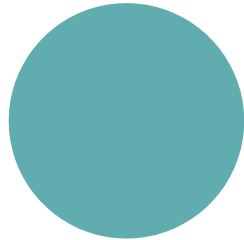
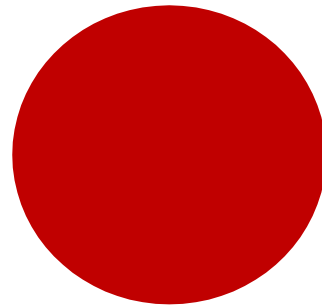




Danish Energy  
Agency



# Information Memorandum



**700 MHz, 900 MHz and 2300 MHz Auction**

**2018**

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## **IMPORTANT NOTICE**

This Information Memorandum (the "Memorandum") has been prepared by the Danish Energy Agency in cooperation with DotEcon Ltd and Analysys Mason (the "Advisers") in connection with the auction of frequencies in the frequency bands 703.0-733.0 MHz, 758.0-788.0 MHz and 738.0-758.0 MHz (the 700 MHz frequency band); 880.0-891.9 MHz, 896.9-915.0 MHz, 925.0-936.9 MHz and 941.9-960.0 MHz (the 900 MHz frequency band); and 2300.0-2400.0 MHz (the 2300 MHz frequency band), due to take place in September 2018.

The Memorandum is for information purposes only. It is provided on the understanding that it will be used by the Recipient for the sole purpose of assisting the Recipient in considering possible participation in the Auction. The Memorandum is not intended to form any part of the basis of any investment decision or evaluation or any other decision to participate in the Auction. The Memorandum should not be considered as a recommendation by the Danish Energy Agency and its Advisers or the Danish Energy Agency's other advisers to any Recipient of this Notice to participate in any future auction.

The Minister for Energy, Utilities and Climate's Decision provides the framework for the auction of the offered frequencies in the 700 MHz, 900 MHz and 2300 MHz frequency bands, see Annex A, and the Danish Energy Agency's Decision includes rules concerning the preparation and implementation of the Auction, see Annex B. Furthermore, Recipients should consult relevant legislation, including the Frequency Act, cf. Consolidated Act No. 1100 of 10 August 2016, see:

<https://www.retsinformation.dk/Forms/R0710.aspx?id=183640>

All information contained in this Memorandum is subject to updating, modification and amendment without notice. It is the responsibility of the Recipient to keep itself aware of such updating, modification and amendment.

The authoritative version of this Information Memorandum is in Danish. An English version is provided only for convenience when the final auction documents are published and is not intended to be the authoritative version.

# 1 Introduction and summary

On 26 February 2017, the Minister for Energy, Utilities and Climate decided that an auction should be held in 2018 of the spectrum that will become available at the end of 2019 in the 900 MHz frequency band, and in the 700 MHz and 2300 MHz frequency bands.

The 700 MHz, 900 MHz and 2300 MHz auction is expected to commence in September 2018. The spectrum will be awarded nationwide on a service- and technology-neutral basis.

The Danish Energy Agency's framework for implementing the award and issuing the Licences is given in the Danish Minister for Energy, Utilities and Climate's Decision of 14 June 2018 regarding the 700 MHz, 900 MHz and 2300 MHz Auction (hereinafter "the Minister's Decision"), cf. annex A.

More detailed rules for the implementation of the 700 MHz, 900 MHz and 2300 MHz Auction are given in the Danish Energy Agency's Decision of 18 June 2018 (hereinafter "the Danish Energy Agency's Decision"), cf. annex B.

This Memorandum describes the frequencies to be auctioned, the regulatory framework and the auction process.

## 1.1 Purpose of the 700 MHz, 900 MHz and 2300 MHz Auction

The auction will be held under the provisions of the Act on Radio Frequencies, cf. Consolidated Act No. 1100 of 10 August 2016. The overall objective of the Auction is to ensure efficient use of spectrum, promote effective competition and meet essential public interest considerations. It is an essential public interest consideration to ensure good mobile coverage - especially in sparsely populated areas and in areas where mobile coverage generally is not satisfactory.

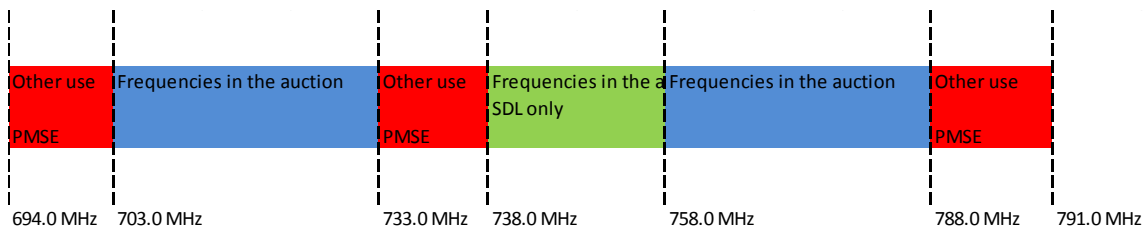
In line with the objectives set down in the Government's policy platform "For et friere, rigere og mere trygt Danmark" (*For a Freer, Richer and More Secure Denmark*) from 2016, ambitious coverage obligations have been set in the 700 MHz, 900 MHz and 2300 MHz licences, aimed at improving the availability of voice and broadband services in areas where the current availability is lowest. The coverage obligations have been described in section 3.4 below.

## 1.2 Spectrum to be awarded

### 1.2.1 The 700 MHz frequency band

The frequencies in the 700 MHz band to be awarded in the 700 MHz, 900 MHz and 2300 MHz auction comprise 2x30 MHz paired frequencies (703-733 MHz paired with 758-788 MHz) and 20 MHz unpaired frequencies (738-758 MHz).

Figure 1: Frequencies in the 700 MHz band



### 1.2.2 The 900 MHz frequency band

The frequencies in the 900 MHz band to be awarded in the 700 MHz, 900 MHz and 2300 MHz auction comprise 2x30 MHz paired frequencies (880.0-891.9 MHz and 896.9-915.0 MHz paired with 925.0-936.9 MHz and 941.9-960.0 MHz respectively).

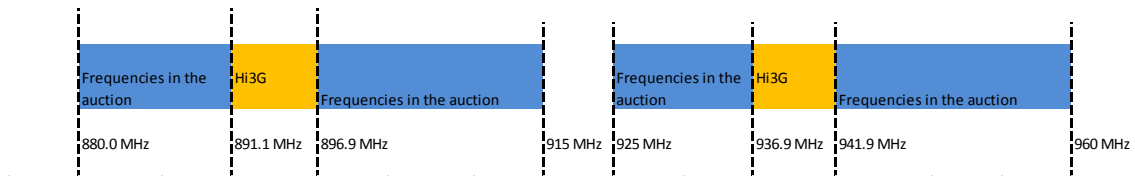
Hi3G has a Licence of 2x5 MHz placed in the middle of the frequency band included in the Auction (891.9-896.9 MHz paired with 936.9-941.9 MHz). The licence was awarded in 2010 and will terminate on 31 December 2034 (Hi3G's existing licence). It follows from Hi3G's frequency licence that the company's existing licence in the frequency band (2x5 MHz) will be moved to the top of the 900 MHz frequency band with effect from 1 January 2020.

In case Hi3G wins additional spectrum in the 900 MHz band in the auction, the specific placement of Hi3G's existing licence can be changed in order to ensure that all licensees will hold contiguous frequencies after the award.

In case Hi3G does not win additional spectrum in the 900 MHz band in the auction, the specific placement of Hi3G's existing licence will be changed to 910-915 MHz paired with 955-960 MHz.



Figure 2: Frequencies in the 900 MHz band



### 1.2.3 The 2300 MHz frequency band

The frequencies in the 2300 MHz band to be awarded in the 700 MHz, 900 MHz and 2300 MHz Auction comprise 100 MHz unpaired frequencies (2300.0-2400.0 MHz).

## 1.3 Coverage obligation

One or more of the licences awarded in this process will be subject to one or more coverage obligations. According to the coverage obligation associated with the 700 MHz or 900 MHz bands, licensees shall ensure provision of an outdoor mobile voice service and a mobile broadband service with a download bit rate of 30 Mbit/s and an upload bit rate of 3 Mbit/s. The coverage obligation applies in the coverage areas specified in the licence, and in each individual coverage area at least 90% of the area shall be covered, cf. section 3.4.1. To allow mobile operators to share the coverage obligation, three coverage area groups have been defined, each of which includes a number of coverage areas.

According to the coverage obligation associated with the 2300 MHz band and under additional coverage obligations, Licensees shall ensure provision of an outdoor mobile voice service and a mobile broadband service with a download bit rate of minimum 50 Mbit/s and an upload bit rate of minimum 5 Mbit/s. [At selected addresses it is sufficient to ensure provision of an outdoor mobile voice service and a mobile broadband service with download bit rate of at least 30 Mbit/s and an upload bit rate of at least 3 Mbit/s, cf. annex J and K.] Coverage obligations shall apply to at least 98 % of the addresses specified in the licence. Coverage may be provided assuming that any end-customer at the address is using fixed equipment for receiving the connection, if the licensee is generally marketing such product at a reasonable cost for the end-customer, cf. section 3.4.2 and section 3.4.3.

## 1.4 Lots available in the auction

Spectrum is offered in generic frequency lots. The specific frequencies assigned to each winner in the Auction are determined in a separate auction stage when the frequency generic lots are assigned. Each winner will be guaranteed to receive contiguous spectrum corresponding to the bandwidth it has won in each frequency band.

Some of the spectrum will be offered in the form of lots that are linked to a coverage obligation. The coverage obligations must be met by the bidders who win the corresponding spectrum lots with coverage obligations. Note the following:

- Lot A1: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 1.
- Lot A2: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 2.
- Lot A3: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 3.
- Lot E: 40 MHz of spectrum in the 2300 MHz band with the coverage obligation.

We refer to lots A1, A2 and A3 collectively as 'A lots'.

The remaining spectrum will be offered in the following lots:

- B lots, each including 2x5 MHz of paired spectrum in the 700 MHz band. There will be zero, two, four or six B lots available, depending on which spectrum is assigned as A lots.
- C lots, each including 2x5 MHz FDD spectrum in the 900 MHz band. There will be zero, two, four or six C lots available, depending on which spectrum is assigned as A lots.
- D lots, each including 5 MHz of unpaired spectrum in the 700 MHz band. There will be four D lots available.
- F lots, each including 10 MHz of spectrum in the 2300 MHz band. There will be six F lots available.

## 1.5 Spectrum Caps

For paired spectrum in the 700 MHz and 900 MHz bands, a cap of four lots is set on the total number of lots that each bidder can acquire across categories A1, A2, A3, B and C. The total amount of spectrum a bidder can acquire in these bands depends on which lot categories the bidder bids for (cf. section 7.2.3)

A cap of 60 MHz is set on the total amount of spectrum that each bidder can acquire in the 2300 MHz band.

No cap is set on the total amount of unpaired spectrum that each bidder can acquire in the 700 MHz band.

## 1.6 Overview of the process for assigning spectrum and coverage obligations

The auction has four stages.

A lots are initially offered in the first auction stage, where each bidder may win at most one A lot. Each of the A lots may include 2x10 MHz in the 700 MHz band or 2x10 MHz in the 900 MHz band, and the bidder is free to specify the band in which it desires to be assigned the spectrum in relation to an A lot awarded in the first auction stage.

All other lots (including any A lots not assigned in the first auction stage) are offered in the second auction stage. In this second stage bidders may bid for any combination of lots that is consistent with the spectrum caps.

If any A lots remain unassigned in the first stage and are offered in the second auction stage, then such A lots will include 2x10 MHz in the 700 MHz band (and thus the winner of the lot will not be able to choose whether it prefers the lot to include 700 MHz or 900 MHz spectrum).

The assignment of spectrum lots and coverage obligations in the first and second auction stages will be followed by the third auction stage, which will determine the specific frequencies to be assigned to each winner. In this stage, the Danish Energy Agency will determine the possible placements that are consistent with each winner receiving contiguous frequencies corresponding to the bandwidth it has won in each band. The Danish Energy Agency will also determine each bidder's bid options with respect to their individual placements. All bidders who have multiple placement options available will be able to bid for their alternative placements. The Danish Energy Agency will then calculate the value of each possible placement and select the placements that give the highest value.

The fourth (and final) stage of the auction allows winners of spectrum lots to take on additional coverage obligations in exchange for a reduction in the price they will have to pay for the spectrum they have been assigned in preceding stages.

Bidders who have been assigned spectrum in the preceding auction stages may submit bids for coverage obligations for specific address groups. Bids should specify the reduction in price that the bidder requires in order to cover the address group. On the basis of these bids the Danish Energy Agency will assign additional coverage obligations to Bidders, cf. Section 7.4.1.

## 1.7 The Auction process

The auction process consists of the following stages:

- The **Application Stage**, in which bidders submit applications to participate in the auction (along with any application to participate in the first auction stage and thus submission of a bid at reserve for all A-lots) and furnish deposits.
- The **Qualification Stage**, in which the Danish Energy Agency determines which bidders are qualified to participate in the auction and whether an auction is to be held.

- The **Auction**, which includes:
  - the **first auction stage**, in which lots A1, A2 and A3 may be assigned;
  - the **second auction stage**, in which bidders can bid for the remaining lots (including A1, A2 and A3 if they have not been assigned in the first auction stage);
  - the **third auction stage**, in which specific frequencies are assigned to each winner of spectrum; and
  - the **fourth auction stage**, in which additional coverage obligations may be assigned.
- The **Grant Stage**, in which winning Bidders make payments for their licences and the Danish Energy Agency issues the licences.

## 1.8 Structure of the Memorandum

The remainder of this Memorandum is structured as follows:

- Section 2 provides details about the lots available in the auction.
- Section 3 provides the licence terms and conditions, including details of the available spectrum, the coverage obligation, usage requirements, the licence duration and obligations regarding the territorial extent of the licences, revocation of licences, modification of licence terms, and details regarding frequency charges.
- Section 4 describes the regulatory framework governing the auction process, the provisions for site sharing and network sharing; the provisions for licence trading and change of use and VAT treatment of licences.
- Section 5 contains an overview of the auction process, including the time schedule; rules on ownership structure of bidders, and bidder behaviour during the auction process; and circumstances under which bidders may be subject to sanctions.
- Section 6 explains the Application and Qualification Stages, including information on deposits and details on the Electronic Auction System (EAS) that will be used for the second, third and fourth auction stages.
- Section 7 provides the rules for the auction.

- Section 8 explains the procedure for the granting of licences, including information on the announcement of the auction result and payment of the licence price.
- Section 9 contains information about communication between the Danish Energy Agency and bidders before and during the auction, and procedures for exceptional circumstances.

## 2 Lots available in the Auction

This section describes the lots available in the auction.

