

## **FRAMEWORK FOR THIRD GENERATION (3G) CELLULAR NETWORK DEPLOYMENT AND SERVICES OFFERING IN SINGAPORE**

### **RESPONSE FROM ERICSSON**

Ericsson has read the consultation by IDA with great interest and shares to a great extent the views expressed therein of the development of the 3G market and services. Ericsson welcomes the possibility to comment on the questions raised in the paper. The comments are given with reference to the section numbers in the consultation.

**1.3** It is our understanding that the US government is neutral concerning technology, and a strong proponent of freedom for the cellular licensees to choose the technology for cellular communication systems. In the US, standardisation is ongoing for cdma2000 as well as for WCDMA and UWC-136. There is strong support from the American industry for all technologies.

The EU has also accepted such a freedom of choice. It is noted that IDA also proposes the same licensing principle. It should also be noted that the freedom to choose technology does not include the right to choose frequency band. This choice must be made by the telecom authorities in order to guarantee efficient use of the spectrum.

**2.1** Ericsson feels that it is important to allocate enough spectrum for each operator to maximise the possibilities of the broadband multimedia (BBMM) and to allow their systems to evolve fully. Although 2x10 MHz is sufficient for the systems to function, 2x15 MHz is considered necessary to give the system full flexibility and full multimedia capability. If less than 2X15MHz is allocated , there will be difficulties to deliver the high speed 2 Mbit/s services that the systems are designed for when the systems become loaded. It should be noted that the early calculations pointed at 2x20 MHz as a minimum for BBMM services.

We also believe that 2x10 MHz may be insufficient spectrum for an operator to build a sound business case with. Most GSM operators in the world have at least 2 x 10 MHz of GSM spectrum, and 3G systems will deliver 200 times higher data speed than GSM. This is of particular relevance in view of IDA's laudable intent stated in 2.2.1, of using 3G as a driver for "a wide range of innovative and value-added services at competitive prices, so as to drive the rapid adoption of mobile BBMM services in Singapore"

It should in this context be pointed out that additional competition concerning services can be achieved through independent service providers, a solution rightly considered by IDA.

**2.2** The advanced functionality of a 3G system will give a lot of room for service innovation, and it is important that the licence conditions give such room. Ericsson welcomes that IDA recognises the new scope for BBMM services compared with traditional voice and low speed data services. Both infrastructure competition and service competition are essential to develop a healthy market for BBMM services and ensure a wide coverage of the systems.

**2.3** The existing operators of 2G mobile systems are a valuable resource for the development of the 3G systems. Their existing network and base station sites will make a deployment of a 3G systems far more simple and quick, and the coverage of their 2G systems will provide valuable support in the early days of 3G. Therefore, it is essential that the existing 2G operators are allowed to take part in the selection process on equal terms with new entrants for 3G licences.

2G operators that do not get a 3G licence have at least two options to give their customers access to BBMM services:

- Upgrade the technology in their existing frequency band to deliver such services. GSM operators can implement GPRS and/or EDGE, IS-136 operators can use UWC-136 and IS-95 operators can implement cdma2000. Such technology can also be valuable to start using BBMM services before 3G systems come into operation.
- Strike an agreement with one of the 3G operators to allow their customer to roam into the 3G network.

**3.1** Referring to what is said previously, **none of the given options** are entirely satisfactory according to Ericsson's view, since they do not guarantee enough frequency spectrum for the systems to be fully flexible to support BBMM services. We are of the opinion that the concept of market forces deciding the number of players is only relevant when considering factors like the rate of market development, economic climate, or the relative competence of the players. If the consolidation is brought about by regulatory failure to facilitate viable business, then even less competition may result. In this context, option (iv) may be the best, as it conserves the freedom of action for IDA to evaluate the functioning of the systems and the commercial success of the operators, and to take corrective action where needed.

