

**A positive trend is emerging in the market due to the availability of new spectrum for private enterprises.**

EUWENA recognised the urgent need to promote the greater uptake of 3GPP-based private mobile broadband networks and to speed up the regulation processes for the availability and harmonisation of sufficient frequency spectrum dedicated to today's industry users.

EUWENA endeavours to keep track of the pan-European spectrum situation. One of our remits will be to 'defend' spectrum interests for private verticals users towards the regulators, to achieve availability and harmonisation for all!

To promote broadband private wireless networks spectrum interests, EUWENA has compiled a country-friendly spectrum MAP, that via a simple scoring system brings into view the countries who are already promoting EU spectrum harmonisation with available spectrum and bandwidths, especially 2.6GHz and 3.8GHz – 4.2GHz.

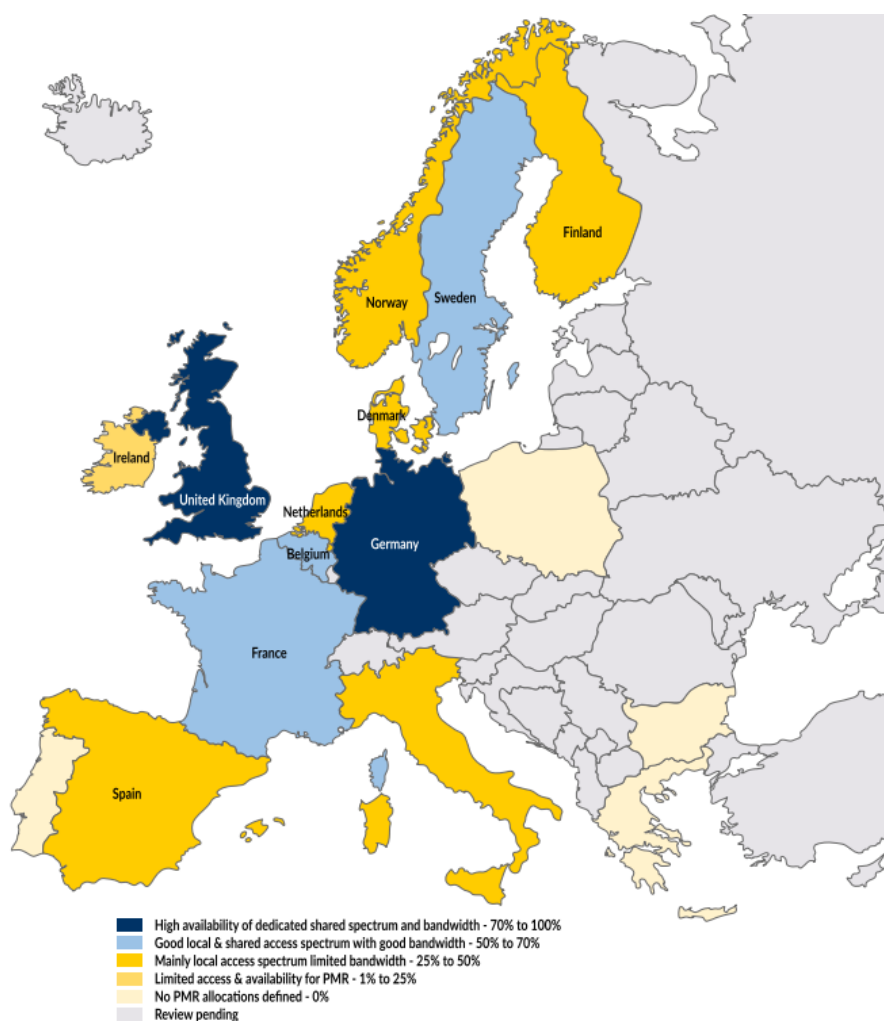
The scoring system is based on a combination of three factors with relation to spectrum accessibility for private enterprise networks. The higher the % threshold score relates to the better a, license option, availability, accessibility, and bandwidth options made available by a country.

- **Band popularity:** A further bonus point is awarded for interesting bands such as 700MHz to 900MHz, or 2.6GHz and 3.4GHz, which have more compatibility between devices and are already or are being made available. 26GHz being a new band, is very restrictive in terms of coverage reach and hence this band is seen as mainly intended for indoor usage.
- **Bandwidth:** A higher score is awarded for larger bandwidths i.e.,  $\geq 20$ MHz.
- **License type:** The final score for popularity and bandwidth are multiplied by a coefficient that relates to the license type available for a private enterprise network. Whereby, Shared licenses, being a dedicated band for enterprises, is more valuable

and attractive than a Local Access license which is owned and leased by an MNO or a temporary R&D license for non-commercial research.

- High availability of dedicated shared spectrum and bandwidth - 70% to 100%
- Good local & shared access spectrum with good bandwidth - 50% to 70%
- Mainly local access spectrum limited bandwidth - 25% to 50%
- Limited access & availability for PMR - 1% to 25%
- No PMR allocations defined - 0%
- Review pending

## Thresholds and definition



ACCESS TO SPECTRUM FOR PRIVATE ENTERPRISE USERS:  
LOCAL ACCESS, SHARED LICENSED, PRIVATE LICENSE OR OPEN ACCESS



## **European Users Wireless Enterprise Network Association**

EUWENA is aware of the difficulty for private individuals to understand the complex environment around private local use spectrum availability in their country. Harder still to fathom out are the licencing conditions, pricing schemes, technical jargon, and the complicated application process. Therefore, EUWENA has tasked itself to simplify this process by compiling a spectrum information observatory. This observatory will be updated annually with more countries being added with a concise overview of the available European frequency spectrums by country for your reference, for private corporate and industry individuals who wish to implement their own private local mobile network.

This information is presented per country across three bands:

### **LOW < 1 GHz**

Typically used in the utility industry for IoT services that require very wide penetrative coverage with low infrequent data rates, with a range of bandwidths from 1.3 MHz typically up to 10 MHz

### **Medium 1 GHz to 6 GHz**

Bands typically used by public mobile operators, from data rates with 25 Mbps\* and wide coverage to very local or confined, short-range coverage with high data rates over 300 Mbps\*. Bandwidths range from 5 MHz to 100 MHz (\*SiSo).

### **HIGH > 6 GHz**

High frequency bands with very high data rates up to 1 Gbps, Typical applications are very local and short range such as point-to-point links.

For each country, we provide the reader with a high-level summary overview, spectrum availability, bandwidths, pricing schemes, applications, and other useful links. In addition, we will annually publish this information and continue to include additional countries both



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European and international. To keep you updated, we will post news of ongoing or planned consultations relating to licensing changes or new spectrum availability for private users.

Furthermore, EUWENA will be available to support your outstanding questions related to the spectrum policies.