The spectrum lots are frequency-generic, meaning that each lot represents a fixed bandwidth within a given frequency band, but is not linked to a specific frequency block within the band. The specific frequencies that will be assigned to each winner of frequency-generic lots will be determined in a separate stage, with the guarantee that each winner will receive contiguous frequencies in each frequency band, corresponding to the bandwidth it has been assigned in that band.

### 2.1 Lots with a coverage obligation

There are four lots in the auction associated with a coverage obligation:

- Lot A1: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 1.
- Lot A2: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 2.
- Lot A3: 2x10 MHz of paired spectrum in the 700 MHz or 900 MHz band with the coverage obligation group 3.
- Lot E: 40 MHz of spectrum in the 2300 MHz band with the coverage obligation associated with the 2300 MHz band.

The reserve price for each of these lots is zero.

We refer to lots A1, A2 and A3 collectively as 'A lots'.

### 2.2 Lots without a coverage obligation

Overall, there are sixteen lots not subject to a coverage obligation. These will be offered in the following lot categories:

- B lots, each including 2x5 MHz of paired spectrum in the 700 MHz band, with a reserve price of DKK 95 million. There will be zero, two, four or six B lots available, depending on the spectrum assigned as A lots.
- C lots, each including 2x5 MHz of paired spectrum in the 900 MHz band, with a reserve price of DKK 95 million. There will be zero, two, four or six C lots available, depending on the spectrum assigned as A lots.

- D lots, each including 5 MHz of unpaired spectrum in the 700 MHz band, with a reserve price of DKK 25 million. There will be four D lots available.
- F lots, each including 10 MHz of unpaired spectrum in the 2300 MHz band, with a reserve price of DKK 25 million. There will be six F lots available.

### **2.3 Additional coverage obligation lots**

In the fourth auction stage, Bidders will be able to submit bids for additional coverage obligation lots comprising various address groups. Each address group specifies a number of specific addresses subject to the coverage obligation. There are 21 address groups of between 51 and 236 addresses with a coverage obligation, labelled T1 to T21. The coverage obligation for each address group is offered separately.

As for the content of the additional coverage obligations, see section 3.4.2.

Bids made for additional coverage obligations involve a commitment to meet the coverage obligation in exchange for a reduction in the Licence price equal to the bid amount. This means that accepted bids for additional coverage obligations will reduce the licence price for assigned spectrum. For example, if a bidder whose price in the previous auction stages is DKK 150 million wins with a bid of DKK 5 million for an additional coverage obligation in the fourth auction stage, then its total licence price will be DKK 145 million.

Bidders can make bids for one or more address groups, specifying for each group the reduction in the price of spectrum assigned in previous auction stages they require in order to meet the coverage obligation. The total sum of bids accepted for any particular bidder in the fourth auction stage cannot exceed the total sum of prices determined for the bidder in the preceding stages.

The Minister for Energy, Utilities and Climate has set the maximum price reduction that may be given to Bidders for each address group. The price reduction offered by the bidder for a given coverage obligation can be lower than the maximum reduction set for the obligation, but cannot exceed it.

### 2.3.1 Overview of additional coverage obligations and the maximum reduction in licence prices for each address group

Table 1: Overview of additional coverage obligations

Address group	Number of addresses included in address group	Maximum price reduction (DKK million)
T1	232	12
T2	85	7
T3	236	10
T4	158	8
T5	89	7
T6	231	11
T7	108	7
T8	111	8
T9	148	9
T10	119	8
T11	111	8
T12	74	5
T13	151	9
T14	85	6
T15	104	7
T16	116	7
T17	101	6
T18	55	4
T19	75	5
T20	124	8
T21	51	3



## 2.4 Overview of offered spectrum lots and reserve prices

Table 2: Overview of spectrum lots

Lot category	Frequency band	Lot bandwidth	Coverage obligation	Lots available	Reserve price per lot (DKK million)
A1	700 MHz or 900 MHz	2x10 MHz	Group 1	1	DKK 0
A2	700 MHz or 900 MHz	2x10 MHz	Group 2	1	DKK 0
A3	700 MHz or 900 MHz	2x10 MHz	Group 3	1	DKK 0
B	700 MHz	2x5 MHz	None	0, 2, 4 or 6	DKK 95 million
C	900 MHz	2x5 MHz	None	0, 2, 4 or 6	DKK 95 million
D	700 MHz	5 MHz	None	4	DKK 25 million
E	2300 MHz	40 MHz	Coverage obligation	1	DKK 0
F	2300 MHz	10 MHz	None	6	DKK 25 million

## 3 Licence terms

On the basis of the results of the completed auction, the Danish Energy Agency will issue Licences to use frequencies in the 700 MHz and 900 MHz bands and Licences to use frequencies in the 2300 MHz band.

This section describes the licence terms of the available licences in this auction.

### 3.1 The 700 MHz frequency band

The frequencies in the 700 MHz frequency band to be awarded in the 700 MHz, 900 MHz and 2300 MHz Auction comprise 2x30 MHz paired frequencies (703-733 MHz paired with 758-788 MHz) and 20 MHz unpaired frequencies (738-758 MHz).

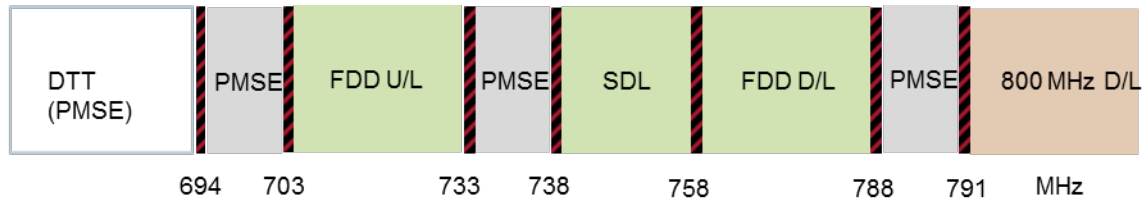
Each bidder will be awarded a single licence encompassing the amount of spectrum won in the 700 MHz and/or 900 MHz frequency bands. The spectrum assigned to each winner in the auction will form a contiguous frequency range.

The frequencies are available nationally with the restrictions appearing from section 3.1.2, and the licences will be issued as nationwide licences with the mentioned geographical restrictions.

In case one of the awarded 700 MHz frequency blocks is larger than 10 MHz and across 713 MHz (for example a block from 703-723 MHz or a block from 708-728 MHz), it will be a licence condition that the block may not be used as one contiguous frequency block, but must be implemented as two independent blocks separated at 713 MHz. This condition is set in order to protect terrestrial digital TV (DTT) in the band 470-694 MHz, cf. Commission Implementing Decision (EU) 2016/687 of 28 April 2016, Article 3 (annex C, Table 12, notes 1 and 3), cf. annex O. This condition will lapse if, for example, the use of the frequency band 470-694 MHz for DTT ceases.

Licensees must accept the present and future use of frequencies in adjacent frequency bands. The uses of the bands adjacent to the 700 MHz band are summarised in Figure 3 below.

Figure 3: Uses of frequency bands adjacent to the 700 MHz band



The frequency range 470-694 MHz is used for terrestrial digital TV (DTT), see section 3.1.1 about the special conditions applicable to DTT.

Frequency ranges 694-703 MHz and 733-738 MHz may be used for PMSE (wireless microphones) under Commission Implementing Decision (EU) 2016/687 on the harmonisation of the 694-790 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services and for flexible national use in the Union. It has not yet been determined how the frequency band 788-791 MHz should be used, but a possible use will be PMSE (wireless microphones).

The frequency range 791-862 MHz is used under Commission Decision (2010/267/EU) on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

### 3.1.1 Specific conditions regarding DTT and the 700 MHz frequency band

The present DTT transmission network uses the frequency range 470-790 MHz up to and including 3 April 2020. The present licences for nationwide DTT transmission networks are assigned to I/S DIGI-TV and Boxer TV A/S. Boxer TV A/S' existing licence expires on 3 April 2020. Up to 5 March 2018, the Radio and Television Board has held a public invitation to tender<sup>1</sup> in order to find the future licensee. On 6 June 2018, based on this invitation to tender, the Radio and Television Board awarded the new distribution licence to Boxer TV A/S<sup>2</sup>. From 4 April 2020, DIGI-TV and Boxer will transmit DTT in 470-694 MHz. As for Bornholm, due to frequency use in our neighbouring countries (in practice Poland), it is not certain that DTT may use only 470-694 MHz from 4 April 2020. In this case, the Danish Energy Agency will assign temporary frequencies for DTT in 694-790 MHz. Specific options might be channel 56 (750-758 MHz) and channel 59 (774-782 MHz), cf. section 3.1.2.

<sup>1</sup> <https://slks.dk/medier/tv/distributoerer-af-digital-tv/udbud-af-jordbaserede-digitale-tv-sendemuligheder-dtt/>

<sup>2</sup> <https://slks.dk/medier/tv/distributoerer-af-digital-tv/boxer-tv-as/>

Some of Denmark's neighbouring countries are likely to use 694-790 MHz for DTT, in whole or in part, after 4 April 2020. Especially the use in the uplink band, of 703-733 MHz (TV channels 50-53) for DTT in Norway and Poland, due to interference of the uplink, might constitute a substantial restriction on the practical use of the affected uplink channels. This means that the base station's reception of the signal from mobile telephones may be exposed to interference from a powerful TV signal on the same frequency from Norway or Poland. As far as Norway is concerned, the restriction will be towards Jutland north of the line Randers-Ringkøbing, and in the case of Poland the restriction will be towards Bornholm, Møn and Stevns.

According to Decision (EU) 2017/899 of the European Parliament and of the Council on the use of the 470-790 MHz frequency band in the Union, Member States, by 30 June 2020, shall allow the use of the 700 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services. However, there are a number of exemptions, which might mean that Poland will be able to continue its use of the frequency band for DTT after 30 June 2020. Both Poland and Norway have indicated that they are working towards ceasing the use of the 700 MHz frequency band for DTT before 30 June 2020.

Sweden and Germany have ceased using the 700 MHz frequency band for DTT.

### **3.1.2 Temporary geographical restrictions due to DTT**

As the frequencies 750-758 MHz (channel 56) and 774-782 MHz (channel 59) might be assigned temporarily for the use of DTT in Bornholm, the affected FDD downlink channels in this case will not be included in the licences issued as far as Bornholm is concerned.

It is expected that the temporary period will last till the end of 2023.

## **3.2 The 900 MHz frequency band**

The frequencies in the 900 MHz frequency band to be awarded in the 700 MHz, 900 MHz and 2300 MHz auction comprise 2x30 MHz paired frequencies (880.0-891.9 MHz and 896.9-915.0 MHz paired with 925.0-936.9 MHz and 941.9-960.0 MHz respectively).

A single licence will be awarded to each winning bidder encompassing the amount of spectrum won in the 700 MHz and/or 900 MHz frequency bands. The spectrum assigned to each winner in this auction will form a contiguous frequency range.

Hi3G has a licence of 2x5 MHz placed in the middle of the frequency band included in the auction (891.9-896.9 MHz and 936.9-941.9 MHz). The licence was awarded in 2010 and will terminate on 31 December 2034 ('Hi3G's existing licence').

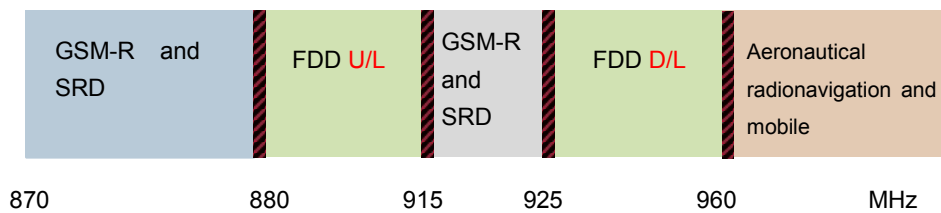
In case Hi3G wins additional spectrum in the 900 MHz frequency band in the auction, the specific placement of Hi3G's existing licence can be changed in order to ensure that all licensees will hold contiguous frequencies after the award.

In case Hi3G does not win additional spectrum in the 900 MHz frequency band in the auction, the specific placement of Hi3G's existing licence will be changed to 910-915 MHz paired with 955-960 MHz.

The frequencies are available nationally, and the licences will be issued as nationwide licences.

Licensees must accept the present and future use of frequencies in adjacent frequency bands. The uses of the frequency bands adjacent to the 900 MHz band are summarised in Figure 4 below.

Figure 4: Uses of frequency bands adjacent to the 900 MHz band



876-880 MHz and 921-925 MHz are used for GSM-R (railway radio), and the licences will include a condition requiring the licensee to coordinate frequency usage with the GSM-R licensee in order to ensure that no interference will occur between GSM-R and the mobile networks.

The frequency band above 960 MHz is used for aeronautical radio navigation and aeronautical mobile communication in Denmark and the rest of the world. There are no current plans to change this frequency use.

The frequency bands 870-876 MHz and 915-921 MHz are only used to a limited extent today. It is expected that in the future frequencies will be used for various SRD (Short-Range Device) applications, including RFID (Radio Frequency Identification). There are currently discussions at EU level on the future use of these frequency bands, but it is uncertain whether any final clarification will be reached before this auction has been held.

### 3.3 The 2300 MHz frequency band

The frequencies in the 2300 MHz frequency band to be awarded in the 700 MHz, 900 MHz and 2300 MHz auction comprise 100 MHz unpaired frequencies (2300.0-2400.0 MHz).

The frequencies are available nationally, and the licences will be issued as nationwide licences.

A single licence will be awarded to each winning bidder encompassing the amount of spectrum won in the 2300 MHz band, which will be at least 10 MHz and at most 60 MHz. The spectrum assigned to each winner in the auction will form a contiguous frequency range.

Licensees must accept the present and future use of frequencies in adjacent frequency bands. The uses of the bands adjacent to the 2300 MHz band are summarised in Figure 5 below.

*Figure 5: Uses of frequency bands adjacent to the 2300 MHz band*



2200-2300 MHz is allocated to certain PMSE applications (primarily wireless video cameras). In addition, the frequency band is also used for various space services, including space research and earth exploration.

The frequency range 2400-2483.5 MHz is an ISM band (Industrial, Scientific and Medical). In addition, the frequency band is also used for a variety of SRD services, including WiFi, alarms and RFID. This is pursuant to Commission Decision (2006/771/EC) on harmonisation of the radio spectrum for use by short-range devices, as amended most recently by 2013/752/EU.

### 3.4 Coverage obligations

#### 3.4.1 Coverage obligations for the 700 MHz and 900 MHz frequency bands

Licences may be subject to a coverage obligation to supply a mobile voice service and a mobile broadband service in one or more specified coverage area groups. The coverage areas are divided into three non-overlapping coverage area groups equally distributed throughout Denmark, cf. annex 1 to the Minister's Decision in annex A.

