



Montevideo, 13 de febrero del 2023

**UNIDAD REGULADORA DE SERVICIOS DE COMUNICACIONES (“URSEC”)**

Señora

Mercedes Aramendia

**Presidente URSEC**

**Ref. Observaciones al borrador de Pliego de Bases y Condiciones**  
**(Dec.425/022)**

De nuestra mayor consideración,

**AM WIRELESS URUGUAY S.A.** (en adelante “CLARO”), representada en este acto por Sandra Doldan, según representación ya acreditada ante esta Unidad, en virtud del borrador del Pliego de bases y condiciones redactado por la URSEC con el fin de regular el procedimiento competitivo para la adquisición de espectro en la banda 3,5 GHz (Dec.425/022), se presenta con la finalidad de formular las siguientes consideraciones:

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En primer lugar, consideramos que es muy positivo que se haya puesto a consulta el Borrador del Pliego de Bases y Condiciones (Dec.425/022), en adelante “el Borrador de Pliego”, por parte de URSEC. Esta medida contribuirá a enriquecer la información y análisis de las cuestiones esenciales que involucran al proceso de adopción del nuevo servicio de 5G en Uruguay mediante la aprobación de las condiciones definitivas del Pliego por parte de URSEC y el Poder Ejecutivo.

Destacamos la complejidad del marco para la incorporación de 5G como lo han reconocido la mayoría de los reguladores y operadores donde este



servicio se ha incorporado, y el valor agregado que ha aportado el proceso de discusión previa de todos los actores involucrados. Aun cuando en el presente caso ello tiene lugar luego de haberse emitido el Decreto 425/022, de todas formas tiene valor que se posibilite esta instancia de comentarios.

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### Principales Comentarios

Consideramos que el Borrador de Pliego es una oportunidad para mejorar el marco del desarrollo de 5G de acuerdo con los desafíos de inversiones que requiere la nueva tecnología y las posibilidades de ingresos que se presentan para hacerlas posibles.

1. Una primera cuestión que es central es el precio de los lotes de 100 Mhz de la banda de 3.5GHZ, el cual se encuentra en un rango de valor no justificado, ni justificable para Uruguay.

Este elemento, ha sido la principal consideración para el lanzamiento de 5G en los países que han seguido las mejores recomendaciones para que tener un caso de éxito.

El precio del espectro a subastar es todavía más sensible en el caso de Uruguay dado que se superpone con otros dos (2) esfuerzos sustantivos de inversiones (i) la renovación de espectro que vencen en el período 2022-2024. En el caso de Claro ello representa un total de u\$s 18.120.000; y (ii) el despliegue de una nueva red 5G, que en nuestro caso representa un mínimo de inversiones que estimamos en aproximadamente 50 millones de dólares adicionales en los próximos años cuatro.

En atención a ello es que planteamos varias medidas para atenuar en forma equilibrada el costo del espectro, duplicando las obligaciones de despliegue de radio bases, extendiendo la duración de las licencias y el calendario de pagos.



2.- Marco de Despliegue Eficiente: En las buenas prácticas comparadas en los marcos de despliegue, se ha puesto especial énfasis en tomar medidas para que éstas permitan que sean más eficientes las inversiones en infraestructura de conectividad. Lamentablemente éste es un capítulo todavía ausente en el Decreto 425/2022 y en el Borrador del Pliego. Esperamos que ello sea incluido en forma complementaria a la brevedad, como por ejemplo el otorgamiento largamente demorado de la licencia B para dar internet, teniendo en cuenta las importantes inversiones en Fibra óptica para 5G que no pueden ser utilizadas en forma eficiente por mi representada, y si lo viene haciendo el operador con mayor participación de mercado.

3.- En cuanto a la estructura de la subasta, se observa que ella define que un operador tiene asegurado el espectro en 3.5 GHZ, mientras que CLARO que tiene inversiones significativas en el país desde hace más de 18 años, se encuentra a riesgo de no poder acceder a ese espectro. El diseño de la subasta genera un escenario artificial de escasez, la cual es identificada como una práctica que debe evitarse a toda costa. Existe en el país espectro suficiente en la banda de 3.5GHZ para nuevos operadores móviles que quisieran ingresar al mercado.

4.- Por otra parte, se define en el Decreto 425/22 un cap de 100 Mhz de tenencia en espectro en 3.5GHZ, y luego se lo incumple para el operador ANTEL al cual, además, se la posibilidad de solicitar se le asignen el o los lotes vacantes. Estas disposiciones violan las normas de competencia, la normativa de telecomunicaciones y el Tratado de protección de inversiones entre Uruguay y México. Planteamos alternativas para evitar lo que consideramos disposiciones ilegales.

5.- De igual relevancia es nuestro pedido para que todos los operadores puedan importar y desplegar equipos 5G, estableciéndose una fecha común de ocho (8) meses desde la adjudicación efectiva del espectro, para que se pueda comenzar a prestar el servicio 5G. En caso contrario, se dará lugar a un caso enorme de



ventaja anticompetitiva para el operador ANTEL, por las razones que se exponen en el presente.

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## DETALLE DE LAS OBSERVACIONES

### 1) ARTICULO 2.- ASIGNACIONES DE FRECUENCIAS.

En el párrafo segundo se establece que “El Lote EA04 se reserva a favor de ANTEL...”. Esta disposición de asegurar a ese operador el acceso al espectro de 3.5GHz (recurso indispensable para poder prestar el nuevo servicio de 5G), a un solo operador (ANTEL) importa crear, injustificadamente, **un tratamiento discriminatorio anticompetitivo** respecto de mi mandante y del otro operador móvil existente (Movistar).

Esto resulta así dado que se expone a los competidores móviles de ANTEL, que llevamos realizadas inversiones de redes móviles millonarias en Uruguay desde hace más de 20 años, a quedar sin acceso al citado espectro y con ello a que sus más de 2,5 Millones de clientes se vean privados del servicio 5G.

Existiendo 200 Mhz adicionales en la banda de 3.5GHz, entendemos que lo razonable es que se permita a los tres operadores existentes iguales condiciones de acceso a un Lote de 100 Mhz en esa banda y que si se considera que es conveniente como política pública que haya más operadores móviles en Uruguay, se podría incluir un lote adicional para un operador entrante que se subaste exclusivamente para interesados en ingresar a Uruguay como inversores y operadores móviles.



Solicitamos se modifique el presente artículo, por su manifiesta ilegalidad al crear condiciones en favor de un operador, con el agravante de ser una empresa cuyo accionista es el Estado Uruguayo (se parte y reparte favoreciendo a su propia empresa); se trasgrede la normativa de telecomunicaciones móviles que es un sistema de plena competencia sin ningún atributo legal de preferencias para ANTEL; se trasgrede la normativa nacional (Ley Nro. 18.159) que dispone que en su artículo 2do *“todos los mercados estarán regidos por los principios y reglas de la libre competencia...”* y se trasgrede el Tratado de Protección de Inversiones entre Uruguay y México: Acuerdo para la promoción y protección recíprocas de las inversiones, aprobado por la Ley Nro. 17.501 de 27/05/2002, que dispone en su artículo 3.2 que no habrá trato discriminatorio entre inversores nacionales e inversores mexicanos.

En reemplazo de la norma observada, sugerimos que se incluya para esta subasta, o para una subasta a posteriori, un cuarto Lote de 100Mhz para terceros interesados en ingresar como un cuarto operador móvil entrante.

La medida que solicitamos respeta las normas de competencia, de telecomunicaciones móviles de Uruguay y los Tratados de Protección de Inversiones.

## **2) ARTÍCULO 3.- ALCANCE DE LA CONVOCATORIA**

### **3.1.- Sobre la estructura de la subasta para el segmento privado:**

El artículo 3ero del Borrador de Pliego, dispone que podrán participar del procedimiento competitivo a) quienes son actualmente titulares de autorizaciones para prestación del Servicio de Comunicaciones Móviles en el país y b) otras personas jurídicas, nacionales o extranjeras, que no siendo titulares de autorización para prestar Servicios de Comunicaciones Móviles, cumplan los requisitos de ese documento y sean Precalificados.



Estas disposiciones definen que los bloques de espectro objeto de la subasta serán para los operadores móviles existentes en Uruguay, CLARO y MOVISTAR, y otros Operadores entrantes. Es decir que la estructura del Borrador del Pliego es que para brindar el Servicio de 5G de Comunicaciones Móviles siga habiendo solo tres operadores (dado que es esa la cantidad de Lotes de Espectro objeto del procedimiento de subasta, dos para privados y uno reservado para Antel).

Con independencia de las observaciones al Artículo 2do por la reserva de un Lote de espectro a ANTEL, como observación general a este punto consideramos que la estructura propuesta no es adecuada al crear artificialmente escasez de espectro en la banda de 3.5GHz que no es el caso de Uruguay.

Adicionalmente, la estructura de subasta crea un fuerte desaliento a la evolución tecnológica para los operadores móviles existentes en el país hace más de 20 años (CLARO y MOVISTAR).

**El diseño de subasta para el sector privado representa un salto al vacío, ello dado que no se encuentra justificado con ningún informe específico que justifiquen para 5G que sea viable y que generará valor, incorporar uno o dos operadores móviles nuevos que desplacen a los operadores existentes** que atienden a más de 2,5 millones de clientes móviles y que tienen más de 2000 radiobases y dos redes troncales de fibra óptica en Uruguay.

Las características del tamaño del mercado de clientes personas de Uruguay con un escenario de crecimiento acotado (tanto de población como de empresas), representa por el contrario un caso que demandará altas inversiones y muy limitadas utilidades, escenario que en modo alguno justifica que se desplacen a los operadores móviles actuales y que haya un mejor caso de negocio para un entrante. La estructura de subasta para el sector privado no



tiene ningún justificativo de generación de valor sino conduce a lo contrario y resulta ilógica y arbitraria.

Por ello es que consideramos que la subasta para un operador móvil entrante, si es eso lo que se quiere hacer por parte del Gobierno de Uruguay, podría organizarse mediante la inclusión de un lote de 100 Mhz adicionales en la banda de 3.5 GHz. Entendemos que ello se podrá incluir en actual borrador del Pliego, pero con fecha de realización posterior dado que se requerirá el dictado de las medidas administrativas para su instrumentación. Entre ellas, para revocar la autorización de uso precario y revocable de una parte del espectro de los 200 Mhz de la banda de 3.5GHz que tiene en ese carácter, y esta atribuida para brindar el servicio de comunicaciones fijas. Actualmente el licenciataria de ese bloque tiene aproximadamente 9000 clientes y **no tiene justificativo que se esté reteniendo espectro que no se utiliza y es necesario para brindar el servicio móvil si es que quiere que haya más operadores móviles en Uruguay.**

Vale además destacar que los reguladores realizan estos corrimientos de licenciataria en el uso de espectro que estaba atribuido precariamente a otros fines, por nuevos servicios. Ello particularmente es lo que viene sucediendo en la mayoría de los mercados para liberar de usuarios precarios a la banda de 3.5GHz, como en el pasado ha ocurrido -incluso en el propio Uruguay- en la subasta del 2017, con la banda de 700 Mhz, y en la subasta del 2019 con la banda de 2600Mhz.

Adicionalmente, sería de buena práctica regulatoria, que se efectuó un estudio del regulador que explicita los fundamentos técnicos y de políticas públicas, para aumentar la cantidad de operadores móviles en Uruguay; cómo esa medida resultará más beneficiosa para aumentar la competencia y reducir la participación de mercado del operador dominante; también si este buscado escenario es coherente con los desafíos de inversiones que representa 5G y qué



casos de negocios justifican un cuarto operador; y cómo ese camino será más beneficioso para los clientes y el desarrollo del sector móvil en Uruguay.

Respecto a este punto, nos permitimos adjuntar como **ANEXO I** Informe de GSMA “Subastas 5G: 3 aciertos de Brasil para tener en cuenta en la región”.

Destacamos que CLARO se encuentra plenamente a favor del aumento de la competencia y del ingreso de un nuevo operador en igualdad de condiciones a los operadores existentes.

## **2.- Sobre los requisitos para operadores sin licencia en Uruguay para brindar Servicios Móviles:**

El literal b) del artículo 3ero contempla los requisitos de exigibilidad para las personas jurídicas nacionales o extranjeras que no son titulares de autorización para la prestación en el país del Servicio de Comunicaciones Móviles.

Observamos que dentro de éstos **no se establece la exigencia de acreditar un patrimonio neto mínimo que asegure el respaldo de los compromisos a asumir por cada nuevo operador que quiera participar de la subasta.**

La ausencia de la exigencia de un patrimonio neto mínimo acorde a las inversiones y plazo de construcción de una nueva red móvil en Uruguay, hace que las ratios que incluye el artículo en cuestión sean irrelevantes.

Por otra parte, señalamos que la experiencia de dos años en la operación de un servicio móvil es por demás insuficiente por cuanto solo construir una red móvil demanda más de ese tiempo.

Por tales motivos, solicitamos que se exija un patrimonio neto mínimo que asegure que los terceros interesados en participar de la subasta puedan pagar el precio del lote de espectro, y solventar la construcción de una nueva red móvil en un plazo de 24 meses. Adicionalmente que tengan una experiencia mínima





de cuatro años en la prestación del servicio de Operador Móvil en dos países como se indica en el Borrador de Pliego.

3. Dentro de estos requisitos, en el punto número 4 se observan errores de tipeo en cuanto la simbolización no coincide con lo aclarado en los paréntesis: “Ratio 1: Nivel de endeudamiento del INTERESADO: Pasivo sobre el activo total < 75% (mayor al setenta y cinco por ciento). Ratio 2: Pasivo/EBITDA < 4 (mayor a cuatro)”.

### 3) ARTICULO 12.- INFORMACIÓN TÉCNICA

El artículo 12° afirma que los participantes del proceso “... *asumen la exclusiva y plena responsabilidad por conocer todo aspecto técnico y condición actual del espectro radioeléctrico y de su uso, no pudiendo reclamar a la CONVOCANTE ni por la falta de información, ni por defectos o insuficiencias en la mismas.*”

Esta norma pretende imponer un conocimiento sobre las asignaciones de uso que se hubieren dado sobre los segmentos de espectro de los Lotes a subasta y de sus actuales condiciones de uso, con el efecto que nada se podrá reclamar al respecto.

La disposición invierte las reglas en la materia de limpieza del espectro objeto de la subasta, como si la operación de la subasta se tratara de una venta de un inmueble. Esto no es así por cuanto el espectro es un recurso inalienable del Estado, y éste es su único administrador, los particulares tienen o acceden a licencias de uso bajo un marco de normas de uso.

Corresponde al CONVOCANTE informar si hay otros usuarios con permisos de uso revocables sobre los segmentos de los Lotes de 3.5GHz objeto de subasta, y por su poder de imperio es el CONVOCANTE el que tiene que disponer las medidas de liberación o corrimiento de esos potenciales usuario. En el caso que se den situaciones de uso no autorizado de espectro en esos Lotes, también corresponde al CONVOCANTE disponer las medidas de liberación pertinentes.



El único que conoce o debería conocer las condiciones actuales de uso del espectro incluido en los Lotes a subasta es el CONVOCANTE. Por tal motivo solicitamos se elimine la redacción actual del artículo del Borrador del Pliego y se sustituya con un Anexo en el que el CONVOCANTE informe la situación de uso del espectro en los referidos lotes. Asimismo, el compromiso del CONVOCANTE de adoptar las medidas administrativas pertinentes para que los adjudicatarios pueden hacer uso del espectro objeto de la subasta sin interferencias ni obstaculización de otros licenciarios que reclamen tener derechos de uso prevalentes.

Es responsabilidad del Regulador, quien tiene las herramientas y la obligación de conocer el estado jurídico y técnico del espectro, de garantizar la libre disponibilidad, calidad y “limpieza” del espectro. No procede trasladar en el eventual adquirente la carga de conocer el estado del espectro cuando el organismo no brindó información suficiente sobre las condiciones técnicas y jurídicas del espectro (si el mismo tiene o no interferencias, si hay controversias judiciales en trámite o pendientes y/o reclamos o reserva de derechos planteados al Gobierno, sobre derechos de uso de dichas bandas o derechos de uso vigentes en parte de estas).

Se debería prever que si hay interferencias que deben ser resueltas por la URSEC, se extienda el plazo de la autorización por todo el plazo que haya requerido su resolución.

#### **4) ARTICULO 40.- PAGO DE LOS PRECIOS.**

El artículo 40 establece un cronograma de pagos de 25% dentro de los 30 días corridos de la solicitud a URSEC para efectivizar la asignación; un 50% a los 12 meses de hacer efectiva la asignación y el 25% restante a los 24 meses de la asignación.



En atención a las elevadísimas inversiones que se requerirá para brindar un competitivo servicio de 5G, es que en línea con las mejores prácticas en la materia, solicitamos se modifique ese calendario de pagos para priorizar brindar el servicio a mayor cantidad de población con anticipación en el tiempo. A título de referencia, se solicita que el calendario de pagos sea 25% a los 30 días de solicitud de la asignación a URSEC; 25% a los 12 meses de la asignación efectiva y del 50% restantes, 25% a los 24 meses y 25% a los 36 meses de la asignación efectiva.

A título de referencia, cabe señalar que en el caso de la subasta de espectro para 5G, no solo el precio de ingresos al Fisco de ese país fue el 5% del precio de reserva o precio base, sino que se posibilita su pago en un solo pago o en 20 años, en cuotas anuales ajustables. El Pliego de subasta de Brasil dispuso:

“ 5.5 Las siguientes son condiciones de pago por el monto ofertado en las Propuestas de Precio:

a) El precio público adeudado por la Autorización de Uso de Radiofrecuencias podrá ser pagado en una sola cuota, en efectivo o en cuotas anuales iguales, siempre que el valor de las cuotas sea igual o superior a R\$ 500,00 (quinientos reales) .

b) El plazo para la liquidación de la cuota única o de la primera cuota anual será de 30 (treinta) días, contados a partir de la recepción de la notificación emitida por Anatel.

c) En el caso de pago fraccionado, el número máximo de cuotas anuales será igual al plazo, en años, del Derecho de Uso de Radiofrecuencias, y el valor de cada cuota se actualizará por la tasa de referencia del Sistema Especial. de Liquidación y Custodia - SELIC, devengado mensualmente, desde la fecha de



publicación del extracto del Plazo de Autorización para el Uso de Radiofrecuencias en el Diario Oficial de la Federación - DOU, hasta la fecha del pago efectivo.

5.5.1. Si el Postor no realiza el pago previsto en el numeral 5.5, inciso “a”, de la cuota única o de la primera cuota anual, en la fecha prevista, se adoptarán las medidas indicadas en el numeral 11.2.

5.5.2. El retraso en el pago previsto en el numeral 5.5, inciso “a”, de las demás cuotas anuales, en caso de fraccionamiento, además de la multa prevista en el numeral 11.3, podrá dar lugar a la terminación del otorgamiento de la Autorización para Uso de Radiofrecuencia y/o revocación o caducidad del correspondiente servicio de telecomunicaciones asociado a la misma.”

## **5) ARTICULO 40.- PAGO DE LOS PRECIOS. CAP DE ESPECTRO**

El pliego dispone lo siguiente: “Si luego de finalizada la IFP quedaran Lotes sin asignación, ANTEL, dentro de los 30 días corridos siguientes, podrá solicitar le sean asignados, lo que URSEC efectuará en las mismas condiciones establecidas en el PLIEGO”.

Hacemos presente que el Decreto N° 425/022 dispone una limitación en la cantidad de espectro que pueden adquirir los operadores privados, mientras que la redacción antes transcripta le deja abierta la posibilidad a Antel de incluso quedarse con todo el espectro ofrecido, para el caso de que los dos lotes queden vacantes.

