences have not been put in use/are only partly been put in use because:

- Several companies are still rolling-out their network, and some companies have not yet started to roll out.
- Market/strategic reasons.

Most of the NRAs consider restrictions and obligations in licenses not to reduce the incentives for investments in 2G/3G mobile networks. Three NRAs believe roll-out obligations for 3G licenses may have a negative impact on the business case for new operators. It is also pointed out that a trend towards licenses not specifically linked to any technology and service would increase innovation, investments and competition.

No NRA considers lack of capital for investment in mobile network as a bottleneck in their mobile market. A few NRAs consider lack of capital as an entry barrier.

Most of the NRAs do not see any actual or potential competition problems related to the distribution of radio spectrum allocation in their country. In two countries GSM frequencies have historically been assigned unequally between GSM operators, this has forced reallocation of frequency resources. One country considers it to be a competition problem that most spectrums for telecom services are concentrated on a few operators.

Some NRAs are of the opinion that potential competition problems can be reduced by removing or softening some of the restrictions related to the use of frequencies, especially a higher degree of technology- and service-neutrality in licenses combined with spectrum trading. Other countries are not of the opinion that competition problems can be reduced by removing or softening of restrictions.

Most of the NRAs do not consider any competition problems regarding the procedure for assigning frequencies/licenses for 2G/3G mobile networks. A few NRAs consider the time from request to assigned licences could influence competition.

Most of the NRAs find relaxing spectrum restrictions (stimulating infrastructure competition) to best remedy competition problems. A few NRAs find MVNO access or both relaxing spectrum restrictions and MVNO access to best remedy competition problems.

Answers to the questionnaire

Bottlenecks/potential bottlenecks

1. Are there available licences/frequency resources for 2G or 3G mobile networks in your country? Please specify.

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| Austria | (sentence omitted) |
| Czech Republic | <p>There are no other licences or frequencies available/intended for mobile networks. Everything is allocated.</p> <p>In the frequency band for GSM 1800 and UMTS, there are free frequencies for building a network available but it is not clear whether they can ensure full coverage. CTO will consider the possibility of assigning a fourth licence for public mobile network services.</p> |
| Cyprus | <p>Two authorizations have been granted, one in November 2003 and the other one in February 2004. Both authorizations include spectrum for both 2G and 3G services.</p> <p>A certain amount of spectrum (2X10 MHz in the GSM 900E, 2X24.8 MHz in the GSM 1800E and 2X30+25 MHz in the UMTS band) has been reserved for future use.</p> |
| Denmark | There are no available frequencies allocated for 2G at the moment. The frequency band 2010-2025 MHz, which has been allocated for 3G TDD, is vacant. |
| Estonia | <p>Yes. 1 license is still available.</p> <ol style="list-style-type: none"> 1. The IVth 3G licence is still available in Estonia and the Estonian administration will open the public tender for a forth licence in the end of July 2006. 2. 27 MHz frequency recourse is also available in GSM 1800 MHz band and this spectrum is part of the public tender of IV 3G licence. 3. GSM-E band is reserved for future applications. |
| Finland | <p>No, although part of 2G frequencies are not in use, those can be considered as reserve spectrum for existing 2G license holders. There would be room for one more 3G operator because one licence was revoked by the MINTC, however there is no interest in the market to get one more 3G licence.</p> |

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| France | <p>3G : 4 licences were designed. Only 3 were assigned. So there is still 1 available.</p> <p>2G : There are 3 operators, and no frequencies available.</p> |
| Germany | In 2005 the Federal Network Agency started a hearing regarding the provision of further frequencies for mobile communications within the frequency range of about 2 GHz and 2.5 GHz. The hearing of the Agency is due to pursue the goal of supplying further frequencies for the public digital cellular mobile radio by meeting the demand as soon as possible. |
| Hungary | Yes |
| Iceland | Yes |
| Ireland | <p>A. In the 900MHz 2G band there is currently 12.2 MHz of unassigned spectrum available. In the 1800 MHz spectrum there is currently 30.8 MHz of spectrum available.</p> <p>For 3G services 2 MHz of TDD spectrum is available at 1900 MHz and 15 MHz of TDD spectrum at 2 GHz is currently available. In 2005 ComReg ran a licence competition for 2x15 MHz +5 MHz of spectrum in the 3G core bands. The outcome is currently subject to a legal challenge.</p> |
| Italy | Yes. From 1 January 2006 there are around 6 MHz at 900 MHz available for GSM (standing the current in force allocation provisions). Furthermore, in January 2006 the fifth UMTS license (given to IPSE2000) has been withdrawn since the operator failed to fulfil the coverage obligations. An appeal proceeding is pending on this case however. The assignment plans for these bands have not yet been decided. |
| Latvia | Frequency bands: 880- 914MHz, 925-959 MHz, 1710-1785MHz, 1805-1880MHz, 1900-1980MHz, 2110-2170MHz, 453,0-457,5/463,0-467,5MHz are allocated to operators for 2G or 3G mobile networks. |
| Lithuania | There are no more available UMTS frequencies in the bands 1920-1980/2110 - 2170 MHz - three licences were issued to all operators that applied for them. The potential UMTS frequencies in the bands 1900-1920 MHz, 1980-2010 MHz, 2010-2025 MHz and 2170-2200 MHz are under consideration (sentence omitted). In GSM 900 spectrum there are no more free channels, in DCS 1800 band there are some free channels. |
| Malta | 3 3G licences have been issued. There is sufficient frequency for another 2G. |
| Norway | <p>In the case of 2G, more than 30 MHz of duplex channels in the 1800 MHz band remain unassigned. However, all 900 MHz frequencies are assigned.</p> <p>In the case of 3G, 1 of 4 licences remains unassigned. It should, however, be pointed out that interest has been shown in this</p> |

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| | vacant licence lately. |
| Poland | Currently there are available frequency resources of 1710-1730 MHz band and 1805-1825 MHz band (99 duplex radio channels) assigned to construction of a mobile public telephone network in GSM 1800 standard. Frequency resources are assigned to companies in the course of a public tender. |
| Slovakia | Currently we are running the tender process for granting the “third mobile licence” which is combined 2G and 3G. Beside these frequencies there are still free some channels in 1800 MHz frequency band. |
| Slovenia | 3G: 2x15MHz FDD and 5MHz TDD are available. |
| Spain | No |
| Sweden | 2G: there are a few narrow blocks available in the 1800 MHz, in total 2*7 MHz. Furthermore 2*4,9 MHz is available in the E-GSM-band. 3G: there is no FDD spectrum available. However there is 15 MHz TDD spectrum available (1900-1905 MHz and 2010-2020 MHz). |
| Switzerland | No |