Licensees shall ensure provision, not later than 4 April 2022, of an outdoor mobile voice service and a mobile broadband service with a download bit rate of at least 30

Mbit/s and an upload bit rate of at least 3 Mbit/s. The coverage obligation applies in the coverage areas specified in the licence, and in each individual coverage area at least 90 % of the area shall be covered.

Licensees are not required to fulfil the coverage obligation with the 700 MHz or 900 MHz frequencies included in their licence. Hence the coverage obligation can be fulfilled by using any frequencies that the licensees have at their disposal.

The coverage obligation may also be fulfilled via national roaming agreements. In this case the requirements as to how the licensees must document compliance with the coverage obligation are the same as if the licensee undertakes its own development of the infrastructure required to fulfil the coverage obligation, see below on documentation of compliance with the coverage obligation.

Documentation of compliance with the coverage obligation shall consist of coverage calculations/simulations supplemented with measurements confirming such calculations/simulations. When preparing calculations/simulations, the licensee can use the method that it finds most suitable, taking into account the technology used and the implementation of the network. Calculations may for example be made using the same model as that used for calculating the mobile coverage, as reported for the use of Tjekditnet.dk to the Danish Energy Agency.

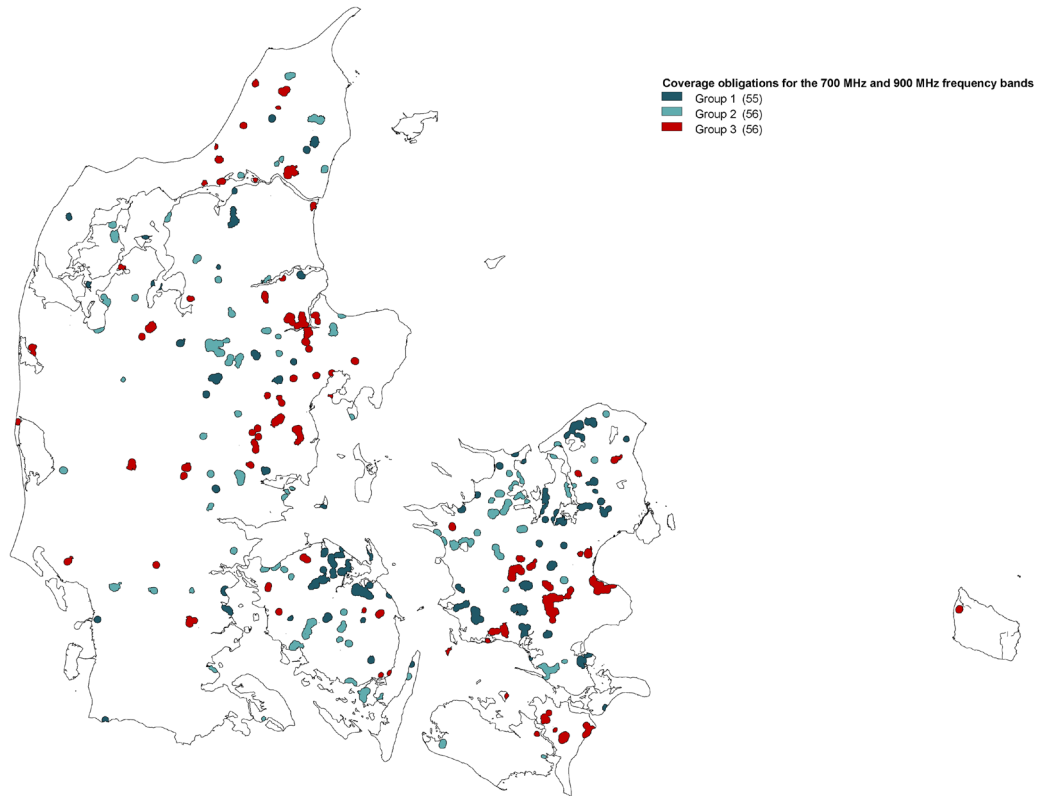
Either the licensee can provide documentation for the functioning of the network with chosen technical parameters, or it can simulate the grade-of-service that it can deliver in the network with the chosen technical parameters and other operational parameters. These parameters are, for example: Transmitting power, propagation model, link budget, geographical distribution of users, number of simultaneous users, usage pattern etc.

Calculations/simulations shall be verified by concrete measurements. The measurements in question shall be made in a representative range of radio-related environments (i.e. ground and building conditions), over distances and with equipment matching the conditions applicable in relation to the user. Information about the calculation model, measurement results and degree of correlation between the calculation model and measurement results shall be included in the material that the licensee shall submit to the Danish Energy Agency in connection with the supervision. Thus the licensee shall make a sufficient number of measurements to verify the calculation model (i.e. there should be correlation between the results/prognoses shown by the calculation model and the actual conditions). Measurements can be made gradually as the infrastructure is rolled out.

The licensee shall provide documentation for the fulfilment of the coverage obligation not later than 1 July 2022.

The coverage areas that are subject to the coverage obligation are shown in the map below.

Figure 6: Groups of coverage areas subject to the coverage obligation in the 700 MHz and 900 MHz frequency bands.



The three groups of areas subject to the coverage obligation are contained in the three data files mentioned below, all of which are identified by their respective digital fingerprints, as found by the cryptographic hash function SHA-1<sup>3</sup>, cf. annex I.

700-900	MHz	dækningsgruppe	1.zip	SHA-1: e03a6b8d73720dee49b91faae486352e2b462599
700-900	MHz	dækningsgruppe	2.zip	SHA-1: da6289101601a498258d5b1b1245c6c740df45b4
700-900	MHz	dækningsgruppe	3.zip	SHA-1: 8a6ca69895577b6b26fb38f84c5036c01974f480

<sup>3</sup> Secure Hash Algorithm, SHA-1, specified and standardised in ISO/IEC 10118-3.



The data files contain a set of GIS files in the ESRI Shape format, which describe the respective geographical areas.

The coverage obligation applies to winners of A lots in the respective group of coverage areas associated with the relevant A lot.

### **3.4.2 Coverage obligations for the 2300 MHz band**

Licences may be subject to a coverage obligation to supply a mobile voice service and a mobile broadband service in one or more specified address groups. The addresses are divided into non-overlapping coverage groups equally distributed throughout Denmark, cf. Annex 1 to the Minister's Decision in Annex A.

Licensees shall ensure provision, not later than 4 April 2022, of an outdoor mobile voice service and a mobile broadband service with a download bit rate of at least 50 Mbit/s and an upload bit rate of at least 5 Mbit/s. [At selected addresses it is sufficient to ensure provision of a mobile voice service and a mobile broadband service with an outdoor download bit rate of at least 30 Mbit/s and an upload bit rate of at least 3 Mbit/s, cf. annex J and K.] Coverage obligations shall apply to at least 98 % of the addresses specified in the licence. Coverage may be provided assuming that any end-customer at the address is using fixed equipment for receiving the connection, if the licensee is generally marketing such product at a reasonable cost for the end-customer.

Licensees are not required to fulfil the coverage obligation with the frequencies included in their licence. Hence the coverage obligation can be fulfilled by using any frequencies that the licensees have at their disposal.

The coverage obligation may also be fulfilled via national roaming agreements or via bilateral agreements among the licensees. In this case the requirements as to how the licensees must document compliance with the coverage obligation are the same as if the licensee undertakes its own development of the infrastructure required to fulfil the coverage obligation, see below on documentation of compliance with the coverage obligation. If the coverage obligation is fulfilled via a bilateral agreement, a specific agreement regarding coverage at the specific adresse must be available.

Documentation of compliance with the coverage obligation shall consist of coverage calculations/simulations supplemented with measurements confirming such calculations/simulations. When preparing calculations/simulations, the licensee can use the method that it finds most suitable, taking into account the technology used and the implementation of the network. Calculations may for example be made using the same model as that used for calculating the coverage reported for the use of Tjekditnet.dk to the Danish Energy Agency.

Either the licensee can provide documentation for the functioning of the network with chosen technical parameters, or it can simulate the grade-of-service that it can deliver

in the network with the chosen technical parameters and other operational parameters. These parameters are, for example: Transmitting power, propagation model, link budget, geographical distribution of users, number of simultaneous users, usage pattern etc. Furthermore it may be assumed that a possible end-customer is using fixed receiving equipment placed at a height of 4 m above ground level and has a directional antenna placed optimally if the licensee is marketing such product, see above.

Calculations/simulations shall be verified by concrete measurements. The measurements in question shall be made in a radio-related environment (i.e. ground conditions), over distances and with equipment matching the conditions applicable in relation to the user. Information about the calculation model, measurement results and degree of correlation between the calculation model and measurement results shall be included in the material that the licensee shall submit to the Danish Energy Agency in connection with the supervision. Thus the Licensee shall make a sufficient number of measurements to be able to verify the results of the calculation model, and measurements may be made gradually as the infrastructure is rolled out.

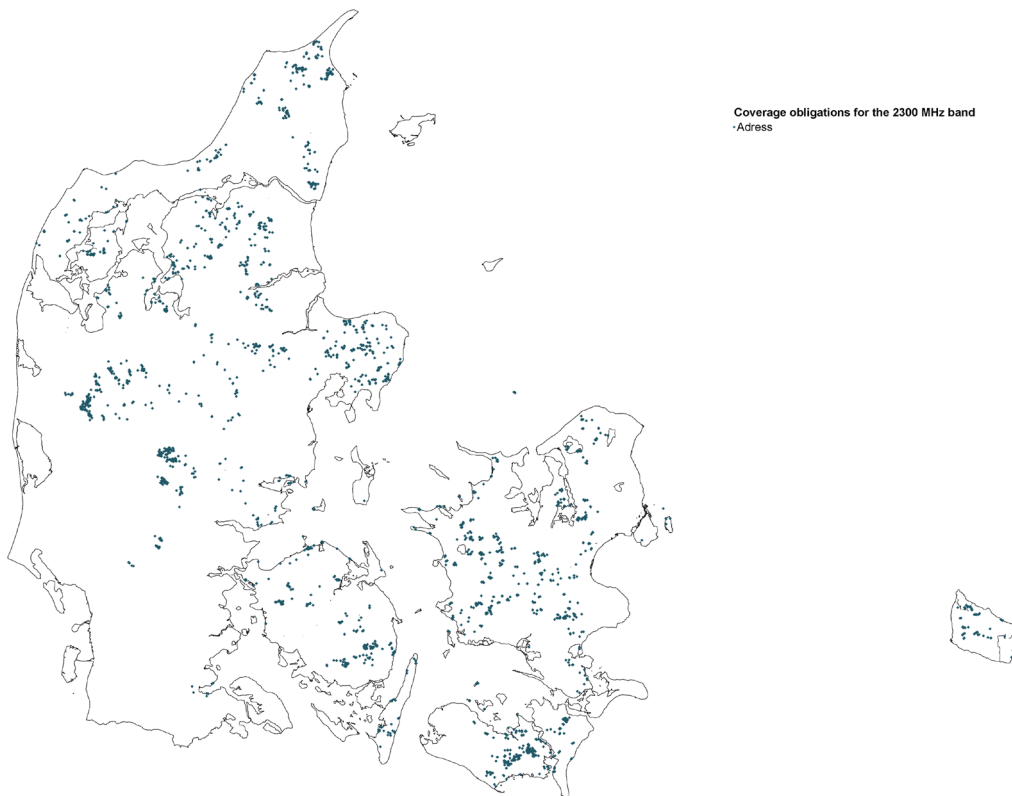
If the coverage obligation is fulfilled via a bilateral agreement, the licensee shall in addition to the abovementioned documentation also forward the bilateral agreement. The agreement shall consequently be enclosed as part of the material, which the licensee forwards to the Danish Energy Agency in connection with documenting fulfilling the coverage obligation.

The licensee shall forward a list of those addresses not to be covered. For each address the licensee shall substantiate the reason for not covering the addresses in question. The list including the substantiation will be published at the Danish Energy Agency's website.

The licensee shall provide documentation for the fulfilment of the coverage obligation not later than 1 April 2022.

The addresses subject to the coverage obligation are shown in the map below. The specific addresses are appended as annex J.

Figure 7: Addresses subject to the coverage obligation in the 2300 MHz frequency band



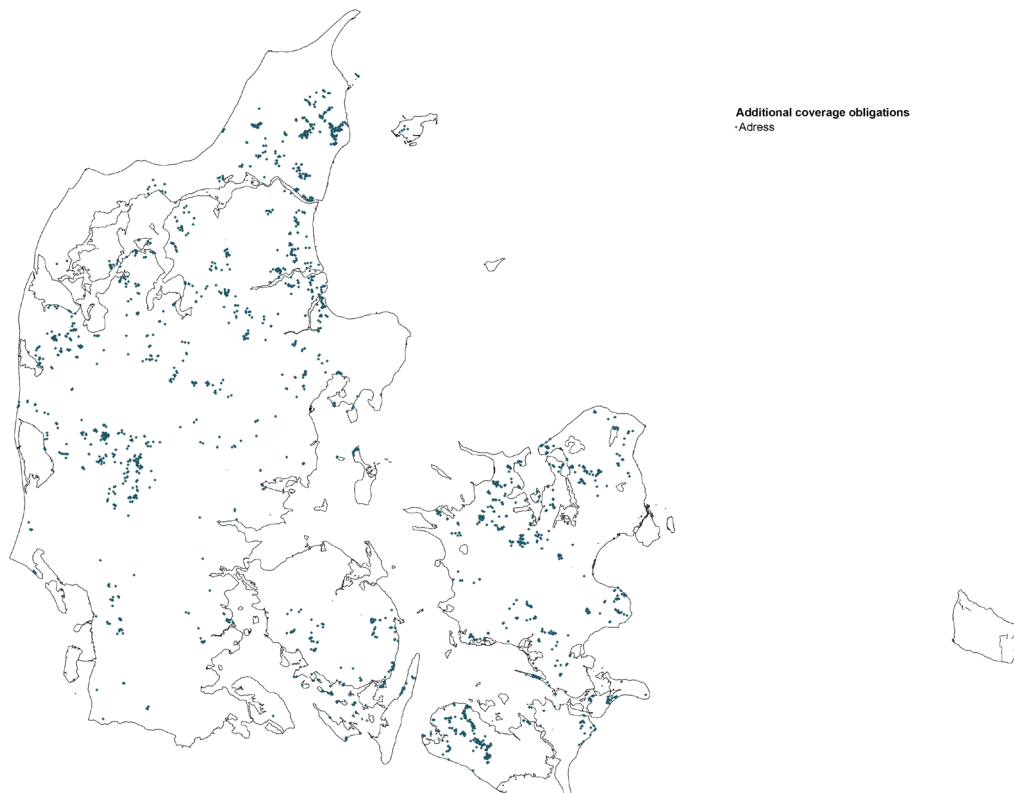
### 3.4.3 Additional coverage obligations

Licensees who have won additional coverage obligations in the auction, cf. section 5.1.3, shall fulfil the same terms as those described in section 3.4.2 (coverage obligations for the 2300 MHz band) for fulfilling the additional coverage obligation (address groups), cf. annex 3 to the Minister's Decision in annex A.