Por tal motivo, se considera que debería preverse en el pliego que para el caso de que quede un lote o más lotes residuales, se debería realizar una nueva subasta creando lotes más reducidos, de 20 MHz y adecuar el cap de espectro



establecido por el Decreto N° 425, a través del nuevo Decreto que homologue el pliego.

Es de hacer notar que el propio Decreto N° 425/022 cuando fundamenta la limitación de cap de espectro dispone que la limitación se produce con el objeto de evitar que un operador obtenga todo el espectro, sin embargo, esta finalidad no se ve cumplida desde el momento en que habilita a Antel a obtener todo el espectro, para el caso de que el mismo quede vacante, posibilidad que no tienen los operadores privados.

Esta previsión genera una nueva vulneración del Acuerdo para la promoción y protección recíproca de las inversiones en las obligaciones asumidas en el artículo 3.2. y la ley 18.159, en su artículo 2.

## **6) ARTÍCULO 41.- AUTORIZACIÓN DE USO DE FRECUENCIAS.**

Este artículo contempla que dentro de los 30 días de abonado el espectro asignado, se procederá a emitir la autorización de uso de frecuencias. Observamos esa disposición, dado que viene a crear otra condición de desigualdad anticompetitiva en favor del operador ANTEL.

En efecto, como ha hecho público ese operador que ya conoce la porción del espectro a asignar y que tiene asegurado un lote con ubicación determinada en el dial de la banda de 3.5GHZ, le ha permitido adquirir, importar y montar equipamiento para brindar 5G.

Esto es algo que CLARO, ni tampoco los otros operadores que resulten participando de la subasta, han podido ni pueden hacer. Primero porque no saben si tendrán espectro en la banda de 3.5GHz. Segundo porque los dos Lotes previstos en el Borrador del Pliego para los privados se encuentran en dos extremos opuestos de esa banda, y como es de conocimiento de URSEC, no existe equipamiento que pueda utilizarse para los dos Lotes a subasta.



En tal sentido adjuntamos a la presente el Informe de los proveedores de tecnología (Nokia y Huawei) que se adjunta como **ANEXO II**, en ellos se da cuenta que hay un límite de MHz por IBW. Por ello, los equipos para 5G van de 3.3. a 3.7 y de 3.7 a 3.8.

La situación descrita requiere ser corregida para evitar una ventaja anticompetitiva de ANTEL de aproximadamente 8 meses, que es la duración mínima de adquisición, importación y montaje de tecnología desde que se asigne el espectro, mientras que ANTEL de acuerdo al artículo del borrador del pliego, podrá activar 5 G dentro de los 30 días del pago del espectro que le sea asignado.

El artículo 41 crea una situación de tratamiento diferencial, con lo que se vulnera el principio de igualdad en el acceso al mercado (time to market) que le permitiría artificialmente a ANTEL obtener una significativa ventaja de mercado perjudicando a mi representada, particularmente en los clientes de mayor valor.

Por ello, se solicita que se modifique la redacción del artículo 41 y se disponga que la autorización del uso de frecuencias tendrá lugar a partir de los 240 días de asignado el espectro.

Por otra parte, y en atención a que se trata de un servicio de comunicaciones móviles nuevo y que demandará la construcción de una red nueva, es que se solicita que el plazo de duración de la licencia sea de 28 años desde la asignación del Lote de espectro. Ello por cuanto se estima que se requerirá un mínimo de 3 años para montar una red con un área de cobertura y densidad comercial sustentable, y también de cambio sustantivo del parque de equipos celulares por parte de los clientes.

## **7 ARTÍCULO 50.- OBLIGACIÓN DE LIBERACIÓN PARCIAL DE ESPECTRO.**



Teniendo presente el tipo de servicio a prestar entendemos que este artículo debería ser eliminado dado que la banda es atribuida a nivel nacional y con obligaciones de cobertura definidas por lo que no es posible habilitar a otro interesado a que pueda acceder a parte del mismo. Por otra parte, esta posibilidad estaría desconsiderando los innumerables problemas de interferencias que se pueden ocasionar. Es de hacer notar, por otra parte, que la Administración cuenta con posibilidad de atender las necesidades de otros posibles interesados en alguna fracción del espectro de la banda 3.5, que se encuentra no utilizado, tomando en cuenta el uso para el que les fue asignado y la cantidad de usuarios involucrados.

#### **8) ARTÍCULO 53.- PROCEDIMIENTO A APLICAR AL VENCIMIENTO DE LA ASIGNACIÓN.**

La norma no define si los operadores podrán o no renovar el espectro objeto de la subasta, ello va en contra de inversiones de largo plazo como las que requiere la infraestructura de redes móviles, y más intensas se prevén para las redes 5G que tendrán un horizonte de mucho mayor densidad de back bone de fibra óptica y de pequeñas antenas (small cells).

Por lo tanto, y de acuerdo con las mejores prácticas en la materia es que se contemple como primera alternativa la de renovación de la autorización de uso, de acuerdo con las condiciones de mercado y de uso efectivo que se ha dado al espectro y a la evolución tecnológica

#### **9) ARTÍCULO 54.- ENLACES COMPLEMENTARIOS.**

Tomando en consideración el volumen de espectro a asignar, se requerirá la instalación de enlaces con más capacidad, por lo que se solicita que esta circunstancia sea tomada en consideración para reducir precios vinculados con estos.



## **10) ANEXO I.2 – ASIGNACIONES E IDENTIFICACIONES NACIONALES DE LAS BANDAS DE FRECUENCIA PARA IMT.**

Al haberse incluido bandas que no son objeto de la presente subasta, consideramos pertinente que la URSEC aclare cuál es el sentido y alcance de la redacción.

En segundo lugar, se solicita se informe en el Pliego, la atribución de uso que tienen las bandas incluidas en la actual redacción del Borrador del Pliego, o que ello se limite a la banda de 3.5GHz, si es que se considera innecesario incluir todas las bandas proyectadas en ese documento.

Solicitamos que se nos informe el acto administrativo mediante el cual se llevó a cabo el acto de atribución de uso de la banda de 3.5GHz y de las demás bandas que incluyan en el Pliego.

## **11) ANEXO I.3 – OBLIGACIONES DE DESPLIEGUE.**

Entendemos conveniente que se aclare que las obligaciones de despliegue previstas por fases de tres años no son acumulativas y que si se realiza un despliegue contemplando las exigencias dispuestas en cada una de las mismas, podrá darse por cumplida la obligación con las 70 bases nacionales mencionadas para el primer año.

En segundo lugar, en nuestra visión, como ya lo hemos expresado, el precio base de la subasta resulta muy elevado para las características del mercado de Uruguay. Para el mercadomasivo ( personas) no hay proyección de crecimiento sustantivo de la población; y en el mercado corporativo, el sector industrial como potencial vector para el uso de 5G es muy limitado ( aporta solo el 11% del PIB y tiene menos de 800 empresas con más de 100 empleados, mientras que el 86% tiene menos de 4 empleados).





Ante ello, es que solicitamos se considere incluir en el pliego que los operadores podrán imputar inversiones en despliegue de red por hasta u\$s 4.000.000 sobre el precio que resulte de cada lote, como imputables como pago a cuenta de la última cuota al prevista en la estructura de pagos. Esto se encuentra sujeto a que el operador que lo solicite despliegue un total de 140 estaciones de base con tecnología 4 o 5G en el territorio nacional, en los primeros 24 meses desde la asignación efectiva del espectro. Consideramos que esta medida balancea priorizar un mayor despliegue y que al computarlo parcialmente como parte del espectro se contribuirá a mejorar la sustentabilidad del desarrollo de 5G en Uruguay.

## **12) ANEXO I.4 – EQUIPOS DE RADIOCOMUNICACIONES A SER UTILIZADOS.**

Solicitamos se informe si hay equipamiento para brindar servicio 5G que se haya autorizado por parte de URSEC; y si hay operadores que hayan informado y/o solicitado autorización para el montaje y despliegue de equipamiento 5G.

En el caso que haya actos de URSEC habilitando equipos para 5G se solicita la individualización, fecha y copia de esos actos administrativos y la fecha se otorgaron las autorizaciones y a quienes.

## **13) ANEXO I.5 – INSTALACIONES Y USOS DE FRECUENCIAS.**

En lo referido a las instalaciones y uso de frecuencias, tomando en consideración que dada la ubicación de los Lotes de Espectro dentro de la banda de 3.5GHz, se requiere establecer una regla/principio para resolver el eventual conflicto ante interferencias con el usuario precario al que se le adjudicó la banda 3400-3600,



dado que el pliego sólo prevé mecanismos de resolución de eventuales conflictos de interferencias entre los asignatarios de la subasta.

Solicitamos que en primer lugar se establezca como regla general, que los autorizados al uso de frecuencias radioeléctricas que pudieren interferir con los lotes de espectro objeto de la subasta tendrán la obligación de coordinación técnica para evitar interferencias a la prestación del servicio 5G.

En segundo lugar, ante la falta de acuerdo de coordinación entre las partes involucradas, que el criterio de resolución del conflicto por parte de URSEC será que prevalecerá la definición de arquitectura de red del Servicio de Comunicaciones Móviles. Si hubiere que adoptar bandas de guarda, estas serán sobre las porciones de espectro que no son objetos de los Lotes de la subasta (EA01 y EA05),

#### **14) ANEXO I.6 – AUTORIZACIONES DE LAS ESTACIONES.**

Respecto de las consideraciones técnicas realizadas en este numeral, hacemos las siguientes apreciaciones:

Observamos en este punto el establecimiento de una zona de exclusión alrededor del Aeropuerto Internacional de Carrasco, sin embargo, no se aclara si los niveles de PIRE son en el centro de la pista o en las orillas del área delimitada.

Si entendemos que el fin es limitar el riesgo de interferencia con los altímetros entonces ese valor debería considerarse en la pista de aterrizaje, de otra forma se limitaría al dar servicio en la zona cercana.

De todas formas, cabe aclarar que ese escenario solo se ha dado en USA ya que en Europa y Asia no se ha establecido ese tipo de limitaciones considerando que la operación de esos equipos está por encima de los 4.2GHz.

De hecho, el párrafo tampoco establece si la PIRE establecida se medirá sobre la banda de operación de los altímetros o sobre la banda completa que se está



licitando (3.3-3.6 o 3.6-3.8 GHz). Si no somos co-canales con los altímetros y ya tienen límites establecidos para las emisiones fuera de banda (OoBE) y espurias, entonces no hace sentido definir un límite para el PIRE.

- En el último párrafo del numeral citado se establece:

*“En estos casos la PIRE por polarización no deberá superar:*

- - 67 dBm/100 MHz, cuando opere en la subbanda de 3300 MHz a 3600 MHz;
- o
- - 65 dBm/100 MHz, cuando opere en la subbanda de 3600 MHz a 3800 MHz.”

Entendemos que se trata de un error en la redacción dado que estos valores prácticamente implicarían que no se pueda brindar el servicio, es por ello que interpretamos que puede referirse a valores de potencia a medir en campo, y no en la antena como en el caso de la PIRE. En ese caso sería necesario especificar la metodología y condiciones de medición y confirmar si se refiere a mediciones de potencia a nivel de campo.

En cuanto a la metodología, correspondería determinar también el período de tiempo en el que se realiza cada medición. Como ejemplo, la guía de la ICNIRP (International Commission on Non-Ionizing Radiation Protection (1998). Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)) especifica una ventana promedio de 6 minutos en el tiempo para la medición de PRA o PRIA. La misma es adoptada por la ITU en la recomendación K.100 (06/2021).

## **15) ANEXO I.7 – LÍMITE DE POTENCIA**

*“Sin perjuicio de ello se establece que la potencia radiada aparente (PRA) de las estaciones de bases y estaciones repetidoras no debe superar los 605 dBm”.*

Respecto de lo antes transcrito entendemos que desde que los operadores son los encargados de asegurar el desempeño y experiencia de los usuarios de 5G,



que el regulador defina un límite no parece tener sentido técnico que justifique el límite de 60 dBm por rama indicado.

Este escenario puede llevar a la utilización de equipos más grandes (Ej 64T) para sortear esa limitante, dependiendo de las necesidades en cada sitio. Entendemos, para el caso de corresponder, que correspondería poner una limitación razonable en la potencia total independientemente de la cantidad de ramas.

De ser necesario definir un límite a la potencia radiada, el mismo podría ser de 80 dBm por portadora de 100 MHz (PRE), considerando las potencias que manejan hoy los equipos en esta tecnología.

En definitiva, consideramos que la potencia total no debería estar limitada, y solo debería quedar determinada por las condiciones de diseño definidas para cada sitio, y necesarias para cumplir con el punto 3 del mismo anexo (“que operen en condiciones satisfactorias de continuidad y calidad...”).

## **16) ANEXO IV – INSTRUCTIVO DEL PROCEDIMIENTO COMPETITIVO**

Tal como está diseñado el procedimiento, se entiende que un oferente pudiera pedir la asignación de más de un lote de frecuencia. Esto entra en contraposición con lo establecido en el Decreto que no permite adquirir más de un lote de 100 MHz. Por tanto, solicitamos al Regulador que se modifique la actual redacción limitando las ofertas a un solo Lote por participante en el proceso de puja.

## **17) ANEXO IV.4- INCREMENTO MÍNIMO PARA VALIDAR UNA OFERTA**

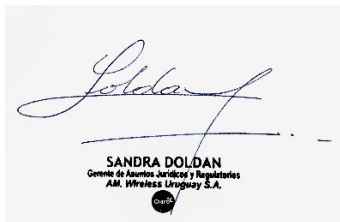
En el entendido que el Pliego definitivo será aprobado por un Decreto que es un instrumento jurídico hábil para modificar lo establecido el Decreto n° 425/022, es menester mencionar que el precio base fijado (USD 28.000.000,00), no tiene justificación, y por ende es una disposición administrativa nula por arbitrariedad.



Pedimos sea revisado, y que se tome como Valor Base por cada Lote U\$S 20.000.000, tomando para ello un valor levemente inferior a la comparación de mercado de URSEC de folio n° 9 del Expediente 2022-8-10-0000083. Este pedido se efectúa conforme a la buena práctica de tomar un valor inferior a la comparativa de mercado dado que entre otros aspectos estos son el resultado de procesos de pujas no de los valores base de subasta. En tal sentido, la Recomendación de la Comunidad Económica Europea 2020/1307, en su Recomendación 20, Promoción de adecuados precios de reserva, señala que los precios base de las subastas deben ser menores que el benchmark en caso de que la subasta se espera se competitiva, o un valor próximo al benchmark cuando no se espera mucha competencia. (Como **Anexo III** se adjunta esa Recomendación 2020/1307 “I Common Union Toolbox For Connectivity”).

Si el precio base es de U\$S 28.000.000, ese importe está previsto se incremente en 7% para la segunda ronda, lo cual agrava un valor de subasta ya de por sí inapropiado para el mercado de Uruguay lo cual ocasionará perjuicios al despliegue de 5G en el país y directamente a los consumidores.

Saluda atentamente,



SANDRA DOLDAN  
Gerente de Asuntos Jurídicos y Regulatorios  
AM Wireless Uruguay S.A.

Por **AM WIRELESS URUGUAY S.A**

Dra. Sandra Doldan

**AM Wireless Uruguay S.A.**  
**Av. Gral. San Martín 2460 – Montevideo**



## **ANEXO I**

**Informe de GSMA “Subastas 5G: 3 aciertos de Brasil para tener en cuenta en la región.**

# GSMA Latin America

ES



## Subastas 5G: 3 aciertos de Brasil para tener en cuenta en la región

martes 31 enero, 2023

5G | Brasil | Espectro | Políticas Públicas

Los últimos días del 2022 perfilaron al 2023 como el año de las subastas 5G en América Latina. En Argentina, la **última reunión de directorio de ENACOM** estableció la atribución de 3.5 GHz para estos servicios y aprobó el reglamento para regular su uso. Las autoridades hablan del primer trimestre como horizonte para realizar la subasta. En Uruguay, un decreto del Ministerio de Industria, Energía y Minería estableció las bases para licitar espectro en 3.5 GHz, con marzo como fecha probable. La SUBTEL de Chile manifestó la intención de entregar más espectro 5G, y en Colombia y México avanzaron con consultas públicas para sondear el interés de los operadores en procesos futuros. Los planes en Costa Rica también parecen estar marcados en el calendario. ¿Será entonces el 2023 un año de asignaciones más masivas en la región?

Con las primeras mil millones de conexiones alcanzadas a nivel global a finales de 2022, el 5G no es el futuro sino el presente de la industria móvil. El espectro es la llave maestra de la que dependen la velocidad, el alcance y la calidad de estos servicios. Sin olvidar que América Latina aún tiene por delante un importante margen de crecimiento 4G, es una buena noticia que el 5G esté en la agenda de gobiernos y reguladores de América Latina. Planificar es clave. Pero el desarrollo del 5G no es una carrera *sprint*, sino una maratón, y la asignación de espectro es el primer paso. Para que ese paso sea con el pie derecho, se necesitan asignaciones de espectro bien planificadas, que aseguren a los operadores acceso a la cantidad y el

tipo de espectro adecuados, en condiciones y precios razonables, y en el momento oportuno para el mercado. Nadie gana con asignaciones apresuradas o a cualquier costo; de hecho, el costo puede ser la diferencia entre el éxito o el fracaso de una asignación.

La **subasta 5G de Brasil** es reconocida a nivel global como un caso de éxito con resultados positivos para gobierno, industria y usuarios. Aunque cada licitación debe ajustarse a las características propias del mercado en que se desarrolla, los aciertos del proceso brasilero dejan 3 lecciones fundamentales para seguir en la región.

## 1. Las asignaciones exitosas son el resultado del trabajo en equipo.

La subasta de Brasil fue el producto de años de cooperación entre reguladores, operadores, proveedores de Internet, cadenas de radiodifusión, academia, entre otros actores. Los costos y condiciones de una licitación deben estar alineados a la realidad del país y las posibilidades de los operadores. En muchos casos, la asignación de espectro requiere migrar servicios existentes a otras bandas, como sucedió **en Brasil con los servicios de Recepción de Televisión Únicamente (Television Receive Only- TVRO)**. La coordinación solo es posible si todos los actores relevantes son parte activa del diseño del proceso. Para los operadores, la adquisición de espectro requiere desembolsar capital y asumir grandes compromisos a largo plazo. Este tipo de decisiones requieren previsibilidad y planificación, y es importante que las autoridades de Argentina y Uruguay involucren a la industria en los procesos, en especial dadas las expectativas temporales anunciadas.

## 2. Las asignaciones exitosas buscan maximizar la inclusión digital y la innovación, no la recaudación.

Un interés permanente de las haciendas nacionales es cuánto dinero recaudará una subasta de espectro. Lo cierto es que las subastas más exitosas no son las que más ingresos reportan y, de hecho, investigaciones demuestran justo lo contrario. Precios altos de espectro pueden conducir a subastas desiertas, reducción de las inversiones o impactos negativos en los servicios. Hacer a un lado la visión recaudatoria fue uno de los mayores aciertos del éxito de la subasta de Brasil. Solo el 5% del precio se pagó como ingresos al fisco, mientras que las inversiones en el despliegue de la red fueron reconocidas como la parte mayoritaria del precio del espectro.



