

25 February 2022

Radio.Spectrum@mbie.govt.nz

Reference: 5 Year Spectrum Outlook”

<https://www.rsm.govt.nz/projects-and-auctions/consultations/five-year-spectrum-outlook-2022-2026/>

Dear Madam, Sir,

We are writing to you on behalf of the 450 MHz Alliance in response to the public consultation on the *Draft Five Year Spectrum Outlook 2022-2026* that we have read with great interest. In this response we wish to provide additional information that might be of interest for you on the lower frequency bands mentioned in the Outlook (600 MHz and below).

The 450 MHz Alliance is an industry association that represents the interests of stakeholders in CDMA and LTE systems in the frequency range of 380 – 512 MHz, which are outside the focus of the main mobile operators but address important niche use cases in many countries. 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.

The 450 MHz Alliance strongly believes in the potential of these lower frequency bands and advocates harmonization and standardization in this field. The members of the 450 MHz Alliance have successfully contributed to standardization and harmonization, and developed mature ecosystems (standards, chipsets, modules, devices, network equipment and tooling) for the lower frequency bands.

Wideband communications at 380-512 MHz

Wideband communications in the range of 380 – 512 MHz (for simplicity referred to as “400 MHz”) can be characterized as follows:

- **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 (including 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 for 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 at 400 MHz that we see around the globe are communications for critical infrastructures like Smart Grids, Smart Metering (Electricity, Gas and Water), Smart Health, Mobility and PPDR (Public Protection & Disaster Relief), amongst others. In several European countries, licenses have been assigned with the explicit demand to serve these types of use cases, either to private users (Ireland, Poland) or to operators to serve the market (Germany, The Netherlands, Austria). The network operation in Netherland is the world’s largest private network in regard to number of connected SIM cards and are only based on the 450 MHz band. It is expected that Germany and Poland will become even bigger within the next years.

Contributions from the 450 MHz Alliance

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. Since a couple of years we haven seen 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 this frequency range. Furthermore, voice and group communication are possible with dedicated 450 MHz push-to-talk phones offering a highly resilient solution for emergency communication.

The 450 MHz Alliance 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 until now 5 different bands for LTE communication, see figure 1.

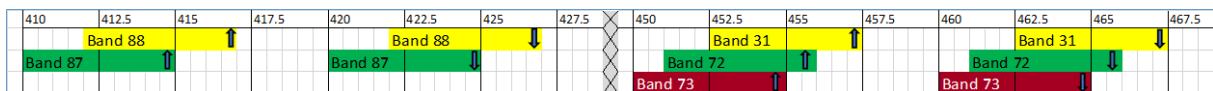


Figure 1: current 3GPP defined bands between 380 and 512 MHz

Conclusions and Recommendations

The 450 MHz Alliance recognizes the analysis done by RSM in the *Draft Five Year Spectrum Outlook 2022-2026*. The emergence of use cases that require reliable M2M/IoT solutions, combined with a growing demand for private or semi-private networks and the progress of 3GPP standardization, are the key drivers for the developments in many frequency bands. For M2M/IoT, especially the lower frequency bands are important, since they require the connectivity for many devices rather than high capacity / high throughputs per device.

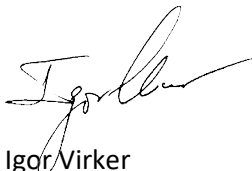
Where it comes to the 600 MHz band, we recommend to pay due attention to ecosystem development and further standardization. Active support for the new license holder might be helpful here. If the 450 MHz Alliance could be of help here by sharing our experience in such developments, we will certainly be willing to support.

The Alliance is aware that frequency bands below 600 MHz are not covered in the *Draft Five Year Spectrum Outlook 2022-2026*. Given the intense current usage at these frequencies, this is understandable. On the other hand, exactly because a rearrangement of these bands may take many years, we strongly recommend RSM to start working on a longer term vision for these bands, taking into account the international developments and the considerations we provided in this document. This may also identify the need to standardize additional frequency bands in this part of the spectrum by 3GPP. In such a case, the 450 MHz Alliance would be willing to support the definition of Work Items in the different Working Groups, where needed.

The 450 MHz Alliance is at your disposal should you require further explanation regarding any of the points raised through this response. This could be in the form of written text, phone calls or even a workshop with some of our members. Please let us know if you wish to engage in any form of further information exchange.

On behalf of the 450 MHz Alliance, we wish to express our appreciation for this opportunity to share our insights.

Yours Sincerely,

A handwritten signature in black ink, appearing to read 'Igor Virker'.

Igor Virker
Managing Director

A handwritten signature in blue ink, appearing to read 'Gösta Kallner'.

Gösta Kallner
Chairman