2. If yes, please explain why the licences/frequencies remain unassigned.

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| Austria | See question 1. |
| Cyprus | In the auction for assigning spectrum to the new entrant that took place in October 2003, to ensure that the new entrant has the necessary certainty to successfully launch competing mobile services, we have stated that the reserved blocks of spectrum will not be licensed for a period of five (5) years or until the new entrant has achieved a market share of 25%, whichever comes first. |
| Czech Republic | Frequency bands for GSM and UMTS networks were given to 3 mobile operators – Telefónica O2, a.s., T- Mobile Czech Republic a.s. a Vodafone Czech Republic a.s. All of them use it for public mobile network services in GSM. Telefónica and T-Mobile began using UMTS in a limited range (Prague area) and continue with their broadening. Vodafone announced that because of low recovery of investments stops building its UMTS network. |
| Denmark | The band 2010-2020 MHz had been reserved for self-provided applications in accordance with ECC Decision (99) 25. However |

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| | <p>this Decision has been abrogated recently. In the upcoming revision of the national frequency allocation table it is planned to make this band available for new licenses. The band 2020-2025 MHz is regulated through the 3G Act. This means that this band can only be licensed through an auction. No decision has been made if and when to have an auction regarding this frequency band.</p> |
| Estonia | <p>2G mobile network operators (Elisa, EMT, Tele2) had possibility to buy 3G license without competition and they realized it. The fourth license was set on auction with the same price as for other market players. There was no interest for this license.</p> <p>No interest by the operators.</p> |
| Finland | |
| France | Only 3 candidates applied to the 3G beauty contest. |
| Germany | Only in 2005 the frequency ranges placed to the hearing were started to be liberalised for new applications or shall be liberalised for new applications from 2008 onwards having been first internationally harmonised. |
| Hungary | <p>Regarding the 3G the following frequency bands had been allocated for UMTS services: 1900-1920 MHz for UMTS-TDD; 1920-1980 MHz/ 2110-2170 MHz for UMTS-FDD.</p> <p>The frequency band 1900-1920 MHz was divided into 4 Time Division Duplex (TDD) blocks with a nominal bandwidth of 5 MHz and the frequency band 1920-1980/2110-2170 MHz was divided into 4 Frequency Division Duplex (FDD) with a nominal bandwidth of 15 MHz. (Hereinafter referred to as blocks “A”, “B”, “C”, and “D”).</p> <p>The block “A”, “B” and “C” was assigned by the 3 Hungarian GSM service providers (T-mobile, Pannon, Vodafone).</p> <p>The block ”D” remained unassigned. (For the winner of this bloc, theoretically it is available the same block size in 1800 Mhz band as for the actual MNOs and a part of the actual block size in 900 Mhz band.</p> <p>The tender for the block “D” remained unsuccessful.</p> |
| Iceland | The frequencies were allocated but were later returned to PTA. |
| Ireland | <p>For 3G TDD services, no interest has been expressed in using this spectrum.</p> <p>No interest expressed in additional 2G spectrum.</p> |
| Italy | The frequencies in 900 MHz band became free recently, those in 2.1 GHz band are subject to a pending judicial case. |
| Latvia | |

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| Lithuania | Only three operators applied for UMTS licences and all of them were awarded. There is no demand on extra UMTS frequencies. There were no requests for free DCS 1800 channels from new operators (sentence omitted) |
| Malta | Unlikely there would be interest in 2G. |
| Norway | <p>The simple fact is that there has not been sufficient interest in neither acquiring nor making use of these frequencies in the Norwegian marketplace. It is difficult to explain all the reasons for this fact, but it should be taken into account that Norway is a country with difficult topography and in relative terms a rather widespread population, furthermore amounting to no more than approximately 4.6 million people. Due to the topography, networks with national coverage are difficult and expensive to roll out. Back in the year 2000 all 4 licences covering the frequencies in the 3G “core band” were assigned, but for various reasons 2 licences were returned to the authorities. In 2003 these were offered in an auction, but only 1 licence was then acquired. These frequencies have not yet been taken into use.</p> <p>It could also be added that spectrum fees are charged for these bands. It might be possible that these fees are considered to be too high compared to their potential use.</p> |
| Poland | <p>Because tenders which were supposed to allocate GSM 1800 frequencies of 1710 – 1730 MHz band and 1805 – 1825 MHz band assigned to construction of a mobile public telephone network in GSM 1800 standard published in 2004 and 2005 have failed to appoint a winner President of UKE announced the beginning of a consultation for allocation of the abovementioned frequencies. The aim of the consultation process is to find out opinions of telecommunication environment before repeated tender for allocation of 1710 – 1730 MHz band and 1805 – 1825 MHz band. Companies interested in obtaining the abovementioned frequency bands were entitled to submit proposals (in writing) concerning the allocation of the given frequency band in the headquarter of the Office of Electronic Communication (UKE) in Warsaw until 15 August 2006.</p> <p>At present the following proposals for frequency resources reservation in GSM 1800 band have been submitted:</p> <ul style="list-style-type: none"> • Proposal of the mobile operator: Polska Telefonia Komórkowa „Centertel” Spółka z o. o. (in the proposal of 31 May 2006 the company applied for reservation of 33 duplex radio channels in the frequency band of 1710-1716 MHz and 1805 – 1811 MHz), • Proposal of the operator Telekomunikacja Kolejowa Spółka z o.o. (in the proposal of 6 July 2006 the company applied for reservation of 66 duplex radio channels in the frequency band of 1710-1730 MHz and 1805 – 1825 MHz), • Proposal of the operator CERNET S.A. (in the proposal of 12 July 2006 the company applied for reservation of 66 duplex radio channels in the frequency band of 1710-1730 MHz and 1805 – 1825 MHz), • Proposal of the mobile operator POLKOMTEL S.A. (in the proposal of 27 July 2006 the company applied for reservation |