### 3. Las asignaciones exitosas son parte de un plan integral.

La subasta de Brasil no sucedió de la noche a la mañana ni fue un hecho aislado. El proceso se inició hace **varios años con la modernización de varias políticas regulatorias**. En 2019, se modificó la **Ley de Telecomunicaciones** en tres aspectos cruciales: períodos de licencia de mayor duración, mercado secundario de espectro e instancias ilimitadas de renovación de licencias. El **silencio positivo administrativo** para la instalación de antenas y la **reducción de tasas** como el Fondo de Fiscalización de Telecomunicaciones (Fistel) o el impuesto estadual (ICMS) son otros ejemplos. Cada una de estas medidas contribuyó a generar un clima propicio para las inversiones en redes. Además, si bien el espectro es un componente esencial del futuro del 5G, no es el único. La nueva generación va a demandar más de 10 veces más antenas que 4G, por lo que agilizar el despliegue de infraestructura, por ejemplo, es fundamental. Asegurar certidumbre jurídica para las inversiones a través de políticas fiscales razonables, estabilidad institucional y coordinación intersectorial también es crucial.

En la actualidad, existe en el mundo una variación significativa en la cantidad de espectro 5G asignado y los precios pagados, por lo que se verán desarrollos muy variados. Esto, a su vez, repercutirá directamente sobre los beneficios socioeconómicos de los servicios y la competitividad de las economías nacionales. Las subastas mal diseñadas o con costos altos pueden tener **un impacto negativo en los mercados**. Los responsables políticos deberían tomar en serio esta posibilidad y tomar medidas para asegurar una entrada exitosa en la era 5G.



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## Recursos

- **Auction Best Practice GSMA Public Policy Position**, GSMA, 2021.
- **Subasta multibanda de Brasil: una de las más grandes en la historia de las comunicaciones móviles**, GSMA, 2021.

**AM Wireless Uruguay S.A.**  
**Av. Gral. San Martín 2460 – Montevideo**



## **ANEXO II**

### **INFORME DE 5G (NOKIA Y HUAWEI)**

# Analisis sobre espectro FDD en Uruguay

## B2 (1900Mhz) vs B5 (850Mhz)

Pablo Garelo – Account Manager , Mobile Networks – Amx AUP  
08.02.23

## Variables sobre el costo del espectro

Los siguientes factores influyen directamente en el costo del espectro radioeléctrico en bandas FDD.

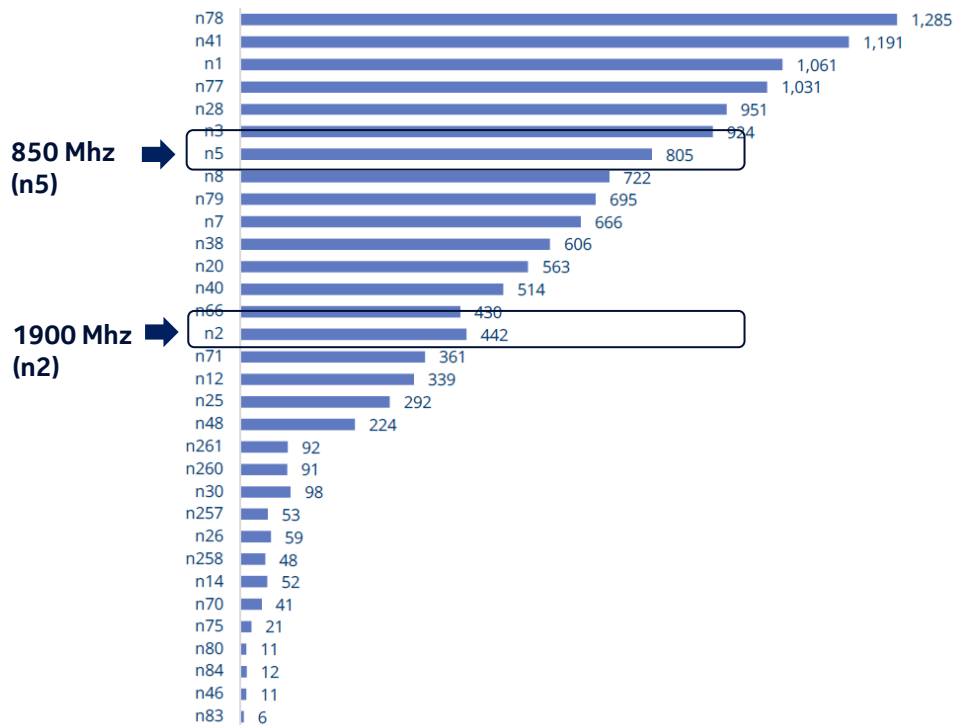
1. Tipo de servicio a ser prestado (ej. móvil / bfi)
2. Alcance del 'lease' en términos de duración y población alcanzable.
3. **Tecnologías** a ser explotadas sobre el canal (ej. 5G, 4G, 3/2G, IoT)
4. **Disponibilidad** del canal de frecuencia a licitar
5. **Cobertura** del canal de frecuencia (y su impacto en la cantidad de BTS a instalar en una zona geográfica)

En esta comparativa de B2 (1900) vs B5 (850) analizamos los factores diferenciadores #3, #4 y #5.

# Las tecnologías a ser explotadas dependen del ecosistema de terminales

## Cantidad de modelos de terminales 5G por banda soportada

(Incluye high/mid/low range)



- Las capacidades de la gama de mid-range marcan los límites en cuanto a que tan explotable es el espectro en el mercado.
- El soporte de nuevas tecnologías (ie 5G) sirve como catalizador.
- GSA, Enero/23: **número de modelos de terminales 5G soportando 850Mhz es casi el doble que para 1900Mhz**  
=> Ecosistema nutrido de 850Mhz implica menores costos de adopción de cara al futuro.

Fuente: GSA 5G Device Ecosystem – Member Report, Enero 2023

## La disponibilidad de espectro es el cuello de botella

Las capacidades de las bandas FDD no son match frente a 3.5Ghz TDD en 5G

Band	Name	Mode	Downlink (MHz)			Bandwidth DL/UL (MHz)	Uplink (MHz)			Duplex spacing (MHz)
			Low	Middle Earfcn	High		Low	Middle Earfcn	High	
1	2100	FDD	2110 0	2140 300	2170 599	60	1920 18000	1950 18300	1980 18599	190
2	1900 PCS	FDD	1930 600	1960 900	1990 1199	60	1850 18600	1880 18900	1910 19199	80
3	1800+	FDD	1805 1200	1842.5 1575	1880 1949	75	1710 19200	1747.5 19575	1785 19949	95
4	AWS-1	FDD	2110 1950	2132.5 2175	2155 2399	45	1710 19950	1732.5 20175	1755 20399	400
5	850	FDD	869 2400	881.5 2525	894 2649	25	824 20400	836.5 20525	849 20649	45

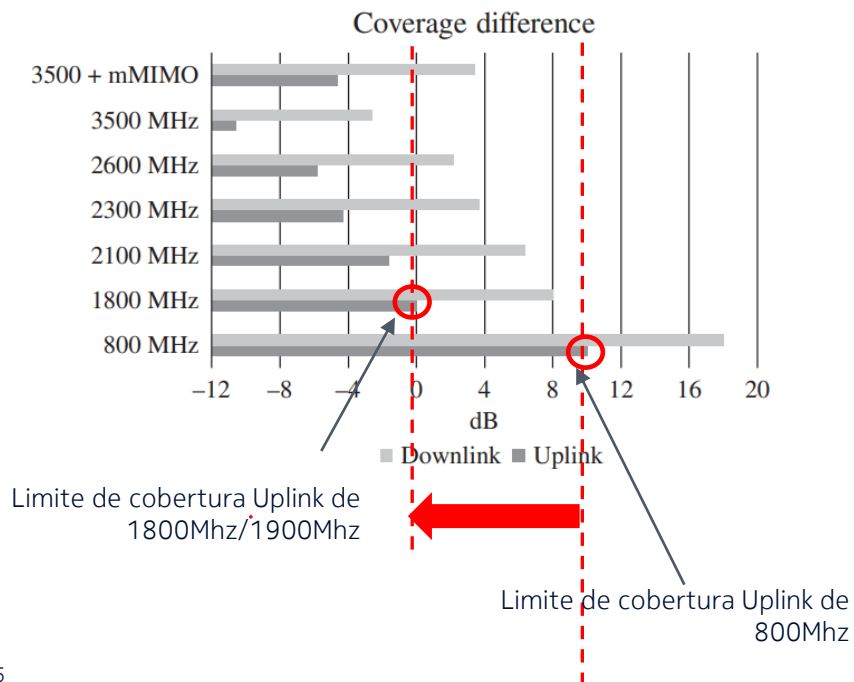
Fuente: 3GPP

- La banda B5 850Mhz dispone de 25Mhz + 25Mhz
  - La banda B2 1900Mhz dispone de 60Mhz + 60Mhz
- => B5 850Mhz es un bien escaso globalmente**

# La cobertura depende de la frecuencia del canal y la grilla de sitios

A igual grilla de sitios, la cobertura de 850Mhz es ampliamente ventajosa vs 1900Mhz

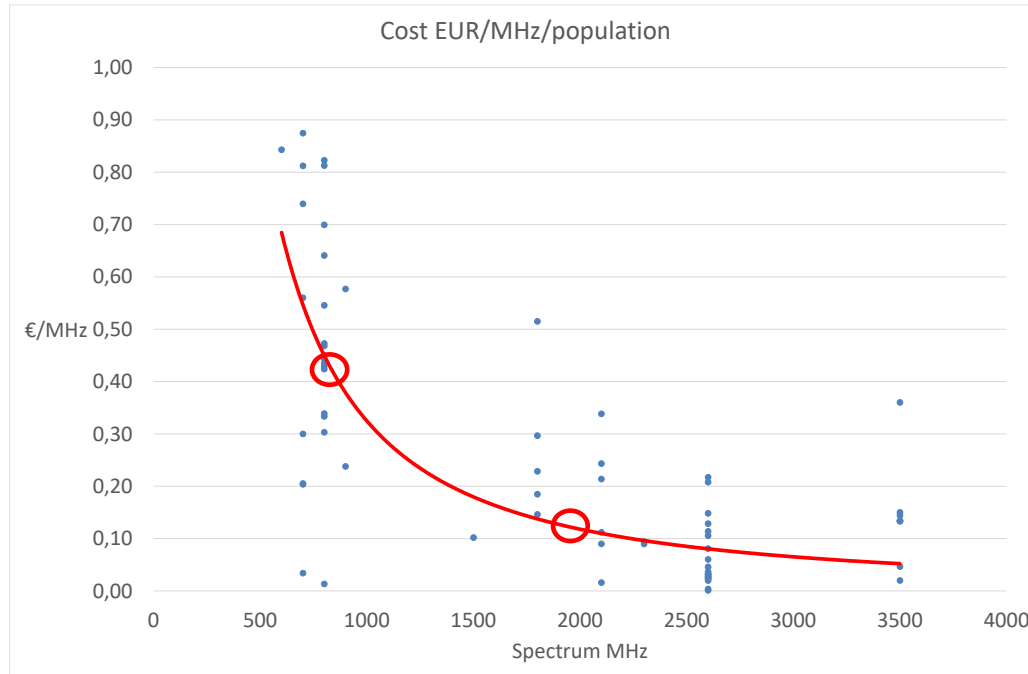
## Pérdida por propagación



- El factor limitante de cobertura en un canal FDD es siempre el Uplink.
  - B5 850Mhz tiene una cobertura UL en promedio +8dB mayor que B2 1900Mhz.
  - No se puede nivelar con la tecnología de BTSs disponible al día de hoy
- => Simplificando: **a iguales condiciones, L850 te puede dar x2.6 el radio de L1900.** Ejemplo de un cliente LAT, Urban: L1900 = 520m, L850: 1,36km

Fuente: "5G Technology 3GPP New Radio". H. Holma, A.Toskala, T.Nakamura. Wiley

# El costo del espectro FDD en bandas bajas es mucho mayor que en bandas altas



Fuente: Nokia proprietary

- Debido a 3+4+5 el **espectro en bandas bajas FDD (ie 850Mhz)** es en promedio **x3.3 veces más costoso** que en bandas altas FDD.
- **B2 1900Mhz** precisará una mayor cantidad de BTS en la zona a cubrir por lo que el costo de despliegue será mayor que en el caso de **B5 850MHz**.



## Resumen

- El ecosistema de UEs es prácticamente el doble para 850Mhz vs 1900Mhz **lo que implica menores costos de adopción de cara al futuro.**
- B5 850Mhz tiene una cobertura UL en promedio +8dB mayor que B2 1900Mhz, lo que **ante iguales condiciones de radio, L850 puede dar hasta x2.6 el radio de L1900.** Ejemplo de un cliente LAT, Urban: L1900 = 520m, L850: 1,36km
- B2 1900Mhz precisará una mayor cantidad de BTS en la zona a cubrir por lo que **el costo de despliegue será mayor que en el caso de B5 850MHz.**



Pablo Garelo – Account Manager - Mobile Networks – Amx AUP

A large, semi-transparent white Nokia logo is centered horizontally across the image. The background is a night landscape featuring a vibrant green aurora borealis in the sky, a dark horizon line, and a body of water with reeds in the foreground. The water reflects the aurora and a bright light source on the right. The overall scene is serene and atmospheric.

NOKIA

NOKIA

# Equipamiento cmWave – Análisis para Claro UY

Pablo Garello – Account Manager , Mobile Networks – Amx AUP  
08.02.23

# Características de Equipamiento cmmWave

5G	AQQL	AQQY
TxRx	64	32
Volume (l)	49	27.9 (56%)
Weight (Kg)	36	17 (47%)
Dimensions (HxWxD)	1001x448x113mm	625x395x100mm

## Productos en comparación

- 64 TRX AQQL (320 W)
  - 3440 MHz-3800 MHz
  - OBW / IBW: 200 MHz / 400 MHz
- 32 TRX AQQY (240 W)
  - 3400 MHz-3800 MHz
  - OBW / IBW: 200 MHz / 400 MHz
- 8 TRX AKQJ (320 W)
  - 3400 MHz-3800 MHz
  - OBW / IBW: 200 MHz / 300 MHz
  - Se require antena externa

## Radios cm Wave



64T64R				
3300	3400	3500	3600	3700
AQQL				
AQQN				

32T32R				
3300	3400	3500	3600	3700
AQQY				
AQQA				



- 5G n78 (3.3 a 3.7MHz / 3.4 a 3.8MHz) el límite es de 400MHz de IBW por limitaciones de HW.
- En el caso de AMX UY no es posible tener un equipo desplegado anticipadamente que cubra las posibilidades que tienen según la licitación (3.3 a 3.4 o 3.7 a 3.8).



Pablo Garelo – Account Manager - Mobile Networks – Amx AUP

## Wide band massive MIMO Adaptive Antenna Solution for n78 (3.4-3.8 GHz)

### Product Benefits

- Adaptive Antenna System for optimized capacity and coverage
- Digital beamforming for multi-user MIMO
- Beamforming capable 64T64R with total 320 W output power
- Wide frequency range with 200 MHz occupied BW

Specification*	Details (Preliminary)
RAT standards	NR, ready for LTE
TX/RX, BF, AEs	64T64R, Digital Beamforming, 192AE
Max Output Power	320 W
Supported Bands	n78 TRX: 3400-3800 MHz
Instantaneous bandwidth (IBW)	400 MHz
Occupied bandwidth (OBW)	200 MHz
NR Carrier bandwidth	Up to 100 MHz, 2 CC combinations
Fronthaul Support	eCPRI
Supply voltage	-48 V DC
Operational temperature range	-40 °C to +55 °C / Active Cooling
Dimensions (H x W x D)	1001 x 448 x 113 mm
Volume / Weight	49 l / 36 kg



## Wide band massive MIMO Adaptive Antenna Solution for n78 (3.3-3.7 GHz)

### Product Benefits

- Adaptive Antenna System for optimized capacity and coverage
- Digital beamforming for multi-user MIMO
- Beamforming capable 64T64R with total 320W output power
- Wide frequency range with 200 MHz occupied BW

Specification*	Details (Preliminary)
RAT standards	NR, ready for LTE
TX/RX, BF, AEs	64T64R, Digital Beamforming, 192AE
Max Output Power	320 W
Supported Bands	n78 TRX: 3300-3700 MHz
Instantaneous bandwidth (IBW)	400 MHz
Occupied bandwidth (OBW)	200 MHz
NR Carrier bandwidth	Up to 100 MHz, 2 CC combinations
Fronthaul Support	eCPRI
Supply voltage	-48 V DC
Operational temperature range	-40 °C to +55 °C / Active Cooling
Dimensions (H x W x D)	1001 x 448 x 113 mm
Volume / Weight	49 l / 36 kg

\* HW specifications such as capacity, performance and functions are subject to the SW roadmap, configurations & traffic model and use case combined with the specific variant in use. Variant details are found in the datasheets.



CB007907

## Wide band massive MIMO Adaptive Antenna Solution for n78 (3.4-3.8 GHz)

### Product Benefits

- Adaptive Antenna System for optimized capacity and coverage
- Digital beamforming for multi-user MIMO
- Beamforming capable 32T32R with total 240W output power
- Wide frequency range with 200 MHz occupied BW

Specification*	Details (Preliminary)
RAT standards	NR, ready for LTE
TX/RX, BF, AEs	32T32R, Digital Beamforming, 128AE
Max Output Power	240 W
Supported Bands	n78 TRX: 3400-3800 MHz
Instantaneous bandwidth (IBW)	400 MHz
Occupied bandwidth (OBW)	200 MHz
NR Carrier bandwidth	Up to 100 MHz, 2 CC combinations
Fronthaul Support	eCPRI
Supply voltage	-48 V DC
Operational temperature range	-40 °C to +55 °C / Active Cooling
Dimensions (H x W x D)	625 x 395 x 100 mm
Volume / Weight	27.9 l / 17 kg



## Wide band massive MIMO Adaptive Antenna Solution for n78 (3.3-3.7 GHz)

### Product Benefits

- Adaptive Antenna System for optimized capacity and coverage
- Digital beamforming for multi-user MIMO
- Beamforming capable 32T32R with total 320W output power
- Wide frequency range with 200 MHz occupied BW

Specification*	Details (Preliminary)
RAT standards	NR, ready for LTE
TX/RX, BF, AEs	32T32R, Digital Beamforming, 192AE
Max Output Power	320 W
Supported Bands	n78 TRX: 3300-3700 MHz
Instantaneous bandwidth (IBW)	400 MHz
Occupied bandwidth (OBW)	200 MHz
NR Carrier bandwidth	Up to 100 MHz, 2 CC combinations
Fronthaul Support	eCPRI
Supply voltage	-48 V DC
Operational temperature range	-40 °C to +55 °C / Active Cooling
Dimensions (H x W x D)	707 x 395 x 106 mm
Volume / Weight	30 l / <19 kg

\* HW specifications such as capacity, performance and functions are subject to the SW roadmap, configurations & traffic model and use case combined with the specific variant in use. Variant details are found in the datasheets.



CB006545



# Reporte de bandas de funcionamiento de equipos

## 1 Bandas de funcionamiento de equipos 5G

### 1.1 Banda de análisis

La tecnología de 5G, si bien funciona en muchas de las actuales bandas de espectro destinados a comunicaciones móviles, la porción de espectro comprendido entre 3.3GHz y 3.8GHz, denominado como n78 o Banda C, será el foco de este análisis.