Basically, additional coverage obligations will be linked to frequency licences in the 2300 MHz band. If the licensee has not won spectrum in this frequency band, additional coverage obligations will be linked to frequency licences in the 700 MHz or 900 MHz bands. Notwithstanding the frequency licence with which the additional coverage obligations are associated, the same terms will apply, cf. section 3.4.2.

The address groups for which bids may be made are shown in the map below. The specific addresses included in each address group are appended as Annex K.

Figure 8: Additional coverage obligations divided into address groups



### 3.5 Usage obligations

According to section 10(3), no. 2, of the Frequency Act, the Danish Energy Agency may lay down usage obligations in Licences issued on the basis of an auction or public tender process. Usage obligations shall be met no matter whether coverage obligations are associated with the licence. Below are described the usage obligations that will be specified in the 700 MHz, 900 MHz and 2300 MHz frequency licences, cf. draft licences in annexes C and D.

Licensees with 700 MHz and 900 MHz frequency licences and/or 2300 MHz frequency licences shall have installed antennas and transmitting and receiving equipment capable of using the frequencies included in the licence not later than 4 April 2022 at a minimum of 100 mast positions. The equipment at the relevant mast positions shall be connected to the necessary telecommunications infrastructure in such a way as to enable the licensee, via the relevant mast positions, to offer at least one electronic communications service (at the licensee's own discretion) to end-users by using the frequencies specified in the licence.

In relation to the Danish Energy Agency's supervision of the usage requirement, the licensee shall send, not later than 1 July 2022, a report to the Danish Energy Agency specifying the mast positions at which antennas and transmitting and receiving

equipment have been installed such that at least one electronic communications service can be offered to end-users by using the frequencies covered by the licence. In the report, the licensee shall indicate the geographical coordinates of the mast positions and the type of the installed transmitting and receiving equipment.

### **3.6 Usage restrictions**

Usage of the various frequencies may be subject to restrictions. For example, the maximum allowed transmitting power for the various frequency bands is specified in the draft licence, cf. annexes C and D.

#### **3.6.1 Out-of-band emissions**

##### ***700 MHz frequency band***

For the frequency band 738-788 MHz, base station emissions shall comply with the technical requirements specified in Commission Implementing Decision 2016/687/EU on the harmonisation of the 694-790 MHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services. The Implementing Decision is appended as annex O.

##### ***900 MHz frequency band***

Base station emissions shall comply with the relevant harmonised standard in the ETSI EN 301 908 series applicable to the technology chosen as regards the frequency band 925-960 MHz.

##### ***2300 MHz frequency band***

For the frequency band 2300-2400 MHz, base station emissions shall comply with the technical requirements specified in annex 2 of CEPT ECC Decision (14) 02 regarding "Harmonised technical and regulatory conditions for the use of the band 2300-2400 MHz for Mobile/Fixed Communications Networks (MFCN)". The decision is appended as annex P.

#### **3.6.2 Restrictions due to international coordination**

The licensees are bound by existing and future agreements on border coordination between Denmark and neighbouring countries. New agreements may be concluded continuously.

Denmark has border coordination agreements with Sweden and Germany regarding the 700 MHz and 900 MHz frequency bands and with Russia regarding the 700 MHz frequency band. For further details, the coordination agreements with Sweden and

Germany are appended as annexes L and M and the agreement with Russia as annex N.

A border coordination agreement with Sweden and Germany regarding the 2300 MHz frequency band has not yet been concluded. Agreements may be made in the future. The agreements made from time to time between Denmark and other countries on the use of 2300-2400 MHz are a licence term and shall be complied with. Until coordination agreements with Germany and Sweden are entered into, the requirements in ECC/REC/(14)04, annex 1, shall be respected.

### 3.7 Duration of Licences

Two types of licence will be issued after the auction, one for the 700 MHz and 900 MHz frequencies and one for the 2300 MHz frequencies.

The 700 MHz licences have a duration of 20 years and are valid from 4 April 2020 until 3 April 2040. The Danish Energy Agency may at short notice postpone the date of coming into force to 1 May 2020 at the latest, with a corresponding extension of the expiry of the licence in 2040 such that the duration of the licence will be 20 years in all circumstances.

Upon expiry, the licences shall lapse without further notice without the possibility of extension.

The 900 MHz licences have a duration of **14 years and 9 months** and are valid from 1 **April** 2020 until 31 December 2034. Upon expiry, the licences shall lapse without further notice without the possibility of extension.

The duration of the 900 MHz Licences is set to synchronise the expiry of these licences with the expiry of the existing 900 MHz licence held by Hi3G.

The 2300 MHz licences have a duration of **just below 23 years** and are valid from **date of issue** until 31 December 2041. Upon expiry, the licences will lapse without further notice and without for the possibility of extension.

### 3.8 Geographical scope of licences

The frequency licences will be issued as nationwide licences, subject to any restrictions described in relation to the 700 MHz frequency band.

The extent of a nationwide frequency licence is to be determined by the rules of international law in conjunction with Danish law.

Under international law, the land territory is deemed to include inner territorial waters plus outer territorial waters. Under Danish law, Danish outer territorial waters are defined as up to 12 nautical miles from the so-called baseline, cf. Executive Order No. 242 of 21 April 1999 concerning the Delimitation of Denmark's Territorial Sea. The baseline largely corresponds to the coastline including islands near the coast.

The geographical extent of a nationwide frequency Licence will therefore be the land territory plus inner and outer territorial waters.

The licences do not reflect an exclusive right since the same frequencies might possibly be used for other purposes in the future which do not cause harmful interference to the licensee.

Frequencies in the band 880-915 MHz and 925-960 MHz are also used for public mobile communications on board vessels (MCV) and aircraft (MCA) in accordance with Commission Implementing Decision 2008/294/EC on MCA services as amended by Implementing Decision 2013/654/EU and 2016/2317/EU, and Commission Implementing Decision 2010/166/EU on MCV services as amended by Implementing Decision 2017/191/EU. In the future, it cannot be precluded that the possibility of other uses may arise. Nor can it be precluded that at some future date frequency bands 703-733 MHz, 738-758 MHz, 758-788 MHz and 2300-2400 MHz will fall under the rules on public communications in vessels and aircraft. Shared use may occur within the geographical area covered by the nationwide licences, but it will only be possible on condition that the licensee shall not suffer harmful interference.

## **3.9 Revocation of Licences and amendment of licence conditions**

### **3.9.1 Revocation of Licence**

The Danish Energy Agency may revoke a licence after it has been issued if the Agency finds that the licensee, the licensee's Connected Persons or Insiders have violated the provisions described in clause 82 of the Danish Energy Agency's decision relating to joint control of a bidder by two or more Mobile Operators; bidder relationships and behaviour during the auction; payment of the licence price and the auction costs and failure to provide required information, or provision of incorrect or imprecise information, cf. clauses 88-90.

If a licence is revoked by the Danish Energy Agency, the licensee shall pay on demand an amount equivalent to 30 % of the licence price, or if a smaller amount of the licence price is outstanding at the time of revocation, then such smaller amount (see clause 91 of the Danish Energy Agency's decision).

If a licence is revoked, the licensee shall not be entitled to receive reimbursement of any amounts already paid in connection with the auction as described in clauses 93-94 of the Danish Energy Agency's decision.

In addition to the above-mentioned rules on revocation specified in the Danish Energy Agency's decision, the Frequency Act contains rules on revocation that will also be applicable to licences issued after holding the present auction.

This means that the Danish Energy Agency, subject to one year's notice, may revoke a licence if this is necessary in order to ensure fulfilment of commitments following from international frequency cooperation or to meet essential public interest considerations, cf. section 24 of the Frequency Act.

The Danish Energy Agency shall revoke a licence if the Licensee fails to pay frequency charges due, cf. section 25 of the Frequency Act. If the licensee grossly violates the Frequency Act, rules laid down in pursuance of the Act, or conditions in the licence, cf. section 26 of the Frequency Act, the Danish Energy Agency may revoke a licence.

### **3.9.2 Amendment of Licence**

It follows from section 23 of the Frequency Act that the Danish Energy Agency may amend the conditions of frequency licences in order to ensure fulfilment of commitments following from international frequency cooperation or to meet essential public interest considerations. This will be done at one year's notice, unless it is necessary to protect human life or health.

Conditions of licences may also be amended on account of harmful interference, which is not attributable to infringements, but where it is necessary to amend the conditions in order to prevent further interference in accordance with section 23 of the Frequency Act.

Under the Frequency Act, it is also possible for the Danish Energy Agency, subject to application, to relax conditions that have been stipulated in order to avoid harmful interference if, in the Agency's opinion, it is no longer necessary to maintain such terms.

#### ***Amendment of the coverage obligation in 700 MHz, 900 MHz and 2300 MHz Licences***

A licensee may apply for a relaxation of the coverage obligations in quite exceptional cases as described in clause 4 of the Minister's decision and annex 4 to the decision. This possibility for relaxation only applies in situations where the licensee is able to duly substantiate that the licensee cannot ensure supply of a mobile broadband service or mobile voice service in accordance with the coverage obligation associated with the 700 MHz and 900 MHz frequency bands, the 2300 MHz frequency band and the



additional coverage requirement, cf. clause 3 of the Minister's decision, due to conditions over which the licensee has no control, including environmental, preservation-related or quite exceptional radio planning conditions. The possibility of relaxation may for instance relate to cases in which the licensee can substantiate that the coverage obligation for specific addresses or areas cannot be realised by the date of compliance with the coverage obligation, because the processing of an application for permission to establish a mast or set up an antenna has not been finalised. In such cases it may be possible to relax the coverage obligation in relation to the date of compliance. Thus, it is a narrow possibility for relaxation of coverage obligation and in quite exceptional cases, subject to application and after having received proper documentation the Danish Energy Agency conducts an assessment in each individual case.

It shall be conditions which the licensee could not have taken into account at the time of bidding for the spectrum and the coverage obligation in the 700 MHz, 900 MHz and 2300 MHz auction. Thus, it shall be extraordinary further costs to fulfil the coverage obligation, which the licensee could not have foreseen at the time of applying for participating in the auction.

### **3.9.3 Relaxation of the coverage obligation as a result of new auctions**

If the Danish Energy Agency, in connection with the assignment of frequency bands other than the 700 MHz, 900 MHz and 2300 MHz bands, issues licences with coverage obligations, the agency may relax terms on coverage in the 700 MHz, 900 MHz and 2300 MHz licences as described in clause 5 of the Minister's decision. This may be relevant, for example, where coverage areas coincide wholly or partly with other licences, or where other Licences set further requirements for provision of broadband speeds etc.

## **3.10 Annual spectrum fees**

Licensees will be required to pay annual fees to the Danish Energy Agency for the use of frequencies, as outlined in the Frequency licences (annexes C and D). This is in addition to the annual Deferred Payment instalments (if the licensee has not chosen to pay the licence price in full) that form part of the licence price. The spectrum fee is set annually in the Finance Act. The fee will be calculated in accordance with a fee structure that consists of a fixed component and a variable component which together form the total annual fee. The spectrum fee does not include VAT.

As an example, in 2018 the fixed component will be DKK 600 per licence.

The variable component of the fee will be DKK 112,811 per MHz for the licences in the 700 MHz and 900 MHz frequency bands. Thus, the total annual spectrum fee in 2020 for a licence consisting of 2x10 MHz is expected to be DKK 2,256,220 and for a 2x5 MHz licence it is expected to be DKK 1,128,110.

The variable component of the fee will be DKK 56,405 per MHz for the licences in the 2300 MHz frequency band. Thus, the total annual spectrum fee in 2020 for a licence consisting of 10 MHz is expected to be DKK 564,050 and for a 40 MHz licence it is expected to be DKK 2,256,200.

The spectrum fees are also published on the Danish Energy Agency's website: <http://www.ens.dk>.

## 4 Regulation

Section 4 describes the regulatory framework governing the auction process, the provisions for site sharing and network sharing; the provisions for licence trading and change of use and VAT treatment of licences.

### 4.1 Regulatory framework

This section reviews key regulatory conditions for the auction. Regulatory conditions other than those mentioned here may be relevant. Bidders are therefore recommended to consult the relevant legislation in the area. Reference is also made to the Danish Energy Agency's website: [www.ens.dk](http://www.ens.dk).

#### 4.1.1 Frequency Act

The Frequency Act, cf. Consolidated Act No. 1100 of 10 August 2016, came into force on 1 January 2010, and was amended most recently in 2016. In 2016, authority was provided for the Danish Energy Agency to lay down terms on usage obligations in licences issued by auction or tender.

According to section 9(3) and section 10(1) of the Frequency Act, rules and conditions for the auction are laid down in the Minister's decision, cf. annex A, and the Danish Energy Agency's decision, cf. annex B, respectively. The above-mentioned rules of the Frequency Act apply when Licences are issued and essential public interest considerations have to be met.

The Minister's decision determines the overall framework for the 700 MHz, 900 MHz and 2300 MHz Auction, including the type and number of licences to be included in the auction, minimum requirements (e.g. coverage obligations) to be met and reserve prices in the auction.

Based on the Minister's decision, the Danish Energy Agency further decides on the implementation of the auction and the terms of licences that will be issued in connection with the auction. For instance, the Danish Energy Agency's decision will determine the auction format and rules, conditions for participation in the auction and deposit requirements, cf. section 10(2) of the Frequency Act.

#### 4.1.2 Regulation of the Danish telecommunications market

The Danish telecommunications market is regulated by the Danish Energy Agency and the Danish Business Authority. All electronic communications services, including mobile voice telephony and mobile broadband services, as well as the infrastructure related to these services, have been liberalised.

No licence is required to provide electronic communications networks or services in Denmark. However, all providers must fulfil the obligations in the Executive Order on the Provision of Electronic Communications Networks and Services<sup>4</sup>.

A licence may be required for use of scarce resources such as radio spectrum.

#### **4.1.3 Telecommunications providers' assistance to the police**

All providers of electronic communications network and services are required to ensure, without expense to the State, that their technical equipment and systems are arranged in such a manner, cf. section 10(1)<sup>5</sup> of the Telecommunications Act, that the police may intervene in the secrecy of communications. Providers of electronic communications networks or services are also required to register their undertaking with the Telecommunications Centre of the Danish National Police. This obligation appears from section 12(1) of the Telecommunications Act.

For the purpose of investigation and prosecution of criminal offences, all providers are also required to register and store telecommunications traffic data generated or processed in their networks, cf. section 1<sup>6</sup> of the Executive Order on Logging. Information on the data to be stored and the rules relating to logging can be found in the Executive Order on Logging<sup>7</sup>, which falls under the Ministry of Justice.