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| | <p>of 29 duplex radio channels in the frequency band of 1710-1730 MHz and 1805 – 1825 MHz),</p> <ul style="list-style-type: none"> Generally there are 99 duplex radio channels in GSM 1800 band to assign. <p>In accordance with the provision of article 114 subsection 2 and 3 point 1 of the Telecommunication Act of 16 July 2004 the President of the Office of Electronic Communications reserves frequencies for a company that fulfils all the requirements described in the Telecommunication Act under the condition that the frequencies the company applies for are available. If the number of frequency resources is not enough the public tender is organized to appoint the company for which the frequency band will be reserved (article 116 subsection 1 point 2 of the Telecommunications Act).</p> |
| Slovakia | It was not necessary to grant those channels to existing operators. In theory we can grant them to potential forth mobile operator or divide them among existing operators if necessary. |
| Slovenia | 3G: On the second tender 3 bids were received. One bidder already has 3G frequencies so only 2 additional 3G frequencies were awarded. |
| Spain | |
| Sweden | <p>2G: In some parts of the available spectrum there have been military systems. Other parts have not been attractive due to adjacent band usage, eg DECT. Available spectrum is considered to be too narrow to support a viable competitor.</p> <p>3G: the frequency range 1900-1905 MHz has been assigned for a 3G operator which withdraw its licence during 2004. The 2010-2020MHz band has earlier been designated for SPA-usage.</p> |
| Switzerland | |

3. Have all of the assigned 2G/3G licenses/frequencies been put into use by the operators? If no, please specify which licenses/frequencies. Please explain why the assigned licences/frequencies remain unused.

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| Austria | (sentence omitted) |
| Cyprus | Both operators fully utilize the 2G spectrum that is assigned to them. Recently, both of them have also started utilizing the 3G spectrum on a pilot/trial basis. |
| Czech | Licences and obligations as well as fees and other limits are set at the moment as a result of relevant market analyses and under |

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| Republic | <p>new legal framework. And though the licences were issued under old regulatory framework, there was no intention to hinder the market development. Problems and disputes that appeared over the time were solved on case-by-case basis. Therefore it is unlikely that there are any serious reductions of the incentives for investments in use of spectrum for mobile networks.</p> <p>Crucial aspects affecting mobile network investments besides of frequencies are licence fees and size of the market which affects the recovery of investments.</p> |
| Denmark | All 2G licences are in use. With regard to the 3G-licences only two out of four operators provide commercial 3G services. Only the FDD segment is used. |
| Estonia | <p>No, not all. Elisa and EMT have been put into use their 3G networks in few cities. Tele2 has not launched his 3G network.</p> <p>The assigned 2G licenses/frequencies have been put into use by all according operators.</p> <p>There is planned new auction for fourth 2G/3G license and therefore they are not used yet.</p> <p>Three licences are issued in 2G frequency band and all the frequencies are in use. Also three licences are issued in 3G frequency band and two of them are already in use. Accordingly to the obligation of 3G licence the operator has to cover 30% of population to 2010.</p> |
| Finland | All of the assigned frequencies/licenses are in use. 3G networks are nowadays mainly rolled out in urban areas. |
| France | <p>2G : yes</p> <p>3G : 2 of the 3 operators launched their services in late 2004. The 3rd one will launch in 2007, so its frequencies are still unused at this moment.</p> |
| Germany | One holder of a frequency assignment voluntarily did without frequencies for UMTS/IMT-2000 having been assigned in 2000. Frequencies for UMTS/IMT-2000 were recalled to a second owner because of not having used them according to the licence obligations. At present the Federal Network Agency is hearing the case for the need of these frequencies. |
| Hungary | Yes, all the assigned 2G/3G frequencies have been put into use by the operators. |
| Iceland | Information not available. |
| Ireland | <p>All three of the 2G licences issued have been put into use.</p> <p>Three of the four 3G licences have been put into use, the fourth is currently subject to legal action.</p> |
| Italy | All assigned spectrum of GSM/UMTS operators is in use, with the exception of 3 blocks of 5 MHz each in 1800 MHz band, which are in the process of being reallocated by operators from the former user (Defence). This process is foreseen to be |

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| | concluded within the year. |
| Latvia | All of the assigned 2G/3G licenses/frequencies (GSM900, GSM1800, UMTS and CDMA) have been put into use by the operators. We don't have any detailed information about frequency spectrum use for these frequencies. This information is available in the Electronic Communications Office (www.esd.lv ; e-mail: esd@esd.lv). |
| Lithuania | One operator that received UMTS licence still does not offer services, because he says that there is no demand. There is a deadline for starting services in licence, so operator has to meet it. |
| Malta | Of the 3G licences have been assigned. A 3 rd is in legal dispute. |
| Norway | No, as mentioned above, one 3G licence was (re)assigned in 2003, but no network has yet been built. The licence conditions call for coverage of 30% of the population by 2009, so the licensee still has some time to establish a network. The frequencies assigned to 2G are at present being used or taken into use. |
| Poland | All the frequencies assigned to operators of GSM 900 and GSM 1800 networks are used. In the case of UMTS frequencies 3 mobile operators (Polkomtel S.A., Polska Telefonía Komórkowa „Centertel” Spółka z o. o. oraz Polska Telefonía Cyfrowa Spółka z o. o.), which obtained frequency reservation in the course of tender proceedings in 2000 activate networks and provide services in these networks starting from the year 2005. In the case of the fourth operator (Netia Mobile Spółka z o. o.), which obtained the frequency reservation in August 2005 the company intends to activate network and to start providing services in the second half of 2006. |
| Slovakia | Yes both GSM and UMTS licences have been put into use. |
| Slovenia | Yes all GSM and one UMTS licence have been put into use. Additional 3G frequencies were allocated in September 2006 |
| Spain | TME, Vodafone and Amena have put into use their 3G licenses. On the other hand, Xfera, which owns the fourth 3G license, has not started its commercial activity yet. However, since Telia-Sonera's take over, Xfera is expected to launch mobile retail services by the end of 2006. |
| Sweden | The 2G frequencies are in use by the operators. All of the 3G frequencies are not in use by the operators, because they do not yet have so many subscribers which need so much capacity. Furthermore, user terminals have up to now not been able to perform channel handover. |
| Switzerland | 3G Mobile, holder of a UMTS licence, didn't put in use the assigned frequencies and didn't fulfill the coverage obligations of their licence. The licensing authority revoked the licence in spring 2006, but 3G Mobile appealed the decision. The Federal |

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| | Court confirmed the revocation of the licence. |
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4. Do you consider that restrictions and obligations e.g. technology specific licences, service limitations, roll-out obligations, “use it or lose it” clauses, usage fees and spectrum taxes, duration of licenses, individually or as an aggregate effect, reduce the incentives for investments in use of spectrum for 2G/3G mobile networks in your country? Please elaborate.