### 1.2 Radios para la banda N78

A continuación, se detalla el detalle de radios para 5G en Banda N78 disponibles:

64T64R	240W			320W	
Item	AAU5639w	AAU5639	AAU5649	AAU5636w	AAU5636
RAT	TDD/NR/TDD+NR	TDD/NR/TDD+NR	TDD/NR/TDD+NR	TDD/NR/TDD+NR	NR only
Band	3.5/3.7G, 3.5(EU)	3.5/3.7G, 3.5(EU)	3420-3800MHz	3.5/3.7G	3300-3550MHz LA
Power	240W	240W	240W	320W	320W
IBW/OBW	200M/200M	200M/100M	380M/200M	200M/200M	200M/100M
Antenna Gain	25dBi	25dBi	25dBi	25dBi	25dBi
Size/Weight	730*395*160mm3/27kg	730*395*160mm3/27kg	795*470*190mm3/38kg	730*395*160 mm3/27kg	730*395*180 mm3/28kg
Version	SRAN15.1	SRAN16.1	SRAN15.1	SRAN16.1	SRAN16.1
GA	2020Q1	2020Q3	2020Q2 TR5	3.7G 2020Q4 3.5G 2021Q3	2021Q4


64T64R	MetaAAU		32T32R	240W	
Item	AAU5636m	AAU5636m	Item	AAU5339w	AAU5339
RAT	TDD/NR/TDD+NR	TDD/NR/TDD+NR	RAT	TDD/NR/TDD+NR	TDD/NR
Band	3400-3600MHz 3Gpp	3600-3800MHz 3Gpp/ECC	Band	3.5/3.7G, 3.5G(EU)	3.5/3.7G, 3.5G(EU)
Power	320W	320W	Power	240W	240W
IBW/OBW	200M/200M	200M/200M	IBW/OBW	200M/200M	200M/100M
Antenna Gain	27dBi	27dBi	Antenna Gain	23.8dBi	23.8dBi
Size/Weight	1450 x 400 x 180 mm3/30kg	1450 x 400 x 180 mm3/30kg	Size/Weight	699*395*160mm3/24kg	699*395*160mm3/24kg
Version	SRAN18.1	SRAN18.1	Version	SRAN16.0	SRAN16.0
GA	2022Q2 TR5	2022Q3 TR5	GA	3.7G: 2020Q2 3.5G: 2020Q3	2020Q3

### 1.3 Resultados

Para definir la medición del resultado, se debe entender que los parámetros IBW y OBW definen el ancho de banda o frecuencia de trabajo del radio en MHz, a partir del cual se obtiene el siguiente resumen:

Tipo de Radio	IBW Min	IBW Max	IBW Prom	OBW Min	OBW Max	OBW Prom
64T64R	200	380	290	100	200	150
32T32R	200	200	200	100	200	150
Meta AAU	200	200	200	200	200	200

## 2 Conclusiones

1. Los radios de telecomunicaciones disponibles en el mercado trabajan sobre bandas específicas de funcionamiento, en un rango habitual de 100MHz hasta 200MHz para banda C. Debido a la limitante en la física en los circuitos electrónicos y filtros, no es posible contener toda la banda N78 con un solo radio.	
Vendor: Huawei	Ingeniero del Vendor: Pedro Calzadilla  Fecha: 13/02/2023
Cliente:	Firma del Cliente:  Fecha:

**AM Wireless Uruguay S.A.**  
**Av. Gral. San Martín 2460 – Montevideo**



### **ANEXO III**

## **RECOMENDACIÓN 2020/1307 “L COMMON UNION TOOLBOX FOR CONNECTIVITY**

# COMMON UNION TOOLBOX FOR CONNECTIVITY

pursuant to Commission Recommendation (EU) 2020/1307 on a common Union toolbox for reducing the cost of deploying very high capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum, to foster connectivity in support of economic recovery from the COVID-19 crisis in the Union.

Connectivity Special Group for developing  
a common Union toolbox for connectivity

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# 1. Introduction

Last year, the emergence of the COVID-19 pandemic caused a sudden change in the working and living manners. Modern, secure, sustainable and high-performance electronic communication networks form more than ever the essential basis for continuing work processes and human contacts around the world. A robust infrastructure for digital connectivity is a key element to enhance productivity and increase resilience during such a destabilising event. It has become clear that the COVID-19 pandemic has brought about the need for a step-change in digitalization that Member States have to take advantage of, and address. In this context, the potential of the recovery and resilience facility is recognised, including for ensuring efficient public spending and creating the conditions best suited for private investment. In order to prepare for future connectivity needs, a number of measures are required to improve and guarantee digital connectivity both for European Union (EU) businesses and citizens.

Advanced and sustainable networks are one of the most fundamental building blocks of the EU twin digital and green transformation and an essential pillar for the post-pandemic recovery. The timely deployment of very high capacity networks (VHCN), including fibre and 5G, will offer significant economic opportunities for the years to come, as a crucial asset for European competitiveness, sustainability and a major enabler for future digital services.

The Council Conclusions on ‘Shaping Europe’s Digital Future’ of 9 June 2020<sup>1</sup> emphasized that the COVID-19 pandemic had demonstrated the need that Member States work closely together and with the Commission for ensuring fast and ubiquitous connectivity.

Within the EU, the Broadband Cost Reduction Directive<sup>2</sup> constitutes a critical piece of legislation that aims to facilitate and incentivize the roll-out of high-speed electronic communications networks. The Broadband Cost Reduction Directive promotes measures for facilitating the joint use of existing physical infrastructure and a more efficient deployment of new physical infrastructure at lower cost. Member States have implemented the 2014 Directive into their national rules. The 2018 Commission’s report on the implementation of the Broadband Cost Reduction Directive<sup>3</sup> revealed a number of problems in terms of its efficiency and consistent implementation. In 2020, the Commission launched the process for reviewing the Broadband Cost Reduction Directive<sup>4</sup>.

The European Electronic Communications Code<sup>5</sup> will improve regulatory conditions to incentivise private investments for the deployment and take-up of VHCN. The timely and investment-friendly access to 5G radio spectrum is also addressed in the European Electronic Communications Code, which provided for some concrete deadlines for assignment of 5G spectrum by June and December 2020. Member States had to transpose and apply the provisions

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<sup>1</sup> Conclusions on Shaping Europe’s Digital Future, 9 June 2020, 8711/20, <https://data.consilium.europa.eu/doc/document/ST-8711-2020-INIT/en/pdf>.

<sup>2</sup> Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks, OJ L 155, 23.5.2014, p. 1.

<sup>3</sup> Commission’s report on the implementation of Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks, COM(2018) 492 final. Link: [http://www.europarl.europa.eu/RegData/docs\\_autres\\_institutions/commission\\_europeenne/com/2018/0492/COM\\_COM\(2018\)0492\\_EN.pdf](http://www.europarl.europa.eu/RegData/docs_autres_institutions/commission_europeenne/com/2018/0492/COM_COM(2018)0492_EN.pdf)

<sup>4</sup> BCRD review in Europa site: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12463-Review-of-the-Broadband-Cost-Reduction-Directive-Directive-2014-61-EU-> .

<sup>5</sup> Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code, OJ L 321, 17.12.2018, p. 36.

of the Code as from 21 December 2020 (unless an earlier date was indicated for specific provisions).

On 18 September 2020, the Commission adopted a Recommendation<sup>6</sup> (Recommendation) calling on Member States to develop and agree on a common Union Toolbox of best practices to foster connectivity (Connectivity Toolbox) and, in particular, the deployment of VHCN, including fibre and 5G.

This report contains the Connectivity Union Toolbox of best practices which Member States agreed in a consensual procedure, as well as background on the objectives and work process, and guidance on the implementation and next steps. The timely implementation of the Connectivity Toolbox<sup>7</sup> should foster the continued investment in connectivity infrastructure and services to sustain the digitalisation of industry and society thus boosting the competitiveness of the EU economy as well as social inclusion.

## **2. Objectives of the Toolbox**

The Connectivity Toolbox Recommendation aims at fostering connectivity across the EU by (i) reducing the cost and increasing the speed of deploying VHCN and (ii) ensuring a timely and investment-friendly access to 5G radio spectrum. These objectives are also aligned with the general objectives of the European Electronic Communications Code, in particular as regards boosting connectivity and widespread availability and take-up of VHCN.

In this regard, the Connectivity Toolbox, as the main outcome of the Recommendation, contains best practices proposed by Member States to address the two main areas of reducing deployment costs and ensuring access to 5G radio spectrum.

Regarding the reduction of network deployment costs, the best practices of the Connectivity Toolbox are organized along six major topics: (i) streamlining permit granting procedures for civil works, (ii) improving transparency and reinforcing the capabilities of the single information point, (iii) expanding the right of access to existing physical infrastructures controlled by public sector bodies, (iv) improving the effectiveness and efficacy of the dispute resolution mechanism, (v) reducing the environmental footprint of networks and (vi) performing and taking account of the results of environmental impact assessments.

Regarding the timely access to 5G radio spectrum, the best practices of the Connectivity Toolbox address (i) financial incentives of spectrum authorisation procedures with a focus on pioneer bands and (ii) aspects of radio spectrum management to support high-quality wireless connectivity for industrial use cases with a cross-border dimension. In addition to the scope of the Recommendation, the Connectivity Toolbox also includes best practices to increase public transparency and trust in 5G deployment in regard to the protection of public health from electromagnetic waves.

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<sup>6</sup> Commission Recommendation (EU) 2020/1307 of 18 September 2020 on a common Union toolbox for reducing the cost of deploying very high-capacity networks and ensuring timely and investment-friendly access to 5G radio spectrum, to foster connectivity in support of economic recovery from the COVID-19 crisis in the Union, OJ L 305, 21.09.2020, p.33.

<sup>7</sup> The Toolbox process is without prejudice to the respective Member States' positions concerning the revision of the Broadband Cost Reduction Directive.



### 3. Working method

The Recommendation called upon Member States to work together, and in close cooperation with the Commission, in order to develop and agree on a Toolbox of best practices to foster connectivity. In order to accomplish the tasks in line with the Recommendation, a Special Group (Connectivity Special Group), composed of representatives of each Member State and the Commission<sup>8</sup>, was formally set up and met first on 16 October 2020.

The overall task of the Connectivity Special Group is to establish cooperation between the Member States as well as coordination with the Commission for identifying and sharing best practices (phase 1), developing and agreeing on the Connectivity Toolbox (phase 2) and assisting Member States, upon request, in the implementation of the Toolbox and reporting (phase 3). The Connectivity Special Group remains in existence until the completion of those tasks (30 April 2022). Two sub-groups were established within the Connectivity Special Group with the aim of allowing for closer cooperation and working on each of the two major areas, namely cost reduction of network deployment and access to 5G radio spectrum. Both sub-groups remained in existence until the delivery of the Toolbox.

The Connectivity Special Group meetings have been co-chaired by one representative each of the Commission, Germany (due to its Presidency of the Council in the second half of 2020) and Portugal (due to its Presidency of the Council in the first half of 2021). Both sub-groups have been co-chaired by the representatives of Germany and Portugal<sup>9</sup>.

In phase 1 (identification of and sharing best practices), Member States were invited to answer a questionnaire reporting on relevant best practices for the different topics identified in the Recommendation, as well as aspects related to increasing public transparency and trust in 5G deployment with a view to minimise concerns as regards its electromagnetic fields (EMF) impact and any other potentially relevant matters. Member States participated actively and submitted final contributions by the end of November 2020. The notion of “best practices” was understood as measures, practices or procedures, which are planned or implemented at any administrative level (central, regional, local) that demonstrate, or are expected to have, a significant contribution to resolving the issues set out in the Recommendation. The submitted best practices were examined by both sub-groups in order to identify common trends without an assessment.

Moreover, the Connectivity Special Group sought input from the Radio Spectrum Policy Group (RSPG) and the Body of European Regulators for Electronic Communications (BEREC). The national regulatory authorities (NRAs), the Broadband Competence Offices (BCO) network as well as the competent authorities in charge of the functions of the single information point (SIP)

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<sup>8</sup> Non-EU countries of the European Economic Area and countries that are candidates for accession to the EU were able to participate as observers. Norway participated in the work of the Special Group.

<sup>9</sup> As of 1 July 2021, the Connectivity Special Group will be co-chaired by a representative of the respective Presidency of the Council (Slovenia) and a representative of the following Presidency of the Council (France) as well as by a representative of the Commission.

were deemed to be involved at national level by the Member States' representatives in the Connectivity Special Group. BEREC<sup>10</sup> and RSPG<sup>11</sup> provided written contributions to phase 1.

As the outcome of phase 1, on 17 December 2020 the Connectivity Special Group agreed on a Compilation Report, including an Annex made up of a compilation of the individual inputs, which was then published on the Europa website<sup>12</sup>.

In order to structure the process for phase 2 (development and agreement of the Connectivity Toolbox), different drafting groups were set up each dedicated to one specific topic where the representatives of the Member States assessed, discussed and drafted initial proposals of best practices, which are proposed to be included in the Connectivity Toolbox. With the aim to facilitate a common approach on the qualitative assessment and the identification of best practices, the Connectivity Special Group endorsed a guidance document presenting high-level qualitative criteria to assist the drafting groups in assessing the best practices on the basis of the Compilation Report and further relevant inputs and considerations. The criteria, which included inter alia aspects of proportionality, effectiveness, time-efficiency, potential impact, appropriateness, regulatory predictability, modularity and replicability, had an illustrative character and served as orientation to be applied at the discretion of the drafting groups.

The proposals submitted by the drafting groups were discussed by the respective sub-groups at the beginning of February 2021. The sub-groups further engaged in discussions with RSPG, BEREC and the BCO network<sup>13</sup>. The RSPG provided a written contribution to phase 2<sup>14</sup>. Later, the Connectivity Special Group discussed the proposals for best practices for the Toolbox at the beginning of March 2021 and, following subsequent revisions, reached agreement on the final version of the Connectivity Toolbox on 25 March 2021. The Connectivity Toolbox is published on the Europa website as well as via the single information points.

## **4. Best Practices**

### **STREAMLINING PERMIT GRANTING PROCEDURES**

#### **RECOMMEND 8a**

While tacit approval has been implemented in several Member States (for certain types of permits in general or for specific circumstances) as a measure to facilitate the granting of permits for deployment of electronic communications networks, Member States do not consensually agree on the introduction of tacit approval as a best practice to be considered by all Member States in the context of the Connectivity Toolbox.

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<sup>10</sup> See Annex to the compilation report at <https://ec.europa.eu/digital-single-market/en/news/eu-member-states-present-report-best-practices-fast-network-rollout-first-step-towards>.

<sup>11</sup> Document RSPG20-039 final “First Input of the Radio Spectrum Policy Group to the “Connectivity Special Group”” of 4 December 2020.

<sup>12</sup> <https://ec.europa.eu/digital-single-market/en/news/eu-member-states-present-report-best-practices-fast-network-rollout-first-step-towards>

<sup>13</sup> Three joint workshops were organised with BEREC (2 February), the Broadband Competence Offices network (2 February) and RSPG (12 February).

<sup>14</sup> Document “High level conclusions of the Radio Spectrum Policy Group to the Connectivity Special Group” of 3 March 2021.

**RECOMMEND 8b**

**1. INTRODUCE PERMIT EXEMPTIONS AND FAST TRACK PROCEDURES AND PROMOTE THE APPLICATION OF EXISTING LIGHTER PERMIT GRANTING PROCEDURES**

**Permit exemptions or mere notification mechanisms can help streamlining procedures for obtaining permission to roll out infrastructure. Therefore, the introduction of new permit exemptions or notification mechanisms should be considered, when relevant legislation is under review, if not earlier. Moreover, permit-granting competent authorities should be encouraged to make use of existing and relevant light permit granting procedures which are available to use by them on a voluntary basis, where appropriate.**

This best practice focuses on streamlining administrative procedures required before being able to roll out infrastructure for digital connectivity, such as masts, antennas, poles, underground cables, etc., for which building permits, digging permits or other permits may be required:

- Exemptions from requirements for permits, so that a certain type of infrastructure rollout or civil works project can be done without first obtaining a certain type of permit, or in some cases without any prior permits;
- Prior/post-hoc notification procedures, where a notification to the relevant authority replaces one or more permit(s). In some cases, it may be deemed sufficient to send a post-hoc notification to the relevant authorities that a project covered by the mechanism has already been completed. In other cases, it can be relevant to require only a prior notification of an intended project, which can then be commenced either straight away or after the elapse of a short deadline for the authority to raise objections, but which is not a matter of applying for a permit. It can also be considered to allow for several infrastructure elements to be notified at once in a “batch”.

Both measures are suitable to reduce administrative burden and speed up the deployment of electronic communications infrastructure. Since introducing such procedures will often require changing legislation, it is recommended that these two tools are considered in relation to infrastructure for digital connectivity when relevant legislation (such as building regulation, zoning legislation etc.) is being revised if not earlier. This best practice does not include any reporting or documentation requirements for the Member State. Where national legislation (already) provides for regional or local authorities to use exemptions or notification mechanisms at their discretion, it is recommended that national authorities raise awareness of these possibilities and encourage its use, where appropriate, and/or identify any barriers to their use.

The scope of permit exemptions or notification mechanisms should always be clearly defined. Usually, there will be certain criteria defining which types of infrastructure or civil works project the permit exemptions or notification mechanisms apply to.

The purpose of requiring a permit is, among other things, ensuring a concrete assessment of a project’s impact on matters such as landscapes, urban planning, traffic, etc. There will be situations where the need for such a concrete assessment outweighs the benefits of a permit exemption or notification mechanism. The assessment of when this is the case is for each Member State to make, and it is also natural that the assessment can differ for different permit types, so that projects covered by an exemption from one permit type can still require other

permit types, especially in specific subsets of cases, e.g. when placing infrastructure in protected areas governed by special rules.

## **2. PROVIDE MODEL REGULATIONS ON ELECTRONIC COMMUNICATIONS NETWORK DEPLOYMENT**

**Provide model provisions (regulations, plans, etc.) with regard to permit granting related to electronic communications network deployment addressed to competent authorities.**

This best practice aims to improve local/regional provisions on electronic communication network deployment and foster more consistent rules when different public administrations are involved (national, regional, local) and support municipalities and other public entities with regard to the electronic communications' permit and/or planning related legal framework.

This practice consists in developing a model regulation or, as the case may be, other relevant types of provisions on electronic communication network deployment that can be used by competent regional/local administrations as a reference when they issue their own rules on this subject. The model regulation can also describe fast-track procedures or other lighter permit mechanisms that can help to comply with the 4-month deadline foreseen in the Broadband Cost Reduction Directive and are possible under the current legal framework.

A model regulation can vary in format, but is essentially a "blueprint" for such legal or quasi-legal documents that may be helpful to competent authorities. Examples include "blueprints" for regional-level legislation, "blueprints" for municipal guidelines for the processing of permit applications, or "blueprints" for zoning plans.

These model provisions may be developed at national level in close cooperation with the different administrations involved in granting permits for network deployment. Operators, manufacturers or any other relevant stakeholders may also participate in developing it.

The adoption of this model provisions by the municipalities/regional authorities would be on a voluntary basis. The measure potentially fosters a uniform approach and increased predictability on local level by enabling municipalities/other competent entities which make use of the model provisions to provide equal conditions for obtaining permits.

The benefit of this measure is that it allows uniformization of regulations and helps ensuring that the legal framework is being applied correctly while also contributing to the spread of fast-track permit procedures and 4-month deadline compliance.

## **3. PROVIDE INFORMATIVE MATERIALS AND WORKSHOPS FOR MUNICIPALITIES AND OTHER COMPETENT AUTHORITIES**

**Provide a set of informative materials aimed at municipalities and other competent authorities in charge of permit granting for civil works describing procedures under the relevant legal framework and measures to speed up and ease permit granting procedures. This may include workshops for local/regional authorities regarding the electronic communications legal framework and related permit fast-track procedures.**

Member States should entrust designated entities or contact persons (e.g. within the competent authorities, national and regional BCOs, NRAs, etc.) to prepare for regional and/or local

authorities (most often municipalities) in charge of permit granting a set of informative materials describing relevant procedures, the legal framework (e.g. on electronic communications, permit or planning rules, etc.) and measures, including fast-track procedures, with regard to the permit granting for civil works necessary for the roll-out of VHCN. The material may include printables/brochures, online knowledge portals, workshops for local/regional authorities, online courses providing basic knowledge regarding VHCN, as well as advanced training for permit granting procedures and related issues. The material may also include contact addresses for further clarification. The information is ideally available on an online platform that is regularly updated.