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz &amp; Medium Band 1 GHz – 6 GHz</b>  <b>700 MHz, 900 MHz, 1400 MHz, 1800 MHz, 2100 MHz and 2600 MHz</b></p> <p>Public auctioned bands but not offered as “private radio communication licenses”. However, BIPT can issue licenses (per radio site) for the use of private radio networks for the following categories:</p> <ul style="list-style-type: none"> <li>• Category 1: private mobile radio communications networks except the ones under Category 3. These include private mobile radio communications networks used for professional ends, for instance by taxi companies, factories, etc. (permanent licence) or at construction sites, events, etc. (temporary licence)</li> <li>• Category 3: mobile radio networks set up by governmental bodies, companies active in transportation by railways and public transport companies, hospitals, and bodies for medical or social help for strictly humanitarian and non-profit purposes. This category aims at a similar use as category 1 licences, only the licence holder has a different capacity.</li> <li>• Category 9: private radio networks or stations             <ul style="list-style-type: none"> <li>a) use for trials or testing – such as 5G test licenses</li> </ul> </li> </ul> <p><b>3.8-4.2 GHz</b> Royal decree on 4<sup>th</sup> June 2023 has enabled the BIPT to identify a 200 MHz band for enterprises.</p> <ul style="list-style-type: none"> <li>• Up to 40 MHz each for private local networks utilising 5G technology in the 3800-4200 MHz band.</li> <li>• Imposed TDD configuration DDDSU (NR slotformat #32) but for 3860 MHz.</li> <li>• Applications are open and can be requested via completing an online form.</li> </ul> <p>Current proposal is:</p> <p><b>High Band &gt; 6 GHz</b>            No spectrum identified for PMR</p>		
<b>DETAILS</b>	<b>LOW &lt; 1 GHz</b>	<b>MEDIUM 1 GHz to 6 GHz</b>	<b>HIGH &gt; 6 GHz</b>
<b>AVAILABLE BANDS</b>	<p><b>700 MHz, 900 MHz</b></p> <p>Applications available for temporary restricted private radio communications licences in &lt; 1 GHz with the BIPT. These are not subject to public country auction rules.</p>	<p><b>1800 MHz, 2100 MHz<sup>2</sup></b></p> <p>Applications available for restricted temporary private radio communications licences with the BIPT. These are not subject to public country auction rules.</p> <p><b>3.8-4.2 GHz:</b> Maximum 40 MHz<sup>1</sup> for enterprise use are available, application open since June 2023.</p>	<p><b>26 GHz</b></p> <p>No spectrum identified for PMR networks, but test licenses are available on application.</p>
<b>BANDWIDTH</b>	Subject to request	<sup>2</sup> Subject to request, <sup>1</sup> 40 MHz	Subject to request
<b>SUPPORTING INFORMATION/LINKS</b>	A new operator Citymesh ( <a href="https://www.citymesh.com/">https://www.citymesh.com/</a> ) is offering enterprise B2B PMR network solutions utilising awarded auctioned national spectrum of 95 MHz across all bands from 700 MHz – 3600 GHz.		
<b>PRICE: INITIAL/YEAR/HZ</b>	<b>3.8-4.2 GHz:</b> 1000 € initial plus yearly fee 0.00001 x (R/100) <sup>2</sup> € /Hz where R is the site radius in metres		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	A Royal decree to set an appropriate framework for Low band spectrum specific to PMN use is ongoing.		
<b>APPLICATION LINKS</b>	<p>Applications for enterprise spectrum in <b>3.8-4.2 GHz:</b> <a href="https://www.bipt.be/operatoren/publicatie/raadpleging-over-het-ontwerpbesluit-betreffende-de-private-lokale-netwerken-in-de-3800-4200mhz-band">https://www.bipt.be/operatoren/publicatie/raadpleging-over-het-ontwerpbesluit-betreffende-de-private-lokale-netwerken-in-de-3800-4200mhz-band</a></p> <p>In BIPT a test licence can be issued for private radio networks or stations for 5G experiments, trials or testing as indicated in <a href="https://www.bipt.be/operators/publication/request-form-to-obtain-a-licence-for-experiments-or-tests">https://www.bipt.be/operators/publication/request-form-to-obtain-a-licence-for-experiments-or-tests</a> and <a href="https://www.bipt.be/operators/tests-rd">https://www.bipt.be/operators/tests-rd</a></p>		
<b>CONTACTS/LINKS</b>	<a href="https://www.bipt.be/operatoren/algemene-machtigingen-voor-radiospectrumgebruik">https://www.bipt.be/operatoren/algemene-machtigingen-voor-radiospectrumgebruik</a>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b> No spectrum designated, for private mobile networks.</p> <p><b>Medium Band 1 GHz – 6 GHz</b> No spectrum designated, for private mobile networks. Interestingly the 3.6 GHz spectrum has already been awarded to the 3x local public MNOs for 5G networks.</p> <p><b>High Band &gt; 6 GHz</b> No spectrum designated, for private mobile networks.</p> <p><b>Test and Trial News:</b></p>		
<b>DETAILS</b>	<b>LOW &lt; 1 GHz</b>	<b>MEDIUM 1 GHz to 6 GHz</b>	<b>HIGH &gt; 6 GHz</b>
<b>AVAILABLE BANDS</b>	No spectrum designated, for private mobile networks.	No spectrum designated, for private mobile networks.	No spectrum designated, for private mobile networks.
<b>BANDWIDTH</b>			
<b>SUPPORTING INFORMATION/LINKS</b>	06-02-2023 For the present there are no plans to allocate frequency spectrum bands for the sole use of private companies.		
<b>PRICE: INITIAL/YEAR/HZ</b>			
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	In line with European Spectrum Policy, the Communications Regulation Commission will provide regulatory conditions for the use of spectrum for 5G networks for sharing or spectrum sharing agreements when available.		
<b>APPLICATION LINKS</b>			
<b>CONTACTS/LINKS</b>	info@crc.bg: Stanislava Yordanov, Secretary General, Communications Regulation commission <a href="https://crc.bg/">https://crc.bg/</a>		



