450 alliance.org

promoting the advancement of 450MHz worldwide.

Request for Information
for
LTE and 5G user equipment supporting 410 and 450 MHz

RFI of 450connect GmbH, Aramco Digital, ArgoNET GmbH, Cibicom, EDF, FortisAlberta, Lyse (ice), PGE, Polkomtel (Plus), SeaTelSat, SRP, Teracom, Tenaga Nasional Berhad (TNB), Transnet, Utility Connect and Oesterreichs Energie
under umbrella of the 450 MHz Alliance

February 2026

Disclaimer

This Request for Information (RFI) document is neither an agreement nor an offer and is only an invitation by 450 MHz Alliance and listed network operators to the interested parties for submission of proposals. The purpose of this RFI is to provide the vendor with consolidated requirements and information from different markets to assist the formulation of their product proposals.

This RFI does not claim to contain all the information each vendor may require. Each vendor should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information in this RFI and where necessary obtain independent advice.

450 MHz Alliance and listed network operators make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this RFI. 450 MHz Alliance and listed network operators may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information in this RFI. All information provided herein is strictly confidential.

Table of Contents

1 Introduction

The aim of this joint RFI is to provide a consolidated view on global 400 MHz spectrum 4G and 5G markets and deployments. In order to achieve better economies of scale, this RFI outlines consolidated requirements for 4G and 5G user equipment products for global deployments in 400 MHz bands b31/n31, b72/n72, b87/n87 and b88/n88.

The first LTE450 network was launched in 2014 and today the global footprint includes countries with a population of more than 750 million. LTE450 network operators may have different approaches for go to market pending on the country's level of communication infrastructure, however all 400 MHz spectrum markets share the focus on critical communication. LTE450 networks are in a unique position to address all requirements of business and mission critical applications due to the benefits of the low frequency and the ability to harden the network infrastructure at a significantly lower cost due to smaller number of sites needed for same coverage compared with higher frequencies.

There are more than hundred countries where 400 MHz band licenses are available and assigned to broadband services. The expectation is that most of these networks will have converted to LTE technology within the next two to three years.

2 Market Overview

This request for information (RFI) is done in cooperation between several network operators from multiple countries with a focus on communication a wide range of end user devices. The listed operators are 450connect, Aramco digital, ArgoNET, Cibicom, EDF, FortisAlberta, Lyse (ice), PGE, Plus, Seatelsat, SRP, Teracom, Tenaga Nasional Berhad (TNB), Transnet, Utility Connect and Oesterreichs Energie, which have operations in Austria, Canada, Denmark, France, Germany, Indonesia, Netherlands, Norway, Poland, Saudi Arabia, South Africa, Sweden and USA.

There are three operators that can not be listed due to different confidentiality issues, these will still be part of the RFI processes and will get access to the material.

2.1 Austria

ArgoNET is a specialised mobile network operator in Austria. For more than 10 years now, ArgoNET is providing private wireless network solutions to the utility sector based on its nationwide band 72 spectrum license. Since 2025 ArgoNET is owned by a joint venture of 10 distribution network operators (DSOs).

2.2 Austria

Oesterreichs Energie is the Association of Austrian Electricity Companies and represents more than 140 energy companies active in generation, trading, transmission, distribution and sales which in total cover more than 90 per cent of the Austrian electricity generation and the entire distribution

2.3 Canada

Electricity Canada is advancing the deployment of private LTE (pLTE) networks as a foundational communications layer for next generation grid modernization. A primary objective of this initiative is the establishment of a secure, utility grade 1.8 GHz pLTE ecosystem capable of supporting high reliability, low latency wireless communications. This spectrum is being positioned to meet the increasing bandwidth, security, and deterministic performance requirements associated with advanced metering infrastructure (AMI), distribution automation (DA), fault location, isolation and service restoration (FLISR), and high penetration distributed energy resource (DER) integration.

With additional operational bands—most notably the 450 MHz band—becoming available for pLTE, there is a growing need to evaluate the propagation characteristics, network capacity, and interference environment of these spectrum options. Lower band frequencies such as 450 MHz present significant advantages for wide area utility coverage due to improved diffraction, extended cell radii, and stronger in building penetration, making them viable candidates for rural and remote grid applications.