The main objective of this best practice is to provide the local/regional authorities with a knowledge tool regarding network deployment related issues, in particular aspects of permit granting, in order to accelerate and streamline permit granting procedures. The measure is an advantage for all parties, including the network operators. Local/regional authorities would benefit extensively from this tool, as they themselves are often not in a position to maintain high-level expert knowledge with regard to the physical roll-out of VHCN. Conversely, the entities designated by Member States to coordinate this material also benefit because the exchange with the administrations is closer and practical experience can provide useful feedback, and may be able to provide useful knowledge on local/regional matters to e.g. higher-level BCOs, the NRA, etc. The measure guarantees effectiveness and efficiency because it can help speed up and streamline procedures. By enhancing the permit granting procedure, this best practice can speed up the broadband roll-out in general and therefore also benefit the network operators and the consumers.

The measure potentially fosters a uniform approach and increased predictability on local level by enabling municipalities/other competent entities which make use of the material to provide equal conditions for the permit granting procedures.

The measure can be implemented directly, since it does not need any legal changes, but it may require somewhat increased staffing levels with high competence in the entities designated by Member States, or a temporary reallocation of existing staff to the task, in order to coordinate the initial set of materials and (possibly) ensure the capacity for workshop programmes at local/regional level. However, the estimated costs of this measure are low and manageable compared to the long-term use of the tool. Costs and effort for the initial initiative have the potential to free up financial means and human resources in the regional/local authorities using the materials. After the initial stage, costs for regular maintenance and updating of the set of materials would be lower and usually quite manageable. For courses, over time preparation effort is reduced due to experience, and time use would mostly be limited to the courses themselves. In the long term, it is possible that administrations would save costs since they benefit from the experience and knowledge through this best practice.

It is important to ensure that no duplication of efforts is made, and it should generally be checked if other authorities at the same or a lower level already have materials on some relevant aspects. For instance, national authorities should not issue materials communicating regional legislation to local authorities, except if this is coordinated with the relevant authorities.

## RECOMMEND 8c

### 4. ENSURE THE USE OF ELECTRONIC MEANS FOR PERMIT APPLICATIONS

**Ensure that all permit applications can be submitted by electronic means and that the corresponding decisions (granting/refusing) by the competent authorities are communicated to the electronic communications operators by electronic means.**

This best practice builds on Article 7(2) of the Broadband Cost Reduction Directive which has an optional character. It is also fully in line with overall EU legislation promoting the use of digital public services, in line with “digital by default” principle and the efforts undertaken by Member States as regards e-Administration. It also reflects the measures reported by 16 Member States as regards the use of electronic means for permit applications, which ranges from use of email to more sophisticated electronic platforms at national or local level.

The possibility of submitting permit applications by electronic means can – as an optional more advanced solution than basic emails – be made available via a digital platform which can consist either in a single digital portal or in interconnected digital portals. The single portal can also be the Single Information Point (SIP), which is already in charge of collecting and making available all the relevant information concerning the conditions and procedures applicable for granting civil works.

Member States which are less advanced in terms of electronic permit granting procedures could consider the need for establishing a transition period to move towards fully electronic permit granting procedures, and the need to support all actors with shared tools and resources to facilitate this transition. This best practice is strongly connected with the next one.

## RECOMMEND 8d

### 5. DIGITAL ADMINISTRATIVE PORTAL/SINGLE INFORMATION POINT (SIP) COORDINATION

**Establish a digital platform – consisting in a single digital portal or interconnected digital portals – which would enable the electronic submission of permit applications by electronic communications operators to competent authorities in charge of permit granting for the deployment of electronic communications networks. This digital platform could also facilitate the communication to the applicant of the decision issued by the competent authority/ies. The competence regarding the granting of permits remains unchanged (i.e. at central/regional/local level) but the information flow is provided via the digital platform.**

**Member States may provide - as an additional option - that the Single Information Point (SIP) is interconnected with the digital platform with regard to the information provided by the SIP. The SIP may have a central role in this platform.**

Currently, in almost all Member States, an electronic communications operator willing to carry out civil works to install communication infrastructures has to request different authorizations from all the authorities involved (municipalities, concessionaires of public infrastructures such as roads and railways, superintendence authorities, etc.). In most Member States the electronic communications operators submit several requests of permission to each of these administrations. This results in burdens and delays for both electronic communications operators and the competent public authorities.

Therefore, in order to facilitate the procedure, Member States should ensure that all permit granting applications are submitted, preferably through a single or interconnected entry point, by electronic means, and that the corresponding decisions (granting/refusing) are also communicated to the operators electronically.

This is fully in line with other EU legislation promoting the use of digital means and the digitisation of public administrations and it should be implemented in accordance with national legislation taking into account, where relevant, already existing portals for administrative services.

An important aspect to consider is that in most Member States many types of permit are not exclusive to the deployment of electronic communications infrastructure. In such cases, it could be most cost-effective to develop a digital application open for all permits of a certain type rather than only for the subset of that type of permit that is needed to deploy digital infrastructure. This approach would also help avoid fragmentation of procedures within sectors.

Member States should ensure that all permit granting applications can be submitted by electronic means and that the corresponding decisions (granting/refusing/requesting additional information) are also communicated to the operators electronically.

The digital platform ensuring a single-entry point for permit granting could either be a single digital portal or several interconnected digital portals that can be used for all kinds of administrative services or dedicated to telco infrastructures permit applications, as an additional option it can be interconnected with the SIP or under the control of the SIP. This platform would simplify the permit application procedure and facilitate the interaction between the applicant and the competent authorities.

The digital platform would allow a two-way interaction. The electronic communications operators would be able to fill in and/or upload the application electronically. The issuing of the permit should be made via electronic means (e.g. digitally signed) and communicated to the electronic communications operators, either via the dedicated digital platform or via a more general digital communication/mailbox systems for official mail. This best practice would allow a drastic time saving for the electronic communication operators as well as a simplification in the process of submitting requests to the competent authorities.

This best practice would not imply a change in competencies of the competent authorities in charge of permit granting. The digital platform (through the single digital portal or several interconnected portals) would only have a role of single-entry point, leaving to the competent administrations (central, regional or local) the power to handle and decide on the permit granting.

A Member State, in accordance with what is allowed by national legislation, could also implement a further digital functionality within the digital platform aimed at coordinating the permit granting workflow. Implementing this system could result in significant cost reduction, due to the time savings and the prevention of miscommunications in the permit granting workflow.

Where Member States prefer to use several (local, federal, central or permit type based) portals, rather than a single central administrative portal, the Member State should consider providing for an interconnection of the portals so that electronic communications operators can easily submit their permit applications.

Where information concerning physical infrastructure is already mapped or collected centrally by the SIP, it can be used to support network operators who need information about existing infrastructures before applying for specific permits through the permit granting procedures. It can also be used by the public authorities in the permit granting procedures.

The digital administrative portal/SIP could offer the following features:

- registry of competent authorities;
- application submission service for electronic communications operators to enable them to submit one or multiple requests and receive a decision by electronic means;
- notification system to allow dialogue between the applicant and the authorities;
- where the portal is interconnected with the SIP, access to information on existing infrastructure and/or planned civil works, on a need-to-know basis and considering any constraints that may apply pursuant to national legislation on access to such information, aiming to facilitate synergies and coordination of works, such in a way to pursue the “dig-once” principle.

The digital platform would facilitate the implementation in all Member States through the use of a modular, configurable and interoperable architecture adaptable to the regulatory provisions of each Member State relating to the permit granting procedures.

The system could provide for transparency of the progress of the permit granting procedures. In case a Member State opts for a single portal, this might also reduce the administrative burden and costs of different competent authorities. These procedures possibly increase the cybersecurity of the permit application procedure.

## RECOMMEND 9

### 6. TACIT APPROVAL FOR RIGHTS OF WAY

**The implementation of tacit approvals for the granting of rights of way via administrative procedures should be considered, when the amendment of relevant legal measures regarding rights of way is under way if not earlier. The best practice consists in considering a rights-of-way request as tacitly approved when there is no response by the competent authority within a certain time period (e.g. 3 months) starting as of the submission of a complete application.**

Where allowed within the constitutional systems, Member States should consider implementing tacit approvals for granting rights of way. This measure aims to ensure that the 6-month deadline for granting right of way according to Article 43 of the European Electronic Communications Code is met. In addition, it raises the chance that rights of way and permits for civil works are granted at the same time or at least within the same timeline of 4 months. It benefits the electronic communications operators, because thus they would be able to receive the rights of way in a fast procedure and with legal certainty. It can only apply in an administrative procedure, since commercial agreements require the explicit consent of all parties involved, with all due respect to the contractual freedom. The considered period (e.g. 3 month) should start as of submission of the complete application by the electronic communications operator.

In order to avoid any problems with regard to the completeness of the application documents, the application could be considered as complete – which means that the aforementioned period



for the assumption of the rights of way to be granted is set in motion – if the competent public authority does not raise objections within a certain period (e.g. one half of the period mentioned above) following the receipt of the application.

This tacit approval process as well as the assumption of completeness of the application will most probably need a constitutional and legal basis and therefore might not be simply implemented in a short time in all Member States. It may, however, prove to be of good help meeting the time criteria set in the European Electronic Communications Code. Therefore, it is suggested that Member States consider such tacit approval procedures whenever they are about to amend the relevant law for rights of way. It is also recommended to arrange a detailed public consultation in which the concerned stakeholders and any interested parties have the possibility to share their opinions on such amendment and raise concerns connected with usability and practicability of a tacit approval in the particular national/local circumstances.

The tacit approval process can also be applied only to minor cases. Where rights of way are not granted in a separate procedure, but are e.g. an implicit or explicit part of necessary permits for the civil works themselves, this best practice does not suggest extending the tacit approval to the necessary civil works permits, which have e.g. traffic safety implications. The cases, in which there are security problems or landscape constraints, as well as agreements between private individuals, may be excluded from such measure.

## 7. FAST TRACK PROCEDURES FOR RIGHTS OF WAY

**The implementation of fast-track procedures for the granting of rights of way should be considered in some cases, when the amendment of relevant legal measures regarding rights of way is under way if not earlier. The best practice may consist of a tacit approval of the request for rights of way within one month following prior information to the relevant authority.**

Where allowed within the constitutional systems, Member States should consider implementing fast-track procedures for granting rights of way. This measure aims to ensure that the 6-month deadline for granting rights of way according to Article 43 of the European Electronic Communications Code is met. In addition, it raises the chances that rights of way and permits for civil works are granted at the same time or at least within the same timeline of 4 months. It benefits the electronic communications operators, because they would be able to receive the rights of way in a fast procedure and with legal certainty. In addition, the fast-track procedures ensure a very short timeline for receiving rights of way in certain situations.

This best practice can only apply in an administrative procedure, since commercial agreements do not require an application, with all due respect to the contractual freedom.

Member States should decide, in which situations such fast-track procedures apply. Possible use cases are minor projects or cases, in which coverage obligations or universal service obligations need to be fulfilled.

One possibility to implement such a fast-track procedure would be to provide that these projects which qualify for fast-track procedure merely need to be reported to the relevant authority. If the relevant authority does not request the electronic communications operator to submit an application for consent to the rights of way within one-month, tacit consent to the rights of way is deemed to have been granted. In this way, it would be possible to grant rights of way within one month.

The implementation of a fast-track procedure may require a change of law in many Member States which should consider implementing fast track procedures, where suitable and appropriate, when a change of the relevant legal provisions for the granting of rights of way is under way, if not earlier. It is also recommended to arrange a detailed public consultation in which the concerned stakeholders and any interested parties have the possibility to share the opinion on such amendment and raise concerns connected with usability and practicability of a tacit approval in the particular national/local circumstances. The cases, in which there are security problems or landscape constraints, as well as agreements between private individuals, may be excluded from such measure.

**8. ESTABLISH BROADBAND COORDINATORS**

**Establish broadband coordinators in order to support the coordination of granting of rights of way and of different permits. The broadband coordinators would inform the electronic communications operators about the necessary permits and enhance communication and coordination with all the competent authorities involved.**

Broadband coordinators can be established at the administrative level which is most suitable to the Member States (local, regional, federal or national level). In many cases, this will be the level at which most rights of way and permits are granted, i.e. mostly the local level. But the level at which broadband coordinators have the most positive effect with the least administrative burden can be best identified by each respective Member States. There might be Member States, where the regional, federal or even the national level is more suitable. Information on contact of these broadband coordinators should be publicly available.

These coordinators support the permit granting process and the granting of rights of way by providing information to the electronic communications operators about the necessary permits and the responsible authorities as well as by supporting the coordination between the electronic communications operators and the authorities involved. Such broadband coordinators may be contacted directly by the electronic communications operators, but this should be just an option and no obligation for the electronic communications network operators. The broadband coordinators can support the granting of rights of way no matter whether those are granted on an administrative or on a commercial basis, as well as ensure communication between the authorities/offices in charge of rights of way and the various permits, including within the same authority.

Broadband coordinators can be established by the municipalities (or other entities which are most suitable to the Member States at local, regional, federal or national level) as a mere support tool without any change of law. They benefit the electronic communications operators involved as well as the responsible authorities and holders of rights of way by providing a fast, efficient and smooth process. When establishing broadband coordinators, Member States should preferably entrust these tasks to an already established competent authority/entity and should avoid additional administrative steps. They should enhance the existing process without establishing any additional formal procedural requirements. If this work cannot be done by the given staff within the municipality it would require additional headcount.

**9. USE OF JOINT PREPARATORY COORDINATION PROCEDURES FOR GRANTING RIGHTS OF WAY AND PERMITS NECESSARY FOR CIVIL WORKS**

**The authorities/entities involved in the granting of rights of way and civil works permits could make use of joint coordination procedures in order to prepare and enhance the**

**formal permit granting process and the process of granting rights of way with a view to grant both civil works permits and rights of way within the same deadline. Such joint coordination procedures may, if feasible and useful, include on-site meetings of the intended path by the authorities/entities involved in the granting of rights of way and the authorities responsible for the permit granting procedures, where electronic communications operators can also participate.**

If the authorities/entities involved in the granting of rights of way and the (other) authorities involved coordinate early with the electronic communications operators, the later formal application procedure can be enhanced. This serves all parties involved, since it facilitates the administrative procedure in general without any binding procedural requirements. The involvement of, ideally, all competent authorities already ahead of the permit granting procedure is regarded as very effective. It requires no change of law but the commitment of all parties involved in the process to solve as many problems as possible ahead of the formal permit granting procedure.

Joint on-site meetings can support such early coordination, if the authorities in charge as well as the network operators regard this as feasible and useful with regard to a certain project. Joint on-site meetings of the intended path by authorities/entities involved in the granting of rights of way and the representatives of the authorities responsible for the permit granting together with the electronic communications operators allow for a good early assessment of the project. The early identification of local particularities and the immediate clarification of how they can be dealt with can reduce the factual duration of the administrative procedures. In addition, the risk of subsequent rectifications and changes of plan becoming necessary can be reduced significantly. One way to carry out such on-site meetings is to rent a bus and drive all parties involved in the process along the envisaged path for the deployment of electronic communication networks/VHCN. All parties should commit to find solutions for any problems identified with regard to the project during the on-site meeting. Agreed solutions should be written down in joint minutes of the parties involved. As long as the COVID-19-situation does not allow for physical meetings, virtual on-site meetings could be considered by the authorities/entities involved.

## **RECOMMEND 10**

### **10. LEGAL REQUIREMENTS WITH REGARD TO THE APPROPRIATENESS OF FEES**

**Member States should provide for objectively justified, transparent, non-discriminatory, proportionate and cost based fees with regard to permits for civil works. This could either be done by particular legal provisions with regard to the electronic communications network/VHCN roll-out or it could be provided for in the general/horizontal rules on fees.**

**Member States should avoid non-transparent, unproportioned or discriminatory usage fees/rent with regard to rights of way on public ground.**

**In case of high and/or strongly varying fees at local level for civil works permits and rights of way on public ground, Member States should provide guidance with regard to the calculation of fees. In particular, Member States should promote harmonisation of local policy regarding the criteria for setting fees and exchange of best practices to accelerate deployment of VHCN.**

This measure benefits the electronic communications operators since it ensures that fees for permit granting are appropriate and only cover the administrative costs incurred. According to recommend 10 of the Recommendation, Member States should exchange and agree on best practices to ensure that fees charged for the granting of permits for civil works that are needed to deploy VHCN are objectively justified, transparent, non-discriminatory and proportionate to their intended purpose, and that they cover only the administrative costs incurred for the provision of such permits. This requirement reflects a basic principle which already exists in the horizontal rules in many Member States. If such horizontal rules exist, there should be no additional requirement with regard in particular to the necessary permits for the deployment of VHCN.

This general rule should not prevent Member States from establishing exemptions from fees

- for permits for civil works in general or
- with regard to VHCN or
- for certain cases (e.g. minor projects)

as long as the decision of the competent authority reflects the principles mentioned above.

It does at the same time not prevent municipalities from establishing fixed fees, if such fees adhere to the principles as set out in recommend 10 of the Recommendation.

In addition usage fees or rent for rights of way on public ground for the deployment of electronic communications networks/VHCN for public telecommunications services should not be disproportionate, non-transparent or discriminatory, since this can not only lead to a distortion of competition but could also have a deterring effect on the deployment of broadband networks and VHCN. In case a usage fee is deemed necessary it should not be designed in a way that creates an inappropriate burden on the electronic communications operator and thus could prevent from investment into their electronic communications networks/VHCN.

In cases, where no legal provision on cost based fees exist or where fees still vary and are unreasonably high, a soft law guidance can help to provide more uniform and cost based fees. It might be helpful for the administrations in charge as well as for the electronic communications operators to get some guidance on the calculation of fees for civil works permits with regard to the deployment of electronic communications networks/VHCN. Such guidance should provide for the principles as mentioned in recommend 10 of the recommendation and should offer further guidance on the methods of fees. Soft guiding principles could be established for usage fees/rent for rights of way on public ground to ensure that such fees are transparent, non-discriminatory and proportionate.

# IMPROVING TRANSPARENCY THROUGH THE SINGLE INFORMATION POINT (SIP)

## RECOMMEND 11

### 11. ENSURE THE AVAILABILITY OF INFORMATION FROM DIFFERENT SOURCES AND ENHANCE TRANSPARENCY OF PLANNED CIVIL WORKS

**Ensure that all information regarding existing physical infrastructure as well as planned civil works is regularly provided by all relevant (public/private) entities and, to the extent possible, integrated into a single data portal, managed by the SIP, to accelerate the deployment of electronic communications networks at a lower cost.**

This best practice entails that all existing physical infrastructure and planned civil works information from different sources (e.g. competent national authorities at any level, public sector bodies and network operators) is made available via the SIP (e.g. web based geographic information system).

Responsible for implementing this best practice would be the entity which was commissioned to implement and maintain the SIP. The goal is to equip the SIP to offer transparency to electronic communication operators regarding existing physical infrastructure as well and whenever possible, regarding planned civil works. The latter, in particular, is an additional feature compared to the provisions of the Broadband Cost Reduction Directive and is critical to promote the coordination of civil works building synergies amongst different network operators.

The electronic communications operators who are expanding their networks will benefit from this best practice.