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<p><b>SUMMARY COMMENTS</b></p>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology</b> Current public networks licences are due to expire from Q4 2025, consultations being conducted for the provision of the 800 MHz, 1800 MHz &amp; 2600 MHz spectrum for the rollout of digital infrastructures.</p> <p><b>Low Band &lt; 1 GHz</b> <b>450 MHz</b> Has been allocated to “450connect GmbH”, the course is set for the digitization of the energy and transport transition. <b>800 MHz, 900 MHz:</b> Currently no provision for private mobile networks in these bands.</p> <p><b>Medium Band 1 GHz – 6 GHz</b> <b>2600 MHz:</b> Currently no provision for private mobile networks in these bands. <b>3.7 – 3.8 GHz:</b> local private mobile networks available, including in particular assignments for campus business/commercial/industrial premises, assignment on a technology-neutral basis.</p> <p><b>High Band &gt; 6 GHz</b> <b>26 GHz</b> TDD spectrum assignments for local broadband spectrum</p>		
<p><b>DETAILS</b></p>	<p><b>LOW</b> &lt; 1 GHz</p>	<p><b>MEDIUM</b> 1 GHz to 6 GHz</p>	<p><b>HIGH</b> &gt; 6 GHz</p>
<p><b>AVAILABLE BANDS</b></p>	<p><b>450 MHz</b> in 2020 made available nationwide for wireless network access, primarily for critical infrastructure applications <b>800 MHz, 900 MHz:</b> usage rights for frequencies expire at the end of 2025</p> <p><b>3.7 – 3.8 GHz:</b> TDD Spectrum available for local private mobile campus networks</p> <p><b>26 GHz:</b> 24,25 27,5 GHz spectrum assignments for local broadband spectrum</p>		
<p><b>BANDWIDTH</b></p>	<p>NA</p>	<p>Allocated in multiples of 10 MHz bandwidth on application</p>	<p><b>325 MHz</b> Blocks in multiples of 50 MHz up to 150 MHz assigned for individual spectrum usages.</p>
<p><b>SUPPORTING INFORMATION/LINKS</b></p>	<p>Details can be found in following link: <a href="https://www.bundesnetzagentur.de/DE/Fachthemen/Telekommunikation/Frequenzen/OeffentlicheNetze/LokaleNetze/lokalenetze-node.html">https://www.bundesnetzagentur.de/DE/Fachthemen/Telekommunikation/Frequenzen/OeffentlicheNetze/LokaleNetze/lokalenetze-node.html</a> <a href="https://www.bundesnetzagentur.de/DE/Fachthemen/Telekommunikation/Frequenzen/start.html">https://www.bundesnetzagentur.de/DE/Fachthemen/Telekommunikation/Frequenzen/start.html</a></p>		
<p><b>PRICE: INITIAL/YEAR/HZ</b></p>	<p><b>3.7 – 3.8 GHz</b> Fee = 1000 + B * t * 5 * (6a1 + a2).</p> <ul style="list-style-type: none"> <li>• 1,000 indicates the basic amount in euros,</li> <li>• B denotes the bandwidth in MHz (min. 50 MHz),</li> <li>• t the term of the allocation in years (e.g. 15 years),</li> <li>• a is the area in km<sup>2</sup> with a differentiation between settlement and traffic areas (a1) and other areas (a2).</li> </ul> <p><b>Note:</b> Applicable for both MEDIUM and HIGH frequency pricing. A fee as set out in the BNetzA BGebV-FreqZut will be imposed for spectrum assignment on the basis of section 223(1) TKG</p>		
<p><b>KEY NOTES</b></p>			
<p><b>ONGOING WORKS</b></p>	<p><b>800 MHz, 900 MHz, 1800 MHz, 2600 MHz</b> Ongoing Federal Network Agency consultation reviewing future auction options for expiring current public mobile network spectrum allocations.</p>		
<p><b>APPLICATION LINKS</b></p>	<p><b>3.7-3.8 GHz:</b> <a href="https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/OffentlicheNetze/LokaleNetze/Antragsformblaetter3.7-3.8GHz_zip.zip?__blob=publicationFile&amp;v=7">https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/OffentlicheNetze/LokaleNetze/Antragsformblaetter3.7-3.8GHz_zip.zip?__blob=publicationFile&amp;v=7</a> 226.lokalbreitband@bnetza.de</p> <p><b>26 GHz:</b> <a href="https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/OffentlicheNetze/LokaleNetze/Antragsformbl%C3%A4tter26GHz_zip.zip?__blob=publicationFile&amp;v=2">https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/OffentlicheNetze/LokaleNetze/Antragsformbl%C3%A4tter26GHz_zip.zip?__blob=publicationFile&amp;v=2</a> 226.lokalbreitband@bnetza.de</p>		
<p><b>CONTACTS/LINKS</b></p>	<p><a href="http://www.euwena.eu">www.euwena.eu</a> Kerim.Agdaci@opticoms.de</p>		



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<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b> No Spectrum current available for private networks</p> <p><b>Medium Band 1 GHz – 6 GHz</b> <b>3.740 – 3800 MHz</b> MNOs have an obligation to lease up to 60 MHz to private companies and public institutions for establishing a 'local private network' in a geographical area. Allowing them to enter into agreements with license holders to rent their frequencies. Rental applications are open until 31 May 2025 to obtain an agreement and can utilise spectrum until May 2041.</p> <p><b>High Band &gt; 6 GHz</b> <b>26 GHz</b> Available in the frequency band <b>(26,25-26,65 GHz)</b> for dedicated local 5G license for private operators who can apply directly for their own leased spectrum.</p> <p><b>Test and Trial News:</b> Further reviews studying allocating dedicated local 5G license for private operators to be announced.</p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	No Spectrum current available for private networks	<b>3740-3800 MHz</b> Frequencies available to rent from license operator holders (MNOs) via Telia's and Telenor's joint infrastructure company venture TT Network.	<b>(24.25-24.65 GHz)</b> 400 MHz available for future 5G private networks.
<b>BANDWIDTH</b>		<b>60 MHz</b>	<b>400 MHz</b>
<b>SUPPORTING INFORMATION/LINKS</b>	<p><a href="https://ens.dk/sites/ens.dk/files/Tele/5g_action_plan_for_denmark.pdf">https://ens.dk/sites/ens.dk/files/Tele/5g_action_plan_for_denmark.pdf</a>  <a href="https://sdfi.dk/digital-infrastruktur/frekvenser/private-net-">https://sdfi.dk/digital-infrastruktur/frekvenser/private-net-</a>            Email: Christian Rosenskjold, Chief Adviser</p>		
<b>PRICE: INITIAL/YEAR/HZ</b>	<p>See: <a href="https://sdfi.dk/Media/637916645717918169/ttn_-_35_ghz.pdf">https://sdfi.dk/Media/637916645717918169/ttn_-_35_ghz.pdf</a>  <math>((5.640 \text{ kr MHz} \cdot \text{BW MHz} / 43.123 \text{ km}^2) \cdot A \text{ km}^2) + ((251.545 \text{ kr MHz} \cdot \text{BW MHz} / 43.123 \text{ km}^2) \cdot A \text{ km}^2)</math>            Where A = area to cover including 500 m boundary margin and BW is bandwidth needed in MHz            Approx 7 Euro per MHz per 5 Km<sup>2</sup> (excluding admin fee)</p>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>			
<b>APPLICATION LINKS</b>	Applications to be made via: TT Network, Telia's and Telenor's joint infrastructure company: <a href="mailto:dk-privatemobilenetwork@telia.dk">dk-privatemobilenetwork@telia.dk</a>		
<b>CONTACTS/LINKS</b>	Telenor: Louise Pasgaard, <a href="mailto:privatenetwork@telenor.dk">privatenetwork@telenor.dk</a>		





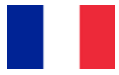
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<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b> 450 MHz reserved for individual PMA use.</p> <p><b>Medium Band 1 GHz – 6 GHz</b> Currently intended for the provision of public operators. To date there is no dedicated spectrum for PMR networks or shared licensing. Public MNOs are providing services to the industry (e.g., private networks for industries such as ports or refineries) with the 700 MHz and the 3.4 to 3.8 GHz. But there so far has not been enough economic or technological demand to justify reserving this spectrum for direct industry use.</p> <p><b>High Band &gt; 6 GHz</b> <b>26 GHz</b> band - CNMC (regulatory commission) has now approved in June 2023 the allocation of ~450 MHz of spectrum in 26 GHz range for 5G private network use, with focus on “4.0 industrial verticals” and regulated under the so-called Cuadro Nacional de Atribución de Frecuencias (CNAF). Spectrum is provided on application to private users for industrial use projects as part of the EU harmonization of the frequencies.</p> <p><b>Test and Trial News:</b> There have been multiple private and public-sponsored industrial 5G initiatives and projects for industrial purposes utilising public operator spectrum.</p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	450 MHz available for individual use	No confirmed availability for private use	26 GHz for private use at reduced scope, on a “self-service” basis.
<b>BANDWIDTH</b>			450 MHz band reserved for Industrial private networks
<b>SUPPORTING INFORMATION/LINKS</b>	<p><a href="mailto:info@cnmc.es">info@cnmc.es</a>  <a href="https://www.boe.es/">https://www.boe.es/</a>  <a href="https://www.rcrwireless.com/20230119">https://www.rcrwireless.com/20230119</a>  <a href="https://avancedigital.mineco.gob.es/Espectro/Paginas/index.aspx">https://avancedigital.mineco.gob.es/Espectro/Paginas/index.aspx</a></p>		
<b>PRICE: INITIAL/YEAR/HZ</b>	Price not currently confirmed		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	There is no current focus on 5G network or spectrum sharing regulations.		
<b>APPLICATION LINKS</b>	<a href="https://www.boe.es/">https://www.boe.es/</a>		
<b>CONTACTS/LINKS</b>	<a href="https://www.boe.es/eli/es/o/2023/06/12/etd625">https://www.boe.es/eli/es/o/2023/06/12/etd625</a>		



