

Appendix 1 to the decision to limit the number of licences in the 700 MHz band,  
ref. no. 15-6916

# Open invitation for applications for licences to use a radio transmitter in the 700 MHz band

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**Open invitation for applications for licences to use a radio transmitter in the 700 MHz band**

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# 1 Introduction

The Swedish Post and Telecom Agency (PTS) has limited the number of licences in the frequency band 694-790 MHz (700 MHz band) and hereby invites interested parties to apply for licences to use radio transmitters in the 700 MHz band. The assignment refers to the FDD<sup>1</sup> segment of the 700 MHz band (703-733/758-788 MHz).

The FDD segment of the 700 MHz band is divided into 5 frequency blocks (FDD1-FDD5). Licences for FDD1-FDD4 will be assigned by a bidding procedure in which the price that the applicants are willing to pay for licences will be decisive (auction). The licence for FDD5 will be assigned through a combination of a comparative selection procedure, in which the coverage that the applicant undertakes will be decisive, and an auction. However, the term "auction" will be used for the whole assignment procedure in this open invitation.

Any party wishing to participate in the assignment must submit an application in writing to PTS; refer to chapter 4.

The invitation is carried out in accordance with:

- Chapter 3 Section 8 in the Electronic Communications Act (2003:389), or LEK,
- PTS regulations (PTSFS 2008:1) on spectrum auctions, as amended by PTSFS 2010:5 and PTSFS 2016:2, and
- PTS regulations (PTSFS 2016:3) on a combined selection procedure for licences to use a radio transmitter in the frequency block 723–733/778–788 MHz (FDD5 in the 700 MHz band)

PTS invites all parties that are interested in participating in the auction to read all the parts of this document as well as the current regulations very carefully. It is important that a party wishing to be a bidder in the auction is aware of all the conditions and regulations in order to

- avoid the risk of losing the opportunity of obtaining the frequency blocks desired, and
- ensuring that the conditions attached to the licences are fully understood.

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<sup>1</sup> FDD: *Frequency Division Duplex* is a technology in which communications to and from the base station take place in separate frequency bands.

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The rules for the assignment procedure can be found in the above regulations and in this, as specified in more detail in the regulations. This open invitation provides a description of the rules that are set out more directly in the regulations, in order for applicants to obtain an overview of the entire assignment procedure. As a result, the rules that follow directly from the regulations may be repeated or summarised in this open invitation.

## 2 Licences and licence conditions

Chapter 2 deals with licence conditions that are common to all frequency blocks FDD1-5. Chapter 3 deals with the licence conditions relating to the requirements for coverage and rollout, which are specific to the frequency block FDD5.

### 2.1 Geographical area and frequency blocks

The assignment refers to national licences to use radio transmitters in the 700 MHz band (694 - 790 MHz). PTS has divided the frequency band's FDD segments into four licences (blocks) of 2×5 MHz (FDD1 - FDD4) and one license (block) of 2×10 MHz with coverage requirements (FDD5), all for FDD use in accordance with Table 1 and Figure 1 below. Each frequency block constitutes one licence.

Frequency block	Uplink band (MHz)	Downlink band (MHz)
FDD1	703-708	758-763
FDD2	708-713	763-768
FDD3	713-718	768-773
FDD4	718-723	773-778
FDD5	723-733	778-788

Table 1: Frequency blocks in the FDD segment

694-703	703-708	708-713	713-718	718-723	723-728	728-733	733-738	738-743	743-748	748-753	753-758	758-763	763-768	768-773	773-778	778-783	783-788	788-791
	FDD1	FDD2	FDD3	FDD4	FDD5							FDD1'	FDD2'	FDD3'	FDD4'	FDD5'		

Figure 1: Frequency arrangements in the 700 MHz band (frequencies stated in MHz)

Frequency space directly below 694 MHz is currently used primarily for terrestrial TV, but also for wireless microphones etc. Frequency space directly above 791 MHz is used for mobile downlink in the 800 MHz band.



## 2.2 Technology and area of use

Following the PTS spectrum strategy, the licences have as few restrictive conditions as possible. Licence holders may, with certain restrictions, choose the technology used and the desired area of use. It follows that a licence holder can change technology and area of use during the period of the licence, as long as they remain within the framework of the licence conditions. However, licences are granted on condition that frequency division is used as the duplex method (FDD). One of the licences is also granted on condition of coverage and rollout, meaning that the holder of the licence must provide access to voice and data services (at least 10 Mb/s) where there are consumers<sup>2</sup> and in areas which, for various reasons, are important to cover from a social perspective. A more detailed description of the coverage requirement can be found in chapter 3.

## 2.3 Term of licence

The winning bidder for frequency blocks at the auction will have access to the frequencies from 1 April 2017 to 31 December 2039 inclusive.

## 2.4 Technical conditions

### 2.4.1 Spectrum mask and power levels

PTS has drawn up the technical conditions for the 700 MHz band in accordance with the European Commission Decision 2016/687 of 28 April 2016<sup>3</sup>. This decision is based on the concept of a spectrum mask (*Block Edge Mask*), i.e. the licence holder is free to choose the technology used, but must limit the radiation from their usage of radio to other licence holders in adjacent frequencies to avoid the occurrence of harmful interference.

The Commission's decision 2016/687 of 28 April 2016 defines which harmonised technical conditions must be implemented for terminals. Licences in the 700 MHz band provide the option for licence holders to use a higher average power than 23 dBm for installations of terminals outside urban areas. However, this is on condition that no interference is caused to other radio usage and that relevant obligations toward other countries are fulfilled.

The licences will be subject to the technical conditions set out in **items 1 to 7 in Appendix A**.

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<sup>2</sup> When PTS uses the term consumer in this open invitation, it includes all users of the services that may be facilitated using the assigned frequencies.

<sup>3</sup> The Commission's implementing decision (EU) 2016/687 of 28 April 2016 on the harmonisation of the frequency band 694-790 MHz for terrestrial systems that can provide wireless broadband services and for flexible national use in the European Union

At present there is no decision in Sweden on the use of frequencies for those parts of the 700 MHz band not included in the FDD segment. The technical conditions proposed for the use of frequency blocks in the FDD segment have therefore been drawn up to avoid the prevention of other possible uses outside the FDD segment. Depending on decisions taken on the future use of the frequency spectrum in the 700 MHz band, it is conceivable that PTS may modify certain technical conditions for the use of the FDD segment, but in a manner that would not be more demanding for licence holders. In this case, it would be relevant after application by licence holders.

#### **2.4.2 Sharing**

All newly assigned licences should, in accordance with the PTS Spectrum Strategy<sup>4</sup>, be future-proof with regard to the possibility of sharing frequency space. In much the same way as current regulations for block licences already assigned, it must be possible to issue local and temporary licences (no longer than six months) for other usage in the frequency space. Such a licence may also be issued to another licence holder in the 700 MHz band. Sharing via the application of a future standardised regulatory framework or sophisticated technology (e.g. a concept similar to LSA<sup>5</sup> with database support) must also be possible. In the event of such a regulatory framework being implemented, which cannot be excluded during the licence period, the licence holder would be obliged to make available information concerning the primary use that is considered necessary to enable the effective sharing of frequencies. The arrangements for making available such information, however, must not involve an unreasonable administrative burden for any party.

The usage that the licence holder has through the licence assigned at this auction must be protected and given priority. The licence holder's right to rent out will have precedence over the right of PTS to grant a licence through the sharing of frequency space in the event of conflict between them.

Refer to **items 12-13 in Appendix A.**

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<sup>4</sup> PTS-ER-2014:16 p. 24, Principle 2.

<sup>5</sup> LSA: *Licensed Shared Access*

## **2.5 Prohibition of causing interference and undertaking to cooperate and remedy interference to TV reception**

### **2.5.1 Prohibition of causing interference to TV reception**

The reception of terrestrial TV in the frequency band 470-694 MHz must not be prevented. Licences for the 700 MHz band are therefore granted on condition that licence holders do not cause interference with TV reception in the frequency band 470-694 MHz (television interference). Refer to **item 8 in Appendix A**.

There is a definition of what is considered to be television interference in the licence conditions. In order to determine whether a household (with permanent residents)<sup>6</sup> is exposed to TV interference, the signal levels must be measured with a reference antenna 10 metres above the ground at the household in question.

### **2.5.2 Undertaking to cooperate on and remedy television interference**

Licences for FDD1-FDD5 include a condition that corresponds to the undertaking of the licence holder. Refer to **item 9 in Appendix A**. The undertaking involves a requirement on the licenceholder to establish and maintain cooperation with other licenceholders in the 700 MHz band to take appropriate measures to remedy TV interference that may arise when using the 700 MHz band.

The undertaking to cooperate on and remedy TV interference is a prerequisite for participating in the auction. The undertaking is made in the application and constitutes a licence condition under Chapter 3 Section 11 first paragraph of LEK.

Costs associated with cooperation, investigations and measures to remedy TV interference shall be borne by the licence holders. Licence holders in the 700 MHz band may agree among themselves on fair and reasonable cost sharing for cooperation and investigations. Any investigation into the reasons for TV interference must be free for TV viewers, regardless of whether the source of interference is found to be with a licence holder or otherwise. Any licence holder that has caused TV interference must pay for remedial measures taken.