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| Austria | (sentence omitted)) |
| Cyprus | No. In fact, the authorizations have no restrictions and obligations, other than mainly technical requirements related to the use of spectrum and some geographic coverage requirements, to promote infrastructure competition, which in our view, are a driver for investment. |
| Czech Republic | No. (see above) |
| Denmark | The less restrictions the more attractive a licence will get, just like the duration is of great importance – the longer a licence lasts the more attractive it gets. But it is very difficult to be very specific on how exactly restrictions and obligations as mentioned will affect the incentives for investments etc. |
| Estonia | <p>No.</p> <p>Historically, if there is clear business case for 2G/3G mobile network operators, there is always enough interest for investments. The obligations have to be rational and not influence competition on the market because the strong obligations and restrictions can influence the state of economy of licence holder and reduce the investiveness. Restrictions for example to technology are some cases related with pan-European systems and than those restrictions are needed.</p> <p>In Estonia the restrictions of 2G and 3G networks are mainly related only with technology because of pan-European systems and the other restrictions would not be obstacles to investments.</p> |
| Finland | No real effect on the investments. Spectrum fees in Finland are not notable compared to license fees derived form auctions. |
| France | <p>No :</p> <ul style="list-style-type: none"> • Roll-out obligations or “use it or lose it” clauses maintain pressure on the operators • Usage fees and spectrum taxes, if too high, may have a negative impact on investment. In France, their impact is difficult |

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| | <p>to evaluate : fees and taxes are on the whole a few percents of the annual turnover:</p> <ul style="list-style-type: none"> • 3G : 619 million euros for 20 years and 1% of annual turnover each year • 2G : each year 25 million euros and 1 % of annual turnover • Duration of licences are long enough to stimulate investment (15 years for 2G and 20 years for 3G) |
| Germany | Experience saw the return of frequencies for UMTS/IMT-2000 not having been used by two holders for reasons of superordinate firm-specific, strategic considerations. (Sentence omitted) |
| Hungary | According to surveys a strict roll-out obligation or the non-compliance of the frequency band could appreciably reduce incentives for investment for 2G/3G mobile networks. In Hungary we invited our tenders for 2G/3G in accordance with these surveys. Thanks to it the Hungarian mobile market is growing since ages and the competition in this market is almost effective. |
| Iceland | The two mobile companies have pointed that high demands for roll – out obligations is making 3G not sensible in Iceland. |
| Ireland | No, providing account is taken of market developments at time of issuing the licences. The 3G licence competition in 2002 was designed to facilitate both new market entrants and existing mobile operators. The result was licences issued to both types of operator and subsequent roll-out of services in accordance with licence commitments and requirements. |
| Italy | In general AGCOM thinks that technology specific license (in the specific case of GSM), roll-out obligations, use-it-or-lose-it clauses, usage fees, duration of licenses could foster investments in mobile networks, while service limitation and operators taxes would hinder such investments. However we recognise there is a trend towards licenses (rights of use to be more precise) not specifically linked to any technology and service (see COM(2006)334 on the Review). This would increase innovation, investments and competition according to the Commission's analysis. In general AGCOM favours such an approach provided it is introduced gradually, that the appropriate compatibility studies are carried out and recognised by the community, that transition to new regime is managed in order to ensure equitable treatment and reciprocity, and that Member States are given the flexibility to take into account national circumstances. |
| Latvia | We have only some special restrictions and obligations (except those included in national frequency plan, for example, coverage plan etc.), but they have not delayed companies to begin their activities. The restrictions and obligations don't reduce the incentives for investments. All mobile telephone companies are working with good profit. |
| Lithuania | All licences has such restrictions and obligations, nevertheless all available licences are issued – if conditions are based on rationality, they should not reduce the incentives for investment. |
| Malta | They definitely have an impact. |

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| Norway | Seen from the viewpoint of a potential licensee, all restrictions, obligations and fees of course contribute to reduce the overall value attributed to the spectrum in question by the said licensee. Low valuation of the spectrum resource might possibly lead various market players to decide not to invest in services based upon radio spectrum or to postpone their decisions on what to do. Especially, the NPT is of the view that restrictions on the flexibility of the use of the spectrum as well as restrictions on the possibility to trade the licence in a secondary market might have severe negative effects. Therefore, technology neutral and tradable licences are considered very important in Norwegian spectrum management. |
| Poland | The abovementioned restrictions and obligations for mobile networks operators do not have any influence and do not reduce the incentives for investments in use of spectrum and networks' development. If standards give the possibility to introduce new services operators can introduce these new services without any obstacles within the frames of the given standard under the condition that no consent of the administrative organ is required in this case. |
| Slovakia | Obligations like roll-out obligations, "use it or lose it" clauses, usage fees and spectrum taxes are stimulators of investment into network. But on the other side technology specific licences, service limitations could reduce incentives for investment, when the services provided through those frequencies do not bring expected economic effect. |
| Slovenia | No |
| Spain | <p>Due to those factors affect on the supply side of the market, they could explain but only partially the underdevelopment of 3G mobile networks. Other issues related to the demand may be more relevant to explain the reasons why MNOs have delayed their investments. Consumer willingness to pay for those new 3G data services has turned to be lower than it was expected, reducing the profitability of investments and, consequently, the incentives to invest.</p> <p>Precisely, under this environment of uncertainty and unmet market expectations the potential negative impact of those obligations increases significantly. By restricting the strategy of MNOs, these regulatory requirements reduce their capacity to adapt to changing market conditions and reinforce the magnitude of negative consequences above explained.</p> <p>Apart from that, restrictions are justified as a mean to secure the commitment to investing of the licensees. These restrictions prevent licensees from exploiting inefficiently a scarce resource or obtaining a license with the unique aim of delaying the development of services that could be a potential competitive threat.</p> <p>Thus, restrictions are necessary but they should guarantee a sufficient degree of flexibility for adapting to changing market conditions.</p> |
| Sweden | Yes, the roll-out obligations for 3G licenses may have a negative impact on the business case for new operators. Other policies, notably spectrum fees, are generally very beneficial to mobile operators in Sweden. |

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| Switzerland | (sentence omitted) |
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5. Due you consider lack of capital for investment in mobile network as a bottleneck in you national mobile market?