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<b>SUMMARY COMMENTS</b>	<p>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</p> <p><b>Low Band &lt; 1 GHz</b></p> <p><b>Medium Band 1 GHz – 6 GHz</b> New legislation entered into force at the beginning of 2021, the purpose of which is to lighten licence practices. <b>2.3 and 2.4 GHz</b> allocated for private local networks. <b>3.5 GHz</b> MNO spectrum can be leased for private networks but only where MNOs cannot already offer similar vertical-specific network solutions in that area.</p> <p><b>High Band &gt; 6 GHz</b> <b>24.25–25.1 GHz</b> are available to local use 4G/5G industry networks but reserved for testing and teaching in certain geographic areas in Espoo, Tampere, and Oulu.</p> <p><b>Test and Trial News:</b> The DEDICAT6G project develops sixth generation (6G) wireless networks, which will be deployed in the early 2030s. The main aims are to achieve dynamic coverage extension and distributed intelligence for human-centric applications.</p>		
<b>DETAILS</b>	<b>LOW &lt; 1 GHz</b>	<b>MEDIUM 1 GHz to 6 GHz</b>	<b>HIGH &gt; 6 GHz</b>
<b>AVAILABLE BANDS</b>	No dedicated private spectrum indicated.	<b>2300–2320 MHz</b> dedicated for local private industry <b>3.5 GHz</b> Available as leased MNO spectrum subject to local conditions	<b>24.25–25.1 GHz</b> dedicated for local private industry
<b>BANDWIDTH</b>		Bandwidths available 5 MHz to 20 MHz in 2.3 MHz	Bandwidths available 50 MHz to 200 MHz
<b>SUPPORTING INFORMATION/LINKS</b>	<a href="https://www.traficom.fi/en/communications/communications-networks/5g-projects-and-trials-finland">https://www.traficom.fi/en/communications/communications-networks/5g-projects-and-trials-finland</a> <a href="https://www.traficom.fi/fi">https://www.traficom.fi/fi</a> <a href="https://www.traficom.fi/en/communications/communications-networks/local-4g5g-networks">https://www.traficom.fi/en/communications/communications-networks/local-4g5g-networks</a>		
<b>PRICE: INITIAL/YEAR/HZ</b>	<p>A 6-year period license; annual frequency fee example range.</p> <p><b>2.3 MHz;</b> 5 MHz = €279.83 to 20 MHz = €1119.31  <b>24 GHz;</b> 50 MHz = €310.19 to 200 MHz = €1243.68</p>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	<a href="https://www.traficom.fi/en/communications/communications-networks/5g-projects-and-trials-finland">https://www.traficom.fi/en/communications/communications-networks/5g-projects-and-trials-finland</a>		
<b>APPLICATION LINKS</b>	<a href="https://www.traficom.fi/en/communications/communications-networks/applying-frequency-reservation-and-radio-licence">https://www.traficom.fi/en/communications/communications-networks/applying-frequency-reservation-and-radio-licence</a>		
<b>CONTACTS/LINKS</b>	<a href="https://www.traficom.fi/en/customerservice?group=radiolicences%2Cexamsandcertificates">https://www.traficom.fi/en/customerservice?group=radiolicences%2Cexamsandcertificates</a>		