#### **2.5.2.1 Establishing and maintaining cooperation**

The undertaking means that licence holders must establish and maintain cooperation with other licence holders in the 700 MHz band. Such

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<sup>6</sup> 'Permanent residents' refers to people in the household who are registered at that address.

cooperation must result in any TV interference being dealt with quickly and efficiently.

The licence holders may themselves determine the form of cooperation, but it must provide rapid action, i.e. the source of interference must be identified immediately and the interference investigated and remedied as soon as possible thereafter.

#### 2.5.2.2. Shared point of contact and good accessibility

To remedy TV interference quickly, it is necessary to arrange a shared point of contact with good accessibility for TV viewers who have a problem with TV reception. TV viewers must be able to call with any complaints and receive personal service at the shared point of contact. It must be free for TV viewers to make a complaint.

The licence holders may decide among themselves on the form of cooperation for the shared point of contact. Examples of commonly occurring forms of consumer contact are customer service and supplementary website tools.

The licence holders must help to coordinate the point of contact with that already established for TV viewers whose TV reception is affected by the use of the 800 MHz band.

#### 2.5.2.3. Identifying, investigating and remedying TV interference

The undertaking also involves a requirement to immediately identify which licence holders have caused the TV interference and as soon as possible thereafter investigate and remedy the stated TV interference.

There are several examples of how licence holders can remedy TV interference. Filters on TV receivers are one possibility. Another method is by adapting and adjusting the base stations by re-locating and re-orienting the antennas. If a filter solution is chosen, PTS can see major advantages in including the uplink band, i.e. filtering from 703 MHz and upward.

To ensure that the undertaking is effectively monitored, licence holders must keep records of any complaints. PTS must be able to read the records on request.

#### 2.5.2.4. Restrictions in the undertaking

The obligation to remedy interference on TV receivers refers to permanent residents. The definition corresponds to the transmission obligation under the programme companies' licence to transmit terrestrial television.

It is only interference as in the licence conditions' definition of interference (TV interference) that is covered by the undertaking.

### **2.5.3 Supervision of the undertaking**

PTS is both a licensing and supervisory authority. The licence holders are thus accountable to PTS for implementing the undertaking.

## **2.6 Coordination**

### **2.6.1 Coordination of Swedish mobile broadband usage with other countries**

Licences for FDD1-FDD5 are subject to the licence holder complying with agreements that Sweden has made with other states. Refer to **item 11 in Appendix A**.

In Europe the 700 MHz band is currently used primarily for the broadcast of terrestrial TV, but also for mobile services. In Russia it is also used for aeronautical radio navigation services (ARNS).

A prerequisite for using radio transmitters is that the usage does not cause interference to radio usage in other countries. The conditions for radio usage are stated in the International Telecommunications Union's Radio Regulations (ITU-RR)<sup>7</sup>. Other conditions, such as more generous conditions, may be established between countries through bilateral coordination agreements. These agreements normally indicate what levels of field strengths may be emitted and tolerated by mobile base stations, for example, and when more detailed coordination must take place. Coordination agreements and arrangements that Sweden has made, or plans to make, are published on the PTS website.<sup>8</sup>

All radio usage in the 700 MHz band must comply with the international and bilateral agreements that Sweden makes with other countries. Rollout may need to be adapted in order to meet coordination requirements. Applicants are therefore invited to carefully consider protection requirements in the various agreements and the impact that may result from the usage of radio services in other countries.

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<sup>7</sup> Refer to <http://www.itu.int/publ/R-REG-RR/en>.

<sup>8</sup> Refer to <http://www.pts.se/sv/Bransch/Radio/Koordineringsavtal/Mobiltelefoni/>. This website also includes other coordination agreements that are used for mobile services, such as the 2.6 GHz and 3.6-3.8 GHz bands.

## **2.6.2 Voluntary coordination between licence holders**

PTS encourages voluntary coordination between the licence holders affected regarding technical requirements in the licence conditions. Coordination can take place between licence holders within the frequency band in question and with licence holders in adjacent frequency bands.

For licence holders in the 700 MHz band, it is possible to deviate from certain technical requirements in the conditions of the licence provided that those licence holders affected by the deviations come to an agreement. Refer to **item 7 in Appendix A**. Special caution must be observed, however, since deviations may affect other radio usage within and outside the bands, which is also protected by the technical requirements in the licence conditions.

## **2.6.3 The Swedish Armed Forces**

The Swedish Armed Forces may need to influence the location of new base stations, radiated power in different directions and the characteristics of the antennas and radio plants in order to prevent interference with sensitive installations in certain municipalities. The risk of interference from a base station near one of the Armed Forces' outdoor facilities can be minimised by directing the transmission power elsewhere or reducing it in all directions.

The licence is thus subject to the licence holder coordinating with and seeking consent from the Armed Forces when locating base station equipment in the vicinity of the Armed Forces' outdoor facilities in the municipalities of Ystad, Gotland and Karlskrona. Refer to **item 10 in Appendix A**.

PTS may, after completion of the assignment procedure, provide information on how coordination with the Armed Forces can be implemented. The procedure has already been drawn up for existing licences in the 1800 MHz band.

## **2.7 Other matters**

### **2.7.1 Annual fee**

From 1 April 2017, licence holders must pay an annual fee to PTS for a licence to use a radio transmitter under LEK. PTS determines the amount of the fee in regulations that are reviewed annually. Under PTS regulations (PTSFS 2015:5) on fees, which apply from 1 January 2016, the annual fee for 2 x 5 MHz in the

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700 MHz band (FDD1–4) amounts to SEK 615,000<sup>9</sup> and for 2×10 MHz in the 700 MHz band (FDD5) it amounts to SEK 1,230,000<sup>10</sup>.

To the annual fee for the licence is added an annual fee for supervision under the Radio Equipment Act (2016:392). Under the PTS regulations (PTSFS 2015:5) on fees, the 2016 fee amounts to 3% of the annual fee. The fee would then amount to SEK 18,450 for a licence covering 2 x 5 MHz<sup>11</sup> and SEK 36,900 for a licence covering 2×10 MHz<sup>12</sup>.

### **2.7.2 Ultra Wide Band (UWB)**

Radio usage with UWB technology is exempted from the requirement for a licence in frequency bands up to 1600 MHz in accordance with the technical implementation measures contained in the EU Commission's decision on UWB.<sup>13</sup> UWB usage in the 700 MHz band under these provisions is permitted in the PTS regulations on exemptions from the license requirement, with the power densities stipulated in the regulations.<sup>14</sup>

### **2.7.3 Transfer and renting of licences**

A licence holder has the right, under Chapter 3 Sections 23-24 of LEK, to transfer or rent a licence or part thereof to use a radio transmitter, with the prior consent of PTS.

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<sup>9</sup> Calculation: 2 x 5 MHz × SEK 102,500 (price per MHz) × 1 (service key) × 0.6 (distribution key) = SEK 615,000

<sup>10</sup> Calculation: 2×10 MHz × SEK 102,500 (price per MHz) × 1 (service key) × 0.6 (distribution key) = SEK 1,230,000

<sup>11</sup> Calculation: SEK 615,000 × 3% = SEK 18,450

<sup>12</sup> Calculation: SEK 1,230,000 × 3% = SEK 36,900

<sup>13</sup> The Commission's decision of 21 February 2007 on the harmonised use of the radio spectrum for equipment using UWB technology in the Community (2007/131/EC), last amended by a decision of 7 October 2014 (2014/702/EU).

<sup>14</sup> From 1 January 2016, refer to Chapter 3 Sections 6-11 of the Swedish Post and Telecom Agency's regulations (PTSFS 2015:4) on exceptions from the license requirement for certain radio transmitters

## **3 Requirements on coverage and rollout**

### **3.1 Purpose of the coverage requirement**

As can be seen from the "Report of the government commission to investigate the future usage of the 700 MHz band,"<sup>15</sup> PTS finds it justified to include coverage requirements as a licence condition for the 700 MHz band (FDD5), primarily to increase accessibility to mobile communication services wherever there are consumers. The coverage requirement focuses on improving consumers' access to coverage and their options of using mobile call and data services (at least 10 Mb/s) by improving outdoor coverage in areas where consumers spend time.

The coverage requirement consists of two parts. In the main part, PTS highlights areas prior to assignment. The starting point was to give priority to areas near roads, areas where consumers live and work, and areas with holiday homes; refer to section 3.4. In the supplementary part of the coverage requirement, PTS will point out areas that must be covered after the assignment process; refer to section 3.5.

### **3.2 Combined selection procedure for the assignment of FDD5**

The licence for FDD5 will be assigned through a combined selection procedure; i.e., a combination of a comparative selection procedure (à la beauty contest) and an auction in accordance with LEK. The coverage requirement means that the licence holder must provide coverage in a selection of the coverage gaps that PTS has identified (priority areas), as well as in a number of areas that PTS will indicate after assignment.

The lowest bid that can be made for FDD5 is SEK 200 million. The highest bid that can be made in the form of coverage is SEK 300 million, the ceiling for coverage. Bids up to SEK 300 million will be a binding commitment to the provision of coverage. Any winning bids exceeding the ceiling must be paid as auction cash. When the licence is assigned, the coverage requirement amount is determined for the winning bid for FDD5 up to and including the ceiling. The licence holder does not pay the coverage requirement amount, but will use it to provide coverage.

