

30 April 2020

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EETT  
60 Kifisias Avenue  
151 25 Marousi  
Greece

Reference: *Conduct a Public Consultation on the Granting of Radio Frequency Use Rights in the 410-430 MHz band.*

Dear Madam, Sir,

I am writing to you on behalf of the 450 MHz Alliance in response to the document *Public Consultation on the Granting of Radio Frequency Use Rights in the 410-430 MHz band* released by your agency on March 23, 2020.

The 450 MHz Alliance is an industry association that represents the interests of stakeholders in wideband systems in the frequency range of 380 – 512 MHz. Our members include traditional wireless industry companies such as wireless license holders, carriers and major equipment manufacturers, as well as companies representing various vertical markets for machine-to-machine communication.

Given the nature of our organization, the 450 MHz Alliance will not apply for a license in Greece and neither will express an opinion on national topics like pricing for the license or temporary prolongation of current licenses. We do however wish to share our vision on 400 MHz communications and reflect on some of your observations and plans, hoping that it will support your decision making. We want to express our appreciation for this opportunity to be offered.

#### Wideband communications at 400 MHz

Wideband communications in the 400 MHz band can be described by the following characteristics:

- **Coverage & capacity:** thanks to the physical properties of the frequencies involved, very good coverage and very good indoor penetration is obtained with a relatively low number of sites. On the other hand: channel bandwidths above 5 MHz are not available with standardized equipment. This makes the 400 MHz band very suitable for services with high demands on coverage and low to moderate demands on capacity.
- **Reliability:** thanks to the limited number of sites needed, high protection of radio sites (such as long lasting battery backup) is economically feasible. Hence 400 MHz networks can be built according to much higher reliability standards than networks at higher frequencies.
- **Private Networks:** reliable networks with high coverage and moderate capacity are less suitable to serve mass market communication needs. Instead we see this band to be mainly used as PAMR (Public Access Mobile Radio) networks in the B2B and B2G segments for critical services.

- **Security:** as critical applications also impose high security demands, it is important to have stand-alone networks that operate independently and have no direct connections with public networks and the internet.

Typical applications we find (and see emerging) around Europe and elsewhere are communications for critical infrastructures like Smart Grids, Smart Metering, Smart Health and PPDR.

The development of a new mobile ecosystem for the 400 MHz band is a topic of great interest and is driven by the members of the 450 MHz Alliance. Historically, CDMA was globally used and a mature ecosystem exists, albeit at the end of its lifecycle. With LTE being the natural and future proof successor, standardization and operationalization of LTE400 technology has been a focal point for the 450 MHz Alliance for years already. At 450 MHz, we now see the development to gain traction as the emergence of Machine to Machine communications (M2M) has become the game changer for this ecosystem. The M2M applications for PMR/PAMR use cases including those for operators of critical infrastructures in energy, transport and health, provided for the first time an outlook on volumes of millions and even tens of millions. For the major chipset and module vendors this was the trigger to get engaged in 450 MHz. Furthermore, voice and group communication are possible with dedicated 450 MHz push-to-talk phones offering a highly resilient solution for emergency communication.

Recently, several European countries assigned spectrum in the 410 – 430 MHz range for critical communications by Electricity Grid Operators (Ireland, Poland) or PPDR (Czech Republic). Supported by advancing standardization efforts, this will definitely boost the ecosystem development in this frequency range as well.

### Standardization and Harmonization

The 450 MHz Alliance strongly believes in the potential of the 400 MHz frequency band and advocates harmonization and standardization in this field. Members of the Alliance actively contribute to standardization and harmonization in 3GPP, ITU, ETSI and ECC.

In the 400 MHz range, 3GPP defined 5 different bands for LTE communication, see figure 1. Band 87 and 88 were accepted in 2019, but standards on conformance testing and equipment are yet to be detailed. The 450 MHz Alliance pushes hard to get all this being done as quick as possible.

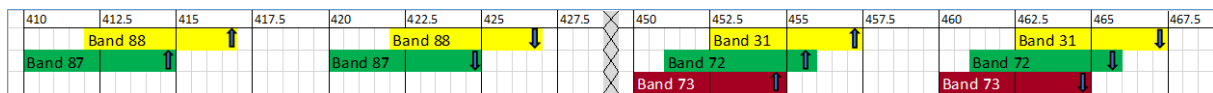


Figure 1: current 3GPP defined bands between 380 and 512 MHz

### Comments specific to the Greek proposal

In general terms, the 450 MHz Alliance welcomes the Greek initiative to make frequencies available for future national use. We believe this may prove to be very valuable for the operators of critical applications needing extremely reliable and secure wireless communications.

Commenting on the specifications in Chapter 5, the 450 MHz Alliance wants to bring the following comments up for consideration:

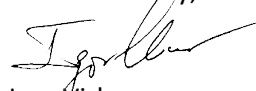
- Technology neutrality and Channel Bandwidths (section 5.1): the 450 MHz Alliance supports the concept of technology neutral licenses. It should however be taken into consideration that an operator acquiring a license in the 410 – 430 MHz band is likely to choose for an LTE based system (LTE-4, LTE-1, LTE-M and/or NB-IoT). As a consequence, useful bandwidths are in the first place 200 kHz, 1,4 MHz, 3 MHz and 5 MHz. A 1,25 MHz channel is in this respect less suitable.
- LTE Bands (section 5.1): of the 3 options mentioned for 5 MHz allocations in the 410-430 MHz range, only Option 1 (Band 88) and Option 3 (Band 87) are currently covered by 3GPP. We would therefore recommend to disregard Option 2.
- Co-existence (section 5.2): we support the conclusions by the ECC referred to in this section, with the footnote that these are generally based on conservative assumptions. Less stringent conditions could be considered but should be handled with care and be confirmed by field testing before releasing them.  
Furthermore it may be worthwhile to point at the fact that the ECC considered coexistence where the lower part of the band (so the 410-420 MHz range) is used for the Uplink (from User Equipment to Base Station) and the higher part for the Downlink (from BS to UE). In the current band plan in Greece the Up Link and Down Link seem to be reversed in comparison with the commonly applied band plan. If EETT intends to keep it this way (which from a harmonization perspective is not recommended), the co-existence evaluation may be different for a couple of cases.
- Spectral range (section 5.3): Although a block of 2x2 MHz could be filled with a 1.4 MHz LTE-1 (or LTE-M) based system plus several NB-IoT channels, a 3 MHz or even 5 MHz range would allow for a 100% use by an LTE system, which would imply a much better spectral efficiency. Although it may be difficult to make this bandwidth available, it might be a policy to take into consideration.
- Liabilities (section 5.5): given that networks in the 400 MHz band tend to be used for M2M connectivity rather than for general voice application, requirements in terms of Main Roads to be covered within 3 years may be less useful. It could be considered to specify requirements for area coverage in Urban, Sub-Urban and Rural areas instead. Also a requirement on the number of devices to be connected may be considered.

### Conclusion

The 450 MHz Alliance welcomes the plans of the EETT for assigning spectrum in the 410 – 430 MHz Band to the development of new wireless networks. The intention to comply with international standards and recommendations, including those submitted by the ECC, are strongly endorsed. In addition, the 450 MHz Alliance recommends to align with 3GPP bands 87 or 88, including the UL/DL arrangement and the standard LTE bandwidths of 1,4 MHz, 3 MHz or 5 MHz.

Dear madam, sir, the 450 MHz Alliance remains at your disposition for any further questions.

Yours Sincerely,



Igor Virker  
Managing Director



Gösta Kallner  
Chairman

**Consent:** the 450 MHz Alliance has no objections to integral publication of this memo.