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<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	<p><b>400 MHz:</b> 414,5/424,5 – 420/430 MHz to 453/463 – 460/470 MHz</p> <p><b>700 MHz:</b> 733/788 – 736/791 MHz and 698/753 – 703/758 MHz</p>	<p><b>2.6 GHz:</b> 2575 – 2615 MHz</p> <p><b>3.4-3.8 GHz:</b> 3490-3800 MHz</p> <p><b>3.8-4.2 GHz:</b> 3800-4000 MHz</p>	<p><b>26 GHz:</b> 26.5 – 27.5 GHz</p>
<b>BANDWIDTH</b>	<p><b>400 MHz:</b> Narrow band</p> <p><b>700 MHz:</b> 2* 3 MHz FDD (LTE B28) &amp; 2* 5 MHz (LTE B68 FDD)</p>	<p><b>2.6 GHz:</b> 5, 10, 15, 20 or 40 MHz in TDD (LTE B38/5G N38)</p> <p><b>3.4-3.8 GHz:</b> MNO channels in TDD (5G N77)</p> <p><b>3.8-4.2 GHz:</b> up to 100 MHz in TDD (5G N78)</p>	<p><b>26 GHz:</b> up to 1 GHz of spectrum (N257 and N258 band) in TDD</p>
<b>SUPPORTING INFORMATION/LINKS</b>			
<b>PRICE: INITIAL/YEAR/HZ</b>	<p><b>2.6 GHz:</b> Annual fee related to area size assigned (progressive rates from 0,3 to 100 km<sup>2</sup>) and bandwidth utilised. For example:</p> <ul style="list-style-type: none"> <li>• 600 € per year for 20 MHz and 0,3 km<sup>2</sup></li> <li>• 70 000 € per year for 20 MHz and 100 km<sup>2</sup></li> </ul>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	<p>Arcep is working in 2032 on the freeing up to 2*3 MHz for private mobile broadband networks in the 450 MHz band.</p> <p>DGE has issued in January a new spectrum tariffication scheme that reduces the prices for small zones.</p>		
<b>APPLICATION LINKS</b>	<p><b>2.6 GHz:</b> Access to counter  <a href="https://dali.arcep.fr/frontend/pmr_2_6/#/view">https://dali.arcep.fr/frontend/pmr_2_6/#/view</a></p> <p><b>3.8-4.2 GHz:</b> Applications for experimental use  <a href="https://www.arcep.fr/demarches-et-services/professionnels/transformation-numerique-des-entreprises/plateformes-experimentation-5g-bande-38-40-ghz.html#:~:text=This%20counter%20will%20be%20open%20for%20the%20r%C3%A9ception%20of%20file">https://www.arcep.fr/demarches-et-services/professionnels/transformation-numerique-des-entreprises/plateformes-experimentation-5g-bande-38-40-ghz.html#:~:text=This%20counter%20will%20be%20open%20for%20the%20r%C3%A9ception%20of%20file</a></p> <p><b>26 GHz:</b> Applications for 5G Pilots  <a href="https://www.arcep.fr/actualites/les-communiqués-de-presse/detail/n/frequences-5g.html">https://www.arcep.fr/actualites/les-communiqués-de-presse/detail/n/frequences-5g.html</a></p>		
<b>CONTACTS/LINKS</b>	<p>Arcep: <a href="http://www.arcep.fr">www.arcep.fr</a>  Agurre: <a href="http://www.agurre.fr">www.agurre.fr</a></p>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b> 400 MHz for private professional radio users. 700 MHz 3 MHz has been reserved currently for educational and startups to research and develop applications and services in 5G technology for a period of 12 months.</p> <p><b>Medium Band 1 GHz – 6 GHz</b> 3400 – 3410 MHz 10 MHz has been reserved currently for educational and startups to research and develop applications and services in 5G technology for a period of 12 months.</p> <p><b>High Band &gt; 6 GHz</b> 26 GHz 200 MHz has been reserved currently for educational and startups to research and develop applications and services in 5G technology for a period of 12 months.</p>		
<b>DETAILS</b>	<b>LOW &lt; 1 GHz</b>	<b>MEDIUM 1 GHz to 6 GHz</b>	<b>HIGH &gt; 6 GHz</b>
<b>AVAILABLE BANDS</b>	700 MHz 4 MHz bandwidth for research and development for a limited period of 12 months.	3400 – 3410 MHz 10 MHz bandwidth for research and development for a limited period of 12 months.	26 GHz 200 MHz bandwidth for research and development for a limited period of 12 months.
<b>BANDWIDTH</b>	4 MHz	10 MHz	200 MHz
<b>SUPPORTING INFORMATION/LINKS</b>	<a href="https://www.eett.gr/en/operators/radio-frequency-spectrum/radiospectrum-licensing/experimental-research-operation/">https://www.eett.gr/en/operators/radio-frequency-spectrum/radiospectrum-licensing/experimental-research-operation/</a>		
<b>PRICE: INITIAL/YEAR/HZ</b>	Spectrum for research and development is free.		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	Currently no announcements for private enterprise spectrum availability.		
<b>APPLICATION LINKS</b>	Interested parties may send their request to <a href="mailto:info@eett.gr">info@eett.gr</a>		
<b>CONTACTS/LINKS</b>	<a href="https://www.eett.gr/en/operators/radio-frequency-spectrum/">https://www.eett.gr/en/operators/radio-frequency-spectrum/</a>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<p><b>SUMMARY COMMENTS</b></p>	<p>Currently in Ireland it is not possible to apply for a Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</p> <p><b>Only narrowband PMR/DMR/ Trunked/Tetra radio licences can be applied for.</b></p> <p>The National regulator (www.comreg.ie) have recently consulted on their work plan for 2022 to 2024 and have concluded by making the following statements:</p> <p><b>BB-PPDR:</b></p> <p>Ireland has yet to make decisions on its BB-PPDR deployment model and may require spectrum for BB-PPDR, ComReg proposed to make spectrum available for BB-PPDR in the 400 MHz Band and in the 700 MHz Duplex Gap and 700 MHz Guard Bands as detailed below.</p> <p><b>400 MHz Band Spectrum Award – Smart Grid – Awarded to the Electricity Supply Board (ESB)</b></p> <p>Part A; one 2 x 3 MHz Lot (410 – 413 MHz / 420 – 423 MHz) for the provision of wireless communications for <b>Smart Grids</b>; and</p> <p>Part B; ten Lots of 2 x 100 kHz (413 – 414 MHz / 423 – 424 MHz) for a technology and service neutral basis. These Lots may be used to support Smart Grid or uses including Business Radio type applications.</p> <p><b>3800-4200 MHz frequency band</b></p> <p>ComReg continues to monitor and provide input to the development of EC and ECC studies in harmonising decisions on the use of the 3800-4200 MHz band for local-area network connectivity which could serve both private (e.g., enterprise) and public (e.g., community-type) networks.</p> <p><b>3.6 GHz and 26 GHz</b></p> <p>The 3.6 GHz and 26 GHz spectrum have been awarded to economic operators.</p> <p><b>Test and Trial:</b></p> <p>ComReg also encourage users to apply for test and trail spectrum for Proof of Concepts to prove technology and use cases. These licences are available for 12 months. The spectrum ranges from 8.3 kHz to 300 GHz</p>		
<p><b>DETAILS</b></p>	<p><b>LOW</b> &lt; 1 GHz</p>	<p><b>MEDIUM</b> 1 GHz to 6 GHz</p>	<p><b>HIGH</b> &gt; 6 GHz</p>
<p><b>AVAILABLE BANDS</b></p>	<p><b>400 MHz BB-PPDR</b> <b>414 – 417 MHz / 424 – 427 MHz</b> This is 3GPP Band 88 in the 3GPP E-UTRA specifications.</p> <p><b>700 MHz BB-PPDR</b> <b>700 MHz Duplex Gap and 700 MHz Guard Bands</b> may be available under notice (EU)2016/687 (the “EC 700 MHz Decision”).</p>	<p><b>3800 – 4200 MHz</b></p> <p>ComReg continues to monitor and provide input to the development of EC and ECC studies in harmonising decisions on the use of this band.</p>	<p><b>26 GHz:</b></p> <p>No details available on any band above being considered for Private Wireless Network Use.</p>
<p><b>BANDWIDTH</b></p>	<p>2 x 3 MHz: 400 MHz Band 2 x 5 MHz + 2 x 3 MHz: 700 MHz Band (3GPP Band 68 &amp; 28B)</p>		
<p><b>SUPPORTING INFORMATION/LINKS</b></p>	<p><a href="https://www.comreg.ie/?dlm_download=broadband-public-protection-and-disaster-relief-bb-ppdr-spectrum-options-october-2020-update">https://www.comreg.ie/?dlm_download=broadband-public-protection-and-disaster-relief-bb-ppdr-spectrum-options-october-2020-update</a> <a href="https://www.comreg.ie/publication/radio-spectrum-management-strategy-statement-2022-to-2024">https://www.comreg.ie/publication/radio-spectrum-management-strategy-statement-2022-to-2024</a> <a href="https://www.testandtrial.ie/">https://www.testandtrial.ie/</a></p>		
<p><b>PRICE: INITIAL/YEAR/HZ</b></p>	<p>From €100 for test and trial spectrum for a 12 month period.</p>		
<p><b>KEY NOTES</b></p>			
<p><b>ONGOING WORKS</b></p>	<p>As per the statements above and contained in document: <a href="https://www.comreg.ie/publication/radio-spectrum-management-strategy-statement-2022-to-2024">https://www.comreg.ie/publication/radio-spectrum-management-strategy-statement-2022-to-2024</a></p>		
<p><b>APPLICATION LINKS</b></p>	<p><a href="https://www.testandtrial.ie/">https://www.testandtrial.ie/</a></p> <p>There are no other current active application forms open with the regulator for Broadband Private Spectrum -other than Test and detailed above.</p>		
<p><b>CONTACTS/LINKS</b></p>	<p><a href="http://www.comreg.ie">www.comreg.ie</a></p>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<p><b>SUMMARY COMMENTS</b></p>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b>  <b>700 MHz SDL (694-790) MHz</b>  As of 2022, action winning public operators: TIM, Vodafone, WindTre, Iliad and Fastweb*.</p> <p><b>Medium Band 1 GHz – 6 GHz</b>  Studies and trials from 2016 have been conducted in 2.3-2.4 GHz bands for local restricted Licensed Shared Access by private users, enabling 5G through SHARED spectrum. No further announcements on spectrum policy changes for private enterprise networks. Though, 122x 5G projects are in the trial phase with MNOs utilising own private network services to develop innovative solutions for Industry 4.0 and smart manufacturing by leveraging 5G.</p> <p><b>3600-3800 MHz</b>  Since 2019 spectrum awarded only to public the operators: Telecom Italia, Vodafone Italia, Iliad, Wind Tre and Fastweb*. To date no private enterprise spectrum available. But commercial third parties, such as neutral hosts, who do not own spectrum, can deploy a small network to develop new business cases, upon agreement or by leasing frequencies, if the licensee does not cover a specific area.</p> <p><b>High Band &gt; 6 GHz</b>  <b>26 GHz</b> awarded since 2018 to handful of bidders*.  Further <b>24.25-26.5 GHz</b> band since 2022, there is public consultation on the rules for the use of harmonized frequencies for electronic communications services*. Currently new licensees' holders must provide access (wholesale capacity) to other players (non-telco providers) to develop 5G services.</p> <p>*Licensees have certain obligations to grant other MNO companies access to their 5G network, where the government is supporting 5G infrastructure sharing by MNOs to develop the network in rural areas.</p>		
<p><b>DETAILS</b></p>	<p><b>LOW</b> &lt; 1 GHz</p>	<p><b>MEDIUM</b> 1 GHz to 6 GHz</p>	<p><b>HIGH</b> &gt; 6 GHz</p>
<p><b>AVAILABLE BANDS</b></p>	<p>Private enterprise bands currently not reserved.</p>	<p>Private enterprise bands currently not reserved.</p>	<p>Private enterprise bands currently not reserved.</p>
<p><b>BANDWIDTH</b></p>			
<p><b>SUPPORTING INFORMATION/LINKS</b></p>	<p><a href="https://www.agcom.it/">https://www.agcom.it/</a>  <a href="https://www.gsmacom.com/spectrum/wp-content/uploads/2014/02/The-Impacts-of-Licensed-Shared-Use-of-Spectrum-Deloitte-Feb-20142.pdf">https://www.gsmacom.com/spectrum/wp-content/uploads/2014/02/The-Impacts-of-Licensed-Shared-Use-of-Spectrum-Deloitte-Feb-20142.pdf</a>  <a href="https://www.mise.gov.it/images/stories/documenti/The%20shared%20access%20to%20spectrum%20based%20on%20Licensed%20Shared%20Access.pdf">https://www.mise.gov.it/images/stories/documenti/The%20shared%20access%20to%20spectrum%20based%20on%20Licensed%20Shared%20Access.pdf</a></p>		
<p><b>PRICE: INITIAL/YEAR/HZ</b></p>			
<p><b>KEY NOTES</b></p>			
<p><b>ONGOING WORKS</b></p>	<p>A consultation: 131/21/CONS, has been made reviewing the need for private spectrum in local areas. At present the has been no decision made, but consideration is deemed necessary to harmonise spectrum with other EU lands.</p> <p>Italy has been granted permission to obtain from European Union's (EU) Recovery and Resilience Facility (RRF) to provide aid in the form of direct grants for local private network communications services providers to provide high performing fixed 5G mobile networks. Which will run until June 30, 2026.</p> <p>According to a recent study by the 5G &amp; Beyond Observatory of the School of Management at the Politecnico of Milan, 122 5G projects are in the trial phase, some via public grants.</p>		
<p><b>APPLICATION LINKS</b></p>			
<p><b>CONTACTS/LINKS</b></p>			



