Office of Communications (Ofcom)
Wireless Telegraphy Act 2006

SPECTRUM ACCESS 2100 MHz LICENCE

Licence no: **1391663/1**

Date of issue: **01 August 2025**

Fee payment date **1 January (annually)**

1. The Office of Communications (Ofcom) grants this wireless telegraphy licence ("the Licence") to

Vodafone Limited
(Company registration number 1471587)
Vodafone House
The Connection
Newbury
Berkshire
RG14 2FN

and

Telefónica UK Limited
(Company registration number 01743099)
500 Brook Drives
Reading
RG2 6UU

(hereafter "the Licensees"), to establish, install and use wireless telegraphy stations and/or wireless telegraphy apparatus as described in the schedules to this Licence (together "the Radio Equipment") subject to the terms set out below.

Licence Term

2. This Licence shall continue in force until 30 September 2031 unless earlier revoked by Ofcom or surrendered by the Licensees.

Licence Variation and Revocation

3. Pursuant to schedule 1 paragraph 8 of the Wireless Telegraphy Act 2006 ("the Act"), Ofcom may not revoke this Licence under schedule 1 paragraph 6 of the Act except:

(a) at the request, or with the consent, of the Licensees;

(b) if there has been a breach of any of the terms of this Licence;

(c) in accordance with schedule 1 paragraph 8(5) of the Act;

(d) if it appears to Ofcom to be necessary or expedient to revoke the licence for the purpose of complying with a direction by the Secretary of State given to Ofcom under Section 5 of the Act or Section 5 of the Communications Act 2003;

(e) if, in connection with the transfer or proposed transfer of rights and obligations arising by virtue of the Licence, there has been a breach of any provision of regulations made by Ofcom under the powers conferred by section 30 of the Act[1];

(f) for reasons related to the management of the radio spectrum, provided that in such a case the power to revoke may only be exercised after at least five years' notice is given in writing.

4. Ofcom may only revoke or vary this Licence by notification in writing to the Licensees and in accordance with schedule 1 paragraphs 6, 6A and 7 of the Act.

Transfer

5. This Licence may not be transferred. The transfer of rights and obligations arising by virtue of this Licence may however be authorised in accordance with regulations made by Ofcom under powers conferred by section 30 of the Act[2].

Changes to Licensees' Details

6. The Licensees shall give prior notice to Ofcom in writing of any changes to the Licensees' name and/or address as recorded in paragraph 1 of this Licence.

Fees

7. The Licensees shall each year pay to Ofcom the relevant fee(s) as provided in section 12 of the Act and the regulations made thereunder on or before the fee payment date shown above, or on or before such dates as shall be notified in writing to the Licensees.

8. The Licensees shall also pay interest to Ofcom on any amount which is due to Ofcom under the terms of this Licence or provided for in any regulations made by Ofcom under sections 12 and 13(2) of the Act from the date such amount falls due until the date of payment, calculated with reference to the Bank of England base rate from time to time. In accordance with section 15 of the Act any such amount and any such interest is recoverable by Ofcom.

9. If the Licence is surrendered or revoked, no refund, whether in whole or in part of any amount which is due under the terms of this Licence or provided for in any Regulations made by Ofcom under sections 12 and 13(2) of the Act will be made, except at the absolute discretion of Ofcom.

Radio Equipment Use

10. The Licensees shall ensure that the Radio Equipment is constructed and used only in accordance with the provisions specified in the schedules to this Licence. Any proposal to amend any detail specified in the schedules to this Licence must be agreed with Ofcom in advance and implemented only after this Licence has been varied or reissued accordingly.

[1] These are regulations on spectrum trading.
[2] See Ofcom's website for the latest position on spectrum trading and the types of trade which are permitted.

11. The Licensees shall ensure that the Radio Equipment is operated in compliance with the terms of this Licence and is used only by persons who have been authorised in writing by the Licensees to do so and that such persons are made aware of, and of the requirement to comply with, the terms of this Licence.

12. The Licensees must ensure that all Radio Equipment is established, installed, modified and used only in accordance with the provisions specified in schedule 3 (EMF Licence Condition) of this Licence.

Access and Inspection

13. The Licensees shall permit a person authorised by Ofcom:

    (a) to have access to the Radio Equipment; and

    (b) to inspect this Licence and to inspect, examine and test the Radio Equipment,

at any and all reasonable times or, when in the opinion of that person an urgent situation exists, at any time to ensure the Radio Equipment is being used in accordance with the terms of this Licence.