FortisAlberta Inc., a participating member of Electricity Canada, is actively executing field and lab based evaluations of multiple pLTE technologies across diverse frequency bands. These assessments include benchmarking radio performance, backhaul integration architectures, QoS management, latency profiles, and interoperability with existing operational technology (OT) systems. With several spectrum bands and OEM solutions under consideration, FortisAlberta's objective is to identify the pLTE configuration that delivers the highest reliability, scalability, and operational alignment with its distribution network and application portfolio.

2.4 Denmark

Cibicom operates a nationwide LTE network in Denmark on the 450 MHz band (Band 31), which was upgraded to LTE in 2015, and a total renewal of the radio and core network was done in 2020. The network delivers both mobile broadband (MBB) and machine-to-machine (M2M) services, achieving over 92% geographic coverage across the country. Cibicom provides M2M solutions to several companies in the utility sector, and the company's strategic focus has shifted entirely towards business-critical communications, including eMTC, with an emphasis on connectivity, management, and security across diverse markets.

2.5 France

EDF group with AGURRE is discussing the French regulation ARCEP since the end of the 2010s to open a 2x3 MHz frequency bloc in the 450 MHz. This action made good progress in 2025 with a broader group of French stakeholders interested. This led to an onsite test authorization in Cantal, using an Enedis site during one week in November. In 2026 EDF group and all the other stakeholders would like to assess the technical and economics conditions for a France wide network 453-456 x 463-466 MHz, including our oversea territories.

2.6 Germany

450connect is operating Germany's nationwide 450-MHz mission-critical network for utilities and other critical-infrastructure sectors. Supported by 70+ utility shareholders—including Alliander, E.ON, a consortium of regional energy suppliers and the Utilities Alliance 450—providing strong operational expertise behind the network. Building on earlier CDMA450 operations, 450connect has deployed an LTE450 network (Band 72) now covering more than 95% of Germany. The 450connect platform delivers resilient emergency voice and secure M2M connectivity on a non-discriminatory basis for operators of critical infrastructures such as energy, water, transport, healthcare, logistics, and smart-city applications - providing secure, highly available communications that strengthen national resilience and enable the digital transformation of essential services.

2.7 Indonesia

SeaTelSat are sourcing hardware for two initiatives in Indonesia: a Rural Connectivity project utilizing LTE B31 with GEO satellite backhaul, and a Private LTE network for MCx, Smart City, and IoT applications.
The business require LTE Cat-4 B31 modems (indoor/outdoor) equipped with Ethernet and Wi-Fi interfaces and capable of supporting external Yagi antennas, as well as a portfolio of MC-PTT and smart IoT devices (IP cameras, sensors, meters,etc). Devices shall support LTE, LTE-M, or NB-IoT technologies with mandatory support for B31/B72.

2.8 Malaysia

Tenaga Nasional Berhad (TNB) is currently exploring the use of the 450 MHz band to support future mission-critical communication requirements across its smart grid operations. Initial implementation activities in Band 31 are being

undertaken to evaluate coverage characteristics, technology performance and operational considerations for utility-related applications.

The assessment is intended to support TNB's long-term communication strategy, with a focus on enabling reliable, secure and scalable connectivity for critical infrastructure services.

2.9 Netherlands

Utility Connect is a wireless service provider (Utelco) in the Netherlands operating a private and standalone wireless network. UC provides connectivity for smart assets and for the control and operations of vital infrastructures in The Netherlands. Emergency voice communication and data will also be included the service portfolio, starting with voice on LTE-M developing towards LTE voice in 2034.

Utility Connect is a joint venture by Alliander and Stedin, two Distribution System Operators (DSO) in The Netherlands who cover more than 60% of the Dutch power grid. Currently, Utility Connect is deploying a CDMA2000 1xRTT based network in the 450 MHz band to serve Dutch DSO's with connectivity for Smart Meters, Public Lighting and Distribution Automation. The current users are Alliander and Stedin as well as Westland Infra. Approximately 3.3 million devices are connected. The CDMA network will remain operational until the end of 2034.