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b> Available use of spectrum for private use is still limited, with discussions still ongoing to provide dedicated spectrum in the lower and middle bands. <b>1800 MHz</b> is still free and available, though limited in bandwidth 5 MHz. Applications currently closed in 2023 for spectrum of <b>3.4 to 3.8 GHz</b>, to free up spectrum for the 5G national mobile public MNO auction due in 2023 for spectrum <b>3.5 to 3.7 GHz</b>. After which new enterprises local broadband networks permit applications will be announced. Current use of band <b>3.7-4.2 GHz</b> in areas above Amsterdam are limited only to Ministry of defence satellite earth station in Burum.</p> <p><b>Low Band &lt; 1 GHz</b> <b>450 MHz</b> Only a very local use licence for temporary event available</p> <p><b>Medium Band 1 GHz – 6 GHz</b> <b>1800 MHz</b> extended DECT band free license mainly for inbuilding low power small cell coverage up to 5 MHz <b>3.4 – 3.8 GHz TDD</b> Band 43 Reserved for local industry/enterprise use, geographical restrictions apply to a line above Amsterdam. (As of 28 February 2023, the RDI will no longer grant new licenses in the 3.5 GHz ban).</p> <p><b>High Band &gt; 6 GHz</b> <b>26 GHz</b> licenses are still under consultation.</p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	<b>400 MHz: 446 MHz<sup>1</sup> (PMR 446)</b> <b>450-460 MHz LMR<sup>1</sup></b>	<b>1800 MHz<sup>1</sup>:</b> DECT guard band, 1780–1785 MHz and 1875–1880 MHz License free <b>3.4 – 3.8 GHz</b> Reserved for local industry/enterprise use until 2026. (Applications currently closed in 2023)	<b>26 GHz</b> in consultation
<b>BANDWIDTH</b>	<b>400 MHz</b> narrow band	<b>1800 MHz</b> DECT guard band 2x2,8 MHz FDD <sup>1</sup> <b>3.4 – 3.8 GHz</b> TDD Maximum 40Mhz per license	
<b>SUPPORTING INFORMATION/LINKS</b>	<p><a href="https://www.rdi.nl/onderwerpen/internetverbinding-verbeteren">https://www.rdi.nl/onderwerpen/internetverbinding-verbeteren</a> <a href="https://open.overheid.nl/repository/ronl-3533c9fa-ab90-4a9e-9d1c-96ad03aea410/1/pdf/Nota%20Mobielle%20Communicatie.pdf">https://open.overheid.nl/repository/ronl-3533c9fa-ab90-4a9e-9d1c-96ad03aea410/1/pdf/Nota%20Mobielle%20Communicatie.pdf</a></p>		
<b>PRICE: INITIAL/YEAR/HZ</b>	<p>Free Licence<sup>1</sup>, <a href="https://www.agentschaptelecom.nl/onderwerpen/portofoons-en-mobilofoons/tarieven-landmobiele-communicatie">https://www.agentschaptelecom.nl/onderwerpen/portofoons-en-mobilofoons/tarieven-landmobiele-communicatie</a> <a href="https://zoek.officielebekendmakingen.nl/stcrt-2021-45605.html">https://zoek.officielebekendmakingen.nl/stcrt-2021-45605.html</a></p>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	<p>The ministry of Economic Affairs and Climate is preparing the auction of the <b>3.5 GHz</b> band. Planned in Q1 of 2023. In the <b>3.5 GHz</b> band <b>100 MHz TDD</b> is expected to be assigned to local/private networks. <a href="https://www.rdi.nl/onderwerpen/internetverbinding-verbeteren">https://www.rdi.nl/onderwerpen/internetverbinding-verbeteren</a>.</p> <p>In the <b>3.8-4.2 GHz</b> band a DSMS (dynamic spectrum management and sharing) pilot is planned to gain information how to protect the present users (Satcom operators) in this band.</p> <p>In the <b>400 MHz</b> band, the PAMR band, <b>1.5 MHz</b> will become available for critical communication nationwide usage.</p>		
<b>APPLICATION LINKS</b>	Ministerie van Economische Zaken		
<b>CONTACTS/LINKS</b>	<p>Ministry of Economic Affairs : <a href="https://www.rijksoverheid.nl/onderwerpen/telecommunicatie/nationaal-frequentiebeleid">https://www.rijksoverheid.nl/onderwerpen/telecommunicatie/nationaal-frequentiebeleid</a>. Agentschap Telecom : <a href="https://www.agentschaptelecom.nl/onderwerpen/vergunningen-en-registraties">https://www.agentschaptelecom.nl/onderwerpen/vergunningen-en-registraties</a></p>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b> The Norwegian Communications Authority (Nkom) wants to give industry and verticals early access to 5G in non-public networks (NPN) on a localized area. After piloting the band in 2022, interested parties now can apply for up to 10-year licenses in the 3,8-4,2 GHz band.</p> <p><b>Low Band &lt; 1 GHz</b></p> <p><b>Medium Band 1 GHz – 6 GHz</b> 3.8-4.2 GHz band up to 80 MHz for private standalone networks, either low or medium power licence versions (per based station). Low power limited to 50m radius and 18 dBm/5 MHz EIRP. Medium power 36 dBm/5 MHz EIRP but no antenna height restriction but are not permitted to be set up in areas lying within a zone of 10 km outside urban settlements with more than 10,000 inhabitants.</p> <p><b>High Band &gt; 6 GHz</b></p> <p><b>Test and Trial News:</b></p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	No current identified bands available for private users.	<b>3.8-4.2 GHz</b> band for enterprises to deploy local-area private networks. (excluding a guard band 3800-3840 MHz), subject to permissions.	No current identified bands available for private users.
<b>BANDWIDTH</b>		20, 40, 60 and 80 MHz bandwidth, low or medium power, unsynchronized networks	
<b>SUPPORTING INFORMATION/LINKS</b>	Sharing of equipment or frequency resources with public network mobile operators by a “Standalone isolated private network”, which could expand the coverage or capacity of public nationwide mobile network is not permitted. All allocated transmission points must be implemented in accordance with the licence within 12 months of the licence coming into force. <a href="https://www.nkom.no/english/frequency-licences">https://www.nkom.no/english/frequency-licences</a> <a href="https://www.nkom.no/aktuelt/nkom-has-opened-3-8-4-2-ghz-for-local-area-5g-networks">https://www.nkom.no/aktuelt/nkom-has-opened-3-8-4-2-ghz-for-local-area-5g-networks</a>		
<b>PRICE: INITIAL/YEAR/HZ</b>	Low power NOK 200 (€20) for 20 MHz to NOK 1,600 (€160) for 80 MHz per annum. Medium power NOK 1,000 (€100) to NOK 3,800 (€380) for 80 MHz per annum.		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>			
<b>APPLICATION LINKS</b>	<a href="https://www.altinn.no/skjemaoversikt/nasjonal-kommunikasjonsmyndighet-nkom/frekvenstillatelse-sendertillatelse/">https://www.altinn.no/skjemaoversikt/nasjonal-kommunikasjonsmyndighet-nkom/frekvenstillatelse-sendertillatelse/</a>		
<b>CONTACTS/LINKS</b>	<a href="https://nkom.no/aktuelt/nkom-has-opened-3-8-4-2-ghz-for-local-area-5g-networks">https://nkom.no/aktuelt/nkom-has-opened-3-8-4-2-ghz-for-local-area-5g-networks</a>		





## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<p><b>SUMMARY COMMENTS</b></p>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p><b>Low Band &lt; 1 GHz</b>  <b>700 MHz.</b> 25 MHz auctioned to public MNOs in 2022. The results of a public consultation have considered the positions of the various players in the market - manufacturers, operators, private and public entities and others - on availability in the 700 MHz band - (733-758 MHz, duplex gap bands; 694-703 MHz and 788-791 MHz, guard bands). Currently no decision has been made, but the allocation of these and other bands may be reviewed again in 2025.</p> <p><b>Medium Band 1 GHz – 6 GHz</b>          No Spectrum currently identified for Private mobile operators.</p> <p><b>High Band &gt; 6 GHz</b>          No Spectrum currently identified for Private mobile operators.</p> <p><b>Test and Trial News:</b></p>		
<p><b>DETAILS</b></p>	<p><b>LOW</b> &lt; 1 GHz</p>	<p><b>MEDIUM</b> 1 GHz to 6 GHz</p>	<p><b>HIGH</b> &gt; 6 GHz</p>
<p><b>AVAILABLE BANDS</b></p>	<p>No private bands currently available.</p>	<p>No private bands currently available.</p>	<p>No private bands currently available.</p>
<p><b>BANDWIDTH</b></p>			
<p><b>SUPPORTING INFORMATION/LINKS</b></p>	<p><a href="https://www.anacom.pt/render.jsp?categoryId=416723">https://www.anacom.pt/render.jsp?categoryId=416723</a></p>		
<p><b>PRICE: INITIAL/YEAR/HZ</b></p>			
<p><b>KEY NOTES</b></p>			
<p><b>ONGOING WORKS</b></p>	<p>Public consultation results considering the best approach for the use of the duplex gap (733-758 MHz) and guard bands (694-703 MHz and 788-791 MHz).</p>		
<p><b>APPLICATION LINKS</b></p>			
<p><b>CONTACTS/LINKS</b></p>	<p>Atendimento <a href="mailto:info@anacom.pt">info@anacom.pt</a>          Augusto Frago: Director-General for Information and Innovation</p>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b> The Swedish Post and Telecommunications Board (PTS) is now starting a consultation on all conditions for the permits in the 900 MHz, 2.1 GHz and 2.6 GHz bands, as well as rules for the auction procedure. No provisions currently made for private or shared access users. Update due end 2023.</p> <p><b>Low Band &lt; 1 GHz</b> The PTS shall assign national block licenses in the 900 MHz, band, with a spectrum cap of 2x20 MHz. These will be awarded before the current permit expires but there are no plans to include local licences private industry users in spectrum licensing for these bands.</p> <p><b>Medium Band 1 GHz – 6 GHz</b> The PTS shall assign national block licenses in the 2.1 GHz bands, with a spectrum cap of 120 MHz. These will be awarded before the current permit expires. The Post and Telecom Agency (Post &amp; Teletyrelsen, PTS) in Sweden has made available spectrum for private industry users in the 3.7 GHz band (3720 MHz-3800 MHz) from 1 January 2023.</p> <p><b>High Band &gt; 6 GHz</b> The PTS shall assign national block licenses in the 26 GHz bands, with a spectrum cap of 120 MHz. These will be awarded before the current permit expires. Currently Long-term solution for fixed radio exist for fixed links in 10.5 GHz, 26 GHz and 28 GHz permits expire in 2023/2024. The Post and Telecom Agency (Post &amp; Teletyrelsen, PTS) in Sweden has made available spectrum for private industry users in the 26 GHz from 1 January 2023.</p> <p><b>Test and Trial News:</b></p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	No plans to include local licences	The frequency space <b>3720 – 3800 MHz</b> (total 80 MHz for local permits from 1 January 2023. Indoor & Outdoor use.	<b>(24.25-24.65 GHz)</b> for local permits. Available for indoor use only.
<b>BANDWIDTH</b>		Minimum block 10 MHz in increments of 10 MHz to a maximum of 80 MHz	Minimum block 50 MHz with steps of 50 MHz to a maximum of 400 MHz
<b>SUPPORTING INFORMATION/LINKS</b>	<p><a href="https://www.pts.se/sv/bransch/radio/auktioner/900--2100--och-2600-mhz-banden/">https://www.pts.se/sv/bransch/radio/auktioner/900--2100--och-2600-mhz-banden/</a>  <a href="https://pts.se/sv/bransch/radio/radiotillstand/lokala-tillstand-i-37-ghz--och-26-ghz-banden/">https://pts.se/sv/bransch/radio/radiotillstand/lokala-tillstand-i-37-ghz--och-26-ghz-banden/</a>            Local permits are valid until December 31, 2026, with the possibility of an extension for a further five years.</p>		
<b>PRICE: INITIAL/YEAR/HZ</b>	<p><b>(3720 – 3800 MHz):</b> The annual fees for the year 2022 amount to SEK 524 (Euro 46) per 10 MHz  <b>(24.25 – 25.1 GHz):</b> The annual fees for the year 2022 amount to SEK 262 (Euro 23) per 50 MHz</p>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	The allocation of the frequency bands 900 MHz, 2.1 GHz and 2.6 GHz is planned for the third quarter of 2023. But no provision mentioned for Private or shared mobile networks access		
<b>APPLICATION LINKS</b>	<p><b>(3720 – 3800 MHz ):</b> <a href="https://pts.se/globalassets/startpage/dokument/bransch/radio/radiotillstand/lokala-tillstand-37-och-26/ansokningsblankett-37-ghz-lokala-tillstand.pdf">https://pts.se/globalassets/startpage/dokument/bransch/radio/radiotillstand/lokala-tillstand-37-och-26/ansokningsblankett-37-ghz-lokala-tillstand.pdf</a>  <b>(24,25 – 25,10 GHz):</b> <a href="https://pts.se/globalassets/startpage/dokument/bransch/radio/radiotillstand/lokala-tillstand-37-och-26/blankett-26-ghz_t.pdf">https://pts.se/globalassets/startpage/dokument/bransch/radio/radiotillstand/lokala-tillstand-37-och-26/blankett-26-ghz_t.pdf</a></p>		
<b>CONTACTS/LINKS</b>	Cecilia Stenhols, Lawyer, The Swedish Post and Telecom Authority, Resource Management Department, Section for Spectrum Licensing: <a href="mailto:cecilia.stenhols@pts.se">cecilia.stenhols@pts.se</a>		