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<sup>15</sup> PTS-ER-2015:15



Coverage requirement amounts do not include VAT. The coverage requirement amount will be adjusted annually with inflation<sup>16</sup>.

### **3.3 The structure of the coverage requirement**

The coverage requirement consists of a main part and a supplementary part. For the main part, PTS has drawn up a number of priority areas (refer to section 3.4).

SEK 100 million<sup>17</sup> of the coverage requirement amount shall be used to provide coverage in priority areas which do not have outdoor coverage for voice and data services (10 Mbps). The remaining part of the coverage requirement amount, with the exception of that part used for the supplementary part of the coverage requirement, may also be used in priority areas that only lack outdoor coverage for data services (10 Mbps).

The proportion of priority areas differs from county to county. The counties that have the most priority areas are Jämtland, Norrbotten, Dalarna, Västerbotten, Västernorrland, Gävleborg and Värmland. At least 50% of the part of the coverage requirement amount that must be used for coverage in priority areas shall be used to provide coverage in these counties, in accordance with the percentage allocations stated in **item 17 of Appendix A**. For the remaining 50%, the licence holder may choose freely among all the priority areas.

The supplementary part of the coverage requirement is a smaller percentage of the coverage requirement amount (SEK 40 million<sup>18</sup>) and shall be used for areas that PTS selects after assignment.

If settlement for those areas that PTS selects in the supplementary part of the coverage requirement do not amount to SEK 40 million, the excess amount shall be used for the main part of the coverage requirement to provide coverage in priority areas.

Coverage in accordance with the requirements laid down in the licence conditions shall be maintained throughout the licence period.

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<sup>16</sup>The coverage requirement amount shall be adjusted for inflation annually, starting on 31 January 2018. From 31 January 2021, that part of the coverage requirement amount that remains each year, after deduction of costs that have been settled for rollout, is adjusted with inflation. The annual average of the Consumer Price Index (CPI, 1980=100) is used as a measure of inflation. Indexation takes place every year until the earmarked funds for coverage are settled.

<sup>17</sup> Adjusted for inflation, starting on 31 January 2018. The annual average of the Consumer Price Index (CPI, 1980=100) is used as a measure of inflation.

<sup>18</sup> Refer to footnote 17.

Refer to **items 14 -18 and 24 in Appendix A.**

### **3.4 Priority areas for the main part of the coverage requirement**

For settlement to be made from the amount corresponding to the main part of the coverage requirement, rollout must improve the coverage of any one or more of the priority areas defined by PTS. The licence holder may choose the location of the new masts<sup>19</sup>, which means that only a selection of the priority areas will need to be covered.

In drawing up the priority areas, PTS has as its starting point the total coverage reported to PTS (excluding 450 MHz band) for speech by mobile operators in the latest annual mapping of accessibility to the mobile communications network.<sup>20</sup>

The coverage gaps that are located near to roads, households and holiday homes constitute the priority areas. The priority areas are defined on the basis of two levels:

- Priority area– type 1: Areas that have no outdoor coverage for voice and data services (10 Mbps)
- Priority area– type 2: Areas that have no outdoor coverage for data services (10 Mbps)

In both cases, the assumption is that a handheld terminal is used.

As regards coverage for data services, PTS makes the assumption that the majority of the masts which currently contribute to surface coverage for speech will be equipped with 3G or 4G through mobile operators' ongoing upgrades when licences for the 700 MHz band become applicable. The identified coverage gaps which are the basis for the priority areas have therefore been drawn up on the assumption that all existing masts are equipped with 4G in a surface coverage frequency band below 1 GHz.

Below is an example of the appearance of priority areas.

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<sup>19</sup> A mast in this open invitation refers to the construction which carries the antennas and the technical space that houses the radio equipment. The radio equipment itself, the antennas and other peripherals required, are also included in the term mast.

<sup>20</sup> PTS-ER-2016:11

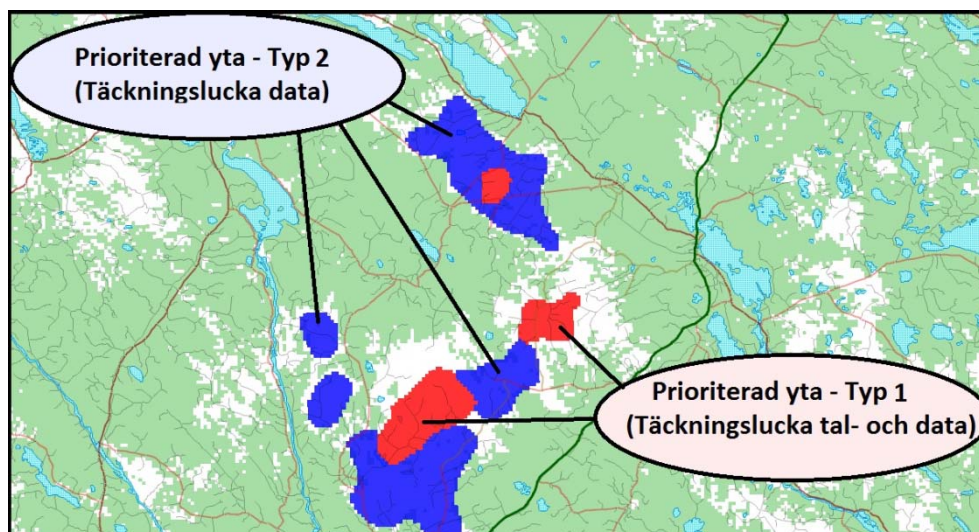


Figure 2: An example of the appearance of priority areas. The red areas correspond to priority area type 1 (area where there is no coverage for voice and data services), and blue areas correspond to priority area type 2 (areas where there is no coverage for data services).

Maps of priority areas can be found in **Appendix B** of this open invitation. The priority areas are also available electronically as GIS<sup>21</sup> data in MapInfo format, which can be accessed via the PTS website.

### 3.5 Areas to be covered according to the supplementary part of the coverage requirement

In the supplementary part of the coverage requirement, PTS has the right to select certain specific areas that the licence holder must cover. The areas may overlap or fully coincide with the defined priority areas of type 1 and 2 in the main part of the coverage requirement. For the purpose of providing information, PTS states below the categories that will become relevant when the authority selects areas for coverage within the supplementary part of the coverage requirement. In addition to the following considerations, this process will also take into account other relevant legislation.

1. Coverage to satisfy the right to universal services<sup>22</sup>, as per 31 March 2017, for existing permanent dwellings or fixed places of business; compare with Chapter 5 Section 1 in LEK.

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<sup>21</sup> Geographical Information System

<sup>22</sup> For the current definition of universal services, compare Section 29 a in the Regulation (2003:396) on Electronic Communications.

2. After 31 March 2017, newly established permanent dwellings or fixed places of business that do not have universal services and have not been able to obtain it through the market's provisions on reasonable terms. This applies if there is a reasonable demand for connection in accordance with Chapter 5 Section 1 in LEK, given that in the case of new construction, a requirement should be possible for both private persons and companies to take measures on their own initiative to ensure access to communications services.

3. Sami residences - which do not fall under item 1 or 2 above - but which are necessary for the pursuit of business activities in the form of reindeer husbandry and which are regularly used for long periods of time. The designation must relate to a point and not a large area.

4. Cases which are not covered by the right to universal service but which may be considered to lie close to this.

The above items are listed in rank order priority, i.e. the needs of a higher category must be met before a lower category is considered. However, PTS may give priority in individual cases on the basis of a social benefit perspective, e.g. the number of persons affected. There are thus no guarantees that any particular case in a given category will be singled out for rollout.

Within the various categories, PTS will give priority to possible areas on the basis of a social benefit perspective. The licence holder shall strive to satisfy the need for improved coverage which was the basis for indicating the area in question. The licence holder must therefore consult PTS before deciding on the location of a mast. The process for areas to be covered in accordance with the supplementary part of the coverage requirement contains an overall description of the following items.

- PTS will inform the licence holder of where there is a need to improve coverage (based on the above order of priority).
- The licence holder consults PTS regarding the planned rollout, including preliminary cost estimates for this.
- PTS gives feedback to the licence holder if the information given by the licence holder is still relevant with an indication, and states whether the development plan can be expected to meet the need which was the basis for the indication.
- After the rollout, the licence holder reports the costs for the rollout (in accordance with the settlement model in section 3.10.2). PTS will review invoice documents and will settle the costs which are deemed to be approved for settlement from the SEK 40 million of the coverage

requirement amount that shall be used for this part of the coverage requirement.

### **3.6 Requirements on coverage and rollout**

#### **3.6.1 Requirements for access to voice and data services**

Coverage for voice services shall be deemed to exist if it is possible to pick up a call with a handheld terminal and if the connection can be maintained with good voice quality without interruption.

Access to data service shall be deemed to exist if it is possible to receive data at a rate of at least 10 Mb/s, and to send data, using a handheld terminal. The minimum speed of 10 Mb/s is an estimate of the downlink bit rate that a consumer can typically expect, given normal load conditions in the network. Capacity and performance<sup>23</sup> in the coverage area must be equal to at least 2×10 MHz LTE with 2×2 MIMO in the 700 MHz band.