In May 2025, the shareholders of Utility Connect gave their approval to build a new wireless network based on LTE-M technology, to run in parallel with the CDMA-network. The LTE-M network will initially use a 2x 1.4 MHz spectrum in Band 72, for which a license was obtained that is valid until 2050. As of 2035, 2x 3MHz will be available for this 4G/5G network. It is expected that more Dutch DSO's as well as other operators of critical public infrastructures will make use of the future services of Utility Connect which will result in millions of devices to be connected to UC's LTE-M network. All devices rolled out these days are tested and accredited to be connected to the network in 2028, when it's live using GSMA Remote SIM Provisioning technology.

2.10 Norway

Lyse Tele AS is a leading Norwegian telecommunications company within the Lyse Group, providing mobile, broadband, and digital infrastructure services nationwide. The company operates through well-known brands such as Altibox, delivering high-speed fiber broadband, and ice, which operates a national 4G and expanding 5G mobile network. Lyse Tele focuses on building robust, future-oriented networks with high quality, security, and customer value, playing a key role in Norway's digital development.

2.11 Poland PGE

PGE Polska Grupa Energetyczna, Poland's largest power company serving nearly six million customers, is pursuing a 2035 strategy centered on renewable energy development, system flexibility, modern grid and heating infrastructure, and a path toward climate neutrality by 2050. To support these ambitions, PGE is deploying the nationwide LTE450 network using frequencies legally reserved for the energy sector. LTE450 replaces outdated communication systems and enables reliable dispatcher communication, smart grid operations, remote metering, asset management, and integration of renewable energy and electric vehicle charging. Built on the 3GPP standard, the network ensures resilience, independence from commercial operators, and continuity of service during extended power outages. Its architecture integrates local DSO infrastructure with centralized oversight, providing a secure nationwide system that strengthens Poland's digital and energy security.

2.12 Poland Plus

The Polish operator Polkomtel (marketed as Plus) completed the implementation of its LTE network in the 410 MHz (B87) band in 2025. Currently, it has 95% coverage. The primary services it plans to provide are MCX systems and data transmission for critical infrastructure. Both the services and the network are designed for business customers requiring a resilient cellular network with call prioritization and guaranteed operation in crisis situations.

2.13 Saudi Arabia

Aramco Digital is deploying a nationwide 450 MHz private broadband network in Saudi Arabia to support mission- and business-critical industrial communications across energy, utilities, transportation and other key industrial sectors. Using the unique propagation and coverage characteristics of the 450 MHz band, the network will deliver robust outdoor and deep-indoor coverage for remote operational sites, pipelines, plants and ports in harsh environmental conditions.

2.14 South Africa

Transnet is a logistics Company based in South Africa that is in the process of implementing a Mission Critical LTE networks for operations in the Railway, Port and Petroleum Pipeline environments. As part of the deployment Transnet would like to source peripheral devices that can operate for MCPTT, MCDATA, MCVIDEO and IOT applications.

2.15 Sweden

Teracom currently runs a nationwide LTE network operating in the 450 MHz band 31 and 2.3 GHz B40.
Teracom currently provides both MBB and M2M services with over 95% geographical coverage. Teracom already provides M2M service for several companies within the utility sector in Sweden. The company focus has entirely shifted towards pure business critical communication position for including connectivity, management and security within the different market segments.

2.16 USA

SRP provides affordable, reliable water and power to more than two million people in Central Arizona. The District operates an integrated electric system that generates, purchases, transmits, and distributes power to residential, commercial, industrial, and agricultural customers across a 2,900-square-mile service territory in portions of Maricopa, Gila, and Pinal counties, as well as providing service to mining operations in an adjacent 2,400-square-mile area. In addition, the Association manages SRP's irrigation and drainage system as the District's agent, overseeing the operation and maintenance of the infrastructure that delivers raw water for irrigation and municipal treatment to approximately 248,000 acres within major cities across Central Arizona.

To ensure the continued safe, reliable, and efficient delivery of both power and water, SRP has undertaken significant modernization initiatives across its grid, field operations, and water systems. These initiatives rely increasingly on automated devices, intelligent sensors, and real-time data to support system visibility, situational awareness, and operational decision-making. As these automated systems expand, they require a secure, high-performance wireless communications foundation capable of supporting low-latency control, field mobility, and large volumes of telemetry.