Modification, Restriction and Closedown

14. A person authorised by Ofcom may require the Radio Equipment or any part thereof, to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:

    (a) a breach of this Licence has occurred; and/or

    (b) the use of the Radio Equipment is, or may be, causing or contributing to undue interference to the use of other authorised radio equipment.

15. Ofcom may require any of the Radio Equipment to be modified or restricted in use, or temporarily closed down either immediately or on the expiry of such period as may be specified in the event of a national or local state of emergency being declared. Ofcom may only exercise this power after a written notice has been served on the Licensees or by a general notice applicable to holders of this class of Licence has been published.

Geographical Boundaries

16. Subject to the requirements of any coordination procedures notified to the Licensees pursuant to the schedule(s) to this Licence, the Licensees are authorised to establish, install and use the Radio Equipment in the United Kingdom. For the avoidance of doubt, the United Kingdom includes the United Kingdom's territorial sea (measured in accordance with section 1 of the Territorial Sea Act 1987) and does not include the Channel Islands or the Isle of Man.

Interpretation

17. In this Licence:

    (a) the establishment, installation and use of the Radio Equipment shall be interpreted as establishment and use of wireless telegraphy stations and installation and use of wireless telegraphy apparatus as specified in section 8(1) of the Act;

    (b) the expression "interference" shall have the meaning given by Section 115 of the Act;

(c) the expressions “wireless telegraphy station” and “wireless telegraphy apparatus” shall have the meanings given by section 117 of the Act;

(d) the schedules form part of this Licence together with any subsequent schedule(s) which Ofcom may issue as a variation to this Licence; and

(e) the Interpretation Act 1978 shall apply to the Licence as it applies to an Act of Parliament.

Issued by Ofcom

Office of Communications

SCHEDULE 1 TO LICENCE NUMBER: 1391663/1

Licence Category: **Spectrum Access Licence 2100 MHz (Paired Spectrum)**

Description of Radio Equipment Licensed

1. References in this schedule to the Radio Equipment are references to any wireless telegraphy station or wireless telegraphy apparatus that is established, installed and/or used under this schedule.

Interface requirements for the Radio Equipment

2. Use of the Radio Equipment shall be in accordance with the following Interface Requirements:

IR 2019 – Third Generation Mobile;
IR 2092 – Terrestrial systems capable of providing electronic communications services in the frequency bands 1920 – 1980 MHz and 2110 – 2170 MHz;

or for equipment placed on the market before 8 April 2000, is required to be type approved in accordance with a recognised technical performance standard relating to the service licensed.

Special Conditions relating to the Radio Equipment

3.

(a) The Licensees shall by no later than 30 June 2013 provide and thereafter maintain an electronic communications network that is capable of providing mobile telecommunications services to an area within which at least 90% of the population of the United Kingdom lives and with a 90% probability that users in outdoor locations within that area can receive the service with a sustained downlink speed of not less than 768kbps in a lightly loaded cell.

(b) Subject to paragraph 3(c) of this schedule, during the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensees shall compile and maintain accurate records of the following details relating to the Radio Equipment:

i) postal address (including post code);

ii) National Grid Reference, to at least 10 metre resolution;

iii) antenna height (above ground level) and type, and boresight east of true north (if applicable);

iv) radio frequencies which the Radio Equipment uses;

v) Transmitted power expressed in dBm / 5 MHz EIRP per antenna for non-AAS Radio Equipment;

vi) Transmitted power expressed in dBm / 5 MHz TRP per cell for AAS Radio Equipment; and

without prejudice to this paragraph (b), the Licensees shall furnish to Ofcom in such a manner and at such times as reasonably requested, information in the form of documents, accounts, estimates, returns and any other information, which may be

reasonably required for the purposes of verifying compliance with this Licence and for statistical purposes.

(c) The conditions relating to the keeping of records contained in sub-paragraphs 3(b)i), 3(b)ii) and 3(b)iii) shall not apply in respect of femtocell equipment and smart/intelligent low power repeater equipment.

(d) The Licensees shall submit to Ofcom copies of the records detailed in sub-paragraph 3(b) above at such intervals as Ofcom shall notify to the Licensees.

(e) The Licensees shall, upon request, supply Ofcom or any person authorised on their behalf with the name and address of any subscribing customers of the Network, or require its agents to provide such information on its behalf.

Co-ordination at Frequency and Geographical Boundaries and Compliance with Other Procedures Relating to Interference

4. The Licensees shall ensure that the Radio Equipment is operated in compliance with such co-ordination and sharing procedures as may be notified to the Licensees by Ofcom from time to time.