Refer to **items 19-20 in Appendix A**.

#### **3.6.2 Requirement for area coverage**

Every mast that is constructed to meet the main part of the coverage requirement must provide coverage for both voice services and data services within at least 20 km<sup>2</sup> of priority area. A mast that is constructed to meet the supplementary part of the coverage requirement must cover the area defined by PTS.

If a mast covers at least 20 km<sup>2</sup> of type 1 priority area, the mast is considered to meet the coverage requirement for type 1 priority area. If the licence holder covers the same geographical area using two different masts, only one mast may be counted for the area. Refer to **item 21 in Appendix A**.

The assessment of whether the coverage has been achieved must be based on the assumptions set out in **item 22 of Appendix A**.

#### **3.6.3 Requirements for cost efficiency**

The rollout must provide cost-effective coverage in the priority areas. This means, for example, that the location of the masts does not result in unnecessary overlaps in coverage with a larger total number of masts than required to provide cost-effective coverage of the areas. The antenna configuration on the masts (e.g. number of sectors and antenna directions) must be selected to cover the priority areas effectively.

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<sup>23</sup> In terms of speed and delay (latency).

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Refer to **item 23 of Appendix A**.

### **3.7 Masts to fulfil the coverage requirement**

Coverage of the priority areas must not be fulfilled by using existing masts put into operation before 1 April 2017 using one of the following technologies: GSM, UMTS or LTE, in any of the following frequency bands: 800 MHz, 900 MHz, 1800MHz, 2100 MHz or 2600 MHz. Rollout using other existing or potential antenna carriers other than those included in the limitation in this paragraph may take place, however.

On the other hand, coverage of the areas defined by PTS after assignment may be fulfilled by using existing masts put into operation before 1 April 2017 using one of the following technologies: GSM, UMTS or LTE, in any of the following frequency bands: 800 MHz, 900 MHz, 1800MHz, 2100 MHz or 2600 MHz.

Refer to **item 25 of Appendix A**.

### **3.8 Fulfilment through the use of other frequency bands**

The coverage requirement may be fulfilled by rollout of other frequency bands that have already been assigned. Frequency bands which may be used must have a performance<sup>24</sup> and capacity equal to at least what can be achieved by using 2 x 10 MHz LTE with 2×2 MIMO in the 700 MHz band.

When using other frequency bands that are already assigned, the coverage requirement for voice services in accordance with 3.6.1 must also be realised through the use of existing technologies for voice telephony such as GSM, WCDMA or VoLTE.

See **items 26 and 27 in Appendix A**.

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<sup>24</sup> In terms of speed and delay (latency).

### **3.9 Timetable for the provision of coverage**

#### **3.9.1 The main part of the coverage requirement**

The rollout of coverage must continue until the costs that may be offset in accordance with the settlement model amount to the coverage requirement amount.

- By no later than 31 December 2020, the licence holder must have expanded the coverage that can be offset by an amount corresponding to 25% of the coverage requirement amount to be used for the provision of coverage in priority areas.
- By no later than 31 December 2021, the licence holder must have expanded the coverage that can be offset by an amount corresponding to 50% of the coverage requirement amount to be used for the provision of coverage in priority areas.
- By no later than 31 December 2022, the licence holder must have expanded the coverage that can be offset by an amount corresponding to 75% of the coverage requirement amount to be used for the provision of coverage in priority areas.
- By no later than 31 December 2023, the licence holder must have expanded the coverage that can be offset by an amount corresponding to 100% of the coverage requirement amount to be used for the provision of coverage in priority areas.

Refer to **item 39 of Appendix A**.

#### **3.9.2 The supplementary part of the coverage requirement**

Each year between 2018 and 2023, PTS has the right to define a number of areas which must be expanded within two years of the date they were defined. For example, the areas that were defined by 31 December 2023 must be expanded by 31 December 2025. If all of the amount that must be used for this part of the coverage requirement has not been used by 31 December 2025 due to the fact that PTS has not defined sufficient areas, the licence holder must use the excess amount to provide coverage in the priority areas defined by PTS. Masts constructed as a result of this must be in operation by no later than 31 December 2028.

Refer to **items 18, 40 and 41 in Appendix A**.

### **3.10 Settlement model**

#### **3.10.1 The main part of the coverage requirement**

The settlement model described below shall apply to the main part of the coverage requirement.

For every new mast constructed as a result of the coverage requirement and approved by PTS, the licence holder may offset a lump sum of SEK 1 million. PTS used data from Mobil-LRIC as a basis for calculating this lump sum.<sup>25</sup> The lump sum has been calculated for 2017 and will be indexed for inflation<sup>26</sup> each year from 31 January 2018 onward.

In addition to the lump sum, the licence holder may offset its actual costs for connection to the electricity grid, i.e. the connection charges invoiced by the grid company.<sup>27</sup> The maximum amount that may be offset for electricity is SEK 2 million per mast.<sup>28</sup>

The licence holder may not set off any further costs than the lump sum and the actual costs for connection to the network.

For the licence holder to set off a mast, it must be in operation and meet the coverage requirements in accordance with the criteria set out in **items 14 and 16-27 in Appendix A**.

By no later than 31 May, starting in 2021, the licence holder must submit supporting documents in the form of invoices that substantiate the actual costs for connection to the grid for the preceding year's rollout. An estimate of the energy costs must be submitted to PTS by no later than 31 January each year, starting in 2021. This must be done until the entire coverage requirement amount has been approved for settlement.

Refer to **items 28-32 and 44 in Appendix A**.

#### **3.10.2 The supplementary part of the coverage requirement**

The settlement model described below applies to the supplementary part of the coverage requirement.

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<sup>25</sup> Refer to Cost of a rural LTE site in Sweden, 23 March 2016, Analyses Mason, case appendix 29 in PTS ref. no. 15-6916.

<sup>26</sup> The lump sum shall be indexed for inflation starting on 31 January 2018. The annual average of the Consumer Price Index (CPI, 1980=100) is used as a measure of inflation.

<sup>27</sup> This applies to the grid network as far as the connection point for the location of the mast.

<sup>28</sup> It must be possible to relate the cost to the mast, so information supporting this must be stated, such as the site ID.



The licence holder may offset the actual costs for masts constructed as a result of PTS defining the areas after assignment. To ensure that the licence holder uses earmarked funds for coverage in the intended manner, the rollout must be appropriate and cost-effective. PTS uses the phrase "appropriate and cost-effective" to mean that the rollout must be carried out with justifiable and reasonable costs. PTS has produced guidelines for what costs the authority considers acceptable in an appropriate and cost-effective rollout. The guidelines only include costs arising from the roll-out of new infrastructure; mainly costs for establishing and installing the infrastructure. Costs for maintaining the coverage created, such as costs for operation and maintenance of the network, are not included.

The actual costs that may be offset are listed in **item 36 in Appendix A**. Costs that may not be offset are listed in **item 37**.

The licence holder must report all expenditure for a specific mast under a project-specific code in its accounts. It must be possible to obtain a report from the finance system containing only expenditure for one specific mast. Extracts from the finance system must be supplied to PTS annually by 31 January.

PTS has the right to request all or part of the supporting documents that substantiate the licence holder's costs for the masts constructed.

Refer to **items 38 and 45 in Appendix A**.

### **3.11 Supervision of the coverage requirement fulfilment**

PTS is both a licensing and supervisory authority. The licence holder is thus accountable to PTS for fulfilling the coverage requirement. Below is a description of the information that the licence holder must submit to PTS to enable PTS to supervise the fulfilment of the coverage requirement.

#### **3.11.1 Supervision of rollout in the main part of the coverage requirement**

PTS will request that the licence holder submits documentation in the form of a development plan in good time before rollout starts, but no later than 1 December 2018 (see section 3.11.3) that shows all of the planned rollout until 31 December 2023. The development plan must include rollout within the framework of the main part of the coverage requirement. If necessary, the licence holder shall also provide an updated or revised rollout plan as described above no later than 1 December each year between 2019-2022.

No later than three months after the first or annually updated rollout plan is submitted, i.e. no later than 1 March, PTS intends to provide feedback to the licence holder regarding the development plan. Among other things, this feedback involves PTS making a preliminary assessment of the rollout plans and the potential of the planned masts to fulfil the licence conditions. The licence holder has the right, if necessary, to supplement the rollout plan to some extent after annual feedback from PTS. In this case, PTS will also provide feedback on the changes made in the rollout plan. If necessary, PTS may also require a dialogue in which it can put questions or make comments on the rollout plan relating to the licence holder's potential of fulfilling the coverage requirement.

By no later than 31 January after each year of rollout, starting in 2021, a complete report must be submitted to PTS showing the actual rollout during the year. The report must contain data to substantiate that the timetable for the development requirement has been complied with. PTS will make an assessment of whether the annual coverage requirement has been fulfilled on the basis of this report, and any other relevant information.

After 31 January 2024, PTS will check that the requirement for county-by-county distribution has been fulfilled and that at least SEK 100 million of the coverage requirement amount has been used for coverage in type 1 priority areas.

Refer to **items 42-43 in Appendix A**.