**4.1.a** The possibilities in the development of BBMM services are virtually limitless. Unique services for 3G will be multimedia services and high-speed data services. Ericsson believes that wide-band access to Internet services, will be a very popular service from the start, and provides one platform to offer e-

commerce, information and entertainment services. Services will also become more customer oriented and more personalised. Examples of 3G services have been given e.g. by the UMTS Forum in its first report. This is provided in the following list. However, only time can show which one of these services will actually prosper in the market.

### **Public Information Services**

- Browsing the WWW
- Interactive shopping
- On-line equivalents of printed media
- On-line translations
- Location based broadcasting services
- Intelligent search and filtering facilities

### **Education**

- Virtual schools
- On-line science labs
- On-line libraries
- On-line language labs
- Training

### **Entertainment**

- Audio on demand (as an alternative to CDs, tapes or radio)
- Games on demand
- Video clips
- Virtual sightseeing

### **Community services**

- Emergency services
- Government procedures

### **Business information**

- Mobile office
- Narrowcast business TV
- Virtual work-groups

### **Person to Person Communication services**

- Video telephony
- Videoconferencing
- Voice response and recognition
- Personal location

### **Business and financial services**

- Virtual banking
- Online billing

- Universal SIM-cards and Credit Cards
- Road transport telematics

**Special services**

- Tele-medicine
- Security monitoring services
- Instant help line
- Expertise on tap, such as on line helpdesk functionality
- Personal administration

The first users of 3G will be those that are dependent or accustomed to Internet services and can benefit from a mobile use of such services. Even if the first users of 3G will be more insensitive to price than the ordinary user, it is important that the prices of 3G services are kept as low as possible, in order to allow for a quick growth into a mass market. 3G services will soon become a mass market (i.e. more than 10% penetration) in the same way as other mobile services have become a mass market. Depending on price this may take from three to ten years.

**4.1.b** The 3G spectrum should be reserved for mobile services in urban and densely populated areas. In more rural areas there may be room for other services too, such as fixed wireless access, depending on the operators business plan. See also comment under 2.2.

**4.1.c** Transparency in the eligibility and selection criteria for licensing is very important. The most important criteria should be the capability of the applicant to make a quick build-out of a 3G network and deliver advanced services to the end-users. It is important that the licensing process does not result in large payments of money at the time of licence award or in the beginning of the deployment process, since this will increase prices for services and lead to a slower build-out of the networks. See also comment under 2.1.

Ericsson recommends that the **European allocation model** be used in Asia, and that combination of models within one region should be avoided.

The European model has two paired bands for terrestrial systems, 1710 – 1785 MHz paired with 1805 – 1880 MHz, and 1920 – 1980 MHz paired with 2110 – 2170 MHz. The bands 1880 – 1920 MHz and 2010 – 2025 MHz are unpaired. For mobile satellite systems 1980 – 2010 MHz and 2170 – 2200 MHz are identified.

This is further discussed in the attached paper, **Spectrum recommendations for the bands 1700 – 2200 MHz.**

**4.1.d** The number of operators is dependent specific market factors such as spectrum availability, market demand for BBMM and potential business conditions such as costs and pricing. However as stated in our response to item

2.1, it should be pointed out that additional competition in services could be achieved through independent service providers.

**4.1.e** Since the number of infrastructure licences is limited by the scarcity of frequency spectrum, service competition based on independent content and service providers will be an important element to ensure a sufficiently wide offering of services to the end users. The licensing of such independent providers can be kept to a minimum. The interaction between operators and content/service providers must be based on commercial terms in order to provide incentives for network operators to enhance their networks in response to end-user demands and requirements.

**4.1.f** It is Ericsson's opinion that the 2G network operators have a key role to play in the 3G market. See also comment under 2.3. Infrastructure competition will be crucial for the expansion of the 3G services and must be safeguarded. Infrastructure competition will also be the basis for an intensive service competition. Content providers will play an increasingly important role in the introduction of new services. It is however hard to envisage any single route to the future multi-media services, and a healthy development of the market will necessitate a large freedom for the market players to determine themselves the desirable developments. The end-users must be the judges of their success. The relationship between all types of service providers and network operators should be based on infrastructure competition and commercial agreements. Any regulatory intervention may introduce unbalances in competition and remove the incentive for improvements in services and networks.