## INFORMATION ON EUROPEAN LICENCED FREQUENCY SPECTRUM, FOR PRIVATE WIRELESS NETWORKS

<b>SUMMARY COMMENTS</b>	<p><b>Current Information relating to Broadband Private Wireless Network licence for LTE/4G or 5G Broadband technology.</b></p> <p>There are 2 types of access licenses available, <b>Local access</b> spectrum use that is licensed to the UK's Mobile Network Operators (MNOs) but not utilised in an area or no immediate plans to do so.</p> <p><b>Shared Access</b> licence dedicated bands for private users, which available in four spectrum bands. Both types have 2 sub versions: low or medium power.</p> <p>Further Ofcom as part of its <b>Innovation &amp; Research</b> may also authorise for periods up to 12 months 5G type non-operational test location sites.</p> <p><b>Low Band &lt; 1 GHz</b></p> <p><b>Local access licenses</b> are available to private users for limited periods up to 3 years using existing mobile spectrum bands, for bands (700 MHz, 800 MHz, 900 MHz).</p> <p>Scanning Telemetry links (Windfarms/Substations), used by the utilities and other services (operating in the bands 457.5 – 458.5 MHz &amp; 463 – 464 MHz), are managed externally by Atkins Limited and the Joint Radio Company (JRC)</p> <p><b>Medium Band 1 GHz – 6 GHz</b></p> <p><b>Local access licenses</b> are available to private users for limited periods up to 3 years using existing mobile spectrum bands, for bands (1400 MHz, 1800 MHz, 1900 MHz, 2100 MHz, 2300 MHz, 2600 MHz).</p> <p><b>Shared Access</b> available in bands:</p> <p><b>1800 MHz:</b> 1781.7 to 1785 MHz paired with 1876.7 to 1880 MHz</p> <p><b>2300 MHz:</b> 2390 to 2400 MHz</p> <p><b>3800 to 4200 MHz</b> in blocks of 10 MHz</p> <p><b>High Band &gt; 6 GHz</b></p> <p>Further <b>24.25-26.5 GHz</b> band has been added to the spectrum sharing framework but for indoor-only low power deployment.</p>		
<b>DETAILS</b>	<b>LOW</b> < 1 GHz	<b>MEDIUM</b> 1 GHz to 6 GHz	<b>HIGH</b> > 6 GHz
<b>AVAILABLE BANDS</b>	<p><b>410 - 420 MHz</b> Responsibility for assigning frequencies to this Allocation rests with Ofcom</p> <p><b>Local Access</b> (Existing mobile spectrum bands)</p> <p><b>700 MHz, 800 MHz, 900 MHz</b></p>	<p><b>Local Access</b> (shared use of spectrum which is already licensed on a national basis to public mobile network operators (MNOs))</p> <p><b>Shared Access</b></p> <p><b>1800 MHz, 2300 MHz, 3.8-4.2 GHz</b></p>	<p><b>Shared Access</b></p> <p><b>24.25-26.5 GHz</b> band added to spectrum sharing framework for indoor-only deployment. This is part of the 26 GHz band, identified as a European pioneer 5G band, and could provide additional spectrum options for new applications</p>
<b>BANDWIDTH</b>	<b>Bandwidth in Local/shared spectrum</b> is subject to that available in declared local area	<b>Bandwidth in Local/shared spectrum</b> is subject to that available in declared local area	<b>Bandwidth in shared spectrum</b> is subject to that available in declared local area; available 2.25 GHz
<b>SUPPORTING INFORMATION/LINKS</b>	<p><b>2300 MHz</b> to be compatible with TDD-LTE special subframe configuration 6, also known as 9:3:2.</p> <p>A non-operational <b>Innovation &amp; Research licence</b> may be authorised for periods up to 12 months for which the licence fee is £50.00 for each station or apparatus per location.</p>		
<b>PRICE: INITIAL/YEAR/HZ</b>	<p><b>Local Access:</b> £950 per licence (3 Years Valid). Payment of a licence fee only required when Ofcom have assessed that it is possible to grant a licence.</p> <p><b>Shared Access</b> annual fee: People can apply to Ofcom local access for coordinated access to these bands on a first come, first served basis.</p> <p>£80 in <b>1800 MHz</b> and <b>2300 MHz</b> shared spectrum:</p> <p>£80 per 10 MHz in the <b>3.8-4.2 GHz</b></p> <p><b>24.25-26.5 GHz:</b> A licence fee of £320 does not vary by bandwidth.</p>		
<b>KEY NOTES</b>			
<b>ONGOING WORKS</b>	<p><b>Upper 26 GHz band:</b> Coordinating with Ministry of Defence in the 26.5 GHz-27.5 GHz to make this band available in the future.</p>		
<b>APPLICATION LINKS</b>	<p><a href="https://www.ofcom.org.uk/_data/assets/pdf_file/0021/158232/local-access-licence-application.pdf">https://www.ofcom.org.uk/_data/assets/pdf_file/0021/158232/local-access-licence-application.pdf</a></p> <p><a href="https://www.ofcom.org.uk/_data/assets/pdf_file/0023/80780/application_form_ofw225.pdf">https://www.ofcom.org.uk/_data/assets/pdf_file/0023/80780/application_form_ofw225.pdf</a></p> <p><a href="https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/fixed-terrestrial-links">https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/fixed-terrestrial-links</a></p>		
<b>CONTACTS/LINKS</b>	<p>innovation.licensing@ofcom.org.uk. <a href="https://www.ofcom.org.uk/">https://www.ofcom.org.uk/</a></p>		