The measure requires that all information regarding existing physical infrastructure, future physical infrastructure roll-out and other physical infrastructure of public sector bodies (see Recommend 14) are provided via the SIP and to the extent possible, via one single data portal. Furthermore, Member States should set up, where feasible, a common and user-friendly interface to interconnect the SIP to the platforms of network operators and public sector bodies (e.g. web services).

If all information regarding existing physical infrastructure is available via the SIP, and to the extent possible, via one single data portal, the rollout of electronic communication networks can be more economical as well as more time efficient. However, the provision and processing of georeferenced information via the SIP requires investments not only by the body that operates the SIP but also by the network operators and public sector bodies, especially if the relevant data is not already digitalized. In this case, the necessary tools can be provided by the SIP in order to overcome this potential issue.

## RECOMMEND 12

### 12. ENSURE THE AVAILABILITY OF INFORMATION VIA THE SINGLE INFORMATION POINT (SIP) IN ELECTRONIC FORMAT

**Ensure the availability of information via the SIP in electronic format, including information by public sector bodies and the electronic accessibility for stakeholders.**

The main objective of this best practice is the electronic provision of information on physical infrastructure (by network operators and public sector bodies), including the information provided by public sector bodies. The electronic access of the information and the format of available data should preferably be done through various different formats to enable an easy upload/download of the information (such as \*.xls, \*.shp, \*.kmz or other formats or through other services). In addition the automatic conversion from different data formats and georeferenced coordinates into a unified format when data is integrated into or sent via the SIP could accelerate the processing of the data. In fact, the process of data provision via the SIP can be simplified if a wide range of data formats is accepted. Automating the information supply could also facilitate the provision of the information, as this would be less labour intensive.

The body that performs the functions of the SIP would be ensuring the electronic availability of physical infrastructure information. Alongside, network operators and public sector bodies feeding data into (or providing data via) the SIP should use electronic data formats accordingly.

The electronic provision of information will benefit interested entities, bodies and users alike. Prospectively, the availability of different data (such as physical infrastructure) via a single information point may lead to enhanced synergies for stakeholders and users.

The extent of changes of this best practice may require that the capacities and functionalities of the SIP are expanded and ultimately allow their enhancement. Various data can be provided and (ideally) accessed electronically as well as accessed through a single information portal.

Conditions for the availability of the information in electronic format require investments on the SIP functionalities and capacities through the body that performs and executes the functions of the SIP, as well as on the part of the entities and bodies that feed (or provide) data into (or through) it.

This best practice is linked to best practice 13.

### 13. INCLUDE GEOREFERENCED INFORMATION (MAPS AND DIGITAL MODELS) IN THE DATA MADE AVAILABLE VIA THE SIP

**Ensure that the information made available through the SIP includes georeferenced information on existing physical infrastructure and, whenever possible, also on planned civil works.**

**When such information is not available by the network operators and public sector bodies, the SIP should provide for the necessary tools to transform existing physical infrastructure information into georeferenced format.**

The main objective of this best practice is the better utilization of existing physical infrastructure, the acceleration of network roll-out, the lowering of costs for investors and the

reduction of the environmental footprint. It will support the rational use of space, a minimization of construction of outside infrastructure corridors, a reduction of pressures on green fields according to the “recycle space” concept.

The following stakeholders are responsible for the implementation of this best practice: the national body that performs the functions of SIP (Broadband Cost Reduction Directive, Article 4) and network operators and public bodies, as providers of the georeferenced information.

Where georeferenced information on the existing physical infrastructure is not yet available, Member States should consider establishing a transitional period to digitalize and make georeferenced all relevant information by the network operators and public sector bodies.

The provision of georeferenced information (e.g. in the form of interactive web map, digital models or equivalent) enables browsing or accessing georeferenced data of the existing physical infrastructure and planned civil works to relevant parties such as operators, public administration, local government, NRA, other business, end users and other entities.

The measure requires that SIP capacities are expanded to allow that several entities are able to provide georeferenced information regarding existing physical infrastructures. If the network operators and public sector bodies already have such a type of georeferenced information, the efforts needed on their side would be negligible. Otherwise, the SIP should provide for the necessary tools and resources to help the network operators and public sector bodies to transform their physical infrastructure information into georeferenced information. Member States should consider establishing an obligation for the network operators and public sector bodies to provide georeferenced information regarding existing physical infrastructure and planned civil works.

The availability of georeferenced data contributes to an increased level of shared use of existing capacities and developments of electronic communications networks. When planning the installation of their networks, electronic communication operators would gain faster and simplified access to a larger amount of information about existing physical infrastructure, making it easier to roll-out their networks. It grants operators easier access to all available relevant physical infrastructure information and therefore easier cost-effective planning of rollout in a target geographical area.

It requires investment in the SIP by the national body that performs its function within the Member State, and investment by the network operators and public sector bodies. If such information is already available to infrastructure owners, the additional (financial or human resources) burden for them can be estimated as minimal and in long-term decreased. Otherwise, the SIP should provide the necessary tools to transform existing physical infrastructure information into georeferenced format and specialised knowledge, which would require certain initial investment.

In the process of data provision of the georeferenced information through the SIP, several steps would be advisable:

- all attributes of the information to be provided should be defined unambiguously;
- data should be verified by the data holder;
- the network operators and public sector bodies should be responsible for the accuracy update and relevance of this data;

- data should be sufficiently detailed (e.g. taking into account standards from the Directive 2007/2/EC of 14 March 2007 (INSPIRE Directive), a general framework for a spatial data infrastructure);
- the data should be easy to use, with no additional software needed (e.g. web-browser based), or compatible with widely used software;
- all collected data should be available on equal terms, either to public or to users with granted rights;
- a suitable transitional period for the network operators and public sector bodies of e.g. two years to digitalize could be foreseen.

#### **14. MAKE AVAILABLE INDICATIVE INFORMATION ON THE OCCUPATION LEVEL OF THE INFRASTRUCTURE AND/OR THE EXISTENCE OF DARK FIBRE**

**Make available information via the SIP concerning physical infrastructure beyond the minimum specified in the Broadband Cost Reduction Directive, such as reliable and updated (indicative) information on the occupation level (“*state of occupation*”) of the physical infrastructure.**

**In addition, the provision of an indicative information on the existence (or not) of dark fibre in a physical infrastructure via the SIP would allow for an easy assessment by the access seekers that want to deploy their network.**

This best practice consists in making available information via the SIP concerning physical infrastructure beyond the minimum specified in the Broadband Cost Reduction Directive, in particular reliable and updated (indicative) information on the occupation level (e.g. 90% in a duct segment), where available. This could possibly be extended, on a voluntary basis, to indicative information regarding the availability of dark fibre (yes/no). The provision of both types of information goes beyond the requirements of the Broadband Cost Reduction Directive.

The entities responsible for implementing this best practice would be the body that performs the function of the SIP, the network operators and public sector bodies. The provision of information regarding the occupation level of the physical infrastructure (e.g. duct segment) and the information on the existence (or not) of dark fibre inside by those entities via the SIP is optional.

The access seekers, the network operators and the public sector bodies will benefit from this best practice.

The measure requires that SIP capacities are expanded so that data provided via the SIP can include two new characterization elements of the physical infrastructure objects and that network operators and public sector bodies provide this information (optionally) through the SIP. These changes would ideally require the georeferenced record of physical infrastructure objects (e.g. manhole, duct segment). The “state of occupation” is a characterization element of the physical infrastructure object (e.g. duct segment), which allows an assessment on the current state of the capacity of the physical infrastructure, allowing a fast analysis of the feasibility of the access (for the purpose of installation/rollout of network). The provision of information via the SIP regarding the “state of occupation” by the entities that own/manage physical infrastructure is optional.

The implementation of these measures requires an incremental investment (software update/development) by the body that performs the function of the SIP within the Member



State, and investment by public sector bodies and network operators to provide the information regarding the “state of occupation” of the physical infrastructure (e.g. duct segment) and/or the information on the existence of dark fibre accommodated in such infrastructure.

This best practice is closely linked to best practice 13.

### **RECOMMEND 13**

#### **15. ENSURE THE PROVISION VIA THE SINGLE INFORMATION POINT (SIP) OF TRANSPARENT INFORMATION REGARDING THE CONDITIONS OF ACCESS TO THE EXISTING PHYSICAL INFRASTRUCTURE**

**Make available via the SIP, information concerning the terms and conditions of access to the existing physical infrastructures as defined by the respective owners or managers.**

**The information to be included in (or provided via) the SIP could be presented in text format, without prejudice to the establishment/presentation of web links to the internet web pages where those conditions could already be published by the respective entities responsible.**

This best practice consists in allowing and encouraging network operators and public sector bodies to make available information (via the SIP) concerning access to their existing physical infrastructure (e.g. technical and economic/pricing conditions) in accordance with their national law, e.g. wherever they have already provided such information to electronic communication operators.

This best practice would be implemented by the body that performs the function of the SIP and by the several entities (network operators and public sector bodies) that own/manage physical infrastructure.

This best practice benefits the entities that own/manage physical infrastructures (network operators and public sector bodies) and the access seekers, i.e., electronic communication operators that want to rollout their networks.

The measure requires that SIP capacities are expanded to allow a repository (or the provision) of information concerning several documents (in \*.doc, \*.pdf format) regarding the physical infrastructure (e.g. technical and price conditions, regulations, reference offers, several contacts). The physical infrastructure owners/managers (e.g. network operators and public sector bodies) simply provide such information through the SIP on a voluntary basis, thus, there is no relevant burden associated.

There are mostly positive effects related with an increase of transparency of information regarding the provision of the technical conditions and prices of access to physical infrastructures in (or through) the SIP.

It requires an incremental investment in the SIP (software update/development) by the body that performs its function within the Member States, and by the entities that own/manage physical infrastructure (public sector bodies and/or network operators). Since the provision of this information in (or through) the SIP is optional there are no negative aspects for the network operators and public sector bodies.

## **EXPANDING THE RIGHT OF ACCESS TO EXISTING PHYSICAL INFRASTRUCTURE**

### **RECOMMEND 14**

#### **16. ENSURE ACCESS TO PHYSICAL INFRASTRUCTURE CONTROLLED BY PUBLIC BODIES**

**Member States are encouraged to ensure that all reasonable requests for access to physical infrastructure owned or controlled by public bodies or entities, which is capable of hosting VHCN elements are met, where legally feasible.**

Where allowed within their constitutional systems, Member States are encouraged to ensure that all reasonable requests for access to physical infrastructure owned or controlled by public bodies or entities are met. An obligation imposed on public bodies would be the most direct way to enable operators to obtain access to physical infrastructure (including buildings and street furniture) controlled by these bodies, that is suitable for the deployment of electronic communications networks, including VHCN, following the conditions set in Article 3 of the Broadband Cost Reduction Directive.

There could be some exceptions for historical buildings, security, etc. (similar to Article 57 of European Electronic Communications Code).

Member State could consider the implementation of this best practice where possible under their current legal and administrative rules. As such obligation would most probably require a change of law, Member States could consider the necessary amendment of the relevant legal provisions whenever they are about to change the relevant legal provisions anyways, if not earlier. If the relevant physical infrastructure is owned or controlled by regional or local public bodies, Member States could promote this practice amongst their regional and local authorities.

#### **17. ENTRUST A BODY WITH A COORDINATOR AND/OR PROMOTER ROLE**

**Member States should identify a competent body to advise the relevant public bodies and to ensure the coordination and/or promotion of the processing of access requests to publicly owned or controlled infrastructure.**

The goal is to encourage and facilitate public authorities in the processing of requests for access to any physical infrastructure owned or controlled by them at a national, regional or local level, suitable for the deployment and hosting of electronic communications infrastructure. Public bodies may not have sufficient experience or the necessary technical knowledge to engage in negotiations for access with operators. With this best practice, it is suggested to identify the exact experience or knowledge gaps and address these with the tools described herein as appropriate. The setup of specialised entities to promote and/or negotiate access to a big collection of public property can bring significant efficiencies and lead to faster conclusion of access agreements.

Current poor usability of publicly owned or controlled properties (suitable for hosting VHCN elements), which is experienced especially at the local level, can be significantly improved by identifying a body/entity (e.g. BCO, Ministry of State Properties, SIP, State infrastructure company, etc.) which should coordinate and/or promote the processing of these access requests

and advice the relevant public authorities in establishing access conditions, where necessary, and applying legislation and implementing guidelines.

The coordinating and/or promoting body (hereafter referred to as “Body”) should primarily provide advisory, legal and technical support to all relevant governance authorities and operators, and help establishing access conditions, where necessary.

Where Member States choose to entrust this body with a coordinator role, the Body would serve as the “entry-point” for these requests for access, which will then be digitally sent to responsible governing level waiting for its approval. The Body would also, where useful and feasible, monitor the outcome and timeline of the whole “request for access” process as well as monitor the process of possible disputes, carrying out an impartial advisory role.

In those Member States which choose to give this coordination and/or promotion role to a body other than the SIP, the body should also provide support to the SIP, including but not limited to making available to the SIP all relevant information regarding the infrastructure owned/controlled by public bodies.

The result should be easier and more efficient access to public physical infrastructure of interest to electronic communications operators (going beyond what is already provided for by the Broadband Cost Reduction Directive and in the European Electronic Communications Code).

## **18. DEVELOPMENT OF GUIDELINES FOR ALL GOVERNANCE LEVELS**

<p><b>Developing guidelines – including on pricing methodologies, standard agreement model(s), offer(s) based on fair and reasonable terms and conditions and/or other relevant documentation - as options to facilitate access and usage of physical infrastructure (including buildings and street furniture) and property owned or controlled by public bodies for the purpose of hosting network elements.</b></p>
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This best practice can help to ease some bottlenecks in the process for access to publicly owned or controlled physical infrastructure, which mostly derive from a lack of information or jurisdiction on property ownership, financial considerations or health concerns. These factors may then influence local policy in terms of providing access to public infrastructure for new network deployments.

The practice, if implemented horizontally, will accelerate and increase usage of public properties capable of hosting network elements. Public bodies may not have sufficient experience or the necessary technical knowledge to engage in negotiations for access with operators. Model agreements for access to physical infrastructure and guidelines on pricing methodologies can significantly alleviate the regulatory burden related to such negotiations, enhance predictability and increase the speed of access agreements and subsequent deployments.

Member States could develop guidelines - including on pricing methodologies to avoid discriminatory or disproportionate prices, models of standard agreements and offers based on fair and reasonable terms and conditions and/or other relevant documentation to facilitate access and usage of public infrastructure for the deployment of new networks. Member States should entrust this task to a relevant body (e.g. Ministry, NRAs, dispute resolution bodies). Member States may, if deemed appropriate, set up competent mixed working groups (with representatives of administrations and of private sector) for this purpose.

These documents can be useful both to local authorities and to other interested parties, in particular to network operators. They should be developed with input from experts in the fields of spatial planning, environmental protection and public health, and following a broad and structured consultation with all relevant stakeholders (electronic communication networks, non-electronic communication networks, relevant public bodies).

Member States could also provide guidelines on pricing methodologies on usage fees and rent for physical infrastructure or ground passing, owned or controlled by public bodies. Disproportionately high or unjustified usage fees should be avoided and -in case of electronic communications operators with their own physical infrastructure only passing under the public ground- abolished. The latter represents a financial burden to electronic communications operators and, if avoided or abolished, could in some areas encourage underground construction of networks, which will also have positive impact on the environment.

## **DISPUTE RESOLUTION MECHANISM**

### **19. INCLUDE AN OPTIONAL PRIOR/PARALLEL CONCILIATION MECHANISM**

**A prior/parallel conciliation mechanism with the aim to find a timely mutual agreement under guidance of the dispute settlement body might speed up the process considerably. If such an agreement cannot be reached, a formal binding decision of the dispute settlement body can be issued at the end of the standard dispute resolution procedure, within the deadline set in the Broadband Cost Reduction Directive.**

In the event that a dispute arises and in order to promote cooperation among parties, some Member States strongly encourage or even require the parties to first attempt to amicably settle their differences through a prior/parallel conciliation mechanism, e.g. mediation or an additional round of negotiations under the guidance of the dispute settlement body, prior to or in parallel (at an early stage) of the formal dispute resolution process. These mechanisms might have several advantages over the standard dispute resolution procedure if both parties engage in the process in good faith: they can result in practical solutions that are acceptable to both parties, speed up the proceedings considerably and thereby save costs, and they might be seen as less confrontational (preventing permanently strained relationships). Prior to or throughout the process, the dispute settlement body can facilitate information sharing between the parties as well as help clarifying the facts and the legal requirements.

According to one dispute settlement body, many of the outstanding issues that they dealt with had more to do with a lack of understanding of the law than with a real access problem, especially if the parties included small operators or public administrations. Another dispute settlement body highlighted the high percentage of agreements reached between parties during such proceedings, demonstrating the strategic role of the dispute settlement body in facilitating the amicable settlement of disputes. However, the willingness of the parties involved to negotiate is a prerequisite for prior/parallel conciliation to be successful. Therefore, the prior or parallel conciliation should be optional not mandatory.

The agreement should be reached, either through the prior/parallel conciliation mechanism procedure or through a binding decision by the dispute settlement body, within the deadline set in the Broadband Cost Reduction Directive. The use of a prior/parallel conciliation procedure should not lengthen the procedures.

## 20. ENSURE TRANSPARENCY, AWARENESS AND TRUST IN THE DISPUTE RESOLUTION MECHANISM BY ISSUING GUIDELINES

**For the purpose of increasing transparency, awareness and trust, Member States should issue guidelines, e.g. on dispute resolution processes, pricing methods and any other conditions, and should publish all relevant decisions, respecting confidential information. It is also important that Member States increase awareness of the dispute resolution mechanism possibly through workshops and a dedicated part of the dispute settlement body's website.**

Dispute resolution mechanisms have proven to be very effective in a lot of Member States. Market competition has greatly benefited from the timely and skilful contributions of dispute settlement bodies. However, there is more room for improvement regarding awareness and trust in the dispute settlement mechanism.

Transparency is crucial in order to enhance interested parties' trust in dispute settlement and in order to make the legal process more predictable for market players. In order to promote transparency, legal certainty and speeding up the dispute settlement process, some dispute settlement bodies issue guidelines, e.g. on their own processes and on administrative fees, workforce, procedural time limits, cost calculation methods, rights and duties of all the parties concerned. Publishing former decisions and information regarding them in a visible and clear manner, while respecting confidential information, is also a necessary step towards transparency, because other interested parties can take note of the content of the already concluded dispute decisions. This provides guidance to all interested parties and enhances enforcement as well.

If awareness of dispute settlement mechanism is considered to be insufficient, dispute settlement bodies can organise workshops inviting all potentially interested parties to discuss potential benefits of the dispute settlement regime.

Dispute settlement bodies shall dedicate a part of their website to dispute settlement, publishing easily workshop presentations, events, FAQ, and documentations of the process, methods, business and legal consequences as well as former decisions and information regarding them, in an easily accessible way.

## 21. ENSURE ELECTRONIC COMMUNICATION AND SUBMISSION FOR PARTIES

**In order to contribute to reaching timely decisions, communication between the parties, including the application procedure, bilateral communication, final decision, etc., should be made by electronic means.**

Dispute settlement process requires a great number of transactions between the interested parties. As the successful and timely closing of the procedure is crucial for all the parties involved, the dispute settlement body should be aiming at using as efficient communication channels as possible.

Electronic means of communications can be used throughout the entire procedure of the dispute settlement; from the first request, through problem understanding, promoting bilateral communication between parties, until the final, binding decision. It enhances the dispute settlement body's capacity to handle disputes and makes the entire process effective,

transparent and timely. Formal requirements of such an electronic procedure shall be kept to the minimum in order to make dispute settlements available for most of the interested parties.