International Cross-Border Coordination

5. The Licensees shall ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensees by Ofcom from time to time

Permitted Frequency Blocks

6. Subject to any emission requirements in this schedule, the Radio Equipment may only transmit within the following frequency bands (the "Permitted Frequency Blocks"):

From 1 August 2025 to 1 January 2026

Downlink frequencies	Uplink frequencies
2124.9 – 2134.9 MHz	**1934.9 – 1944.9** MHz

And from 1 January 2026 to 30 September 2031.

Downlink frequencies	Uplink frequencies
2130.3 – 2139.7 MHz	**1940.3 – 1949.7** MHz

Maximum Permissible Transmit Power

7. Subject to any more restrictive limitations imposed by the coordination requirements notified by Ofcom in accordance with paragraphs 3 and 4 of this schedule, the power transmitted in any direction in the Permitted Frequency Blocks by the Radio Equipment shall not exceed:

Radio Equipment	Maximum mean power
non-AAS base station[a]	65 dBm / 5 MHz EIRP per antenna
AAS base station[a]	50 dBm / 5 MHz TRP per cell
Mobile or nomadic terminal station[b]	24 dBm TRP
Fixed or installed terminal station[b]	24 dBm EIRP

[a] For femtocell base stations, power control must be applied to minimise interference to adjacent channels.
[b] The maximum mean power relates to the EIRP or TRP of a specific piece of Radio Equipment irrespective of the number of transmit antennas.

Maximum Power outside the Permitted Frequency Blocks

8. For transmissions on the downlink frequencies, the e.i.r.p. emanating from the Radio Equipment transmissions at any frequency outside the Permitted Frequency Blocks, but within 2110-2170 MHz, shall not exceed the higher (least stringent) of (a) the baseline requirement and (b) the block specific requirements for that frequency;

(a) Baseline Requirements

Frequency Range	Non-AAS mean EIRP limit per antenna[1]	AAS mean TRP limit per cell[2]
Frequencies spaced more than 10 MHz from the lower or upper block edge	9 dBm / 5 MHz	1 dBm / 5 MHz

[1] The non-AAS BEM is defined per antenna and applicable to base station configuration with up to four antennas per sector
[2] In a multi-sector base station, the AAS radiated power limit applies to each one of the individual sectors.

(b) Block-specific requirements

Frequency range	Non-AAS mean EIRP limit per antenna[1]	AAS mean TRP limit per cell[2]
-10 to -5 MHz from lower block edge	11.0 dBm / 5 MHz	3 dBm / 5 MHz
-5 to 0 MHz from lower block edge	16.3 dBm / 5 MHz	8 dBm / 5 MHz
0 to +5 MHz from upper block edge	16.3 dBm / 5 MHz	8 dBm / 5 MHz
+5 to +10 MHz from upper block edge	11.0 dBm / 5 MHz	3 dBm / 5 MHz

[1] The non-AAS BEM is defined per antenna and applicable to base station configuration with up to four antennas per sector
[2] In a multi-sector base station, the AAS radiated power limit applies to each one of the individual sectors.

The baseline and block-specific requirements are defined per antenna and applicable to configurations with up to four antennas per sector.

Interpretation

9. In this schedule:

(a) "AAS" means active antenna system. An AAS is a base station and antenna system where the amplitude and / or phase between antenna elements is continually adjusted resulting in an antenna pattern that varies in response to short term changes in the radio environment. This is not intended to include long term beam shaping such as fixed electrical down tilt. In AAS

base stations the antenna system is integrated as part of the base station system or product;

(b) "Downlink" means transmissions from a base station or repeater to a terminal station (handset);

(c) "dBm" means the power level in decibels (logarithmic scale) referenced against 1 miliwatt (i.e. a value of 0 dBm is 1 milliwatt);

(d) "e.i.r.p." means the effective isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);

(e) A "femtocell" means Radio Equipment transmitting on the downlink frequencies which operates at a power not exceeding 24 dBm e.i.r.p. per carrier which may be established by customers of the Network but which is or will be used only by and under the control of the Network, following the establishment of a telecommunications link between the femtocell and the Network;

(f) "Fixed or installed" means used or installed at specific fixed points;

(g) "IR" means a United Kingdom Radio Interface Requirement published by Ofcom in accordance with the Radio Equipment Regulations 2017, as amended by the Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019;

(h) "lower block edge" means, in relation to the Permitted Frequency Block, the lowest frequency in that Permitted Frequency Block;

(i) "measurement bandwidth" means the size of an individual spectrum segment within the specified frequency range that is used to measure compliance with the specified power limit;

(j) "mobile or nomadic" means intended to be used while in motion or during halts at unspecified points;

(k) "non-AAS" means a piece of Radio Equipment which is not an AAS;

(l) "per antenna" means per radiating unit/component (irrespective of the number of radiating elements that make up that unit/component);