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| Austria | N/a |
| Cyprus | No |
| Czech Republic | The frequency spectrum usage plan enables only limited amount of mobile networks with full coverage. Thus the possibility of entering the market for more operators and potential competition is limited. |
| Denmark | No. But we do consider it a general entry-barrier. |
| Estonia | No. IMHO the market is not ready for 3G services. The biggest restriction for operators to elaborate new technologies is population and the market size therefore the investments to the technology evolution are very carefully calculated and utilized by the operators. The bottleneck can be therefore littleness of mobile market and strong competition between the operators to collect the profit from the market for investments. Therefore the evolution of the mobile networks is not so fast as in other countries but stable. |
| Finland | No, we don't think lack of capital is a bottleneck in Finland because the operators' debts/equity (gearing) is lower than in other countries. We think that bottlenecks for investments are operators' doubts that future techniques (for example 3G) are not profitable. |
| France | Capital for investment and licence fees is clearly a barrier for market entrance. But it is not the only factor and, even though a licence is still available in France, lack of capital may not be the bottleneck to incriminate. |
| Germany | A principal condition for the permission to award procedures for scarce frequency resources is to secure financial efficiency both for acquisition on the one hand and installation and operation of a mobile network on the other. At that time these admission requirements had been met by all holders of frequency assignments. Therefore missing financial efficiency can principally not be assumed to be the reason for not using the frequencies. |

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| Hungary | In Hungary all the three mobile service providers are a subsidiary company of one powerful international mobile service provider company. Due to it lack of capital could not be as a bottleneck in mobile network investment. |
| Iceland | No |
| Ireland | No. |
| Italy | In 2004 AGCOM carried out a public consultation for verifying the market interest for entering the mobile market in GSM, and it was not evidenced a clear interest to invest in a national infrastructured GSM network. In this respect we suspect at this stage there is no profitable business case more then lack of capital investments in GSM mobile networks. As to 3G and other technologies the interest is yet to be proven, and at this stage we cannot say there is a lack of capital for investments. However investing in a mobile network deployed all over a country like Italy may prove a big challenge. Different considerations can be done regarding the entering as MVNO, where the demand seems more mature. |
| Latvia | No. We have four mobile operators - three GSM/UMTS, one CDMA operator and four MVNOs in our national mobile market. |
| Lithuania | No, because Lithuania is relatively small country. At present every of the three GSM networks cover almost all territory of Lithuania. |
| Malta | The characteristics and size of the local maltese market limit the attractiveness of investment for new players. |
| Norway | This question is difficult to answer in general terms, but lack of capital might prove to be a bottleneck for smaller companies in countries such as Norway. Because of the aforementioned difficult topography and sparse population, infrastructure investment is a costly affaire. Furthermore, the two established players in the market (Telenor mobil and NetCom) are both part of multinational companies with access to considerable capital resources. These factors contribute to economic barriers to entry that can only be overcome if the potential entrant has access to sufficient capital. According to media rapports, the company Nordisk Mobiltelefon recently had some problems raising the required capital for their CDMA450 mobile telephony network. Even though they managed to require enough to finance the roll-out of the network, the final result was only half of what they had expected. Another industrial grouping which plans to roll out a 4 th GSM network (Network Norway) claims to have acquired sufficient capital with ease. |
| Poland | <p>According to UKE operators providing services on the Polish mobile market have no problems with lack of capital for investment: the current development of UMTS network is the best evidence of this fact.</p> <p>One of the major bottleneck which face the mobile operators is difficulty in obtaining places for base stations localization. In the most cases the process lasts about 2 years.</p> |

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| Slovakia | This is not situation in Slovak market. Currently we have only two mobile operators with developed networks covering 90 % of population. We received 3 applications for the third mobile licence which is the evidence that potential licence holders intend to invest into Slovak market despite the fact that mobile penetration is close to 90 %. |
| Slovenia | No |
| Spain | Lack of capital may explain some of the difficulties that Xfera has found to enter the market but it can not be considered a bottleneck. Telia-Sonera has become not only the technological partner but also the main stakeholder, contributing with the majority of the financial resources that are required for deploying 3G network, marketing mobile services and acquiring customers. |
| Sweden | No, if other conditions were beneficial to new network investment access to capital would probably not be a problem. |
| Switzerland | No |

Competition problems/potential competitions problems

6. Are you of the opinion that there are any actual or potential competition problems related to the distribution of radio spectrum allocation in your country? (e.g. concentration of spectrum holdings on one or few operators, lack of available frequency resources, distribution and availability of spectrum which enables different potential for commercial utilisation, etc.). Please elaborate.

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| Austria | (sentence omitted) |
| Cyprus | No. |
| Czech Republic | In the viewpoint of frequency spectrum usage, the only limit for potential competition is their availability. |
| Denmark | Further consolidation on the market might pose potential competition problems, however such a consolidation is not expected in the foreseeable future. |
| Estonia | There is no actual or potential competition problems related to the distribution of radio spectrum allocation in Estonia. Because of lack of auction for 2G/3G frequency license there is reason to believe that there is no need for urgent frequency expanding. Even |

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| | <p>if distribution and availability of spectrum would be unlimited, there is no place for new incomers because of need for big start-up investment whilst the existing 2G operators offer low retail prices. Coverage area of 2G operators is 97-99% of Estonia. The Estonian mobile market is very small and therefore is very usual when the operator has the spectrum in different bands. For instance, 2G network operators have also the 3G licences and two of them have WiMax licences as well. The mobile market is divided between few operators which can cause some competition problems for new operators but on the other hand, the market size is not so attractive for new operators and therefore for instance the 4th 3G licence is still available.</p> |
| Finland | <p>900 MHz band was assigned unequally between the three nationally operating MNOs. The two smaller MNOs had expressed their concern and stated that their position to compete is constrained due to lack of P-GSM 900 channels and thereby inefficient cost structures. After a research project conducted in 2004-2005 and amendments made in the Radio Act, FICORA reassigned P-GSM channels more equally (decision 31.12.2005). The equal allocation was further developed by assigning the available E-GSM 900 channels.</p> |
| France | <p>All 2G/3G operators in France have the same amount of spectrum, and are completely independent.</p> <p>Thus, there are no competition problems due to the distribution of radio spectrum allocation, other than the small number of operators due to the intrinsic scarcity of spectrum.</p> |
| Germany | <p>At present the Federal Network Agency is converting a so called GSM concept to adjust historically induced asymmetric frequency equipments between GSM network operators, background of which were former different frequency equipments within the 900 MHz spectrum. To secure fair and to promote sustainable competition two GSM network operators - only holders of frequencies in the 1800 MHz range so far - were given frequencies by the Federal Network Agency having been returned by military forces.</p> |
| Hungary | <p>It does not seem any actual or potential competition problems related to the distribution of radio spectrum allocation for 2G/3G.</p> |
| Iceland | <p>No</p> |
| Ireland | <p>ComReg is gradually moving towards introducing more market-based mechanisms – for instance, it has conducted a number of auctions of spectrum licenses over the last year. There is some excess demand for certain highly-sought portions of spectrum, e.g., for fixed wireless broadband, but ComReg is not currently of the view that any one operator or set of operators own “too much” of the spectrum. Any further move toward market-based mechanisms will aim to guard against this possibility.</p> |
| Italy | <p>We assume the question is referred to spectrum so far designated for mobile services. We think there is no such a problem at this stage. Spectrum is almost evenly distributed among GSM operators, also following decisions AGCOM undertook in 2002. The same in general applies to UMTS. The only difference is that one of the 4 mobile operators has only UMTS spectrum (but it has a</p> |

