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Analysis of the 400 MHz band for future use in the mobile radiocommunication service

STUDY 11 · RADIO SPECTRUM · 5G & VHCN ECOSYSTEM

AT A GLANCE

Study 11 examines how the **410–430 MHz** and **450–470 MHz** bands are used across Europe and the trend toward broadband (LTE) deployment in them, and sets out scenarios for the future use of the 400 MHz band in the Czech Republic. It is designed as an evidence base for strategic spectrum decisions — relevant to every EU Member State balancing a narrowband PMR/PAMR heritage against broadband and mission-critical ambitions.

WHAT THE STUDY COVERS

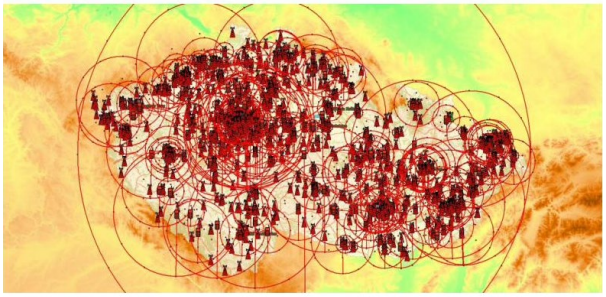
Secure, capacity-efficient radio in the 400 MHz range underpins critical operations for utilities, transport, public safety and industry. The study maps current use of the 410–430 MHz and 450–470 MHz bands, reviews the European trend toward broadband networks, and sets out concrete future scenarios for the Czech Republic.

WHY IT MATTERS

The 400 MHz band is used intensively thanks to its favourable propagation and the availability of suitable equipment. The rapid spread of ICT — smart grids, smart metering and Industry 4.0 — is driving demand for mission-critical machine-to-machine (M2M) communication, putting the long-term role of this band firmly in the spotlight.

FROM A NARROWBAND HERITAGE TO BROADBAND AMBITION

Emergency services and critical-infrastructure operators still rely on narrowband digital systems — primarily TETRA, DMR and dPMR — and these networks are still being newly built and expanded. In parallel, private broadband 4G/LTE networks are appearing in some countries. Cross-border monitoring, however, shows that actual broadband use in the band is very low, with no detections in some neighbouring states.



Regional use of 450–470 MHz in the Czech Republic: narrowband PMR coverage is dense, with congestion around Prague, Brno and Ostrava. Source: ČTÚ.

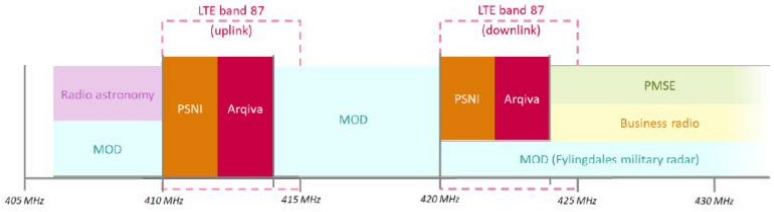
WHO USES THE BAND — SECTORS & USE CASES

Energy & utilities Voice between field crews plus remote metering and control. Grid decentralisation, renewables and smart-metering duties create strong M2M demand (typical rates 2.4 kbps–10 Mbps, high resilience).	**Transport** Operational communication across airports, railways and transport undertakings, with the emphasis on high availability and safety.
Government & public safety	**Industry, finance, retail, agriculture**

Security forces, ambulances and disaster response — the core of mission-critical and PPDR communication.	Industrial process control, cash-in-transit and retail security, and narrowband dGPS for agriculture and forestry.

HOW THE BAND IS STRUCTURED

Within the 400 MHz range, regulators sub-divide spectrum between narrowband PMR/PTMR, dedicated broadband LTE blocks (e.g. 3GPP band 87), public-safety users and, in some countries, defence. Channel widths of 6.25, 12.5 or 25 kHz are typical for narrowband use, while a contiguous block is needed for broadband.



Example band plan (United Kingdom): the 410–430 MHz range split between narrowband users, broadband LTE band 87 and other services. Source: Ofcom.

INTERNATIONAL INSPIRATION

The study surveys 28 European countries — broadband has been allocated in 22, mostly on a technology-neutral basis that allows IMT. Four implementations stand out:

Germany — 450connect
A nationwide private LTE network in 450 MHz dedicated to the energy and utility sector.

Ireland — ESB Networks
A utility-grade private network underpinning the national electricity grid.

Netherlands — Utility Connect
A shared utility LTE network supporting mission-critical M2M for grid operators.

Saudi Arabia — Aramco Digital
A large-scale private network supporting industrial and energy operations.

In addition, Slovenia and Spain have reserved spectrum for broadband public protection and disaster relief (BB-PPDR).

THE CZECH CONTEXT

The Czech Republic has some of Europe's longest experience of operating broadband networks in this band — yet public CDMA services ceased for lack of a viable business case, and the broadband sections of the 410 MHz and 450 MHz bands have been **unused since 2021**. At the same time the regulator (ČTÚ) faces a narrowband spectrum shortage in places — most acutely for TETRA in Prague, where new assignments are effectively blocked.

FOUR SCENARIOS FOR THE FUTURE

1. **Maintain the status quo —** keep the broadband reservations in both bands, preserving the option of future 4G/5G for BB-PPDR and network verticals.
2. **Release 410 MHz for narrowband —** free congested narrowband channels and allow the 450 MHz LTE block to widen to 2×5 MHz, unlocking the full 4G/5G potential.
3. **Narrow the 410 MHz broadband section —** rebalance toward narrowband while retaining a smaller broadband reservation.
4. **Remove or narrow the 450 MHz broadband block —** reallocate the reserved broadband section where demand does not materialise.

Each option carries cross-border-coordination and regulatory implications; reallocating a broadband block to narrowband PMR is, in practice, a long-term and largely irreversible step.

KEY TAKEAWAY

The 400 MHz band remains strategically important for current and future critical communications. Before any major decision on its future use, a broad public consultation should engage current and potential users — especially utilities, transport and public administration.