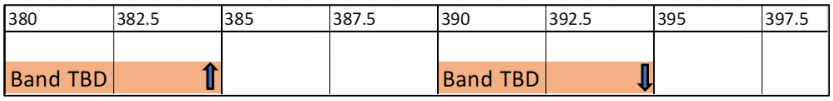
To meet these needs, SRP is evaluating the deployment of a Private LTE (PLTE) network to provide advanced wireless telecommunications across its power and water service territories. A PLTE network would enable SRP to reliably manage thousands of field devices—including grid automation equipment, water delivery infrastructure, and emerging AI-enabled operational tools through a unified, utility-grade communications platform. Implementing PLTE requires access to dedicated Radio Frequency (RF) spectrum, and SRP is therefore pursuing spectrum resources that will ensure long-term reliability, cybersecurity, and capacity for future growth.

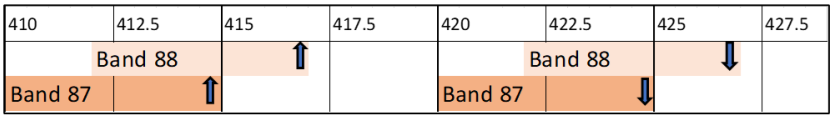
3 Deployment Scenarios

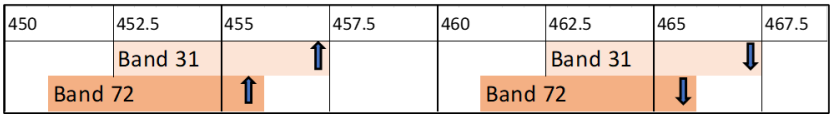
400 MHz network operators are looking for a range of devices for 4G/5G broadband, voice services, eMTC/LTE-M and NB-IoT for machine-to-machine services. Typical use cases would be smartphone, rugged smartphone, mission

critical push to talk, industrial routers/gateways, rugged routers/gateway, smart metering, smart grid, tracking devices, drone, body camera and other type of sensors and devices.

The mandatory spectrum bands to be supported are listed below, at least one of the bands are required to be supported by the device.







LTE band 31 (452,5-457,5 MHz and 462,5-467,5 MHz) was introduced in 3GPP Release 12 and supports 1.4, 3 and 5MHz carrier bandwidth. As part of 3GPP Release 15 band 72 (451-456 MHz and 461-466 MHz), band 87 (410-415 MHz and 420-425 MHz) and band 88 (412-417 MHz and 422-427 MHz) including support for eMTC and NB-IoT. In 3GPP Release 19 5G bands n31 and n72 with 5 MHz carrier and in 3GPP Release 20 5G band n87 and n88 with 5 MHz carrier bandwidth.

Operators participating in this RFI are either using LTE band 31, 72 or 87 in their networks, but may also use a combination of all bands as part of the same radio infrastructure. The networks are running LTE with single carrier (e.g. 1.4 MHz, 3 MHz, 5 MHz) or multiple carrier configurations either within the band or over multiple bands.

First 5G networks are expected during 2026. The first commercial volume will be required during 2027.

4 Product Requirements

This RFI is open for all types of devices with support of the 3GPP bands b31, n31, b72, n72, b87, n87, b88 and n88. Products shall support 3GPP and GSMA SIM standards.

The supplier shall specify spectrum supported by their devices and well as carrier bandwidth. The supplier shall specify the number and type of SIM cards supported by the devices. All parameters shall be provided and submitted in appendix 1. Instructions for Appendix 1 below.

Manufacturer Information	Guide
Company Name	Name
Headquaters Country	Country
Device Manufacturing Country	Country
Willingness to Manufacture in Brazil	Yes/No
Willingness to Manufacture in EU	Yes/No
Willingness to Manufacture in KSA	Yes/No