### **3.11.2 Supervision of rollout in the supplementary part of the coverage requirement**

In the same way as indicated above, PTS will request information from the licence holder to assess how the supplementary part of the coverage requirement is being fulfilled in the areas defined by PTS. This refers to the obligation of the licence holder to submit supporting documents to PTS during the period 2021-2026.

The supplementary part of the coverage requirement must be fulfilled by no later than 31 December 2025. Six months after PTS has judged that the complete supporting documents for financial settlement have been submitted, the authority will present a final assessment of whether the whole amount, SEK 40 million, has been used for this rollout.

If this is not the case, PTS will resume its supervision to assess whether the licence holder uses the remaining amount during the years 2027-2028 to achieve coverage in the priority areas in the main part of the coverage requirement. As indicated above, PTS will request supporting documents from

the licence holder regarding any masts constructed during the year as a result of reallocation from the supplementary part to the main part of the coverage requirement.

Refer to **item 46 of Appendix A**.

### **3.11.3 Structure of the rollout plan and the technical documentation**

The rollout plan, and any other technical documentation which the licence holder is obliged to submit to PTS, must contain information about the geographic location of the masts, their antenna configuration (antenna height, type, antenna directions) and radiated power. The estimated coverage for voice and data services (at least 10 Mb/s) as well as the area that each mast is intended to cover, must be illustrated geographically.

The documentation must include electronic map material showing the location of the masts and their estimated geographic coverage in an agreed format. The resolution of the electronic map material must be at least 250×250 metres. The documentation submitted after each year of rollout must also contain information indicating that the masts to be offset are in operation.

Refer to **items 42-43 in Appendix A**.

#### **Timetable for technical supervision of the rollout**

The timetable below indicates the latest dates for submitting information

<b>Date</b>	<b>Information</b>
01/12/2018	The plan for the entire rollout until 31 December 2023 must be submitted to PTS.  PTS will provide feedback on the rollout plan within three months.
01/12/2019	Supplementation and revision of the rollout plan and feedback from PTS within three months.
01/12/2020	Supplementation and revision of the rollout plan and feedback from PTS within three months.

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31/01/2021	<p>Complete documentation <sup>29</sup>of actual rollout until 31 December 2020 must be submitted to PTS.</p> <p>An estimate of the electricity costs for the previous year shall also be submitted to PTS. Electricity invoices to be submitted by no later than 31 May.</p> <p>Extract from the finance system for masts constructed as a result of the supplementary part of the coverage requirement must be submitted to PTS. Technical supervision of the timetable for the rollout requirement.</p>
01/12/2021	<p>Supplementation and revision of the rollout plan and feedback from PTS within three months.</p>
31/01/2022	<p>Complete documentation of actual rollout until 31 December 2021 must be submitted to PTS. An estimate of the electricity costs for the previous year shall also be submitted to PTS. Electricity invoices to be submitted by no later than 31 May.</p> <p>Extract from the finance system for masts constructed as a result of the supplementary part of the coverage requirement must be submitted to PTS. Technical supervision of the timetable for the rollout requirement.</p>
2022-2023	<p>Continuation in accordance with the above specified structure</p>
31/01/2024	<p>Submission of complete documentation of rollout up to 31 December 2023.</p> <p>An estimate of the electricity costs for the previous year shall also be submitted to PTS. Electricity invoices to be submitted by no later than 31 May.</p> <p>Extract from the finance system for masts constructed as a result of the supplementary part of the coverage requirement must be submitted to PTS.</p>

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<sup>29</sup> Complete documentation refers to documentation for the actual rollout as a result of the main part of the coverage requirement as well as documentation for rollout as a result of the supplementary part of the coverage requirement.

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31/01/2025	<p>Complete documentation of rollout in 2024 of masts, if any, constructed as a result of the supplementary part of the coverage requirement must be submitted.</p> <p>Extract from the finance system for masts constructed as a result of the supplementary part of the coverage requirement must be submitted to PTS.</p>
31/01/2026	<p>Complete documentation of rollout in 2025 of masts, if any, constructed as a result of the supplementary part of the coverage requirement must be submitted.</p> <p>Extract from the finance system for masts constructed as a result of the supplementary part of the coverage requirement must be submitted to PTS.</p>
2027-2029	<p>Complete documentation of masts, if any, constructed during the year as a result of reallocation from the supplementary part to the main part of the coverage requirement must be submitted.</p> <p>An estimate of electricity costs for the previous year shall also be submitted to PTS no later than 31 January. Electricity invoices to be submitted by no later than 31 May.</p>

## 4 Application to take part in the auction

Those who wish to participate as bidders in the auction must submit a full application to take part in the auction to PTS. The application must meet the requirements in the PTS regulations and this open invitation for an applicant to be allowed to participate as a bidder in the auction.

### 4.1 The application documents

A complete application to take part in the auction must contain the following documents:

- application form
- proof of authorized signatory
- information on the applicant's associated companies (refer to section 5.2)
- bank guarantee, and
- undertaking to cooperate on and remedy TV interference; refer to section 2.5.2.

### 4.2 Application

#### 4.2.1 Contents

The application must be made on the application form provided by PTS; refer to **Appendix C**. The application must contain the following.

- Information on the applicant:
  - name or company name,
  - civic registration number or registered organisation number (or the equivalent for a foreign applicant),
  - postal address,
  - contact who is authorised to represent the applicant at the auction, with contact details.
- Assurance that:
  - the applicant is not insolvent,
  - bids made at the auction come from the applicant,
  - the applicant has not during the four years prior to the last date of application had a licence withdrawn by PTS in accordance with Chapter 7, Section 6 paragraph 2 in LEK and

- the applicant, at the time of the application and during the auction, complies with and will comply with the applicable provisions in the PTS regulations and this open invitation.

#### **4.2.2 Appendices**

##### **4.2.2.1 Proof of authorised signatory**

The application form must be signed by the authorised signatory and the original submitted. Attached to the application must be an extract from the business register (or equivalent for foreign applicants) that states which persons are authorised to sign for the company. The extract must be valid and may not be more than six (6) months old.

If the signatory on the application form is not an authorised signatory on the extract from the business register (or equivalent for foreign applicants), an original power of attorney for such authorisation must be submitted to PTS with the application form.

##### *Specifically for foreign applicants*

If the extract from the business register or equivalent is not in Swedish or English, a Swedish or English translation of the extract must be attached to the application. If it is not clear from the extract that the person signing the application form (or the power of attorney) is an authorised signatory for the applicant, a brief description of the right to sign for the company must be attached to the application form with references to the relevant legislation.

#### **4.3 Bank guarantees**

##### **4.3.1 Contents**

Those applying to be bidders at the auction must submit a bank guarantee to PTS before the closing date for applications. If the bank guarantee arrives to PTS too late, the applicant may not take part in the auction. The applicant must provide the bank guarantee in a sealed envelope, preferably in the same one as the application form.

The bank guarantee must be made out in Swedish kronor and must have the content shown in **Appendix D**. The bank guarantee must also be issued by a credit institution, such as a bank or financial institution, in a Member State of the European Union, Iceland, Liechtenstein, Norway or Switzerland.

##### **4.3.2 Amount**

The amount that the bank guarantee must cover is calculated on the basis of how large a frequency range the applicant wishes to bid in the first round of

bids (a bidder's bidding rights in the auction may never exceed the number of frequencies that the bidder's bank guarantee corresponds to).

The amount of the bank guarantee must be equal to SEK 20 million per frequency of 2 x 5 MHz which the applicant wishes to bid for in the auction. As the spectrum cap has been set at 2x20 MHz, a bank guarantee of SEK 80 million will give the bidder the highest possible bidding rights (which correspond to the spectrum cap) in the auction's initial round of bids.

It is the applicant himself who calculates how large the bank guarantee will be. The applicant should not state in the application how many or which frequency blocks the applicant is interested in bidding for at the auction. The amount of the bank guarantee does not constitute a restriction on how high bids a bidder may make at the auction.

#### **4.3.3 Return and use of the bank guarantee**

PTS will return the bank guarantee to any applicants who cannot take part in the auction as soon as possible.

The bank guarantees will be returned to bidders who did not win the bidding for any frequency blocks as soon as possible after the auction. The bank guarantee will be sent to the address specified by the applicant.

Bank guarantees from winning bidders will be returned after the auction amount and cash handling fee have been paid to PTS. If a winning bidder does not pay PTS in time, the authority will cash the bidder's bank guarantee. The bank guarantee will be used in the first instance to pay the cash handling fee, and in the second instance to pay the whole or part of the auction amount.

#### **4.4 Important information regarding the application procedure**

##### **4.4.1 Submitting the application**

The complete application documents must be received by PTS by 1 November 2016 at the latest. The application documents must be submitted to PTS in a sealed envelope marked "Ansökan 700 MHz-tilldelning".

Any application documents that arrive too late will not be examined by PTS.

If the application documents are sent by post, the address is:

Post- och telestyrelsen "Ansökan 700 MHz-tilldelning"
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Box 5398 102 49 Stockholm
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The application documents may be delivered in person or by courier to PTS, Valhallavägen 117, Stockholm, Monday to Friday 08.00 - 17.00. Make an appointment in advance (please contact Anna Beckius, +46 8 678 57 65) if the application documents are delivered personally or by courier.