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| | frequency carrier more than competitors and benefits of national roaming on GSM), while the other three have both GSM and UMTS spectrum. Yet, given the services currently offered, capacity is not an issue at this stage. |
| Latvia | <p>It is difficult to say that there are any actual or potential competition problems related to the distribution of radio spectrum allocation in Latvia. What is the definition for the term “competition in the use of radio spectrum”? In Latvia there are no frequency bands where dominate only one or two operators. Due to that we can consider that there is competition. We consider that four mobile operators for Latvia (2,3 million inhabitants) and four MVNOs are enough for competition.</p> <p>The fixed incumbent operator Lattelecom doesn't have mobile licence.</p> |
| Lithuania | The current situation does not indicate any problems. There were no requests for free DCS 1800 frequencies from new operators. For 3 UMTS licences applied only 3 operators. Mobile access and call origination market (15) was found to be competitive with 3 operators. |
| Malta | No. |
| Norway | This is a question which is difficult to answer straight forward. On the one hand the incumbent operator has through the years acquired significant radio frequency resources. On the other hand considerable parts of the radio frequencies remain unassigned, frequencies which under a technology neutral licensing regime may be utilized for various services competing with existing ones. Therefore, considering the broad picture, the NPT believes that the distribution of spectrum in itself is not creating any major competition problems. |
| Poland | <p>The following operators are present at the Polish mobile market:</p> <ol style="list-style-type: none"> 1. Polska Telefonía Komórkowa „Centertel” Spółka z o. o., which provides services in GSM 900, GSM 1800 and UMTS networks. 2. POLKOMTEL Spółka Akcyjna, which provides services in GSM 900, GSM 1800 and UMTS networks. 3. Polska Telefonía Cyfrowa Spółka z o. o., which provides services in GSM 900, GSM 1800 and UMTS networks. 4. Netia Mobile Spółka z o. o., which in the result of a public tender of 2005 was granted frequencies (1 TDD channel and 3 FDD channels) for UMTS system. The company intends to activate network and to start providing services in the second half of 2006. <p>Generally 99 duplex radio channels in GSM 1800 band are to be assigned by the President of the Office of Electronic Communications in the course of public tender.</p> |

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| Slovakia | Currently we do not see neither actual nor potential competition problems related to distribution of radio spectrum. |
| Slovenia | No |
| Spain | With respect to barriers to entry, actually the distribution of radio spectrum is not the main problem but the common strategy followed by MNOs consisting in denying access to any MVNO or Service Provider. |
| Sweden | Yes. Most spectrum for telecom services are concentrated to a few operators. However, the question of how many operators a relatively small and sparsely populated market as Sweden can support, is not straight-forward to answer. Most technology- and service-neutral licenses are in relatively high frequency bands (e.g. 3.4-3.8 GHz), making it hard to deploy innovative solutions with good coverage. |
| Switzerland | (sentence omitted) |

7. Are you of the opinion that potential competition problems can be reduced by removing or softening some of the restrictions related to use of frequencies? Please elaborate.

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| Austria | (sentence omitted) |
| Cyprus | As we have stated in question 4, we are of the opinion that the frequency authorizations of our two mobile operators have no restrictions that may or do cause competition problems. |
| Czech Republic | No. |
| Denmark | Restriction related to use of frequencies are either introduced to avoid interference or to enhance competition. However, we do believe that competition can be further improved by moving towards more technology neutral licenses. |
| Estonia | Yes, to remove some restrictions like technology obligation in 3G or 2G band opens this band also for new systems to the new operators. Administrations have to remove restrictions only if this decision is rational and encourage competition on the market. Also the administrations have to take into considerations to maintain pan-European systems. |
| Finland | No, since there are no restrictions related to use of frequencies. All operators have same amount <i>of spectrum</i> . |
| France | There is no general answer to that question. It may be different for each country and each operator. Generally speaking, ARCEP |

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| | <p>has a preference on a long-term basis for infrastructure-based competition over service-based competition (i.e. MVNOs).</p> <p>Just to give an example, Arcep considers that the implementation of secondary market for frequencies authorisations is a way of softening usage restrictions that can increase competition.</p> |
| Germany | |
| Hungary | We do have not detailed information about. |
| Iceland | No |
| Ireland | As mentioned above, some operators do have highly-sought portions of spectrum for historical reasons which may limit the possibility for it being moved to new, possibly more efficient uses, but ComReg is currently considering how best to deal with this issue. Increasingly ComReg is also adopting a technology and service neutral approach to spectrum allocations. |
| Italy | <p>We think that competition concerns (not problems, since AGCOM already carried out the mkt 15 analysis without finding SMP operators) could be softened by allowing new competitors enter the market and invest in new infrastructures. As a second best solution we look positively at the entrance of independent service providers, by means of commercial agreements. Furthermore we think that in general softening the restriction related to use of frequencies could give benefits to competition and end users. Yet (see question 4) this should be introduced gradually and possibly starting with not used bands (such as upper TETS, 2010-2025 MHz, 2.6 GHz, etc.).</p> |
| Latvia | We agree that removing or softening some of the restrictions related to the use of frequencies can reduce potential competition problems. We consider, that the best way to improve competition especially in cases when one or few operators have rights of use for radio spectrum, but don't use them effective, is to soften or cancel restrictions related technology use. Probably in some cases spectrum trading could be helpful. |
| Lithuania | All restrictions should be based on a principle of rationality, in this case they would not create any competition problems. |
| Malta | With regards to barriers to entry lowering certain restrictions can potentially help. |
| Norway | Strict technology specific frequency planning and assignment may in many markets lead to what is often referred to as an artificial lack of frequencies. The use of technology neutral licences may certainly be one step which may contribute to alleviate potential competition problems as this, at least in the long run, will increase the amount of spectrum which to a large extent may be used to offer competing services. |
| Poland | Not able to answer the question at present. |