Willingness to Manufacture in USA	Yes/No
Device Details	
Device Type	Listed device types in pull down menu
Device Function	Short over description
Model(s)	Name and/or number
Chipset	Main processor and communication chipset or chipsets
Firmware / OS	Name and release, support for GMS applications (Google Mobile Services)
SIM card support, UICC, eUICC, iUICC	Including description of Dual/multi-SIM support (DSDS), SIM form factor typical Mini, Nano-SIM support, in case of physical SIM and MEP support (Multiple Enabled Profiles) with typical 2 or 2+ eSIMs active simultaneously.
CAT-x support	
eMTC, LTE-M, CAT-M support	Yes/No
NB-IoT, CAT-NB support	Yes/No
RedCap support	Yes/No
VoLTE	Yes/No
VoNR	Yes/No
Power Class Identification	Per band if different per band
MCx support	Yes/No, list verified interoperability with MCX server suppliers.
External controls	Typical volume, push to talk (PTT) (MCx supported), group select for PTT, emergency button, etc.
Device to device communication support (direct mode)	Typical 4G and 5G Sidelink or TETRA/DMR DMO (Direct Mode) fallback or similar for ProSe (Proximity Services)
Network Features	Support of CAG (Closed Access Group) feature for Network Slicing, Support of Private PLMN ID support (general and country specific). Configurable Auto-SIM Switching functionality based on RSRP and network failure.
Temperature Rating	Specify in Celius
Environmental Rating	Ruggedization standards IP and MIL (e.g. MIL-STD 810H)
External Antenna Port	Connector type and number of ports
WAN/LAN Ports	Connector type and number of ports
List of Accessories	List accessories and amend data sheet
Frequency & Band Support	
410 and 450 MHz Support	Mandatory to support at least one of the 410 and 450 MHz bands
Band-87 Support	Yes/No
n-87 Support	Yes/No
Band-72 Support	Yes/No

n-72 Support	Yes/No
Band-31 Support	Yes/No
n-31 Support	Yes/No
700 MHz Support	Yes/No
Band-28 Support	Yes/No
n-28 Support	Yes/No
Band-68 Support	Yes/No
n-68 Support	Yes/No
850 MHz Support	Yes/No
Band-26 Support	Yes/No
n-26 Support	Yes/No
Band-27 Support	Yes/No
n-27 Support	Yes/No
900 MHz Support (USA)	Yes/No
Band-106 Support	Yes/No
n-106 Support	Yes/No
1600 MHz Support (USA)	Yes/No
Band-54 Support	Yes/No
n-54 Support	Yes/No
2300 and 2600 MHz Support	Yes/No
Band-40 Support	Yes/No
n-40 Support	Yes/No
Band-38 Support	Yes/No
n-38 Support	Yes/No
Band-41 Support	Yes/No
n-41 Support	Yes/No
3700 to 4200 MHz Support	Yes/No
n-77 Support	Yes/No
4800 to 4990 MHz Support	Yes/No
n-79 Support	Yes/No
Additional LTE Bands	List additional LTE band according to 3GPP
Additional 5G Bands	List additional 5G band according to 3GPP
Advanced Features	
GNSS receiver for location-based services	Yes/No
LEO NTN Support	Yes/No
GEO NTN Support	Yes/No
Compliance & Certification	
ATEX Zone 0	Yes/No
ATEX Zone 1	Yes/No

ATEX Zone 2	Yes/No
SANS 3000-2-4	Yes/No
TFR.015-A-VSCC, RSR 00-2-5-1:2022	Yes/No
RoHS certified	Yes/No
CE (Conformité Européenne) certified	Yes/No
GCF certified	Yes/No
Anatel certified (Brazil)	Yes/No
Commercial & Standards	
Unit Price for 1,000 Units	USD
Unit Price for 10,000 Units	USD
Unit Price for 100,000 Units	USD
Available for order	Todays date if already commercially available
Lead time from order to delivery	In days, weeks or months
API Format Support	List API's available supported by the device
VPN Support	Specified supported VPN options
3GPP release	Release number
Device Management Support	Specify interface (TR0069, SNMP, etc) and if off the shelf software is available.
450 MHz Alliance Member	

There is specific request of rugged smartphone with large and small screen, tablets with a 10" inch screen, industrial routers and MiFi with battery. Low power devices for assets, persons and vehicle tracking, temperature and vibration sensors. Cameras and body cameras are of great interest as well as drones for multiple uses case, typical power line management, surveying of areas, etc. The preference is to have device with go edge computer capabilities with lower bandwidth requirement in the network.

5 Product Proposal

The following information shall be included in the response.

5.1 Technical specifications

The suppliers shall include all relevant information for the device including radio and environmental specifications, 3GPP release compliance, host interfaces, approvals security solution, positioning solutions, software solution including OTA, evaluation kit, etc.

The suppliers shall provide detailed information on the target power consumption of device. Values for all possible operating modes like TX @dBm, RX, idle and sleep shall be provided, incorporating the use of eDRX and PSM features using default parameters.

The supplier shall disclose the baseband and radio chipsets proposed for the device designs.