Relevant best practices of Member States include: (a) providing dedicated e-mail/electronic data box for the dispute settlement procedures (b) dedicated part of the dispute settlement bodies' website to dispute settlement, and via this dedicated website providing means of electronic communications, i.e. application, submitting documentation.

Most dispute settlement bodies have already been using at least some of the electronic means of communication in their processes, including the dispute settlement regime, and experience its benefits. Among others electronic communication supports better documentation of a certain procedure, and it is easier to follow what and when was already being submitted. Proper use of electronic means of communication can also reduce administrative costs of all parties involved. Electronically submitted documents, technical data as well as mapping details are easier to be processed and used subsequently, thereby decreasing the possible margin of error.

## **REDUCING THE ENVIRONMENTAL FOOTPRINT OF NETWORKS**

### **RECOMMEND 16**

#### **22. LIMIT THE NEGATIVE ENVIRONMENTAL FOOTPRINT OF THE ELECTRONIC COMMUNICATIONS NETWORKS**

**Member States should acknowledge the environmental footprint of electronic communications networks. They shall therefore undertake initiatives with the aim to limit adverse environmental effects and to enhance the sustainability of networks.**

The main goal of this best practice is to encourage the Member States to undertake actions with the potential to limit adverse environmental effects of electronic communications networks and to enhance their sustainability.

Currently, information on the environmental impacts is scarce (and sometimes divergent), and there is a lack of common evaluation criteria to measure it. This is a barrier that can limit policy-making options. It would be advisable to establish common practices, indicators, and methodologies for the monitoring of the environmental footprint of electronic communications networks.

The Green Deal triggered initiatives at EU level that will contribute to limit adverse environmental effects of the digital sector and to enhance its sustainability. Moreover, at the national level, some Member States are already designing measures to tackle it. Nevertheless, there is a lack of concrete evidence to assess the results of such initiatives that have just been applied or are under assessment at the national level.

At this stage, as regards the criteria for assessing the environmental sustainability of networks, there are some network characteristics or forms of network deployment which might contribute to a reduced environmental footprint, some examples are:

- Sharing of physical infrastructure for networks;
- Network sharing (active and/or passive), multi-operator sites for mobile networks;
- Use of energy-efficient processes, equipment and technologies.

There are also some additional measures that can contribute to more environmentally friendly electronic communications networks. These include e.g. increased use of renewable energy, and further implementation of eco-design and recycling, which can be relevant for instance for servers.

When developing criteria for assessing the environmental sustainability of future networks Member States should also take into account the positive effects digitisation might have on the environmental sustainability of other sectors as well.

Member States can pursue these objectives through different approaches, for example:

- Building in cooperation with various stakeholders a common understanding of the environmental impacts of the electronic communications networks and identifying measures to pursue environmental goals;
- Engaging with stakeholders to discuss transparency of environmental data and self-regulatory measures in relation to electronic communications networks;
- Incentivising research and pilot projects aiming to gain further knowledge and limit the adverse environmental impact of electronic communications networks.

A flexible and cooperative approach (working with industry and all administrations involved) to pursue environmental targets can enable the emergence of innovative solutions. It would also allow acquiring knowledge on this matter and identifying best practices in the medium-term.

It is important to note that electromagnetic fields (EMF) issues are not dealt with under this topic. In the framework of the Toolbox, there is another topic on best practices focused on EMF issues (best practices 37-39).

## ENVIRONMENTAL IMPACT ASSESSMENT

### RECOMMEND 17

#### 23. ASSESSMENT OF ENVIRONMENTAL EFFECTS

**Concerning the applicability of the Directives 2001/42/EC, 2011/92/EU and 92/43/EEC for wireless communication network roll-outs, each Member State assesses whether the conditions set out in the aforementioned Directives are fulfilled according to its national circumstances and legal framework and draws conclusions accordingly.**

**At the time of granting rights or issuing licences for spectrum use, the prevailing view among Member States is that the conditions for the application of these Directives do not seem to be fulfilled.**

At the time of granting rights or issuing licences for spectrum use, the prerequisites for the application of the Directives 2001/42/EC, 2011/92/EU and 92/43/EEC do not seem to be fulfilled. As highlighted by the Connectivity Toolbox Recommendation (EU/2020/1307), the environmental assessment could take place at the stage when environmental effects can be identified and assessed.

If the conditions set out in the aforementioned Directives are fulfilled according to the national circumstances and legal framework, this could be done, when the network operator can evaluate the environmental impact, for instance, on a case-by-case analysis, for plans and programmes

which define a significant set of criteria which need to be implemented for future development, consent of construction projects, installations and structures. In doing so, Member States should take care not to delay the coverage of services for the population.

In addition, Member States should avoid delays in spectrum authorisation under Article 54 European Electronic Communications Code as pre-requisite for wireless communication network roll-out.

The problem of human exposure is separated from the environmental assessment. The issue of human exposure is dealt with under section ‘Aspects related to electromagnetic fields and public health’.

The aspects related to climate neutrality, sustainability and the reduction of the carbon footprint are considered in the best practice 22.

## **INCENTIVES FOR INVESTMENT**

### **RECOMMEND 20**

#### **24. PROMOTE ADEQUATE RESERVE PRICES**

**Member States are invited to set reserve prices by using a methodology, including benchmarking for the specific band under consideration, financial valuation models and/or other models. When using a benchmarking exercise as input, prices should be adjusted to consider the country specific circumstances, such as population, licence duration and coverage obligations, among others, and, when justified, with the exclusion of exceptional cases (statistical outliers).**

**Member States should avoid revenue maximization.**

The definition of reserve prices is a starting point and one important element of the spectrum auction in order to discourage strategic behaviour and to ensure an efficient outcome. The correct level of reserve prices, together with the procedural rules, facilitates price discovery in the auction. The right balance is needed in order to avoid speculative participation, discourage strategic bidding such as strategic demand reduction and collusion, perturbing the normal functioning of the auction (if it is too low), as well as to avoid unsold spectrum or to negatively impact network investments.

The use of benchmarking is a common practice in several sectors, including in the electronic communication sector. Benchmarking methods could be implemented in different ways. For example, comparing the prices for the same band or comparable bands with the similar usage possibilities in a set of Member States (e.g., “most similar Member States”) or comparing the prices of previous auctions in the same country. Benchmarking relies on the availability of reference prices for comparison. The benchmarking exercise should be adapted or adjusted to the specific circumstances of the Member State, namely population, the type of the award (auction, tender), license duration and coverage obligations and other specific characteristics that could impact the value of spectrum. Moreover, outliers (i.e. prices which are observed at a level statistically outside the norm) should be excluded from the comparison. Furthermore, the level of competition expected in the award is also relevant and, in order to allow price discovery, the defined reserve prices should be lower than the benchmark value in case the auction is expected to be competitive or closer to it when not much competition is expected.



There are also other methods that could be used for setting balanced reserve prices, including financial valuation models and econometric models.

In any of the cases, the objective with this best practice is to set the reserve prices in a reasoned and substantiated way such as to:

- Avoid speculative participation, strategic demand reduction and collusion in the auction;
- Avoid revenue maximization, as an objective for the auction;
- Allow discovering the value of spectrum with a view of an optimal use of the resources.

Since the spectrum reserve price is the starting price in the auction, if the auction is ascending, a balanced reserve price will enable through the award procedure (competition) to discover the adequate market value of the spectrum. Please note that, although it can be done, in most cases it is not necessary to employ a detailed financial modelling for determining the reserve price.

The decision regarding the method best adapted to each circumstance is up to the Member State.

Furthermore, other aspects related to spectrum fees are also relevant in order to achieve optimal use of the spectrum and should therefore be kept under consideration. When appropriate, other best practices in this Toolbox attempt to cover those aspects.

## **25. TIMELY AVAILABILITY OF 5G HARMONISED BANDS**

**To the extent possible, Member States are encouraged to make a substantial part of the 5G harmonised bands available for wireless broadband networks as early as possible.**

**The decision related to moving incumbents from a harmonised band should be made on a case-by-case basis.**

Deployment of 5G networks requires the timely availability of a sufficient part of the harmonized frequency spectrum. The European Union has identified three 5G pioneer bands: low band (700 MHz), middle band (3.6 GHz) and high band (26 GHz). For avoiding spectrum scarcity, it is necessary to offer to the market sufficient spectrum and in a timely manner. So, Member States are encouraged to enhance the deployment of 5G networks by ensuring the availability of a substantial amount of this spectrum consistent with market demand as early as possible.

To the extent possible and if no considerable delays result from this option, Member States are encouraged to make a substantial part of the 5G harmonised bands available namely taking into account the Commission's harmonisation decisions.

The goal, which is also supported by the deadlines set in the European Electronic Communications Code with regard to the 3.6 GHz band and to at least 1 GHz in the 26 GHz band provided that there is clear evidence of market demand (see Article 54 of the European Electronic Communications Code), and in the "UHF Decision" (EU) 2017/899, with regard to the 700 MHz band, is to make the benefits of 5G-based services available to all European citizens in a timely manner, driving industrial and societal transformation and economic growth in Europe.

Timely award of the 5G harmonised bands in the Member States is important for the economics of the emerging 5G ecosystem, as it can directly affect the costs of devices and infrastructure. It is also important for some 5G applications, which will be used across borders.

Although Member States are urged to award harmonised 5G bands in a timely manner, it is necessary to take into account the situation on the national markets. Sometimes the delay can be caused by (short-term) lack of demand for certain frequency bands or by existing users. Investment wise, it is equally important to ensure the predictability of the legal and operational environment.

For 5G harmonized bands, it is preferable to ensure a solution for the existing users first without prejudicing EU wide harmonisation decisions. Moving incumbents from a harmonised band should be done on a case-by-case basis, with consideration given to the license conditions of the incumbent, to technical aspects (bandwidth requirements, etc.), to the circumstances at the time and to ways of minimising unnecessary disruption.

Furthermore, in order to reduce spectrum scarcity, especially if there are several auctions taking place in a Member State within a short period (e.g. 3 years), this Member State could also consider combining or synchronising these auctions.

## 26. REVIEW NATIONAL SPECTRUM PLANS ON A REGULAR BASIS

**Member States are encouraged to carry out a regular review of national spectrum plans (allocation table and/or award strategy plans) with the objective to take the harmonised bands into use as early as possible. This is useful to the industry and provides planning predictability. It also allows operators to adjust their spectrum holdings to the market development and to their individual demand.**

**In this process, it is advisable to take into account the demand for a certain spectrum and changes that may occur on the national markets.**

A regular review of national spectrum plans (allocation table and/or award strategy plans), including regular consultation, with the objective to identify the demand over longer terms and take harmonised bands into use as soon as possible seems to also contribute to avoid spectrum scarcity.

This practice allows operators to adjust their spectrum holdings to the market development and to their individual demand. Moreover it provides planning predictability to industry.

There are also other aspects that could be taken into account such as designated/reserved 5G spectrum for local networks, private networks and vertical/industry as an important component in the 5G ecosystem. So, it is wise to take into account the long-term demand for certain spectrum and differences on the national market during regular review of the national spectrum plan.

## 27. ENABLE PAYMENTS OF AWARD FEES IN INSTALMENTS

**Especially if the investment in the network deployment is expected to be high, Member States are invited to consider whether providing that operators can opt to pay a considerable amount of the award fees in instalments could help them with their investments; in this case, the amount that is not paid upfront can be spread over e.g.**

**the total duration of the rights or, at least, over a certain period after the usage rights are granted.**

**Member States may charge an interest rate and/or ask for a bank guarantee.**

The possibility to pay the award fees in instalments may lower the cost of capital and may help operators with their investments as operators have more free capital to direct to their core operations. This could have a positive effect on the speed of network rollout and coverage if upfront payments and investments in infrastructure are substantial, e.g. when investment in less densely populated areas has to be made, but also in the case of new entrants that will have to start their network from scratch. Furthermore, this possibility does not harm the public interest, on the contrary. In fact, for the State, the revenue can be the same as it would be if the complete payment was done right after the award, since interest rates may be included to take into account the real value of the postponed payments. So, this option is beneficial both for the State and for the winning participants, and, ultimately, it is beneficial for the whole society.

In the context of the situation provoked by the pandemic, in support of the economic recovery, Member States could additionally consider providing holders of spectrum rights with the possibility of postponing the 1<sup>st</sup> payment as well, which would reduce the financial burden of the investment even further.

Nonetheless, a well-functioning financial market (and in the general case the financial market is noted to meet the financing needs of operators) could also provide a solution that obviates having an instalment scheme.

The payment conditions such as the split between upfront and instalments, the periods of instalments, the bank guarantee, or the interest rate should be designed carefully in order not to compromise the auction. A bank guarantee for the final price (or a part of it) can be an appropriate measure to avoid speculative bidding in the auction process. The guarantee can also cover for bankruptcy, other non-anticipated situations or avoid that bidders might take too much risk in the auction.

## **28. INDIVIDUAL AUTHORISATION REGIME FOR THE 24.25-27.5 GHz FREQUENCY BAND**

**Member States are encouraged to promote flexible authorisation of the 26 GHz band, with a focus on local licensing and infrastructure sharing.**

**Authorisation regimes need to take also future use cases into account, be flexible and should enable different network solutions and topologies in order to ensure efficient use of spectrum and the provision of high quality wireless broadband services also for local networks in case there is sufficient demand.**

**The solutions for local authorisations, including the option of first-come-first-served, depend on the national situation and on the spectrum availability (valid also for other 5G bands, not only 26 GHz).**

Member States are encouraged to provide the possibility of both nationwide and local licences with a view to allowing for an efficient use of spectrum, supporting the provision of high quality wireless broadband services and promoting innovation for the benefit of various use cases. Assuming a proper understanding of demand, Member States are invited to consider a flexible authorisation model that gives an alternative to exclusive nation-wide usage rights and provides for demand over time. Taking into account the limited coverage radius of mm-wave

propagation, the network densification and the enormous amount of bandwidth this frequency band entails, Member States are invited to assess whether it is more efficient to dynamically re-assign at least parts of the band on a local basis, as well as to foster the sharing of infrastructure (see also best practice 30).

The characteristics of 5G technology, such as high data transmission capacity and short delay, support automation of industrial processes and development of other digitalisation related businesses in various sectors of society. In some countries it is foreseen that local solutions will be needed in, for example, industrial plants, harbours, airports, shopping centres, hospitals, agriculture, forestry, energy networks, mines and implementation of in-house networks. Local, tailored networks could be used, for example, for remote control of equipment and machines, industrial robotization and collection of sensor data.

In those Member States reserving part of the frequencies for local use could help to ensure that industrial enterprises, municipalities as well as agricultural and forestry entrepreneurs are able to use services enabled by the 5G network in a way that is appropriate and promotes international competitiveness and innovation. The frequencies could be utilised, for example, in areas and specific locations where national telecommunications operators do not consider it commercially feasible to offer services. Local operators could be able to serve customers with specific needs and gain an understanding of their needs for tailored 5G networks.

Competition in the market for local network implementations could increase investments in 5G and promote service development. Local, tailored networks and the traditional, national networks of telecommunications operators complement each other. Because of the large amount of spectrum in the 26 GHz band (namely 3,250 MHz), a part of the frequency band could be reserved for local use.

Needs for product development, testing and experimental use should also be taken into account in order to identify the different types of innovative use of 5G and to identify optimum authorisation conditions for the usage of the band.

In addition to nationwide licences and in order to respond to demand for local licenses, the different licensing regimes for local networks can be identified:

- Local networks could be provided by mobile operators, third-parties or directly by the local users themselves. The response to demand for local spectrum could be met through spectrum leasing (voluntary/mandatory), by dedicated spectrum reservations for local networks and/or by third party operated local networks. Unlicensed spectrum when possible and suitable can also be used where possible (e.g. for indoor use);
- One possibility could also be “club use” model. It involves individual but not exclusive rights of use of the spectrum, where each licensee can dynamically use all the awarded spectrum in areas where frequencies are not used by other licensees. This could be done with individual licences or by registration of use;
- In case a procedure for local licenses is adopted, mobile operators could be allowed to apply under the same conditions as other spectrum users.

Technical coordination and management of networks, including issues around interoperability of services and network security need to be taken into account in local licences.

## 29. COMBINE COVERAGE OBLIGATIONS WITH FINANCIAL INCENTIVES

**Member States are encouraged to consider the combination of financial incentives with coverage obligations. The financial incentive itself, as well as the coverage obligation imposed, can be designed according to the specific needs of the Member State and its market situation.**

One key element in a quick and efficient network rollout is the financial leeway of network operators. By combining financial incentives with coverage obligations Member States can contribute to mobile operators' having more funds at their disposal necessary for opportune infrastructure rollout, and at the same time ensuring that operators invest those funds into coverage by imposing coverage obligations that go beyond the level provided in the absence of such obligations.

Combining financial incentives with obligations is a simple and cost-effective means to stimulate coverage in economically hard to cover underserved or unserved areas as well as to accelerate coverage in specific areas where it is urgently needed (e.g. schools, highways).

The financial incentive can be manifold, including but not limited to the deferred payment of award fees, the payment of award fees in instalments (in this regard, see also best practice 27) for further details regarding this possibility) or a price discount on the award fees.

Obligations attached to the financial benefit can be diverse and designed according to the particular needs of the Member State: they could include, but are not limited to, (unserved or underserved) rural areas, "white spots", transport and other critical public/national infrastructures and hotspots or vertical use-cases. Furthermore, the principle could potentially be used in order to foster other benefits, e.g. quality, resilience or security of the networks and/or the services.

Combining financial incentives with coverage obligations can be connected to a spectrum auction, however this is not the only possible point of time for the incentive. Regarding the way in which the financial benefit and the obligations are linked to each other various processes are possible, examples include:

- Attach ambitious coverage obligations (i.e. obligations that go beyond the level provided in the absence of such obligations) to all or certain spectrum blocks;
- A reverse auction in which the forward auction worked like a normal auction and in the reverse auction bidders were able to receive discounts on their award fees by bidding on the coverage of specific economically hard to cover underserved or unserved areas. This approach mitigates the risk that coverage cost exceeds the value of spectrum by endogenously determining the level of coverage operators are willing to provide;
- An additional legal contract between the State and the MNO agreeing on obligations in return for financial benefits could be a possibility where legally feasible;
- A financial incentive that is clearly set out in the award rules including the specific coverage obligation;
- A reduction of the reserve price or other fees in exchange for increased coverage requirements.

Notwithstanding the benefits recognised above, it should be noted that improving coverage may be achieved by other means, namely through market and competition drivers which are deemed to force operators to accelerate and expand their coverage.

Furthermore, the cost of meeting the obligations will be considered by the bidders and reflected in their auction bids and therefore, the final result of the auction will take into account the coverage obligations being imposed. Therefore, it will not in all cases be necessary to compensate the coverage obligation with a financial incentive. For the same reason, it is advisable that the financial incentives that could be well planned are set at the moment of the first release of the rights of use (see 1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup> and 5<sup>th</sup> bullet points of the above list of examples).

Nevertheless, regarding the incentives that cannot be planned from the beginning (see 3<sup>rd</sup> bullet point of the above list, and possibly in other cases) it is advisable that Member States define the financial incentives and time their release so as to avoid any strategic delay or diversion of investments by spectrum holders.

This best practice is without prejudice to state aid rules.

### **30. PROMOTE THE OPPORTUNITY OF INFRASTRUCTURE SHARING**

<p><b>Member States are encouraged to consider providing guidelines and to promote the sharing of passive and active infrastructure to facilitate deployment, taking into account the Broadband Cost Reduction Directive and competition law principles.</b></p>
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Member States could provide holders of spectrum rights or other respective undertakings with the possibility to share infrastructure without distorting competition.