**4.1.g** The rollout of the 3G network and the deployment of different services should be made according to market demand, and regulatory intervention should be avoided. Infrastructure competition and national roaming between 3G and 2G operators on commercial conditions will be important elements in a smooth deployment of 3G systems over the national territory. If coverage obligations are considered necessary, they should be balanced between the wish to achieve low service prices and a quick expansion of the market, and the desire to have ubiquitous coverage. The awarding of the licences, however, should allow sufficient lead-time for the winning licensees to procure and commission the network and more importantly, to allow service innovators and providers to develop services to run on these networks.

### **Spectrum recommendations for the bands 1700 – 2200 MHz**

The spectrum 1700 – 2200 MHz is divided in different spectrum bands for mobile systems in different parts of the World. There are two main models for this, namely the European and the American allocation models, see Annex 1.

The **European allocation model** has two paired bands for terrestrial systems, 1710 – 1785 MHz paired with 1805 – 1880 MHz, and 1920 – 1980 MHz paired with 2110 – 2170 MHz. The bands 1880 – 1920 MHz and 2010 – 2025 MHz are unpaired. For mobile satellite systems 1980 – 2010 MHz and 2170 – 2200 MHz are identified.

The **American allocation model** has one paired band for terrestrial systems, 1850 – 1910 MHz paired with 1930 – 1990 MHz, and one unpaired band, 1910 – 1930 MHz. For mobile satellite systems 1990 – 2025 MHz and 2160 – 2200 are identified.

**To combine different models in one area** will however result in a fragmented allocation picture, where certain bands cannot be allocated because the corresponding paired band is not available, thus **resulting in inefficient use of the spectrum**. This can be overcome by choosing only one of the models in each country or region.

#### **Ericsson recommends:**

1.1 The **European allocation model** should preferably be used in Africa, **Asia**, Australia, Europe (incl. Russia), Middle East and Oceania. The upper paired band should be used for third generation systems (IMT-2000) such as W-CDMA. The lower paired band should be used for second generation systems or upgrades to third generation systems such as EDGE.

1.2 Allocations in the upper paired band should be **at least 2x15 MHz**, in order to allow for full performance and flexibility in service provision. It is preferred that also allocations for second generation systems in the lower paired band are at least 2x15 MHz, so that a future upgrading of the systems to third generation performance is possible. Allocations in the unpaired bands may be smaller, especially if they are combined with paired allocations.

2.1 The **American allocation model** should preferably be used in North and Latin America, in countries where extensive allocations in these bands for second generation systems already has been made. New allocations should if possible be made for third generation systems. Upgrading of second generation systems to third generation should be encouraged.

2.2 Each allocation should be **at least 2x15 MHz**, in order to allow for full performance and flexibility in service provision. It is preferred that also new allocations for second generation systems are at least 2x15 MHz, so that a future upgrading of the systems to third generation performance is possible.

3 Countries that already have made extensive allocations according to one of the above mentioned allocation models should not be encouraged to introduce the other model, even if they are located in a region that should do so according to 1.1 or 2.1 above. This will risk introducing spectrum fragmentation.

4 The **paired spectrum bands** should primarily be used for licensed **full mobility services**. No fixed only licenses should be allowed there. Licensed fixed services and unlicensed (licence-exempt) services should be allocated spectrum in the unpaired bands. However, operators with mobile systems should be allowed to use spare capacity for e.g. WLL services.

5 New spectrum for relocated fixed services should be sought above 3 GHz, in order not to interfere with the mobile extension bands that may be decided by the WRC 2000 conference.

6 All recommendations should be given with full respect for the national situation.