PTS will open applications on 2 November 2016. After the applications have been opened, PTS will notify contacts that the applications have been received. By submitting an application, there is no commitment to making a bid at the auction. In other words, applicants are not obliged to bid at the auction even if PTS has approved their application to be a bidder at the auction.

#### **4.4.2 Available contact**

PTS will send all correspondence regarding the assignment procedure to the contact specified in the application. Among other things, this means that PTS will only send information about logging in to the auction system to the contact. It is therefore important that the contact is available and can receive such information from the receipt of the application until the auction has been completed.

#### **4.4.3 Grounds for refusal or exclusion**

PTS may reject an application or exclude a bidder from participating in the auction on the following grounds:

- if the application, including the bank guarantee, was received too late by PTS,
- if the application is not complete,
- if the application contains incorrect information,
- if the contents of the bank guarantee differ from those indicated in **Appendix D**, or
- if two or more bidders coordinate bidding or otherwise cooperate during the auction procedure.

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#### **4.4.4 Time required and important dates**

PTS estimates that the auction will take around 2-10 working days, but interested parties should be aware that it could take longer.

PTS plans to hold a trial auction before starting the auction proper, and strongly recommends that all bidders participate in the trial auction.

Please note the following important dates:

- 1 November 2016  
Application documents must be received by PTS
- 24 November 2016  
Planned date of trial auction
- 1 December 2016  
Planned date for start of auction proper

## **5 Auction procedure**

### **5.1 Spectrum cap**

A spectrum cap of 2×20 MHz applies to the assignment of the FDD segment in the 700 MHz band. A bidder may therefore be assigned 2×20 MHz at most through the auction.

### **5.2 Provision on closely affiliated parties**

If two or more of the applicants are deemed to be closely affiliated, only one of them may take part in the auction. The closely affiliated provision is as follows:

- all companies belonging to the same group, as under Chapter 1 Section 4 of the Swedish Annual Accounts Act (1995:1554) are deemed to be affiliated, and
- if a company or a group holds half of the votes of all the shares in another company, this company (and its subsidiaries, if any) is considered to be affiliated to the owning company and all companies in the ownership group.

The affiliation provision means, among other things, that half-owned grid companies on the mobile telephony market are considered to be affiliated with their owners. It should be noted that two operators who own half of a joint grid company are not considered to be affiliated.

In conjunction with the application, the applicant must submit information on which companies are affiliated with the applicant under the above affiliation provision. If two or more applicants are affiliated with each other, they must indicate which of the companies will take part in the auction at the request of PTS. Failure to comply with this request will result in neither of the affiliated companies taking part in the auction.

If, during the bidding, PTS becomes aware that a bidder has submitted false information about affiliated relations, PTS may decide to exclude the bidder from participating in the selection procedure.

### **5.3 Ban on cooperation**

Cooperation between bidders during the auction may have a negative impact on the outcome of the auction. Bidders may not coordinate bidding or otherwise cooperate during the auction procedure. Any cooperation agreements concluded prior to the auction procedure are covered by this ban on cooperation if the bidders act in accordance with the agreement during the

auction procedure. A discussion of the auction between bidders may also be interpreted as cooperation.

If, during the auction, PTS becomes aware that two or more bidders are cooperating, PTS may exclude these bidders from participation in the auction.

#### **5.4 Auction format**

Under LEK, an auction is an administrative selection process to assign licences. The auction for this assignment will be implemented in an electronic auction system on the internet with several rounds of bids that continue until a higher bid is no longer made, at which point PTS will end the auction. The auction format is a Simultaneous Multi-Round Auction (SMRA) with the right to move the highest valid bid under certain circumstances, as specified below.

The assignment of a licence for the frequency block FDD5 will take place through a combination of a comparative selection procedure (as in a beauty contest) and an auction in accordance with LEK. Bidding for the FDD5 takes place in the same auction system and in the same manner as bidding for all the other blocks, with the difference that bids up to and including the ceiling amount are a binding commitment to coverage. Thus, bids up to and including the ceiling amount are not paid as auction amounts. Bidders can move bids between FDD5 and all the other frequency blocks during the whole auction.

##### *How do bidders take part in the auction process?*

An auction is an iterative and extensive process. Bidders must be active and bid according to the rules specified in this section if they wish to remain in the auction. Bidders must monitor the auction during the times of day decided by PTS.

When the first round of bids starts, any bidder who wants to take part in the auction must be logged in to the auction system and make a bid. In the subsequent rounds, bidders must be logged in if they wish to monitor events in the auction and make bids in order to continue participating. Bidders will only retain their bidding right if they are active in the auction in accordance with the rules relating to bidding rights and activities in section 5.4.7.

After each round of bids, the bidders receive information about the result of the latest round of bids, such as the highest bid in each blocks and whether they themselves made one of the highest bids. The amount a bidder must add to a block to be able to have the highest bid, called the bid level, is determined by PTS in each round of bids.

The auction continues until all bidding has ceased and no bidders choose to pass in the round of bids. Since there is a right, under certain circumstances, to move bids and pass, a frequency block that has had the same highest bid for several rounds of bids may receive several new bids. A frequency block that appeared to be won may receive an even higher bid.

PTS will inform bidders when the next round of bids begins and ends via the auction system. How long the various rounds of bids continue may be changed during the auction process to regulate the pace of the auction.

#### **5.4.1 Frequency blocks and points**

The auction has five frequency blocks:

- Four (4) blocks of 2 x 5 MHz each (FDD1-FDD4)
- One (1) block of 2x10 MHz (FDD5)

Each frequency block has been assigned a value that is specified in points. The frequency blocks FDD1-FDD4 of 2 x 5 MHz (i.e. 10 MHz) have been assigned one (1) point each and frequency block FDD5 has been assigned two (2) points. The reason why PTS uses a point system in the auction is to estimate the bidders' activity and rights to bid in the auction.

The spectrum cap that PTS has set means that a bidder who is only allowed to bid for 2x20 MHz (i.e. 40 MHz) has 4 points in each round of bids. The auction system will not allow bidders to make bids that cover more than the spectrum cap.

#### **5.4.2 Definitions**

**Activity** Activity in the ongoing round of bids is decisive for which bidding right each bidder has in the next round of bids. Activity is calculated in the following way:

Activity =  
The highest current bid at the beginning of a round of bids  
- any retracted bids  
+ actively made bids in the round of bids

Activity can be between 0 and 4. For a bidder to retain his bidding right in the next round of bids, activity in the current round of bids must correspond to the bidding right.

<b>Bids</b>	<p>For FDD1-4:</p> <p>A binding commitment to pay an amount for a licence that is included in the auction.</p> <p>For FDD5:</p> <p>Up to and including the ceiling amount, a binding commitment to coverage; refer to section 3.2. The ceiling amount is SEK 300 million. Bids exceeding the ceiling amount constitute a binding commitment, in addition to coverage, to pay the amount in excess of the ceiling amount for the licence.</p> <p>Bidders can only make bids in the auction program at bid levels decided by PTS for the different frequency blocks.</p>
<b>Bidders</b>	<p>Those who have submitted a complete application to take part in the auction and who meet the requirements in the PTS decision to limit the number of licences and issue an open invitation.</p>
<b>Bid level</b>	<p>The amount that a bidder must add to have the highest bid for the block (or to have the possibility of having the highest bid, if there are more bidders who bid at the current bid level).</p>
<b>Round of bids</b>	<p>A period of time with a start and end time in the auction when the bidders are able to bid for frequency blocks at the bid levels defined by PTS for each round of bids, or pass.</p>
<b>Bidding rights</b>	<p>Defines how many frequency blocks a bidder has the bidding right for. The bidding right is specified as points and may be reduced by the bidder decreasing activity. Each individual bidder's bidding right is updated prior to each round of bids, depending on the activity of the bidder in the previous round of bids (if the bidder has not passed in the previous round of bids).</p>
<b>Standing high bid</b>	<p>Preliminary winning bid, if no other bidder makes a higher bid. The standing high bid is thus the highest bid which has been made for each frequency block. After each round of bids the standing high bid for each frequency block is stated</p>

(where the bidder with the highest bid is selected at random from the bidders who have made the same bid level).

A frequency block that has had the standing high bid retracted and not received any new bids is without a standing high bid. The frequency block retains the same bid level as before.

**Passing** By passing in a round of bids, a bidder can retain the bidding right in the next round of bids, even if the bidder's activity is lower than his bidding right. Each bidder will be assigned a limited number of options to pass.

**Winning bid** The standing high bid for each frequency block at the end of the auction. The bidder with the winning bid is the one who is awarded the licence after the auction amount, if any, is paid.

#### **5.4.3 Login information and internet access**

The auction will be carried out over the internet using software provided by PTS.

Each bidder must state a contact in the application for participation in the auction. This contact will be given the following information on the auction system in good time before the auction: login details, web address to log in, user manual and phone number for support matters.

The bidders themselves are responsible for their participation; e.g. ensuring that their computers, internet connection and other equipment all function correctly, that the right staff participate and that their own login information is stored safely.

The auction system interface for the bidders will be in English.