#### **4.1.4 Network and information security**

The principal task of the Centre for Cyber Security is to support a high level of information security in the information and communication technology infrastructure on which activities vital to society depend. The Centre for Cyber Security administers the rules of the Act on Network and Information Security<sup>8</sup> and rules issued in pursuance thereof. These rules include requirements for information security for providers of publicly available networks and services; information and notification duties regarding network and information security; access by emergency management authorities to

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<sup>4</sup> Executive Order No. 715 of 23 June 2011 on the Provision of Electronic Communications Networks and Services.

<sup>5</sup> Act on Electronic Communications Networks and Services, cf. Consolidated Act No. 128 of 7 February 2014 as amended most recently by Act No. 1676 of 26 December 2017.

<sup>6</sup> Act No. 1567 of 15 December 2015 on Network and Information Security

<sup>7</sup> Executive Order No. 988 of 28 September 2006 on Registration and Storing of Information on Telecommunications Traffic by Providers of Electronic Communications Networks and Electronic Communications Services (Executive Order on Logging) as amended by Executive Order No. 960 of 19 June 2014.

<sup>8</sup> Act No. 1567 of 15 December 2015.

electronic communications in emergency situations etc. and security clearance of employees in the area of network and information security.

#### **4.1.5 The Danish Competition Act**

The Danish Competition Act<sup>9</sup> applies to restrictions of competition that affect the Danish market. The Danish competition authorities are required to apply EU competition law, i.e. articles 101-102 TEUF, if any such behaviour also appreciably affects inter-Member State trade.

The application of sections 6 and 11 of the Competition Act, i.e. the Danish provisions concerning the prohibition of anti-competitive agreements and the abuse of a dominant position, and articles 101-102 TEUF, is mainly concurrent. It follows from the preparatory notes of the Danish Competition Act that the Act is to be interpreted in accordance with EU competition regulation and case law, unless otherwise specifically stated.

#### **4.1.6 EU legislation**

The European Parliament, the Council and the European Commission have adopted a number of communications, directives and decisions on electronic communications networks and services which are relevant to the use of the 700 MHz and 900 MHz frequency bands.

In 2009, the European Commission decided on harmonised technical conditions for using the 900 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community<sup>10</sup> making the spectrum available for UMTS. This Decision was amended by a new Implementing Decision in 2011<sup>11</sup> adding LTE and WiMAX to the list of terrestrial systems for which the spectrum is available. However, the use of spectrum for other systems is not excluded.

The European Commission's Decision implies inter alia an obligation for Member States to make it possible to use the 900 MHz frequency band for electronic communications services. The Decision also sets out mandatory technical criteria to be

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<sup>9</sup> The Danish Competition Act, cf. Consolidated Act No. 31 of 16 January 2018.

<sup>10</sup> Commission Decision 2009/766/EU of 16 October 2009 on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community.

<sup>11</sup> Commission Implementing Decision 2011/251/EU of 18 April 2011 amending Decision 2009/766/EC on the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community.

used when the 900 MHz band is used for electronic communications services using UMTS, LTE or WiMAX technology.

In 2016, the European Commission decided on harmonised technical conditions for using the 700 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community, making the spectrum available for technologies capable of fulfilling the technical requirements that appear from the Decision.

The European Commission's Decision implies inter alia an obligation for Member States to make it possible to use the 700 MHz frequency band for electronic communications services. The Decision also sets out mandatory technical criteria to be used when the 700 MHz band is used for electronic communications services.

Furthermore, the European Parliament and the Council have decided on the use of the 470-790 MHz frequency band in the Union by Decision 2017/899 of 17 May 2017. The Decision implies inter alia that the 700 MHz frequency band should be made available for terrestrial electronic broadband communications services by 30 June 2020.

EU legislation also includes decisions making the spectrum available for other services, including mobile communications on board aircraft (MCA<sup>12</sup>) and mobile communication on board vessels (MCV<sup>13</sup>).

Other highly relevant EU legislation includes the European Commission's guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C165/03), the European Parliament's and the Council's regulation on roaming on public mobile telephone networks within the Community, the European Commission's recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates

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<sup>12</sup> Commission Decision 2008/294/EC of 7 April 2008 on harmonised conditions of spectrum use for the operation of mobile communication services on board aircraft (MCA services) in the Community.

<sup>13</sup> Commission Decision 2010/166/EU of 19 March 2010 on harmonised conditions of use of radio spectrum for mobile communication services on board vessels (MCV services) in the European Union.

in the EU<sup>14</sup> and the telecommunications directive package of 7 March 2002 with amendments of 25 November 2009<sup>15</sup>.

#### 4.1.7 Health and safety issues

There are a number of EU health and safety requirements to be met by all radio communications equipment, and these regulations also apply in Denmark. The requirements reflect, for example, recommendations from the International Commission on Non-Ionising Radiation Protection (ICNIRP) on certain threshold levels for emission.

It follows from Danish legislation on radio equipment that radio equipment must comply with the essential requirements of the Radio Equipment Directive to allow it to be used<sup>16</sup>. Installations for base stations must fulfil the same essential requirements although it is not compulsory to issue a declaration of conformity or affix a CE-mark. Via these essential requirements the provider of a radio service is responsible for compliance with the regulations based on the ICNIRP recommendations.

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<sup>14</sup> Regulation (EC) No 717/2007 of the European Parliament and the Council of 27 June 2007 on roaming on public mobile telephone networks within the Community and amending Directive 2002/21/EC; Regulation (EC) No 544/2009 of the European Parliament and the Council of 18 June 2009 amending Regulation (EC) No 717/2007 on roaming on public mobile telephone networks within the Community and Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services; and Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/DEC).

<sup>15</sup> Comprising European Parliament and Council decision 676/2002/EC of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision); European Parliament and Council directive 2002/19/EC of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive); European Parliament and Council directive 2002/20/EC of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive); European Parliament and Council directive 2002/21/EC of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive); European Parliament and Council directive 2002/22/EC of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive); European Parliament and Council directive 2002/58/EC of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on Privacy and Electronic Communications).

Amendments to the telecommunications directive package were adopted in November 2009. The relevant provisions for the frequency legislation are implemented in the Frequency Act and executive orders issued pursuant thereto. The following amendments have been adopted: European Parliament and Council Directive 2009/140/EC of 25 November 2009 amending Directive 2002/19/EC on access to and interconnection of, electronic communications networks and services, and 2002/20/EC on the authorization of electronic communications networks and services and European Parliament and Council Directive 2009/136/EC of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks, Directive 2002/58/EC concerning the processing of personal data and protection of privacy in the electronic communications sector and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for enforcing consumer protection laws.

<sup>16</sup> Act No. 260 on Radio Equipment and Electromagnetic Matters of 16 March 2016. The Act came into force on 21 March, 20 April and 13 June 2016 and contains provisions implementing parts of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility; parts of Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC; and parts of Commission Directive 2008/63/EC of 20 June 2008 on competition in the markets in telecommunications terminal equipment.

## 4.2 Site sharing and network sharing

### 4.2.1 Site sharing

Denmark has a regime on site sharing which implies that owners of masts for radiocommunications purposes shall meet requests from other operators with a licence to use frequencies to share the mast in question, and also that owners of masts not used for radiocommunications, buildings and other high structures, shall meet requests from operators with a licence to use frequencies for access to set up antenna systems on the mast, building or structure in question. For issues relating to mast siting, the Danish Energy Agency acts under the Act on Establishment and Joint Utilisation of Masts for Radiocommunications Purposes etc. (the Masts Act<sup>17</sup>). The purpose of the Masts Act is to ensure facilities for optimal wireless mobile and broadband coverage, at the same time limiting the number of masts.

An owner of a mast, building or other high structure who enters into an agreement for joint utilisation, or is ordered to allow this or give access to set up antenna systems, is entitled to payment for such site sharing. The payment obligation rests on the party who has made a request for joint utilisation or setting up antenna systems, or who is given access to joint utilisation or setting up antenna systems. There are industry agreements concerning payment and terms for joint utilisation. Further information can be found at: [www.teleindustrien.dk](http://www.teleindustrien.dk).

Under section 16 of the Masts Act, holders of Licences to use radio frequencies for public mobile communications networks with associated basic services, and enterprises which under the Act on Radio and Television Services<sup>18</sup> have a licence for the operation of nationwide radio or TV services via the terrestrial transmission network, should submit quarterly information to the Danish Energy Agency about existing antenna positions and radio coverage plans for at least two years ahead.

In addition, in order to increase transparency on antenna siting, the Masts Act amendment of 2004 provided for a publicly available database of antenna sites. The database is available on [www.mastedatabasen.dk](http://www.mastedatabasen.dk) or [www.it-borger.dk](http://www.it-borger.dk). The database includes the location of existing antennas; plans for new antennas; and the type of service and technology for each individual antenna position.

On the basis of the information in the database and at the request of a local authority, the Danish Energy Agency, in connection with consideration by local authorities of

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<sup>17</sup> The Masts Act, cf. Consolidated Act No. 681 of 23 June 2014 on the Establishment and Joint Utilisation of Masts for Radiocommunications Purposes, etc., as amended most recently by Act No. 1658 of 20 December 2016.

<sup>18</sup> Act on Radio and Television Services, cf. Consolidated Act No. 255 of 20 March 2014, as amended most recently by Act No. 643 of 8 June 2016.



applications for permission to erect new masts for radiocommunications, provides opinions on existing and future antenna positions. In connection with such applications local authorities may specify terms for the overall dimensioning of the mast with a view to making subsequent joint utilisation possible. This is conditional on an opinion by the Danish Energy Agency as to whether other licence holders are planning to set up antennas in the same geographical area, thus enabling the local authorities to coordinate mast sharing. The Danish Energy Agency may also provide an opinion to local authorities on radio engineering in connection with applications for erecting new masts for radiocommunications.

### ***Sharing of passive infrastructure***

Since 1 July 2016, it has been possible for providers of electronic communications networks to get access to the existing passive physical infrastructure of other network operators, for example empty ducts, across utility sectors, including telecommunications, power, water and heating supply etc., for the purpose of establishing high-speed networks for electronic communication. For issues relating to sharing of passive physical infrastructure, the Danish Energy Agency administers the Act on Cable Laying Access, Establishment and Utilisation of Infrastructure for Telecommunications Purposes and Utilisation of Infrastructure Across Utility Sectors etc. (Cable Laying Act)<sup>19</sup>.

Access to a network operator's passive physical infrastructure is granted by request on reasonable terms, including in relation to prices. A network operator may refuse a request based on objective, transparent and proportionate criteria, for example the technical suitability of the infrastructure, available space in the infrastructure, including considerations such as future business plans, the risk of significant impact on other services placed in the same infrastructure etc.

For the purpose of assessing the suitability of the passive physical infrastructure, a network operator may request access to information and access to surveying another network operator's existing passive physical infrastructure. Access to information and surveying is given on proportionate, non-discriminatory and transparent terms, including in relation to prices. Access to information and surveying can be limited when necessary for reasons such as network security and integrity, national security, confidentiality, operational and business secrets etc.

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<sup>19</sup> Act on Cable Laying Access, Establishment and Utilisation of Infrastructure for Telecommunications Purposes and Utilisation of Infrastructure Across Utility Sectors etc., jf. Consolidated Act No. 662 of 10 July 2003, as amended most recently by Act No. 741 of 1 June 2015.

#### **4.2.2 Network sharing**

Network sharing is not specifically regulated for licences to be issued on the basis of the results of this auction. Thus the licence conditions and the frequency legislation will not restrict agreements on network sharing, and therefore network sharing is not subject to the Danish Energy Agency's prior approval.

It should be noted, however, that this does not imply that the Danish Energy Agency has taken any position on possible competition law aspects of such network sharing agreements. This falls within the jurisdiction of the Competition Authorities.

### **4.3 Licence trading**

Licences to use frequencies may be transferred or returned, wholly or partly (divided either in frequency portions or geographically). This follows from section 21 of the Frequency Act.

In this context, the Danish Energy Agency has established rules prescribing that a licensee's plans on transfer shall be notified to the Danish Energy Agency, and that this information be published by the agency, cf. section 5 of Executive Order No. 1329 of 30 November 2017 on Licences to Use Radio Frequencies. A Licensee shall notify the Danish Energy Agency immediately after having made an agreement on transfer. In addition, there are rules prescribing that transfer or return of parts of licences issued after an auction or a public tender process shall be subject to the Danish Energy Agency's prior approval. This follows from section 21(4) and Section 58(5) of the Frequency Act, cf. Executive Order No. 1129 of 1 December 2009 on the Transfer and Return of Certain Licences to Use Radio Frequencies.

### **4.4 Treatment of Licence price for VAT purposes**

On 26 June 2007, the European Court of Justice delivered two judgments about payment of VAT on the award of licences for the use of radio frequencies that are subject to a fee. The main conclusion of the judgments is that assignment by the Member States of radio frequencies such as those dealt with in these cases is not regarded as economic activities subject to VAT.

The judgments of the European Court of Justice are of significance to Denmark in that the Danish VAT legislation must be interpreted in accordance with the judgments. Thus Danish licensees, including the winners of this auction, cannot claim deduction for VAT in the licence price.

## 5 Overview of the auction process

In this section, we provide an overview of the auction process, including an indicative timetable for the completion of the auction; the rules on ownership; rules on Bidder behaviour; and rules on agreed penalties and other sanctions.

### 5.1 Stages of the auction process

The auction process consists of the following stages:

- the Application Stage;
- the Qualification Stage;
- the Auction (comprising four auction stages); and
- the Grant Stage.

#### 5.1.1 The Application Stage

The Application Stage consists of a two-week period during which interested parties can submit their applications and deposits (in the form of a demand guarantee) to participate in the auction.

As part of their application, bidders must specify whether they apply to participate in the first auction stage, where each bidder may acquire at most one of the A lots. Bidders who apply to participate in the first auction stage submit a bid at reserve (thus with a bid amount of zero DKK) for each of the three A lots, and must specify whether they would prefer any A lot that might be assigned to them in this stage to be in the 700 MHz or the 900 MHz band. Bidders who apply to participate in the first auction stage will then have an opportunity to increase their bids for specific A lots during the first auction stage, which will only take place after the agency has announced the list of qualified bidders.

Details on the applications received will be announced in the Application Stage and at the end of the Qualification Stage.

#### 5.1.2 The Qualification Stage

In the Qualification Stage the Danish Energy Agency will check the applications received and qualify the bidders who meet the requirements to participate in the auction. These requirements are set out in section 6. The Qualification Stage is

expected to last two days. The list of Qualified Bidders will be announced at the end of the Qualification Stage.

### **5.1.3 The Auction**

The auction has four stages. The duration of the auction is unknown as it depends on the demand from bidders and the number of bidding rounds required in order to be able to assign the spectrum lots and coverage obligations available among bidders. The auction process and the rules for the auction are described in detail in Section 7.

#### ***First auction stage***

In the first auction stage the A lots are assigned.

If no bidders have applied to participate in the first auction stage, then no A lots will be assigned in the first auction stage.