(m) "per cell" means per specific piece of Radio Equipment. For a multi-sector base station, per cell refers to each one of the individual sectors irrespective of the number of transmit antennas;

(n) "Permitted Frequency Blocks" has the same meaning given to it in paragraph 6 of this schedule;

(o) A "smart/intelligent low power repeater" means a repeater which operates with power not exceeding 24 dBm E.I.R.P. per carrier, which may be established by customers of the Network who have written agreements with the Licensees and:

- The Licensees have ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensees;
- The repeater operates only on the Licensees' frequencies and with their valid Public Land Mobile Network Identifier;

- Must not cause undue interference to other spectrum users; and
- The repeater only transmits on the uplink frequencies when actively carrying a call (voice, video or data) or signalling from serviced handsets.

(p) "TRP" means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;

(q) "upper block edge" means, in relation to the Permitted Frequency Block, the highest frequency in that Permitted Frequency Block; and

(r) "Uplink" means transmissions from a terminal station (handset) or repeater to a base station;

(s) "User Station" means any vehicle mounted or hands portable mobile station designed for mobile use and/or any station designed or adapted to be established and used from static locations which meet the appropriate technical performance requirements as set out in the Wireless Telegraphy (Exemption) Regulation in force from time to time and either complies with the appropriate Interface Regulation listed in paragraph 2, or for equipment placed on the market before 8 April 2000, is type approved in accordance with a recognised technical standard relating to the service licensed.

Ofcom

SCHEDULE 2 TO LICENCE NUMBER: 1391663/1

EMF Licence Condition

Licence category: **Spectrum Access 2100 MHz**

Sites which are not shared with another licensee

1. The Licensees shall only establish, install, modify or use Relevant Radio Equipment if the total electromagnetic field exposure levels produced by the Licensees' On-Site Radio Equipment do not exceed the basic restrictions[3] in the relevant tables for general public exposure identified in the ICNIRP Guidelines[4] in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

Sites which are shared with another licensee

2. In the case of a shared site where the Shared Site Exemption applies to the Licensees, the Licensees shall comply with paragraph 1 above.

3. In the case of a shared site where the Shared Site Exemption does not apply to the Licensees, the Licensees shall only establish, install, modify or use the Relevant Radio Equipment if:

   (a) the total electromagnetic field exposure levels produced by the Licensees' On-Site Radio Equipment, together with
   (b) the total electromagnetic field exposure levels produced by all other wireless telegraphy stations and wireless telegraphy apparatus operated by another licensee on the same site for which the Licensees can reasonably assume that a Shared Site Exemption does not apply,

   do not exceed the basic restrictions[5] in the relevant tables for general public exposure identified in the ICNIRP Guidelines[6] in any area where a member of the general public is or can be expected to be present when transmissions are taking place.

Emergency Situations

4. The obligations in paragraphs 1, 2 and 3 above will not apply if the Relevant Radio Equipment is being used for the purpose of seeking emergency assistance or reporting and responding to an emergency situation (in the vicinity of that situation) including for search and rescue activities and maritime emergency communications[7].

Relationship with authorised transmission levels

5. The Licensees shall comply with paragraphs 1, 2 and 3 above notwithstanding the maximum transmission levels authorised in the Licence.

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[3] Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.
[4] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".
[5] Compliance with the reference levels for general public exposure identified in the ICNIRP Guidelines will ensure compliance with the basic restrictions.
[6] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".
[7] Further information on emergency situations in set out in Ofcom's "Guidance on EMF Compliance and Enforcement".

Records

6. The Licensees shall keep, or shall procure that a third party shall keep, and shall make available to Ofcom on request, records (including the type of records identified in Ofcom's "Guidance on EMF Compliance and Enforcement") that demonstrate how it has complied with paragraphs 1, 2 and 3 above when Relevant Radio Equipment is established, installed, modified or used.

Ofcom's "Guidance on EMF Compliance and Enforcement"

7. When evaluating its compliance with paragraphs 1, 2 and 3 above, the Licensees shall take into account Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.