#### **5.4.4 Auction time**

The auction is planned to start on **1 December 2016 at 10.00**. The start time will not be earlier than this. If the start time needs to be postponed, PTS will inform participants about this on the PTS website [www.pts.se/700MHz](http://www.pts.se/700MHz) and will also inform the bidders' contacts of the change.

One week before the start of the auction, on 24 November 2016, PTS plans to implement a trial auction. PTS strongly recommends that all bidders participate in the trial auction to ensure their equipment is working and that they understand how the auction proceeds.

#### **5.4.5 Bidding**

Bidding will take place in the auction program in accordance with the auction manual which the bidders will receive before the auction.

The auction will take place in rounds of bids, as scheduled by PTS. PTS will announce the start time and end time for each round of bids on the auction program at least 15 minutes before the start time.

PTS reserves the right to decide when the rounds of bids will take place. PTS will not arrange rounds of bids shorter than 10 minutes and there will not be more than 15 rounds of bids per day. PTS will schedule the rounds of bids with the aim of completing the auction within a reasonable period of time, but will take into account that bidders must be allowed sufficient time to consider their bids.

In a round of bids, bidders can:

- bid for a frequency block in the auction and/or withdraw a standing high bid at the start of the round of bids in accordance with the bidding right and activity in section 5.4.7; or
- pass

A bidder may not pass in the same round of bids as he makes a bid and/or withdraws the standing high bid. Bidders may only add new bids for frequency blocks where they do not already have standing high bid.

PTS will determine the bid level (what the next bid above standing high bid must be) for every frequency block in each round of bids.

The bidders' decision to make a bid, withdraw the standing high bid or to pass will be implemented in a number of stages as follows:

- First, the bidders register what they intend to do in the round of bids: either add new bids and/or withdraw the standing high bid, or pass. The bidders can only register decisions which are allowed under the auction rules.
- The auction program will then show what the bidder's decision is and its consequences for the number of remaining passes, reduced rights to bid etc.



- The bidder is then able to confirm the decision. Only confirmed decisions are registered as final by the auction program and bidders can only confirm one decision in each round of bids.

If, for some reason, a bidder does not confirm his decision in the auction program, this will be interpreted as meaning that the bidder has not submitted any new bids and will result in the auction program passing for the bidder, provided that the bidder has at least one (1) remaining right to pass. If the bidder does not confirm his decision, has already used up all his pass rights and has lower activity than the bidding right, this will result in the bidder's bidding right decreasing to the bidder's level of activity.

If two or more bidders have submitted bids for the same frequency block, the standing high bid is determined by drawing lots in the auction system immediately after the round of bids has ended.

The auction will end after a round of bids in which no new bid has been made and no bidders have passed.

#### 5.4.6 Bid level

PTS will determine the initial bid level in the auction in accordance with Table 2 below. The lowest bid must not be interpreted as a valuation of the blocks by PTS.

Frequency block	Lowest bid [SEK]
FDD1	100,000,000
FDD2	100,000,000
FDD3	100,000,000
FDD4	100,000,000
FDD5	200,000,000

Table 2: Lowest bid for each frequency block

In every round of bids, PTS will provide information about the current bid level for each frequency block. For any blocks that have had new bids in the previous round of bids, a new higher bid level will be defined. For blocks which have not had any new bids in the previous round of bids, the current bid level will not be changed from the previous round of bids. Blocks in which the

highest bid has been withdrawn will also retain their bid level if no new bids are made in the round of bids. The bids for frequency blocks will thus never decrease.

PTS reserves the right to determine the bid levels in each round of bids in the auction; the aim, however, is that bids should increase by approximately 2-20% in each round of bids.

#### **5.4.7 Bidding right and activity**

A bidder's activity in a round of bids may not exceed the bidding right that the bidder has at the start of the round of bids.

*Example 1:*

A bidder's bidding right is two (2) at the beginning of a round of bids. The bidder does not have any standing high bids, and thus no activity accrues from these. The bidder may therefore bid for:

- Up to two (2) frequency blocks in FDD1-FDD4, or
- the frequency block FDD5.

A bidder's bidding right in the very first round of bids in the auction corresponds to the bank guarantee which the bidder submitted with the application to take part in the auction. The bank guarantee amounts to SEK 20 million per point for the bidding right. The bidding right amounts to a maximum of four (4) points due to the spectrum cap of  $2 \times 20$  MHz.

PTS will have an activity requirement in the auction, which means that bidders' activity in the previous round of bids will determine the bidders' bidding right in the current round of bids, unless the bidder chose to pass or the auction program passed for the bidder.

*Example 2:*

A bidder's bidding right is two (2) at the beginning of a round of bids. The bidder does not have any standing high bids at the beginning of the round of bids. The bidder only makes one bid on the frequency block FDD1. The bidder's activity in the round of bids is thus one (1). The bidder's bidding right in subsequent rounds of bids will therefore be reduced to one (1).

If the bidder has chosen to pass in the previous round of bids, the bidding right will remain unchanged, even if the requirement for activity has not been fulfilled.

*Example 3:*

A bidder's bidding right is two (2) at the beginning of the round of bids. The bidder has the standing high bid for FDD1, which is equivalent to one (1) point of activity. The bidder chooses to pass in the round of bids, and will therefore maintain his bidding right at two (2) points in the next round of bids, despite the fact that the bidder's activity in the round of bids was lower than the bidder's bidding right. The bidder's number of remaining passes also decreases by one (1).

A bidder whose bidding right has decreased to zero (0) points may no longer take part in the auction and thus cannot win any frequency block(s).

#### **5.4.8 Passing**

At the beginning of the auction every bidder is given three (3) options to pass. Every time a bidder chooses to pass, or if the auction program passes for the bidder, the number of remaining options to pass is reduced by one (1).

Apart from the first round of bids, bidders may choose to pass in any round of bids, provided that the bidder still has the right to pass and the bidder's activity in the round of bids is lower than the bidder's bidding right at the beginning of the round of bids.

A bidder may not pass in the same round of bids as the bidder makes a new bid in, or withdraws one or more standing high bids.

The auction program will automatically pass for a bidder if the bidder fails to confirm his decision before the round of bids closes, and the bidder has lower activity than the bidding right, and the bidder has at least one (1) remaining option to pass.

A bidder who wishes to reduce his bidding right must register and confirm the decision to reduce his bidding right, otherwise the auction program will automatically pass on behalf of the bidder.

#### **5.4.9 Withdrawing the standing high bid**

Bidders may withdraw one or more of their standing high bids if the bidder's bidding right exceeds the bidder's activity from his standing high bid at the start of the round of bids. Since it is not permitted to pass in the same round of bids as a withdrawal of the standing high bid, a bidder must make new bids that correspond to the withdrawn bids for other frequency blocks if he does not wish to reduce his bidding right.

A bidder may not pass in the same round of bids as he has withdrawn one or more standing high bids from.

When a standing high bid is withdrawn from a frequency block, the block will then be without a standing high bid, i.e. there will be no provisional winner of the block until a bidder makes a new bid for the block. Frequency blocks without a standing high bid retain the same bid level as previously, i.e. the bid which a bidder must make to obtain the standing high bid is unchanged.

The following is an example of how the auction rules may be applied in practice. The example is only to illustrate different auction rules and is not a description of how the auction will take place.

*Example 4:*

Assume an auction is taking place with two bidders, bidder A and bidder B. Bidder A has a bank guarantee corresponding to four points in the bidding right, and B has a bank guarantee corresponding to three points in bidding rights.

***First round of bids***

In the first round of bids, the current bid is put at the minimum bid as specified by PTS. We will assume in this example that the lowest bid is 10 for FFD1-FDD4 and the lowest bid is 20 for FDD5.

A makes a bid for FDD1, FDD2, FDD3 and FDD4. A's activity is 4, which corresponds to the bidding right.

B bids in FDD4 and FDD5. B's activity is thus 3, which corresponds to B's bidding right.

The auction program then selects the standing high bid for the frequency blocks, where FDD1, FDD2, FDD3 and FDD5 have had only one bid each. Both bidders A and B have bid for FDD4, and lots are drawn for the bidder who has the standing high bid for this block. Assume that the auction program randomly chooses B as the highest bidder for FDD4.

The result after the first round of bids is therefore:

FDD1	FDD2	FDD3	FDD4	FDD5
<b>A (10)</b>	<b>A (10)</b>	<b>A (10)</b>	A (10)	<b>B (20)</b>

			<b>B (10)</b>	
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The offers in bold type are the standing high bids at the end of the round of bids.

Bidder A's bidding right in the second round of bids will continue to be 4 and bidder B's bidding right will continue to be 3.

***Second round of bids***

Since all frequency blocks were given a bid in the first round of bids, the bid level increases for all blocks. Suppose the bid level increases by 10%, the bid level is 11 for FDD1 - FDD4 and 22 for FDD5.

Bidder B has an activity level of 3 points from his standing high bid. Thus B cannot make any new bids or withdraw his bid and B's activity level will be 3 in this round of bids.

Bidder A has an activity level from the standing high bid that is less than his bidding right from the first round of bids. Assume that bidder A fails to register and confirm a bid before the round of bids ends. A's activity is thus 3.