If at least one bidder has applied to participate in the first auction stage, a sealed bid process is used in order to determine the assignment of A lots amongst the participants:

- Each participant has a default bid of zero DKK for each of the three A lots, and can increase its bid for specific A lots during a bidding round.
- Each participant can be assigned at most one A lot.

The agency will select the winning bids with a view to maximise the total value of winning bids.

#### ***Second auction stage***

In the second auction stage all the remaining spectrum lots are allocated (i.e. B, C, D, E and F lots, and any A lots not disposed of in the first auction stage). This stage will use the CMRA<sup>20</sup> format, which was also used for the 1800 MHz auction in 2016. The CMRA format allows package bids and is conducted over several rounds with increasing prices. The auction is conducted via a web-based Electronic Auction System (EAS).

The second auction stage will proceed over one or more bidding rounds where the Danish Energy Agency will set the round prices. Bidders may make one or more bids for combinations of lots ("packages"). A bidder may only win one of the packages for

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<sup>20</sup> Combinatorial Multi-Round Ascending.

which it has bid, and the bidder is guaranteed to win all the lots included in the package of its winning bid.

### ***The third auction stage***

The third auction stage will determine the actual frequencies that will be assigned to each winner of spectrum lots.

### ***Fourth auction stage***

The fourth auction stage will determine what additional coverage obligations are assigned to winners of spectrum, in exchange for a reduction in the price they are to pay for the frequencies they have been assigned.

#### **5.1.4 Grant Stage**

In the Grant Stage, bidders who have been assigned frequencies in the auction will be granted the corresponding frequency Licences, subject to payment of the full Licence price or 10% of this and provision of a guarantee for the deferred payment.

## **5.2 Time schedule**

There is no pre-determined timetable for the auction process or the auction in particular. However, in order to assist potential bidders in their planning for the auction process, Table 3 below provides an indicative timeframe. The timetable, and any updates as required, will be published on the Danish Energy Agency's website: <http://www.ens.dk>.

The Danish Energy Agency reserves the right to alter any part of the auction process timetable, including the Application Date, at any time. In the event that a scheduled date is changed, the Danish Energy Agency will publish the new date on its website or otherwise advise bidders as soon as possible. The Danish Energy Agency will make any changes to the schedule for a specific event at least 24 hours in advance of the previously scheduled time, except in extraordinary circumstances where the Danish Energy Agency may give less than 24 hours' notice.

Table 3: Indicative timetable for the auction process

<b>Event</b>	<b>Bidder action</b>	<b>Action by the Danish Energy Agency</b>	<b>Indicative timeline</b>
<b>Application Stage</b>			
Submission of Applications.	Interested parties submit Applications, including guarantee for Deposit.		21 Aug 2018
Notification of Bidders and announcement of bidder list.		The Danish Energy Agency announces the identity of Bidders and information on their ownership structure.	28 Aug 2018
Notification on relations.	Deadline for Bidders to notify the Danish Energy Agency of any relations.		30 Aug 2018
Resolution of relations.	Deadline for Bidders to resolve any relations.	Bidders that fail to resolve relations will be excluded.	10 Sep 2018
<b>Qualification Stage</b>			
Final day for withdrawals.	Last date by which a Bidder may withdraw from the process.		10 Sep 2018 13.00 hours
Announcement of Qualified Bidders.		The Danish Energy Agency announces list of Qualified Bidders.	11 Sep 2018
<b>The Auction</b>			
Access to the EAS.		The Danish Energy Agency distributes digital certificates and other material required to use the EAS.	13 Sep 2018 (user manuals and other relevant material are handed out at the Bidder seminar)
Bidder training – first session	Only Qualified Bidders will be allowed to attend the seminar and participate in a mock auction.	The Danish Energy Agency and its Advisors will host a seminar on using the EAS and run a mock auction.	17-21 Sep 2018
<b>First auction stage</b>			
Access to the EAS	Qualified Bidders can test log-in. Qualified Bidders can upload bid files and test that the relative cap updates correctly.		6 Feb 2019
Bidding round for the first auction stage.	Bidders who have applied to participate in the first auction stage may increase their bids for A lots using the EAS (if required).	The Danish Energy Agency sets parameters for the first auction stage round, collects bids and processes the results of the bidding round.	19 Feb 2019

<b>Event</b>	<b>Bidder action</b>	<b>Action by the Danish Energy Agency</b>	<b>Indicative timeline</b>
Communication of the result of the first auction stage to qualified bidders.		The Danish Energy Agency communicates the result of the first auction stage to qualified bidders, including winners of A lots and coverage obligations, and the availability of spectrum lots in the second auction stage.	19 Feb 2019
Bidder training – second session	Only Qualified Bidders will be allowed to attend the mock auction.	The Danish Energy Agency and its Advisors will run a mock auction.	27-28 Feb 2019
<b>Second auction stage</b>			
First bidding round of the second auction stage.	Bidders participate in the second auction stage and submit bids using the EAS.	The Danish Energy Agency sets parameters for the bidding rounds, collects bids and processes the results of the bidding round.	12 Mar 2019
Announcement of the result of the second auction stage in the EAS.		The Danish Energy Agency announces the result of the second auction stage in the EAS.	20 Mar 2019
<b>Third auction stage</b>			
Bidding round for the third auction stage.	Bidders who have been assigned spectrum lots may submit bids for their desired placement in the frequency bands using the EAS (if required).	The Danish Energy Agency sets parameters for the third auction stage round, collects bids and processes the results of the bidding round.	22 Mar 2019
Announcement of the result of the third auction stage in the EAS.		The Danish Energy Agency announces the result of the third auction stage in the EAS.	22 Mar 2019
<b>Fourth auction stage</b>			
Bidding round for the fourth auction stage	Bidders who have been assigned frequencies may submit bids for any desired additional coverage obligations (address groups) using the EAS.	The Danish Energy Agency sets parameters for the fourth auction stage round, collects bids and processes the results of the bidding round.	26 Mar 2019
Publication of Auction results.		The Danish Energy Agency publishes the result of the Auction.	27 Mar 2019
<b>Grant Stage</b>			
Payment of Licence price.	Bidders who have been assigned spectrum pay 20% of the Licence price and provide a demand guarantee for the Deferred Payment, or pay the Licence price in full.		8 Apr 2019
Issue of licences.		Licences issued to winning Bidders that fulfil payment terms.	11 Apr 2019

If the auction should continue so that auction stage two, three or four cannot be completed before Easter, the auction will be paused in the public holidays, i.e. from Thursday 18 April 2019 until and including 22 April 2019.

## 5.3 Ownership rules

In connection with this auction, bidders are subject to the ownership rules described below<sup>21</sup>. Bidders are subject to ownership rules which require that the bidder and its connected persons are not connected or associated with any other bidder and its connected persons or more than one mobile operator.

Bidders should refer to the provisions of the Danish Energy Agency's decision for the application of ownership rules in this auction. Illustrative diagrams and a step-by-step explanation of rules and the disclosure requirements as part of the application are set out in annex H. A summary of the rules is provided below.

### 5.3.1 Definition of Connected Persons and Associated Bidders

#### ***Connected Persons***

Connected persons in relation to a bidder are effectively those parties who:

- control the bidder;
- have a direct or indirect participation of 10 % or more in the bidder and have an agreement, wholly or partly, to finance or otherwise to assist the bidder in connection with the auction or have confidential information concerning the bidder; or
- are controlled by the bidder or parties who fall into the previous two categories.

The full definition of a connected person is given in clause 101 of the Danish Energy Agency's decision, cf. annex B.

#### ***Associated Bidders***

Where a bidder and its connected persons do not overlap with another bidder and its connected persons but there is nonetheless a degree of common ownership between the bidders meeting the conditions below, such bidders will be associated bidders.

Associated bidders shall mean bidders who have one of the following relationships to each other:

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<sup>21</sup> It should be noted that the ownership rules are the same as in the 1800 MHz auction.



- one bidder holds a participation of 20 % or more in the other bidder;
- a connected person in relation to one bidder holds a participation of 20 % or more in the other bidder;
- a person who is not a connected person in relation to any of the bidders concerned holds a participation of 20% or more in both bidders; or
- one of the bidders or a connected person in relation to this bidder or a party who holds a participation of 20 % or more in this bidder, and the other bidder or a connected person in relation to the other bidder or a party who holds a participation of 20 % or more in the other bidder, each hold a participation of 20 % or more in the same mobile operator or persons who control the mobile operator.

The definition of an associated bidder is given in clause 108 of the Danish Energy Agency's decision, cf. annex B.

### **5.3.2 Restrictions on relations between bidders**

The following relations must not exist between bidders:

- one bidder is a connected person with one or more other bidders,
- two or more bidders are associated bidders.

The rules are set out in clause 12 of the Danish Energy Agency's decision, cf. annex B.

The Danish Energy Agency's scope for granting exemptions from the above-mentioned rules is described in further detail in section 5.3.4.

### **5.3.3 Resolution of Bidder relationships**

It is possible at the application date that a bidder is unaware that another party with whom it has common connected persons or an association is applying.

If the Danish Energy Agency finds that the relation referred to in section 5.3.2 exists between bidders, the Danish Energy Agency shall notify this to the bidders affected, indicating a deadline for bidders to apply for exemption from the rules on relations between bidders; bring the relation to an end; or refrain from further participation in the auction.

If the bidders affected are not granted an exemption, do not bring the relation to an end or refrain from participation in the auction, the Danish Energy Agency will exclude the bidders affected from further participation in the auction. If the relation is brought to

light later in the auction process, the Danish Energy Agency may also declare the result of the auction not binding, wholly or partly, for the Danish Energy Agency.

If the above-mentioned relations exist between two bidders, and it is not possible to bring the relation to an end within the deadline set by the Danish Energy Agency, and the Agency does not grant an exemption, one of the bidders may withdraw from participation in the auction, so that it is not necessary for the Danish Energy Agency to exclude both bidders.

#### **5.3.4 Exemption from ownership rules**

The Danish Energy Agency may, at its sole discretion, grant exemption from the ownership rules described above, cf. clause 13 of the Danish Energy Agency's decision, cf. annex B. Furthermore, the Danish Energy Agency may attach terms to a decision about exemption from the ownership rules, cf. clause 14 of the Danish Energy Agency's decision.

In considering whether to grant an exemption, the Danish Energy Agency will put emphasis on ensuring that restrictions on participation in the auction should not go any further than necessary in order to ensure efficient use of spectrum, and at the same time the agency must ensure that competition in utilising the spectrum is promoted in order to give users the greatest possible benefits.

In the case of a relation between two bidders, the Danish Energy Agency may, under clause 13, grant exemption from the rules if it is substantiated to the agency:

- that the connection or the association is temporary;
- that the connection or the association has not been established for the purpose of the auction or the licences;
- that none of the bidders have determined, or may determine, decisions in respect of another bidder or its connected persons, so that the managements of the bidders have made and will make decisions in respect of participation and bidding in connection with the auction in relation to the application independently of each other;
- that none of the connected persons in relation to a bidder has determined or can determine the decisions of the managements for and on behalf of two or more bidders about participation and bidding in connection with the auction; and
- that no bidder or any of its connected persons have received or will receive confidential information concerning two or more bidders.

### **5.3.5 Changes to ownership structures**

It appears from clause 25 of the Danish Energy Agency's decision, cf. annex B, that after the application date a bidder and its connected persons must refrain from actions or omissions that establish a relation to another bidder resulting in the bidders being included under clause 12 of the Danish Energy Agency's decision. In the absence of an exemption, failure to comply with this rule could result in a substantial fine and exclusion from the auction (see section 5.4.5 below).

In any event, as described in section 6.1.7 below, the bidder must notify the Danish Energy Agency of any changes whatsoever in the conditions on which its application is based.

### **5.3.6 Mobile Operators**

It follows from clause 9 of the Danish Energy Agency's decision, cf. annex B, that a bidder may not be under the joint control of two or more mobile operators.

Notwithstanding clause 9 a Bidder may be under the joint control of two or more mobile operators if this is in accordance with the rules of the Competition Act as applicable at the time. The bidder in question is required itself to assess and vouch for compliance with these rules, cf. clause 10 of the Danish Energy Agency's decision, cf. annex B. This implies that the competition authorities need not assess this question prior to the auction as has been the case for previous auctions. Instead the bidder is required itself to assess and vouch for compliance with the competition rules, possibly with external assistance.

Notwithstanding clause 9, a bidder may be under the joint control of two or more mobile operators if the bidder has previously obtained approval under the rules of the Competition Act. In that case the bidder must append documentation of such approval to its application, cf. clause 11 of the Danish Energy Agency's decision. This means that if a bidder has previously obtained approval from the competition authorities regarding a specific case of cooperation or the like, this approval will still apply, and documentation of it, for example by way of a decision, must in that case be appended to the application for the auction.

The rules laid down in the Danish Energy Agency's decision do not imply that the agency has taken a position on what bidder constellations, including constellations other than the one mentioned about bidders under the joint control of mobile operators, are subject to any competition regulation, and if so, to what extent. It is the duty of the bidders to act in accordance with the relevant competition regulations. Any infringements of Danish and EU competition regulations are subject to the jurisdiction of the relevant competition authorities, i.e. the European Commission and/or the Danish Competition Authorities.

## 5.4 Rules on Bidder behaviour

This section summarises the rules, set out in clauses 17-25 of the Danish Energy Agency's decision, cf. annex B, that govern the behaviour of bidders prior to and after submission of applications until the date on which the licence(s) have been issued. The rules contain a general requirement that bidders refrain from any action that could disturb the auction as well as a number of specific rules in relation to collusion, restrictive practices and the behaviour of employees and legal entities that are related to the bidder.

As part of the application to take part in the auction, each bidder is required to confirm that the bidder, its connected persons and its insiders have complied and will comply with these rules. If at any point it becomes apparent that a bidder, its connected persons or its insiders have failed to comply with these rules, the bidder may be fined, excluded from the auction and/or required to pay damages (cf. clauses 82-87 of the Danish Energy Agency's decision). In certain circumstances the Danish Energy Agency may also revoke a successful bidder's licence if after award it emerges that the bidder, its connected persons or its insiders breached these rules, cf. clause 88 of the Danish Energy Agency's decision. The burden of proof is as defined under Danish law.

### 5.4.1 Definition of Confidential Information and Insiders

**Confidential Information:** Confidential Information shall mean information of any nature, which, directly or indirectly, concerns a bid submitted by a bidder or a bid that a bidder considers submitting, and regardless of the media on which such information may exist, if such information – if made accessible to other parties – could affect the bids or the price that a bidder would offer. The results of the auction stages are regarded as confidential information, excluding the result of the final stage of the auction. Confidential information shall include any non-published information about a bidder's strategy in connection with the auction, including the bid that a bidder is willing to submit, which may affect the bidder's price or submission of a bid, and which may influence the bidder's fulfilment of its bid, as well as information about financing the bid sum, cf. clause 102 of the Danish Energy Agency's decision.