The supplier shall describe hardware and software functionalities for implementation of user space applications on the device embedded application processor(s).

The supplier shall describe the functionality of supporting multiple PDN connections per device (e.g. multiple bearers associated with different APNs or using multiple IP addresses.

5.2 Lead time

Shall include date for first delivery of engineering samples and commercial samples. Lead time for forecasted and not forecasted orders shall be provided.

5.3 Volume Forecast

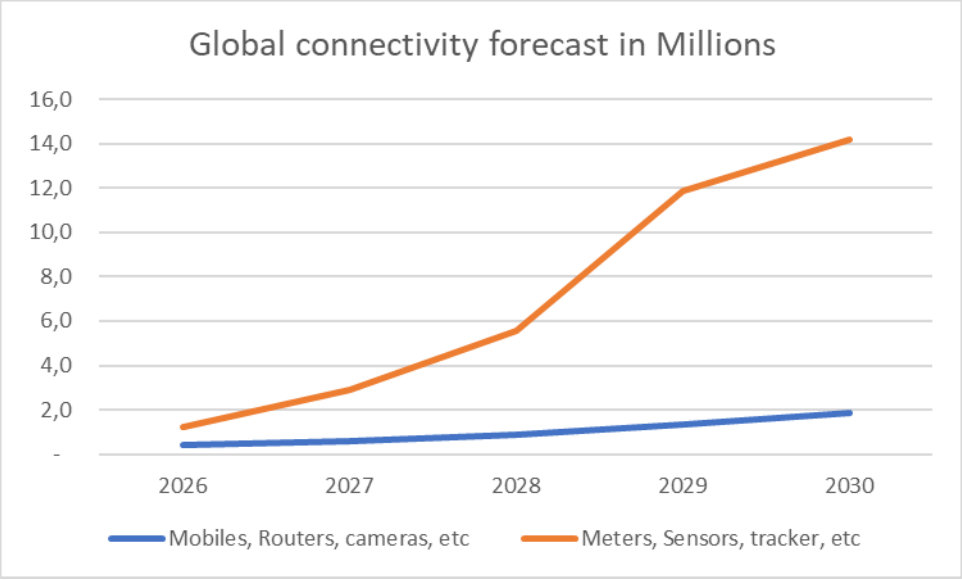
Below table presents non-binding forecast for estimated volume by the participating network operators and forecast from the Annual spectrum update report information. This forecast does not yet include numbers from further 450MHz markets which may join the process at a later stage.

Meters, Sensor, trackers, and other low-capacity use cases:

Year	2026	2027	2028	2029	2030
Total, in '000	1 228	2 923	5 570	11 840	14 150

Mobiles, Routers, cameras and other broadband use cases:

Year	2026	2027	2028	2029	2030
Total, in '000	420	610	892	1 330	1 840



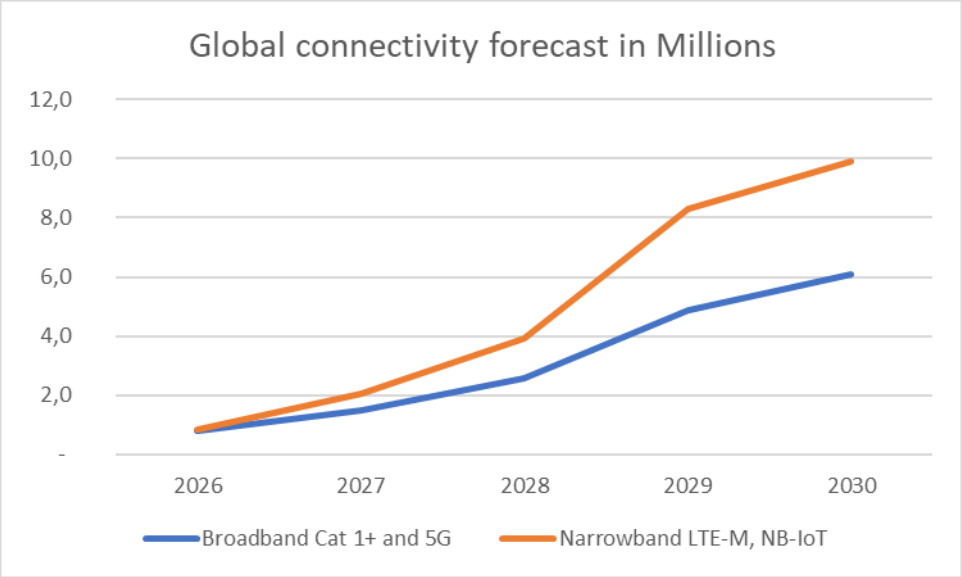
Graph 1. Annual volumes of terminals.