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| Slovakia | As we do not see any competition problems we do not know the answer. |
| Slovenia | No |
| Spain | <p>Whatever measure, designed to soften some of the restrictions related to the use of spectrum frequencies, would tend to reduce the magnitude of this absolute barrier to entry and make mobile markets more contestable and competitive (for example, the development of spectrum trading). Nevertheless, it is important to remark that the limited number of firms is explained not only by the spectrum allocation policy but also by the fact that economies of scale and scope, the magnitude of sunk costs and the artificially created network effects (by means of on-net and off-net tariffs) are important. Consequently, the number of firms may remain equal but the market outcome in terms of prices, range of services and quality of service would be different depending on the access conditions to radio spectrum.</p> <p>Finally, in order to assess any change in spectrum access management, authorities should take into account their impact on the quality and security of the communications and the transaction costs associated to a more market guided approach.</p> |
| Sweden | Yes. A higher degree of technology- and service-neutrality in licenses combined with spectrum trading (which is already allowed in Sweden) would make access to spectrum easier for new actors and new technology. |
| Switzerland | (sentence omitted) |

8. Do you consider any competition problems regarding the procedure for assigning frequencies / licenses for 2G/3G mobile networks (e.g the time scale from request to assigned licenses)? Please specify.

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| Austria | (sentence omitted) |
| Cyprus | No. |
| Czech Republic | N/a |
| Denmark | <p>It can take a long time from request to assigned licences if NITA has to proceed a public consultation, implement a public tender or hold an auction as a basis for issuing licences – and for some parties this could be too long according to investments issues. This could probably influence the competition, since it might keep some parties out of the market.</p> |
| Estonia | No. |

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| | The 2G licences are issued “first come first serve” basis and the licences for 3G networks are issued by the public competition. All operators have the equal number of frequencies in 2G and 3G band and therefore we don’t see competition problems regarding the procedure for assigning frequencies. |
| Finland | No, since licensing procedure has always been flexible and the time scale from request to assigned licenses has been very short. |
| France | No. The only problem could be the time period between the allocations of frequencies for different operators. |
| Germany | No, since licensing procedure has always been flexible and the time scale from request to assigned licenses has been very short. |
| Hungary | We do not have such information. |
| Iceland | No |
| Ireland | Making spectrum available in the time-frame desired by some parties can be problematic, taking into account the need to act in an open ,transparent and non-discriminatory manner, e.g., conducting public consultations. On the other hand, however, this often results in viable services being delivered to consumers. The move towards greater flexibility, i.e., the WAPECS approach should speed up some of these processes. |
| Italy | We think that possible competition problems stemming from the current provisions of regulatory framework that leave to member states the actual details for carrying over the procedures for assigning spectrum for mobile (and other) services, are manageable. Yet we favour decisions at community level that foster harmonisation, and decisions at CEPT level that help giving clarity on which technologies are compatible in a given band and help operators in deciding the technology to choose. In fact this would help in designing the appropriate procedures. The current trend for liberalising the use of frequency (technology and service neutrality) could give concerns in terms of harmonisation., however it should be considered that a mature market can make the most appropriate choices. Of course the consequences of the liberalisation should then be carefully assessed in the downstream markets, being the spectrum itself a production input. In some specific cases there is also a need for coordinating the procedures themselves, by using an approach at EU level, as foreseen in the Communication for the RF Review (i.e. MSS; MCA, etc.). |
| Latvia | Presently no. |
| Lithuania | No competition problems regarding the procedure for assigning frequencies for 2G/3G mobile networks. |
| Malta | No |
| Norway | We do not believe that the time scale relating to the assignment of frequencies itself is creating any considerable difficulties. Of course very special circumstances may occur where the time window for investment may be very short and delays may lead to a |

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| | <p>particular window of opportunity closing, but this is not commonplace. However, if the intention is to create more competition in the marketplace, the NPT is of the view that, for instance in the case of 3G, any restrictions and obligations attached to licences awarded to late entrants to the market should be considered carefully, as they may have severe impact on the business case, which may be marginal compared with the case for operators already in business.</p> |
| Poland | <p>According to UKE there are not any competition problems regarding the procedure for assigning frequencies to mobile operators. Under the Telecommunications Act of 16 July 2004 the President of the Office of Electronic Communications reserves frequencies for a company that fulfils all the requirements described in the Telecommunication Act under the condition that the frequencies the company applies for are available.</p> <p>At present there are 99 duplex radio channels in 1710 – 1730 MHz band and 1805 – 1825 MHz band to assign. Also at present 4 companies applied for a total number of 194 channels. As man can clearly see there are not enough unassigned frequencies available to satisfy needs of all 4 applicants. Because of the situation President of the Office of Electronic Communications will publish a tender for assignment of the abovementioned frequencies. According to the article 116 subsection 3 of the Telecommunications Act the tender proceeding must not exceed 8 months starting from the moment of submission of a first proposal (application) for frequency reservation.</p> |
| Slovakia | The procedure for assigning frequencies as such is not a problem in Slovakia. Assignment process lasts max. 30 days. |
| Slovenia | No |
| Spain | Differences on methods for assigning frequencies among UE countries and among different bands and services (beauty contests vs. auction) may create different access conditions and, consequently, competition conditions. Unexpected changes on the license conditions after having been granted (for example, an increase in spectrum taxes) have a direct impact on MNOs' business plan and future investment decisions. |
| Sweden | <p>One problem is that most spectrum for telecom services are concentrated to a few operators. It will be very hard for new operators to get the same amount of spectrum.</p> <p>Since the 3G licenses have quite severe roll-out obligations one could foresee potential competition problems when assigning new licenses which could provide the same services and with less obligations. Realistically, the incumbent operators probably have many advantages (spectrum holdings, customer bases) that more than mitigate these concerns.</p> |
| Switzerland | As long as the procedure is transparent and non-discriminatory there shouldn't be any negative effects on the level of competition, especially in the case of established technologies. |

9. If you do not have lack of spectrum and capital for investment (ref. question 1 and 5) do you consider relaxing spectrum restrictions (if any) or enforcing MVNO access to best remedy (potential) competition problems? Please elaborate.