An insider means a person who, according clause 103 of the Danish Energy Agency's decision:

- has received confidential information about a bidder, or
- who has undertaken to finance, wholly or partly, or otherwise assist a bidder or the bidder's connected persons in connection with the auction.

An insider can be a legal entity or a natural person. Two or more bidders can have common insiders. In this situation, the bidders shall take a number of special precautions, see section 5.4.4 for more details.

#### **5.4.2 Collusion and other disruption to the Auction**

A bidder, its connected persons and insiders shall, until the issue of the licences, refrain from:

- disclosing any confidential information to others, particularly bidders and their connected persons;
- entering into agreements with other bidders or their connected persons in relation to the auction; and
- undertaking any action that may adversely affect the auction prior to and after the application is submitted, and until the date of issue of the licence.

Mergers or takeovers that are not conducted on grounds of or in the interests of the auction or the licences shall not be deemed to constitute an act that could adversely affect the auction.

A bidder is allowed to disclose confidential information to other parties in certain situations, excluding any other bidder and its connected persons, but the bidder must take all reasonable measures to ensure that parties comply with the above provisions on disclosure and the provisions given in section 5.4.3 below. See clauses 17 and 18 of the Danish Energy Agency's decision.

Bidders should be aware that any disclosure of confidential information may have influence on the possibility to gain exemption from the ownership rules (see section 5.3.4).

#### **5.4.3 Restrictive agreements**

There are three rules covering restrictive agreements as specified in clauses 19-21 of the Danish Energy Agency's decision.

First, a bidder, its connected persons or Insiders may neither prior to the submission of an application, nor after the submission of an application and until the date when the licences have been issued, enter into any agreement with another bidder or its connected persons regarding the auction.

Secondly, a bidder, its connected persons or insiders shall prior to the submission of an application, and after the submission of an application and until the date when the licences have been issued, refrain from any action that could have an adverse effect on the auction.

Thirdly, a bidder, its connected persons and Insiders may neither prior to nor during the auction enter into any agreement or establish any understanding with a third party if the agreement or understanding directs this third party not to participate in the auction, or restricts the ability of this third party to participate in the auction.

#### **5.4.4 Directors and employees, identifying obligations**

Circumstances may occur where bidders, their connected persons and their respective insiders have common directors and/or employees. If this occurs, the bidders concerned need to ensure as specified in clause 22 of the Danish Energy Agency's decision that the respective persons:

- are not involved in the submission of the application, or bidding, for both bidders or their connected persons; and
- are not in possession of, or obtain, any confidential information concerning both bidders or their respective connected persons or insiders.

A bidder shall prior to the submission of its application take all reasonable measures with a view to identifying its connected persons, associated persons and insiders, cf. clause 24 of the Danish Energy Agency's decision.

A bidder shall also ensure that its connected persons take all reasonable measures to identify and inform the bidder if they have any board members or employees who are insiders in relation to another bidder, such that the bidder can take appropriate precautions to ensure that the rules on confidential information are not breached.

#### **5.4.5 Penalties**

The rules on sanctions are set out in clauses 82-87 of the Danish Energy Agency's decision, cf. annex B.

In the event that an individual bidder breaches the auction rules, the bidder can either be fined but permitted to continue in the auction, or be fined and excluded from the auction, depending on the severity of the breach. If a bidder is excluded from the auction, all bids of the bidder in question will be void. For the avoidance of doubt, there may be retrospective changes made to the process of the auction up to that point so far as it affects other bidders.

The Danish Energy Agency may impose a penalty of up to DKK 240 million if the bidder violates the rules mentioned in clause 82.

In case the Danish State has sustained a greater loss as a result of the bidder's breach of the rules, the Danish State may claim compensation under the general rules of Danish law.

The amount of the agreed penalty will be determined following a proportionality assessment that will take account of the nature of the breach and the potential or actual damage caused by the breach, including any impact on the auction or mobile market.

Less severe infringements of the rules, such as a bidder's failure to submit information in connection with an application for the auction, where the actual or potential harm seems limited may therefore result in a lower penalty.

However, a severe breach of the rules applicable to the auction, such as collusion or intentional behaviour intended to unfairly distort competition or have an adverse effect on the auction, will result in a more significant penalty, possibly combined with exclusion from further participation in the auction.

Generally, where infringements are caused not by the bidder, but by its insiders and connected persons, then the Danish Energy Agency has discretion to waive penalties if it can be shown that the bidder has taken all reasonable steps to avoid the infringement and that the infringement has not caused major detriment to the auction, or to determine the size of the penalty with consideration thereof.

Events which may lead to exclusion from the auction and/or imposition of an agreed penalty include the following:

- A bidder has submitted false or misleading information to the Danish Energy Agency.
- A bidder or any of its connected persons is colluding or attempting to collude with any other person to distort the outcome of the auction process, or is acting in a way which is likely to distort the outcome of the auction.
- The bidder or any of its connected persons, or any insider, discloses confidential information to others to an unnecessary extent.
- The bidder or any of its connected persons is obtaining or attempting to obtain confidential information in relation to any other bidder.
- Any director or employee of a bidder or its connected persons, who is also a director or employee of another bidder or its connected persons, is taking part in the preparation of both bidders' participation in the auction or is receiving confidential information relating to both bidders and their connected persons.

Similarly, the Danish Energy Agency may impose a penalty on a licensee of up to DKK 240 million if upon the issue of the licence the Danish Energy Agency finds that the licensee has violated the rules mentioned in clause 82 or the rule in clause 71 regarding demand guarantee for payment instalments.

## 6 Application procedure

Section 6 explains the Application and Qualification Stages, including information on deposits and details on the Electronic Auction System (EAS) that will be used for the second, third and fourth auction stages.

### 6.1 Application Stage

This section describes the process and requirements for applying to participate in the auction.

#### 6.1.1 Bidders

A bidder shall mean a legal entity which intends or considers submitting an application for the auction or which has submitted an application for the auction. This follows from clause 99 of the Danish Energy Agency's decision, cf. annex B.

Under clause 104 of the Danish Energy Agency's decision, a legal entity means a public or private limited company, a partnership or the like.

There are no restrictions on the bidder's country of domicile.

Application for the auction may be submitted by any legal entity. However, there are rules on ownership structure that limit participation by certain bidders, including that a bidder cannot be under the joint control of two or more mobile operators. Reference is also made to section 5.3.6.

#### 6.1.2 Submission of Applications

In order to take part in the auction, bidders must submit an application on paper between 10.00 and 15.00 hours (Danish time) on the application date. The application date will be announced on the Danish Energy Agency's website: <http://www.ens.dk>.

The application shall be in writing, contained in an envelope or box marked **"Tilmelding til 700 MHz-, 900 MHz- og 2300 MHz-auktionen"**.

The application must be delivered to the address specified by the Danish Energy Agency. Unless otherwise specified on the Danish Energy Agency's website, the address will be the reception at the Danish Energy Agency's head office in Copenhagen:



Danish Energy Agency  
Amaliegade 44  
DK-1256 Copenhagen K

Bidders that submit an application during the specified time window will get a receipt to acknowledge submission of the application. Applications received before or after the specified times or delivered to the wrong address will not be accepted.

A bidder is only permitted to submit one application. In the event that a bidder submits more than one application, only the last application received from that bidder during the specified time will be taken into consideration. Any previous applications will be returned.

### **6.1.3 Application content**

The application shall consist of the following documents:

- A completed and signed application Form with associated documents, cf. annex E.
- Guarantee for Deposit; and
- A copy of a Bidder Declaration prepared by the Danish Energy Agency, signed by one or more natural persons who are empowered to sign for the bidder or who are otherwise authorised to bind the bidder, cf. annex G.

The application shall be in Danish and be submitted in three copies signed by the natural persons who are empowered to sign for the bidder or who are otherwise authorised to bind the bidder.

Bidders are also requested to provide a USB key with PDF copies of all documents submitted.

## ***Application Form***

The bidder must complete the Application Form as set out in annex E and provide the associated information and documents specified below. The bidder should refer to the application checklist to ensure that all of the required information for the application has been provided.

The Application Form shall contain the following information and be accompanied by the following documents:

- The bidder's name and an address in Denmark, telephone number and e-mail address where the bidder may be contacted on weekdays between 09.00 and 17.00 hours (Danish time).
- Details and documentation of the names, positions and signatures of the natural persons who are empowered to sign for the bidder or who are otherwise authorised to bind the bidder in any respect regarding the application and the auction process as well as documentation of such power or authority.
- An exhaustive list of the names, positions, and addresses of the bidder's members of the board of management and board of directors or, in the absence of such, similar bodies,
- An exhaustive list of the bidder's Insiders to the extent that the bidder is aware of such insiders.
- A detailed, clear and exhaustive outline of the ownership structure of the bidder, to the extent that the bidder is aware of such particulars, and in accordance with the instructions drawn up by the Danish Energy Agency, including:
  - a) a list of all connected persons and for each of them a statement to explain why the person concerned is a connected person, and if the person is a mobile operator, information to that effect; and
  - b) a list of associated persons and for each of them a statement to explain why the person concerned is an associated person, and whether the person is also an associated person in relation to another bidder.

The outline does not have to state persons that are connected persons in relation to a bidder exclusively as a result of the control over such legal entities by a state.

- A summary of any agreement according to which one or more persons have control over the bidder to the extent that the bidder is aware of such conditions.

- Evidence of any approval in accordance with clause 11 of the Danish Energy Agency's decision.
- If the bidder apply to participate in the first auction stage, its application to participate in the first auction stage, the bidder shall at the same time indicate whether the spectrum relating to any A lot shall linked to the 700 MHz or the 900 MHz band. An indication of applying to participate in the first auction stage requires that the bidder accepts to submit initial bids of zero DKK for each of the A lots in the first auction stage.

Further information about the rules on declaring information about ownership structure can be found in annex H.

### ***Deposit***

As part of the application a bidder must provide security in the form of an irrevocable demand guarantee as deposit in the auction, cf. section 6.3.

The guarantee shall be signed by one or more natural persons who are empowered to sign for, or are otherwise authorised to bind the issuing bank or insurance company, and by one or more natural persons who are empowered to sign for, or are otherwise authorised to bind the bidder, cf. clause 35 of the Danish Energy Agency's Decision. Documentation certifying the authenticity of the signatures shall be appended.

An example of a template for the deposit guarantee can be found on the Danish Energy Agency's website.

The demand guarantee shall state the duration of the guarantee and that it is irrevocable as mentioned in the example of the template for the guarantee.

### ***Bidder Declaration***

Bidders are required to provide a solemn declaration as set out in annex G, signed by the bidder's representative(s) (as specified on the Application Form) as part of the application.

The Bidder Declaration is submitted as a declaration by the bidder that the bidder will comply with the rules and terms of the auction, and should minimise any doubt about the bidder's ability to comply with the licence terms after issue of the licence.

#### **6.1.4 Opening and initial review of applications**

After expiry of the deadline for applications, the Danish Energy Agency will proceed to open all the applications received. Applications that were not received at the specified

address within the deadline will be rejected. The Danish Energy Agency will also undertake an initial review of the applications in order to determine:

- the identity of all bidders, their Insiders and their ownership structure; and
- whether the applications are submitted in accordance with the specified rules and contain the correct information and documentation and that the documents are completed correctly without omissions.

If the Danish Energy Agency finds that the application has not been completed correctly and accurately, the Agency will request the bidder, within a time limit of four days, to correct the matter by supplementing, correcting or specifying the application or annexes; providing relevant documentation or providing security for deposit etc.

If the bidder has not corrected the matter within the time limit of four days, the Danish Energy Agency will reject the application or grant a further extension to correct the matter.

#### **6.1.5 Publication of list of bidders**

Following the initial review of the applications, the Danish Energy Agency will notify all bidders of the identity of all other bidders whose applications have not been rejected and their ownership structure, providing a date by which the bidder must confirm the existence of, or absence of, any relations. Information about the bidders and their ownership structure will also be published on the Danish Energy Agency's website. The published information will not contain a list of insiders.

#### **6.1.6 Notification and resolution of common ownership**

Following the publication of the list of bidders and their ownership structure, each bidder is required to review this list and notify the Danish Energy Agency if they have a relation to another bidder. The rules regarding relations are set out in clause 12 of the Danish Energy Agency's decision, cf. annex B, and are summarised in section 5.3 above. The period for notification will be at least two business days from the day of publication of the list of bidders.

In case there are such relations, each bidder will be granted a deadline of at least five business days to resolve the situation by terminating the relation, or one of the bidders abstaining from further participation in the auction. Alternatively, bidders may apply for an exemption from the ownership rules. The rules in regard to exemption are set out in clause 13 of the Danish Energy Agency's Decision and are summarised in Section 5.3.4 above. As part of this process, the Danish Energy Agency may require further information from the bidders in addition to that provided in their application.

Bidders that do not resolve the relations and do not receive an exemption will have their application rejected.

### **6.1.7 Amendments and correction of Applications**

The rules require bidders to notify the Danish Energy Agency immediately of any changes in the factual information provided as part of their application. In addition, up to the date of the issue of the Licence, a bidder must notify the Danish Energy Agency immediately if it realises, at any point, that the information provided in its application is inaccurate and/or incomplete. These notifications must also specify the name of the bidder and should be signed by the Persons who are authorised or otherwise able to bind the bidder.

A bidder's failure to comply with this requirement may result in the imposition of a penalty and exclusion from the auction.

On receiving such notifications, the Danish Energy Agency will assess or, as appropriate, re-assess whether or not the bidder's application can be accepted. If the bidder's application has already been accepted, the Danish Energy Agency will consider whether the information provided would lead to exclusion from further participation in the auction. If this is the case, the Danish Energy Agency will inform the bidder as soon as possible.

Notices from a bidder to the Danish Energy Agency regarding submission of an application for the auction process shall be sent by a letter marked "700 MHz-, 900 MHz- og 2300 MHz-auktionen" to: The Danish Energy Agency, Amaliegade 44, DK-1256 Copenhagen K, unless the Danish Energy Agency permits that the specific notice is sent in a different way.

## **6.2 Qualification Stage**

The Qualification Stage covers the period from the determination of qualified bidders through to the start of the auction.

### **6.2.1 Last Day For Withdrawal**

Following the resolution of any relations (if applicable), the Danish Energy Agency will notify each bidder of whether it has qualified to participate in the auction and of the last day on which qualified bidders may withdraw their application without being subject to a financial penalty. The last day for withdrawal will be at least two working days after the deadline for resolution of any relations between the bidders.

Bidders that withdraw on or before the last day for withdrawal will not be subject to any penalties.

After this, bidders cannot withdraw the application. Bidders who have participated in the first auction stage bidding for an A lot, will be required to submit at least one valid bid in the first round of the second auction stage unless, by virtue of the ownership

rules, they refrain or are excluded from participating in the auction, cf. clause 61 of the Danish Energy Agency's decision, cf. annex B. Any violation of this provision may involve a penalty.