The auction program will in this case register that bidder A passes, since bidder A had a lower activity level than the bidding right, but did not confirmed this. The outcome of the second round of bids is therefore:

FDD1	FDD2	FDD3	FDD4	FDD5
<b>A (10)</b>	<b>A (10)</b>	<b>A (10)</b>	<b>B (10)</b>	<b>B (20)</b>

Bidder A will still have his bidding right of 4 points in the third round of bids since the auction program automatically passed for A. Bidder B will retain his bidding right of 3 points.

***Third round of bids***

As previously, B cannot make a new bid or withdraw his standing high bid. B's activity from the start of the first round of bids continues to be 3.

Suppose bidder A makes a new bid for FDD4. This means that A's activity is 4 points.

Since A now has now made a higher bid for FDD4, the auction program will select the offer as the standing high bid for the block. The outcome of the third round of bids is therefore:

FDD1	FDD2	FDD3	FDD4	FDD5
<b>A (10)</b>	<b>A (10)</b>	<b>A (10)</b>	B (10) <b>A (11)</b>	<b>B (20)</b>

Bidder A's activity in the round of bids is thus 4 and B's activity is 3. Both the bidders thus retain their bidding rights for the next round of bids.

***Fourth round of bids***

Since a new bid has been made for FDD4, the bid level is raised for this frequency block to 12.

Bidder A's activity in the round of bids is 4 points, since he has the standing high bid for FDD1-FDD4. Therefore A does not need to make any new bids or pass in order to retain his bidding right.

Bidder B needs to pass or make a new bid to maintain his bidding right at 3 points. Since B's activity at the beginning of the round of bids is less than B's bidding right, B can withdraw his bid for FDD5, provided that B makes a new bid for at least two of the four blocks in FDD1 - FDD4.

Suppose that B withdraws his standing high bid for FDD5 and makes a bid for FDD1, FDD2 and FDD3. B's activity is thus 3. Since the bid level is 11 for FDD1, FDD2 and FDD3, B's new bid for these blocks is higher than standing high bid and thus B becomes the bidder with the standing high bid in the auction. The outcome of the fourth round of bids is:

FDD1	FDD2	FDD3	FDD4	FDD5

A (10)	A (10)	A (10)	<b>A (11)</b>	-
<b>B (11)</b>	<b>B (11)</b>	<b>B (11)</b>		

Thus, at the end of the fourth round of bids there is no standing high bid for FDD5.

***Fifth round of bids***

The bid levels for FDD1, FDD2, and FDD3 are now increased to 12, since these blocks have had increased standing high bids. The bid levels for FDD4 and FDD5 are the same as previously.

Bidder A has 4 points in bidding rights at the start of the round of bids, but since the activity of A's standing high bid is only 1, A must make a new bid equivalent to 3 points or pass to retain his bidding right in the next round of bids.

Bidder B has 3 points in bidding rights and 3 activity points from his standing high bid and thus does not need to do anything to retain his bidding rights in the next round of bids.

Suppose bidder A now makes a new bid for FDD5. Since the last standing high bid was 20, A must bid 22, which is the current bid level for this block. This means that A has 3 activity points, which is less than his bidding right. A will be informed by the auction program that if this choice is confirmed, A's bidding right will be reduced to 3.

The outcome of the fifth round of bids is therefore:

FDD1	FDD2	FDD3	FDD4	FDD5
<b>B (11)</b>	<b>B (11)</b>	<b>B (11)</b>	<b>A (11)</b>	<b>A (22)</b>

***The sixth round of bids***

The bid level for FDD5 increases to 24. The bid levels for the remaining blocks are unchanged (12 for FDD1 - FDD4).

A's bidding right is 3 and his activity from the standing high bid is also 3. B's bidding right is 3 and his activity from the standing high bid is 3. Thus, none

of the bidders can change their bids or pass, meaning that the auction ends.  
The outcome of the auction will thus be:

FDD1	FDD2	FDD3	FDD4	FDD5
<b>B (11)</b>	<b>B (11)</b>	<b>B (11)</b>	<b>A (11)</b>	<b>A (22)</b>

#### **5.4.10 Information during the auction**

Before each round of bids, PTS will publish information in the auction program describing:

- the start time and end time for the next round of bids
- the bid level for each frequency block in the next round of bids

After each round of bids, anonymised information on the standing high bid for each frequency block (including frequency blocks without any standing high bid) will be displayed in the auction program).

Historic information from each round of bids will also be available in the auction system.

Every bidder will also be able to see the following information:

- which frequency blocks the bidder has the standing high bid on, and the size of these bids
- the bidder's activity in the previous round of bids and the bidder's bidding rights in the next round of bids
- how many options to pass remain for the bidder

#### **5.4.11 Exclusion from participation**

If, during the auction, it becomes known that a bidder has submitted incorrect information in his application or in any other respect has not complied with the rules, PTS may exclude him from participating in the auction.

#### **5.4.12 Unforeseen events**

In the case of unforeseen events that have a major impact on the auction, PTS may suspend or cancel a certain round of bids, or the whole auction. Under such circumstances, PTS has the right, when appropriate, to

- allow a bidder further options to pass without informing the other bidders,



- resume the auction or round of bids at the stage when bidding was interrupted, *or*
- declare that the auction, a round of bids or further rounds of bids are invalid and restart the auction from the beginning, or from a certain round of bids.

In the case of an unforeseeable event occurring, PTS aims to resume the auction with as little interference or delay as possible. Examples of events that PTS may judge as unforeseen are technical failures affecting PTS or the bidders, a bidder being excluded from participation during the auction, or major malfunctions on the internet. However, it is not possible for PTS to provide an exhaustive list of what should be considered as unforeseen events.

If the auction has a technical breakdown, PTS will in the first instance inform the bidders via the PTS website ([www.pts.se](http://www.pts.se)) or via the telephone number that bidders registered.

#### **5.4.13 Completion of the auction**

The auction will be completed when a round of bids ends without any new bids being made or anybody passing the round of bids. This means that the whole auction ends at the same time.

PTS will notify the bidders via the auction system that the auction is completed, who placed the winning offers for the different frequency blocks, and will inform the winning bidders that they have won.

A bid shall cease to be binding after the auction is closed unless the bid is a winning bid.

## 6 Payment and assignment of licences

When the auction is finished, PTS will publish the names of the bidders, who won the bidding for the FDD1-FDD5 licences, and the winning bids. PTS will make a decision as soon as possible on licences for the bidders who won the bidding for the frequency blocks.

An invoice for the auction amount and handling fees will be sent to the winning bidder after the auction. The invoice is to be paid within thirty days from the invoice date.

The handling fee corresponds to external costs for PTS that are directly linked to the auction procedure. PTS has incurred costs in connection with the auction for consultants, software and translation, among other things. The handling fee will be distributed between the winning bidders according to the amount of assigned spectrum (number of MHz). The handling fee will not exceed SEK 2 million. The final handling fee will be established in the decision on the licence to use a radio transmitter within a certain frequency space.

If, after the end of the auction, PTS becomes aware that a bidder has provided incorrect information or has otherwise not complied with PTS regulations, this will not affect the results of the auction for the other bidders. Bids which are not winning bids cease to be binding after the end of the auction. This means that the bidder who had the next highest bid does not win the licence if the winner's license is subsequently revoked. The obligation to pay is not changed for other bidders who won a licence.

## **7 Risk of withdrawal of a licence**

In accordance with the rules in Chapter 7 of LEK, a licence that was assigned through the auction may be withdrawn by PTS. If a licence is withdrawn, the obligation remains to pay the auction amount, i.e. the winning offer(s), as well as the handling fee.

PTS may withdraw a licence if the winning bidder, for example:

- provided incorrect information,
- did not follow the rules in the PTS regulations and the open invitation,  
or
- did not pay the handling fee or the auction amount within the time stipulated.

Open invitation for applications for licences to use a radio transmitter in the 700 MHz band

The translation of the document is for information only; please note that in the event of any discrepancy between the English version and the Swedish original, the latter will take precedence.

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## 8 Questions and information

Information about the assignment of licences in the 700 MHz band is published on the PTS website: [www.pts.se/700MHz](http://www.pts.se/700MHz).

It is also possible to subscribe to news items published on the website news pages - in this case radio news. Subscribers automatically receive an e-mail as soon as a news item is published. Subscribe by going to <http://www.pts.se/prenumerera> and ticking the boxes "Radio" and "Press releases".

PTS also recommends that interested parties subscribe to "Referrals/consultation" and tick the box "Radio".

PTS recommends that interested parties monitor the following page to obtain updated information on the assignment process: <http://www.pts.se/700mhz>. Not all information about the auction is published in the form of news, so this will provide additional facts.

Questions about the procedure can be sent via e-mail to this address: [700MHzbandet@pts.se](mailto:700MHzbandet@pts.se). Your questions and replies by PTS will be published on the PTS website. PTS does not publish the questioner's identity. If you wish to keep your identity secret, you can engage an agent to put questions. Secret information or facts that are sensitive for your business should not be included in questions put to PTS.

Open invitation for applications for licences to use a radio transmitter in the 700 MHz band

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## 9 Appendices

- Appendix A Draft of licence conditions
- Appendix B Priority areas for the coverage requirement (applies to FDD5)
- Appendix C Application Form
- Appendix D Template for the bank guarantee