Narrowband devices LTE-M and NB-IoT:

Year	2026	2027	2028	2029	2030
Total, in '000	860	2 046	3 899	8 288	9 905

Broadband device 4G Cat-1+ and 5G:

Year	2026	2027	2028	2029	2030
Total, in '000	789	1 487	2 563	4 882	6 085



Graph 2. Annual volumes of terminals.

5.4 Commercial Proposal

A commercial proposal shall be provided by the vendor. The proposal shall include general terms, minimum order quantities (MoQ) and non-binding price indications for order quantities of 1k, 10k and 100k units.

The commercial proposal shall allow contract negotiations & procurement either by operators individually or by a syndicate / group of operators as part of a joint procurement process. The latter may be implemented for synergies on MoQ and NRE related terms.

Subsequent orders for higher volumes may also be placed by selected device suppliers directly to the module vendor.

5.5 Confidentiality

All information provided herein is strictly confidential and subject to the existing non-disclosure agreements (NDA) between the participating network operators and the vendor.

In case of lack of NDA between the selected listed network operator and the vendor, please contact Gösta Kallner (gosta.kallner@450alliance.org) for further clarification before submitting any confidential information in the vendor's answer to the 450 MHz Alliance that cannot be distributed to all listed network operators in the RFI.

6 Vendor Answer and Timeline

The RFI requires appendix 1 to be submitted with data sheet for the product.

The response to this RFI, including all documentation and all additional information shall be provided in a standardized PC-readable format (i.e. .doc, .xls, .pdf).

Please provide the response not later than 22nd March 2026. In case of questions we suggest a phone conference with our team for fast clarification. The contact person for all questions regarding these requests is:

Gösta Kallner

Email: gosta.kallner@450alliance.org

The schedule for clarifications and submission is as follows:

- Vendors' questions with regard to this RFI to be sent until 12th March 2026
- 450MHz Alliance and participating network operators' clarification until 16th March 2026
- Proposals to be submitted until 22nd March 2026

7 Acronyms

3GPP	Third Generation Partnership Project
APN	Access Point Name
CDMA	Code Division Multiple Access
CE Mode	Coverage Enhancement Mode
eDRX	extended Discontinuous Reception
eMTC	enhanced Machine Type Communication
eUICC	embedded Universal Integrated Circuit Card
iUICC	integrated Universal Integrated Circuit Card
EVDO	Evolution Data Optimized (member of CDMA2000 standard family)
FDD	Frequency Division Duplex
GEO	Geo Satellite system
GNSS	Global Navigation Satellite System
H-FDD	Half Duplex Frequency Division Duplex
HW	Hardware
IC	Integrated Circuit
IoT	Internet of Things
LCC	Leadless Chip Carrier
LEO	Low Orbit Satellite
LGA	Land Grid Array
LTE	Long-Term Evolution
M2M	Machine to Machine
MBB	Mobile Broadband
MCX	Mission Critical services
MoQ	Minimum Order Quantity
MTC	Machine Type Communication
NB	Narrowband
NDA	Non-Disclosure Agreement
NRE	Non-Recurring Engineering
NTN	No-Terrestrial Network
OMA-DM	Open Mobile Alliance Device Management
OMA-LW-M2M	Open Mobile Alliance Lightweight M2M
OTA	Over the Air
PA	Power Amplifier
PCIe	Peripheral Component Interconnect Express
PDN	Packet Data Network
PSM	Power Saving Mode
QAM	Quadrature Amplitude Modulation
QCI	QoS Class Identifier
QoS	Quality of Service
RF	Radio Frequency
RFP	Request for Proposal
RX	Receive
SKU	Stock Keeping Unit
SW	Software

TEE	Trusted Execution Environment
TX	Transmit
UE	User Equipment
UICC	Universal Integrated Circuit Card
Vo5G	Voice-over 5G
VoLTE	Voice-over-LTE