Member States are invited to promote this possibility, especially in challenging areas where deployment is desirable and the investment case more difficult (e.g. less densely populated areas, transport paths or other critical public/national infrastructure) and encourage coordinated action on national level (engaging local authorities) with a view to accelerating 5G deployment in an efficient way. This approach will support areas which are considered commercially less attractive, where the cost of network infrastructure is very high compared to the potential revenues, unless applying very high prices to the end users.

In these areas, infrastructure sharing is a good solution to reduce the cost of network deployment and to promote connectivity, coverage and capacity for users.

It should be noted that the European Electronic Communications Code, enables competent authorities to impose passive or even active sharing under very exceptional circumstances set therein (Article 61(4)).

In addition, infrastructure sharing can help reduce energy consumption and radio emissions of networks.

In view of the above, Member States are encouraged to provide guidelines on infrastructure sharing in line with the EU law, taking into account existing obligations under the Broadband Cost Reduction Directive.

The guidelines could concern the different types of infrastructure sharing giving operators sufficient flexibility in reaching commercially less attractive areas through passive and/or active sharing, taking into account the specifics of each.

In particular passive infrastructure refers to the sharing of elements that are not involved in signal processing, for example buildings, sites and masts. It is less burdensome to apply and it enables operators to reduce costs while maintaining their strategic competitiveness. In active sharing, which, as in the case of all types of sharing, should be implemented in compliance with competition rules, active elements of a mobile network (i.e. elements which are involved in signal processing using electronic components) are shared, such as entire base stations or even elements of the core network, and, in some cases, the antennas (smart antennas).

Moreover, active sharing can be further classified into MORAN (Multi-Operator Radio Access Network), where radio access networks are shared and dedicated spectrum is used by each sharing operator, MOCN (Multi-Operator Core Network), where radio access networks and spectrum are shared, and Core Network Sharing, where servers and core network functionalities are shared.

As in the case of passive sharing, MORAN and MOCN can be implemented while maintaining a degree of differentiation; furthermore, compared to passive sharing, complexity and cost-saving potentials are higher.

Roaming can also be considered as a form of sharing, allowing an operator to make use of another operator's network in a place where it has no infrastructure of its own.

It could be possible that coverage obligations attached to spectrum licences can be met at least to some extent, using different types of network sharing (license conditions could provide for instance a coverage requirement that should be fulfilled with the own independent network, and a coverage requirement that can be fulfilled with a shared network for assignee operators in a certain band).

### **31. STRUCTURE OF RECURRENT SPECTRUM FEES TO INCENTIVISE ROLL-OUT**

<p><b>Member States are encouraged to assess whether the recurrent spectrum fee structure could penalise the rollout and densification of the 5G networks and if so to adjust the spectrum fee structure.</b></p>
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A possible way to lower the cost of buildout is to adjust the recurrent fee structure so that it in itself does not penalise the rollout and densification of the networks. This can be especially important in 5G where the prospect of a substantial densification of the network is foreseen in the longer term. Also, gradually decreasing fees in return for roll out commitments could incentivise faster roll out as fees would be lower in a period with higher capex.

The usage fee structure for block licenses could be a low flat rate and independent of the number of base stations in the network. That is if a block license holder doubles or quadruples the number of base stations in their network, the usage fee, normally paid yearly, is still the same. The regulation may also allow for self-planning without prior registration in block licenses which means that there are no extra fees for activating a new base station/radio transmitter and most likely a faster roll out of the networks. In total this means that improving the capacity or expanding the coverage of the network will not incur any additional usage fees. If a Member State's competent authority is in need for detailed information of all base stations, operators

can be obliged to provide this information to that authority on a regular basis (monthly/quarterly/yearly).

### **32. USE FINANCIAL AID AS A COMPLEMENT TO INCENTIVISE INVESTMENTS**

**Member States are encouraged to use financial aid from EU-level programmes to complement 5G deployments to incentivise substantial investments in the roll-out of 5G networks.**

Over time, different European investment programs could be used as a means to incentivise substantial investments in the roll-out of 5G networks. EU-based investment programs could be a good approach to ensure and catalyse investments in digital connectivity infrastructure of common interest for local, national and cross border connectivity across Europe.

## **ENHANCED COORDINATION AT UNION LEVEL ON SPECTRUM ASSIGNMENT FOR CROSS-BORDER INDUSTRIAL USE**

### **RECOMMEND 21**

Regarding Section 5, Recommend 21, letter (a) of the Recommendation, Member States have concluded that it is too early to make an assessment on existing vertical use cases that benefit from cross-border coordination of spectrum assignments. A significant number of Member States reported that there have not yet been applications from the industries for vertical use-cases with cross-border dimension. Therefore, Member States agreed not to include a list of such use cases in the Toolbox. The RSPG has expressed the same view in its contribution to phase 2 of the process.

### **33. USE COHERENT PRACTICE FOR GRANTING RIGHTS OF USE FOR RADIO SPECTRUM BASED ON THE EUROPEAN ELECTRONIC COMMUNICATIONS CODE**

**Member States should use a coherent practice for granting rights of use for radio spectrum.**

**The legal framework for granting rights of use for radio spectrum is given by the European Electronic Communications Code.**

A coherent practice for granting rights of use for radio spectrum to operators to deploy next-generation (including 5G) wireless infrastructure for cross-border industrial use should be applied.

The legal framework for granting rights of use for radio spectrum is given by the European Electronic Communications Code. This directive had to be transposed by Member States into national law in accordance with Article 124 of the European Electronic Communications Code.

Member States are called upon to urgently transpose the relevant provisions for granting rights of use for radio spectrum accordingly – if not yet done so.

Rights of use for any industrial use case with a cross-border dimension, particularly for road transport, rail transport and industrial manufacturing, in line with Union priorities on 5G deployment shall be granted based on the transposed provisions of the European Electronic



Communications Code. The optional peer review process may be included where deemed useful.

To respond to cross-border use cases, Member States reported using or intending to use agreements (like the Harmonised Calculation Method Agreement or the cross-border coordination / coordination agreements or roaming agreements or Memoranda of Understanding).

None of the Member States reported that there was a deficit to respond to applications to grant rights of use for industrial use cases with a cross-border dimension. Hence, there appears to be no lack in the current underlying legal framework, given it is accurately transposed into national law.

#### **34. FACILITATE INTEROPERABILITY THROUGH THE DEVELOPMENT AND APPLICATION OF STANDARDS**

**When necessary to ensure service continuity across borders, including but not limited to quality of service and network security, Member States should facilitate interoperability through the development and application of standards.**

When necessary to ensure service continuity across borders, including but not limited to quality of service and network security, it is recommended that Member States facilitate interoperability through the development and application of standards. Interoperability standards are covered by the provisions of Article 39 of the European Electronic Communications Code.

#### **35. MAKE USE OF HARMONISED TECHNICAL CONDITIONS DEVELOPED BY THE EUROPEAN CONFERENCE OF POSTAL AND TELECOMMUNICATIONS ADMINISTRATIONS (CEPT)/ ELECTRONIC COMMUNICATIONS COMMITTEE (ECC), IF COMMON DEDICATED FREQUENCY RANGES ARE DEEMED NECESSARY**

**If a dedicated frequency range is deemed to be necessary, the best way to ensure usage of such a common dedicated frequency range is to use harmonised technical conditions developed by CEPT/ECC. This would furthermore foster connectivity in cross-border use cases amongst EU and non-EU countries, since the latter are members of CEPT/ECC.**

There is no agreement amongst the Member States within the process of developing this Toolbox that dedicated frequency ranges are needed for industrial ('vertical') use cases with a cross-border dimension. Hence, any recommendation needs to consider the variety of possible use cases and their respective wide range of potential requirements.

However, even if no dedicated frequency ranges can be identified, the technical conditions for the frequency usage should be aligned.

The RSPG provides advice to the Commission on strategic spectrum topics, including on common frequency ranges for specific wireless services or applications. The RSPG has adopted three opinions on a strategic roadmap towards 5G for Europe, with focus on radio spectrum.

If a dedicated frequency range is deemed to be necessary, the best way to ensure usage of such a common dedicated frequency range is to use harmonised technical conditions developed by

CEPT/ECC, since they are always linked with frequency ranges. The CEPT is the coordinating body for European state telecommunications and postal organizations, whereas its ECC is responsible for radiocommunications and telecommunications matters. All EU Member States are Member countries of CEPT/ECC. The ECC develops common European policies and regulations in electronic communications and related applications, and it also constitutes the focal point for information on spectrum use. Its primary objective is to harmonise the efficient use of the radio spectrum, satellite orbits and numbering resources across Europe. The ECC has been involved in many areas related to the growth in the use of wireless broadband, such as Wi-Fi and 5G, as well as of short-range devices, including a wide range of consumer and industrial devices. It continues to play an active role around the technical and regulatory work looking to expand these services. The Radio Spectrum Committee (RSC) is the competent EU-level body for the development of legally binding technical implementing decisions to ensure harmonised technical conditions (across the Union).

Furthermore, harmonised technical conditions developed by CEPT/ECC would foster connectivity in cross-border use cases amongst EU- and non-EU-countries, since also the latter are members of CEPT/ECC.

**36. WHEN IDENTIFYING THE APPROPRIATE AUTHORISATION REGIME MEMBER STATES SHOULD PAY PARTICULAR ATTENTION TO ANY SPECIFICITIES RESULTING FROM A CROSS-BORDER DIMENSION**

**Noting the national responsibility to set authorisation regimes, as well as the conditions attached, it is recommended that Member States, when identifying the appropriate authorisation regime, pay particular attention to any specificities resulting from a cross-border dimension.**

Vertical use cases especially related to mobility may in the future increasingly rely on cross-border coordination. Member States are invited to pay particular attention to any specificities that result from the cross-border dimension. These may include but are not limited to technical conditions for the use of frequency bands as well as other techniques to access spectrum and mitigate interference.

The RSPG provides a peer review platform, well-established and allowing for increased cooperation and knowledge sharing between Member States. Article 35 of the European Electronic Communications Code gives national competent authorities and the RSPG the opportunity to further exchange experiences and best practices on authorisations and awards in a formalised manner, which can result, subject to the request of the concerned national authority in reports and opinions on voluntary Peer Review Forums which are part of annual reports by the RSPG.

**ASPECTS RELATED TO ELECTROMAGNETIC FIELDS AND PUBLIC HEALTH**

**37. PROMOTE CONTINUOUS SCIENTIFIC RESEARCH ON ELECTROMAGNETIC FIELD (EMF) EMISSIONS CARRIED OUT BY CREDIBLE AND INDEPENDENT INSTITUTIONS**

**The availability and dissemination of up-to date evidence-based scientific information on EMF and its impact on health are required for mitigating social resistance to the deployment of 5G networks. Member States and the European Commission should**

**therefore promote scientific research in the field of EMF, the continuous monitoring of new scientific findings in this regard and the assessment of their relevance by credible and independent institutions.**

Continued research on EMF and health issues may make an important contribution to enhancing public confidence. Member States and the European Commission should therefore continuously promote scientific research in the field of EMF and on EMF impacts, especially for new frequencies used for terrestrial wireless broadband such as mm-wave bands. Moreover, new scientific findings should be continuously monitored and their relevance assessed by dedicated institutions, e.g. scientific commissions or specialized agencies. To ensure the credibility of research bodies and other dedicated bodies, Member States should also strive for their independence from the roll-out interests of mobile operators.

### **38. COORDINATED AND TARGETED COMMUNICATION FOR INFORMING AND EDUCATING ON 5G IMPLEMENTATION**

**Member States should use targeted communication including activities using various forms of information sharing ranging from websites and social media to traditional media like TV, radio, leaflets and billboards. The aim is to provide evidence-based information to specific groups and to educate the wider public about 5G thus strengthening public confidence in institutions, which in turn may increase acceptance for the new 5G technology. Successful communication often involves authorities from several fields of expertise and responsibility as well as other stakeholders cooperating in order to translate scientific and technical information into every-day language and to address cross-sectoral issues.**

Targeted communication by the Member States may use various forms of information sharing ranging from websites and social media to traditional media like TV, radio, leaflets and billboards. Information sharing via websites and social media initiatives seems to be most popular but depending on the specific topic and the target audience there are also traditional forms of advertising and campaigning used. The communication may also extend to making available to the public research-results on EMF and its impact on health from trustworthy sources, e.g. via dedicated web-sites, knowledge platforms, organizing of scientific conferences, and publishing of reports and papers addressed to the citizens.

There is widespread agreement amongst authorities that the general public as well as specific opinion leaders (e.g. politicians, journalists, teachers and medical doctors) need to be provided with valid evidence-based information with regard to the roll-out of 5G and alleged health issues due to EMF emissions. The reason is not only the complexity of topics but also increasing misinformation regarding 5G sometimes amplified by conspiracy myths and self-proclaimed influencers. Shared information on potentially complex topics must be transparent, neutral and fact-based and presented in simple and understandable manner, in order to reach the target groups.

As the issues discussed typically involve several fields of expertise and responsibility the cooperation of authorities and other stakeholders (e.g. network operators or vendors) is identified as key element of a successful communication strategy. The examples of cooperation range from international level (e.g. European Commission, World Health Organisation) to national level (e.g. national government, national authorities responsible for telecommunications, for health, for radiation protection, for eEnvironment) and to regional or

local level (e.g. regional governments, local mayors). Communication initiatives may also include network operators, regional media and citizens' initiatives especially when setting up workshops or dialogue fora.

Close cooperation and coordination between competent authorities as well as cooperation with the mobile operators demonstrates awareness of the division of responsibilities, it creates transparency and it reduces eventual misunderstandings. It also shows that competent authorities are open to dialogue related to the concerns of citizens and will strengthen the robustness, authoritativeness and trustworthiness of the information provided.

Local authority decision-makers, e.g. district commissioners, mayors or heads of building authorities, are identified as one strategic target audience as many questions from citizens arise on local level. Therefore, supporting local authorities is deemed essential for competent national authorities as well as mobile operators. A strong accompanying measure is a strengthened cooperation and coordination between competent health authorities and competent authorities monitoring EMF as health issues hotly debated could be encountered with authoritative and evidence-based information.

### **39. INFORM THE PUBLIC ON THE COMPLIANCE OF RADIO BASE STATIONS INSTALLATIONS WITH APPLICABLE EMF SAFE LIMITS**

**EMF levels are measured and monitored in line with the practices considered adequate by the respective Member State. Member States are encouraged to publish results attained during these measurements as well as information on the respective measurement and monitoring regimes with the view to further assure the public with regards to health.**

EMF levels are measured and monitored in line with the practices considered adequate by the respective Member State. This further assures the public with regards to health. Therefore, the results attained during these measurements could be published. In addition, Member States are encouraged to continue collaborating together so as to keep the public updated on the subject matter as well as combat misleading news. The latter, in conjunction with the aforementioned practices, complement each other and contribute to enriched public education.

Whilst safeguarding aspects related to commercial, technical and network integrity and security matters, Member States should consider informing about their respective monitoring and measurement regimes as well as its results, if appropriate, through the use of appropriate channels. Member States should allow for the availability of adequate information for the consumption by the general public. This would depict the respective radio base stations installation compliance with the applicable EMF standards.

## **5. Toolbox implementation**

While Recommendations do not produce binding effects, Member States are required to take them into consideration. Their implementation is therefore under the responsibility and discretion of the Member States. The agreement of the Connectivity Toolbox was based on a collective and consensual best-effort exercise to stimulate its voluntary and coherent implementation and utilisation by the Member States, with the aim to achieve the objectives set out in the Recommendation.

## **5.1. Guiding principles for implementation**

The implementation of the Connectivity Toolbox should be underpinned by the principles of high commitment and flexibility with the aim of making a short to medium-term impact in fostering connectivity throughout the EU. This implies the ambition to make use of the commonly agreed Connectivity Toolbox to the utmost extent, while selecting or adapting proposed measures, where necessary, according to national circumstances. Coordination with other Member States should be taken into consideration where necessary.

The Connectivity Toolbox has a modular nature, meaning also Member States could consider not implementing a best practice if not deemed to be useful with regard to the particular national situation. This allows Member States to assess and decide on the implementation of the specific best practices included therein, following the principles of proportionality, efficiency and purposeful impact, considering overall the resulting costs and benefits.

In this regard, when Member States decide on the specific best practices to be implemented, they should pay attention to (i) the challenges and obstacles within their national market and the national market dynamics, (ii) existing or planned relevant measures at national, regional or local level and the degree of their appropriateness to opportunely solve the specific issues at stake, (iii) possible constraints or needs for adaptations as regards the implementation of the best practices, (iv) the appropriateness of (formally or informally) consulting stakeholders during the implementation phase.

Overall, the implementation of the best practices should be based on the principle of a clear and timely identification of all relevant actors (public authorities at different levels, sectoral stakeholders, organisations) and their responsibilities as regards the implementation of the best practices.

## **5.2. Implementation roadmaps**

In accordance with the Recommendation, by 30 April 2021 each Member State should develop and provide to the Commission a national roadmap for the implementation of the Toolbox which reflects the guiding principles described above. The implementation roadmaps should (i) present an initial assessment by the Member State as to the usefulness of the best practices according to the national situation, (ii) overall reflect the expected plan of the Member State, based on its initial assessment, in regard to the implementation of the best practices and (iii) provide an indicative timing and potential stakeholders for implementation.

Member States will do their utmost to implement the Toolbox as soon and as efficiently as possible.

## **5.3. Reports on the implementation of the Toolbox**

In accordance with the Recommendation, by 30 April 2022, each Member State should report on the current status of the implementation of the Toolbox. In these reports, Member States should describe the status of the process of implementation of the Connectivity Toolbox in accordance with the scope and process outlined in the national implementation roadmaps.

In order to provide a meaningful overview, the reports should focus on the most important facts as regards:

- the status of implementation according to the national roadmap, in particular the best practices already implemented and those in progress with an outlook to their accomplishment;
- major obstacles for the implementation of certain best practices;
- positive effects observed or anticipated; and
- lessons learned.

The reports should ideally not exceed 20 pages, including an executive summary.

## **6. Conclusions**

The Connectivity Toolbox represents an important instrument developed and agreed by the Member States, and the best practices it encompasses will promote and incentivise investments in VHCN, including fibre and 5G, paving the way to gigabit-ready infrastructure. The investment in connectivity infrastructure will contribute significantly to the reduction of the digital divide and to a thriving economy, and is one fundamental aspect of the recovery plan in response to the crisis caused by the COVID-19 pandemic.

The set of best practices included in the Connectivity Toolbox is diverse and has a large scope, covering all the aspects included in the Recommendation, as well as aspects related to increasing public transparency and trust in 5G deployment with a view to minimising concerns as regards its EMF impact. It includes, for example, measures to remove unnecessary administrative hurdles on network deployment, mechanisms for streamlining permit granting procedures, procedures to increase the transparency of information through the single information point, actions to improve dispute resolution procedures, and measures with regard to the spectrum authorisation to incentivise substantial financial investments in 5G networks.

Member States have the discretion and responsibility to implement the Connectivity Toolbox, maximizing the potential of the measures foreseen with the aim to create efficient conditions for private investment in VHCN. Member States should start preparations for implementing the Toolbox whereby, by 30 April 2021, each Member State should provide the Commission with a roadmap for the implementation of the Connectivity Toolbox. By 30 April 2022, each Member State should report on the implementation of the Connectivity Toolbox.

By aiming at the implementation of the Connectivity Toolbox, Member States do not only ensure that the necessary advanced connectivity infrastructure is ready in their Member States for the benefit of citizens and businesses, but also contribute to the overall EU digital strategy and its competitiveness.