Interpretation

8. In this schedule:

(a) **"dBi"** means the ratio in dB (decibel) when comparing the gain of the antenna to the gain of an isotropic antenna. An isotropic antenna is a theoretical antenna which radiates power uniformly in all directions;

(b) **"EIRP"** means equivalent isotropically radiated power which is the product of the power supplied to an antenna and the absolute or isotropic antenna gain in a given direction relative to an isotropic antenna;

(c) **"ERP"** means effective radiated power which is the product of the power supplied to an antenna and its gain in a given direction relative to a half-wave dipole;

(d) "**general public**" means any person who is not: (a) the Licensee, owner, operator or installer of the Relevant Radio Equipment; or (b) acting under a contract of employment or otherwise acting for purposes connected with their trade, business or profession or the performance by them of a public function;[8]

(e) **"ICNIRP Guidelines"** means the version of the Guidelines published by the International Commission on Non-Ionizing Radiation Protection for limiting exposure to electromagnetic fields which are identified in Ofcom's "Guidance on EMF Compliance and Enforcement" that is in force at the relevant time.[9]

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[8] There is pre-existing health and safety legislation which already requires employers to protect workers from exposure to electromagnetic fields ("EMF") including the following legislation specifically relating to EMF (as amended from time to time): The Control of Electromagnetic Fields at Work Regulations 2016, The Control of Electromagnetic Fields at Work Regulations (Northern Ireland) 2016 and The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Electromagnetic Fields) Regulations 2016.

[9] Ofcom's "Guidance on EMF Compliance and Enforcement" will initially require the Licensees to comply with the ICNIRP Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz), published in: Health Physics 74(4):494-522, dated April 1998 and available at: https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf ("1998 Guidelines") or the ICNIRP Guidelines for limiting exposure to electromagnetic fields (100 KHz to 300 GHz), published in: Health Physics 118(5): 483–524; 2020 and available at: https://www.icnirp.org/cms/upload/publications/ICNIRPrfgdl2020.pdf ("2020 Guidelines"). However, once work on the relevant standards explaining the methodology for assessing compliance with the 2020 Guidelines has progressed sufficiently, Ofcom will publish a public consultation on updating its "Guidance on EMF Compliance and Enforcement" to explain that going forward Ofcom will be

(f) **"Licensees' On-Site Radio Equipment"** means the Relevant Radio Equipment and any other wireless telegraphy station(s) and wireless telegraphy apparatus on the same site which transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP.[10]

(g) **"Relevant Radio Equipment"** means all the Radio Equipment that is authorised by this Licence to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP.

(h) **"Shared Site Exemption"** means any of the following three situations apply on a shared site in relation to the Licensees' or another licensee's wireless telegraphy station(s) or wireless telegraphy apparatus that is authorised to transmit at powers higher than 10 Watts EIRP or 6.1 Watts ERP:

- The first situation is that all of the licensees' wireless telegraphy station(s) or wireless telegraphy apparatus on a shared site do not transmit at a combined total radiated power in any particular direction[11] that is higher than 100 Watts EIRP or 61 Watts ERP;[12]
- The second situation is that the total electromagnetic field exposure levels produced by the licensees' wireless telegraphy station(s) or wireless telegraphy apparatus in any area where a member of the general public is or can be expected to be present when transmissions are taking place is no more than 5% of the basic restrictions or 5% of the reference levels in the relevant tables for general public exposure identified in the ICNIRP Guidelines;[13]
- The third situation is where the licensees' wireless telegraphy station or wireless telegraphy apparatus has an antenna gain that is equal to or higher than 29 dBi and has a fixed beam;

(i) **"shared site"** means a site that is shared by the Licensees and at least one other licensee for the purposes of establishing, installing, modifying or using wireless telegraphy stations or wireless telegraphy apparatus;

(j) **"site"** means a physical structure, building, vehicle or moving platform;

(k) **"wireless telegraphy apparatus"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006; and

(l) **"wireless telegraphy station"** has the meaning given to it in section 117 of the Wireless Telegraphy Act 2006.

requiring the Licensees to comply with the 2020 Guidelines only. Following this public consultation, Ofcom will publish an updated version of Ofcom's "Guidance on EMF Compliance and Enforcement" on its website. Ofcom will follow the same process for any subsequent versions of the ICNIRP Guidelines.

[10] 10 Watts EIRP is equivalent to 6.1 Watts ERP. In linear units EIRP (W) = 1.64 x ERP (W); in decibels EIRP (dB) = ERP (dB) + 2.15. Ofcom's "Guidance on EMF Compliance and Enforcement" explains how the Licensees can determine if wireless telegraphy station(s) or wireless telegraphy apparatus "transmits at powers higher than 10 Watts EIRP or 6.1 Watts ERP.

[11] For the purpose of this situation, the combined total radiated power is a simple sum of the radiated powers (in EIRP or ERP) of all of the licensees' wireless telegraphy station(s) or wireless telegraphy apparatus on the shared site that transmits signals covering the same or overlapping areas.

[12] 100 Watts EIRP is equivalent to 61 Watts ERP.

[13] The relevant tables for general public exposure are identified in Ofcom's "Guidance on EMF Compliance and Enforcement".