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| Austria | (sentence omitted) |
| Cyprus | We are of the view that in order to create a healthy competitive environment, we first need to establish infrastructure competition and then allow MVNOs in the market. |
| Czech Republic | |
| Denmark | <p>According to the previous regulations in the Telecommunications Act, mobile operators (MNOs) were considered as having SMP if they had a market share of more than 25% of a telecommunications activity in a specified market. Accordingly, two large MNOs, TDC and SONOFON, were designated as having Significant Market Power (SMP). TDC and SONOFON were consequently subject to the following obligations:</p> <ul style="list-style-type: none"> • An obligation to comply with all reasonable requests for the conclusion or alteration of interconnection agreements in the mobile market, including agreements on expansion of the range of services and agreements on interconnection. • Obligation to offer access to interconnection on objective, transparent and non-discriminatory terms. This means that the companies, in appropriate circumstances must offer the same conditions to other parties which provide the same services and the interconnection products for others on the same conditions and with the same quality as are made available for the internal services, subsidiaries, partners, etc. of the SMP supplier. The non-discrimination principle further implies that the SMP providers, with regard to price, must settle the providers' external turnover on service provider terms and at the same prices as network internal calls. • Obligation to supply all information required to providers considering interconnection agreements, including agreements on collection of traffic, i.e. with the aim of carrier preselection and carrier selection. • Obligation to set up internal “interconnection interfaces” for its own departments, subsidiaries, and purchasers of interconnection services. • Obligation of accounting separation for a number of specified business areas. • Obligation to submit all agreements on interconnection to NITA, who will make the agreements publicly available. <p>The market investigation on market 15 concluded real competition in this market.</p> |

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| | <p>The market 15 ruling enters into force on September 1st. 2006, as of this date obligations on suppliers pursuant to the Act on market 15 are withdrawn. By that the above mentioned obligations regarding reasonable request for entering into or altering agreements on interconnection or national roaming no longer apply.</p> <p>The only obligation not repealed is the right and obligation of suppliers of public electronic communications networks or services to mutually negotiate agreements on interconnection, which will continue to apply.</p> |
| Estonia | <p>If 3G operators had possibility to share some network components (e.g. by setting base stations in remote areas for common use), the networks costs would drop significantly. Operators with common resources could offer lower end-customer prices</p> <p>We propose to reduce spectrum restrictions and to elaborate competitions on the market this way because to enforce only MVNO can not solve the all competitions problems.</p> |
| Finland | <p>According to FICORA's SMP decision in market 15 (call origination and access to mobile networks), access market was found competitive and no MNO holds SMP position. There has been MVNO and other independent service providers with substantial market shares without any regulation on access charges or other remedies.</p> |
| France | <p>As mentioned above, ARCEP would prefer competition on infrastructure on a long-term basis over service-based competition (i.e. MVNOs).</p> <p>However, due to the scarcity of spectrum, only a small number of operators with their own network infrastructures can enter the mobile market : this is an exogenous factor and it limits the infrastructure-based competition.</p> <p>So enforcing MVNO and allowing thus some of them to animate competition existing on the mobile market could be a way to restrict the impact of this exogenous factor (i.e. existence of a small number of mobile networks operators) on the competitive intensity.</p> <p>In conclusion, enforcing MVNO access could be interesting if there were no other way.</p> |
| Germany | |
| Hungary | <p>We are studying the possible effects of appearance of MVNOs in the mobile market. Actually it seems that there is no proof that the MVNO can or cannot influence significantly the competition. In Hungary, we see an almost effective competition at the retail market. However this situation can be changed easily, because we are very close to the saturation of the mobile market. So after reaching it, the introduction of MVNOs could play an important role in maintaining the effective competition in retail market.</p> |
| Iceland | <p>In a draft decision for market 15 PTA is enforcing MVNO access as a remedy.</p> |

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| Ireland | One of the challenges in regulating the Irish mobile market, in particular, is the perceived lack of intensive competition in the market place and the difficulties for new entrants to gain significant footholds in the market. ComReg has tried to facilitate further competition by facilitating MVNO access (through a commitment in the 3G licence competition in 2002 license (which is the case for at least one 3G license) and through it being applied as a remedy through market reviews of the mobile access and origination market. However, the latter failed following a legal challenge. As yet no MVNOs have entered the Irish mobile market. |
| Italy | See also questions 1 and 7. We look with favour to spectrum liberalisation with governance. We closely follow and influence the current debate regarding the 900 MHz (and in future 1800 MHz) refarming to 3G (and possibly other) technologies and regarding in general the Wapecs. As member of ERG we will be also active in formulating the appropriate answer to the Commission consultation on the Review, in particular on the spectrum issues. We already stated that we consider Independent Service Provider access in the mobile market as a way to improve competition and move oligopolistic equilibria away. However AGCOM did not find so far the ground to impose such an access obligation on an ex ante basis. We have also some band available for new assignments, including the 2.6 GHz band from 2008, that could help prevent potential competition problems by allowing either new entries or more capacity, or both. |
| Latvia | Probably relaxing spectrum restrictions or enforcing MVNO access could remedy potential competition. |
| Lithuania | Current situation shows that there are no competition problems in mobile market of Lithuania. |
| Malta | In Malta there are 2 operators with a 50/50 split. An mvno is important to create a more competitive market – and is considered as essential. |
| Norway | Considering infrastructure based competition important for the Norwegian market, relaxing spectrum conditions is certainly one clear possibility to alleviate competition problems. |
| Poland | Not able to answer the question at present. |
| Slovakia | In our situation (with only two mobile operators and third license being assigned) the enforcement of MVNO could have negative impact on entrenchment of the third mobile network operator. |
| Slovenia | In the market 15 MVNO access is one of the remedies. |
| Spain | Given that capital needs do not constitute a bottleneck, if spectrum was not considered a scarce resource, spectrum restrictions would not be relevant (apart from those restrictions for technical and security reasons). Actually, MVNO are relevant to the extent that its presence reveals that the main barrier to entry (access to spectrum) is overcome by MNOs' behaviour. In a scenario where the main barrier to entry did not exist, concerns about competition would be less important and the importance of MVNOs |

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| | would diminish. |
| Sweden | Relaxing spectrum restrictions, especially regarding more technology- and service neutrality, is probably best remedy. |
| Switzerland | (sentence omitted) |