### **6.2.2 Announcement of Qualified Bidders**

After the last day for withdrawal, the Danish Energy Agency will publish a list of all qualified bidders on its website and the number of participants in the first auction stage. If there are no qualified bidders, the auction will be cancelled.

### **6.2.3 Notification of the first auction stage**

After the announcement of qualified bidders, the Danish Energy Agency will notify all qualified bidders to participate in the first auction stage. In the notification the Danish Energy Agency will specify a date and time for a bidder seminar and a mock auction, which will take place shortly before the start of the first auction stage.

## **6.3 Deposit**

### **6.3.1 Deposit, general**

Bidders shall provide security in the form of an irrevocable demand guarantee for deposit, cf. clauses 32-35 of the Danish Energy Agency's Decision. The deposit shall be DKK 240 million. The content of the guarantee for deposit shall conform to the template for the guarantee. The guarantee must be valid for a period of at least one calendar year from the application date.

The guarantee shall be signed by one or more natural persons who are empowered to sign for, or are otherwise authorised to bind the issuing bank or insurance company, and by one or more natural persons who are empowered to sign for, or are otherwise authorised to bind the bidder, cf. clause 38 of the Danish Energy Agency's Decision. Documentation certifying the authenticity of the signatures shall be appended.

The guarantee for deposit cannot be withdrawn, and the Danish Energy Agency may draw down on the guarantee in order to cover penalties or compensation. Deposits in the form of a guarantee shall not accrue interest.

### **6.3.2 Release of Deposit**

The guarantee is released by the Danish Energy Agency in accordance with the rules specified in clause 36 of the Danish Energy Agency's Decision, cf. annex B.

The guarantee shall be released in the following cases:

- an Application is rejected;
- where a bidder is notified that it will not be assigned a licence (after the determination of winning bids); or
- where a bidder is notified that it will be assigned a licence (after the determination of winning bids), and the bidder has paid the licence price in full or has paid 10 % of the licence price and has provided a payment guarantee for the deferred payment.

#### **6.4 The Electronic Auction System (EAS)**

All auction stages will be conducted using an Electronic Auction System (EAS). Bidders are required to submit their bids using the EAS.

The EAS will be accessible over the public internet through a standard web browser via an encrypted connection. No specialist software will be required. However, access to the EAS will be controlled by means of a bidder-specific digital certificate and a password. This means that bidders will need to install the digital certificates distributed in advance of the auction on any computer that they may wish to use to access the EAS.

Details about the EAS, system requirements and the configuration of client terminals will be provided to bidders after the Qualification Stage.

Bidders will be offered a bidder seminar and participation in two mock auctions. Bidders should participate in these activities in order to be able to use the EAS in the best possible way. The Danish Energy Agency will specify the dates for holding the bidder seminar and mock auctions after announcing the list of Qualified Bidders. The bidder seminar and the mock auctions will be held separately for each bidder, cf. the timetable in section 5.2.

The bidder seminar will take place at the premises of the Danish Energy Agency. The Danish Energy Agency will offer general information to bidders about the auction stages and about the use of the EAS. At the bidder seminar, each bidder will also be provided with its authentication credentials for accessing the EAS and the user manual for the EAS.

Bidders should also participate in the mock auctions, which will consist of running a mock of first, second, third and fourth auction stage. Bidders will participate in the mock auctions remotely, logging in onto the EAS from their own premises using their authentication credentials. The first mock auction provides an opportunity for bidders to access the EAS prior to the start of the first auction stage. This is necessary to ensure that bidders can successfully log onto the EAS using their own computers and that the authentication credentials provided can be used. The mock auction also allows bidders

to test their own facilities and procedures and get familiarised with the EAS. The second mock auction will take place between the first and the second auction stage.



## 7 The Auction

This section describes the rules for the auction, which consists of four stages:

- the first auction stage, in which the A lots (A1, A2 and A3) may be assigned, subject to the constraint that each bidder may be assigned at most one lot;
- the second auction stage, in which the remaining lots (including any of A lots that remain unassigned after the first stage) will be assigned;
- the third auction stage, which will determine the specific frequencies to be assigned to those bidders who have won any lots in the preceding auction stages; and
- the fourth auction stage, in which winners of lots may take on additional coverage commitments in exchange for a reduction in the price they have to pay for their licence.

### 7.1 First auction stage

#### 7.1.1 Overview

The first auction stage provides an opportunity for up to three bidders to acquire 2x10 MHz paired spectrum in the 700 MHz or 900 MHz bands with an associated coverage obligation.

Only bidders who have applied to participate in the first auction stage on their application will be able to participate in this stage. Each participating bidder may be assigned no more than one of the A lots.

This stage is conducted as a sealed bid, second-price, combinatorial auction, where:

- each participant makes a bid for each of the A lots, A1, A2 and A3, of which at most one can be selected as a winning bid;
- the winning combination of bids is the combination that gives the highest value, which contains at most one bid from each participant and can be accommodated with the available lots; where more than one combination of bids meets these conditions and generates the same highest value, one of the tied bid combinations is selected at random;

- the prices that winners will be required to pay for the lots assigned in this stage are based on opportunity cost, and may therefore be lower than the amounts offered by the winning bidders.

When applying to participate in the first auction stage, bidders will be required to indicate whether they wish to be assigned the corresponding 2x10 MHz in the 700 MHz or in the 900 MHz band and will be assigned spectrum in accordance with their choice if they win.

Any A lots that remain unassigned in the first auction stage will be offered in the second auction stage. Here bidders may acquire any of the additional A lots (subject to compliance with the spectrum caps) regardless of whether they have already won an A lot in the first auction stage. Bids made in the first auction stage (including bids of zero DKK for each of the A lots made when applying to participate in the first auction stage) will not be considered in the second auction stage. Any A lots not assigned in the first auction stage and consequently included in the second auction stage will automatically be associated with frequencies in the 700 MHz band.

#### **7.1.2 Lots available**

The lots available for assignment in the first auction stage are A1, A2 and A3.

#### **7.1.3 Bids**

A **bid** in the first auction stage is a price offer for the A lot for which it is made. Bidders who apply to participate in the first auction stage place a bid at reserve (with a bid amount of zero DKK) on all three A lots with their application, and can increase their bids for specific A lots during the bidding round of the first auction stage. Each participant may win at most one of A1, A2 and A3 in the first auction stage.

Bids must be for zero DKK or more and must be expressed in whole DKK thousands.

The bid indicates the maximum price that the bidder would be prepared to pay for the corresponding lot if it is assigned this lot in the first auction stage. This imposes an upper limit on the amount the bidder may be required to pay, with actual payments of winning bidders being determined on the basis of opportunity cost. The opportunity costs may be lower than a successful bid and depend on the other bids received.

Bids made in the first auction stage are only valid for the first auction stage, and will not be considered in the second auction stage if A lots are included in that stage.

#### **7.1.4 Scheduling the bidding round for the first auction stage**

If any bidders have applied for the first auction stage, a bidding round will be required. In this case, the Danish Energy Agency will set the schedule for the bidding round in the first auction stage. The round will not start earlier than one week after the announcement of qualified bidders. The Danish Energy Agency anticipates that the bidding round will last one hour and take place between 10.00 and 16.00 hours on a single business day.

When the bidding round is scheduled, the EAS interface of each bidder will display:

- the scheduled start time of the round;
- the scheduled end time of the round; and
- the scheduled duration of the round.

#### **7.1.5 Submission of bids**

Bids for the first auction stage are submitted using a bid form provided by the EAS during the specified round time. The EAS will provide a form, which will list the three A lots, and bidders will be able to enter their bid for each of the lots.

By default, the bid for each A lot is zero DKK.

##### ***The bid submission process***

The procedure for submitting bids involves two steps:

- In the first step, bidders enter their bids and submit them for checking by the EAS.
- If the assignment bids are valid, in a second step the bidder will be presented with a form displaying the bids. The bidder will then be able to confirm submission of the bids or revert to the bid form to modify one or more bids if desired. If an bid is invalid, the bidder is returned automatically to the bid form.

Bids are submitted simultaneously for all three A lots.

Once a bidder has confirmed its bid submission it will not be able to withdraw or modify its bids. Upon confirmation of a bid submission, the EAS will show a summary of the bids submitted.

The bid submission will only be completed if the bidder confirms the bid submission before the end of the round (the end of the round means either when the round ends as scheduled, or as a result of an extension, cf. 7.1.6). Therefore, if a bidder submits its bid form for checking, but fails to confirm its bid submission before the end of the round, the bidder will be deemed not to have submitted any bids, and thus its bids will be zero DKK for all three A lots.

#### **7.1.6 Extension rights**

An extension right provides a bidder with an additional 30 minutes ('the extension period') to complete its bid submission if it has not done so before the scheduled end of the round.

Each bidder who participates in the first auction stage will have one extension right in the first auction stage, and failure by a bidder to confirm submission of bids before the scheduled end time of the round will trigger the extension.

A bidder who had an extension period triggered will be able to complete its bid submission during this period.

If an extension period is triggered for any bidder, the EAS will notify bidders of the end time for the extension period. The extension period lasts at most 30 minutes but may terminate earlier if all bidders for whom an extension period has been triggered complete their respective bid submissions before the end of the extension period.

#### **7.1.7 Evaluation of bids**

A feasible bid combination in the first auction stage is a combination of bids that includes:

- at most one bid from each participant;
- at most one bid for A1 (across all participants);
- at most one bid for A2 (across all participants); and
- at most one bid for A3 (across all participants).

The value of a feasible bid combination is the sum of the bids included in the bid combination.

The winning bid combination is the feasible bid combination that achieves the greatest value. If there are several potential winning bid combinations, then the winning bid

combination will be randomly selected amongst the potential winning bid combinations which assign the maximum possible number of A lots.

A winning bid in the first auction stage is a bid included in the winning bid combination.

First auction stage prices are determined using an opportunity-based pricing rule. The price is determined as follows:

For each winner in the first auction stage, the first auction stage price is the difference between:

- the greatest value across all of the feasible combinations that do not include an bid from the winner concerned; and
- the sum of winning bids from the other winners.

*Example 1: Evaluation of bids in the first auction stage*

Assume that three bidders have submitted the following bids:

Lot	Bidder 1	Bidder 2	Bidder 3
A1	<b>60</b>	55	45
A2	0	<b>50</b>	20
A3	0	0	<b>0</b>

The winning bids are shown in bold: bidder 1 wins A1, bidder 2 wins A2 and bidder 3 wins A3. The value of the winning combination is 110.

The first auction stage price for each winner is determined as follows:

Winner	Greatest value across all feasible combinations that do not include a bid from the winner concerned	Sum of winning bids from other winners	Price for the winner
Bidder 1	95	50	45
Bidder 2	80	60	20
Bidder 3	110	110	0

### **7.1.8 Information at the end of the first auction stage**

At the end of the first auction stage, the Danish Energy Agency will notify each participant of whether they have been assigned an A lot in this stage and the price for the lot.

The Danish Energy Agency will then notify all bidders about:

- any A lots that have not been assigned and will therefore be included in the second auction stage;
- the number of B lots and C lots that will be available in the second auction stage;
- the date and time for the second bidder training session; and
- the date and time for the start of the second auction stage, which will be at least 15 business days from the date of the announcement.

## **7.2 Second auction stage**

### **7.2.1 Overview**

The second auction stage provides an opportunity for bidders to acquire multiple spectrum lots, subject to not exceeding the spectrum caps.

This stage uses a Combinatorial Multiple Round Ascending (CMRA) auction format, in which:

- bidders can make mutually exclusive bids for 'packages' of lots (so that if the bid becomes a winning bid, the bidder will win exclusively the lots included in the package), of which at most one can be selected as a winning bid;
- the auction is conducted in one or more rounds, where the Danish Energy Agency sets the round prices for the available spectrum lots, and bidders indicate their bids for available lots at the prevailing round prices; bidders can make bids at the round prices ("headline bids") along with any other bids ("additional bids") for packages they would be willing to acquire at amounts that cannot exceed the prevailing round prices; bids must comply with the activity rules to ensure that bidding is progressive;
- bidding ends when there exists a combination of bids (among all the bids submitted in all rounds) that:

- a. can be accommodated with the available supply of lots;
- b. includes at most one bid from each bidder;
- c. achieves the highest possible value across all the combinations of bids that satisfy the previous two requirements; and
- d. includes one bid from each bidder.<sup>22</sup>

In the event of a tie, the winning combination is selected on the basis of the criteria set out in section 7.2.8; and

- winners will be required to pay the full amount of their winning bid for the lots assigned in this stage.

Notice that the requirement that the winning combination has to include exactly one bid from each bidder guarantees that bidders are not at risk of leaving the auction empty-handed unless they have explicitly made a bid for an empty package.

Also notice that, as the evaluation of bids takes into account all of the bids received in all of the rounds, some bids at prevailing round prices could be outbid by bids at lower prices. This may occur if it possible to assign a greater number of lots, resulting in a greater total value. Therefore, bidding may continue even if it were feasible to accept all the headline bids submitted in the latest round, if the highest value of bids might be achieved by accepting some of the additional bids and leaving out some of the headline bids. At the same time, bidding could end even if there is excess demand at prevailing round prices (i.e. across the headline bids in the latest round), if some bidders have made additional bids that are included in the winning combination.

Bidders participating in the second auction stage must submit their bids using the EAS provided by the Agency.

### **7.2.2 Lots available**

The lots available in the second auction stage are:

- lot A1 if it has not been assigned in the first auction stage;
- lot A2 if it has not been assigned in the first auction stage;

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<sup>22</sup> It should be noted that if a bidder does not submit a headline bid in a bidding round, then the bidder is assumed to have submitted a bid for zero lots. This bid may be included in the winning combination.

- lot A3 if it has not been assigned in the first auction stage;
- zero, two, four or six lots in lot category B;
- zero, two, four or six lots in lot category C;
- four lots in lot category D;
- the E lot; and
- six lots in lot category F.

The number of B lots and C lots available in the second auction stage depends on the assignment of A lots in the first auction stage. There is a total of 2x30 MHz available in each of the 700 MHz and 900 MHz bands, but 2x30 MHz across the two bands is made available as A lots. Therefore, the total number of B lots and C lots is six. However, the exact number of lots in each of these categories depends on the specific spectrum included in the A lots:

- the number of B lots will be equal to six minus twice the number of A lots that include 700 MHz spectrum (if one or more bidders in the first auction stage have chosen an A lot including 700 MHz spectrum); and
- the number of C lots will be equal to six minus twice the number of A lots that include 900 MHz spectrum (if one or more bidders in the first auction stage have chosen an A lot including 900 MHz spectrum).

The number B and C lots available in each of the possible scenarios for the assignment of A lots in the first auction stage appears from Table 4.



Table 4: B and C lots available

Outcome of the first auction stage			B and C lots available in the second auction stage	
Number of A lots chosen by bidders in 700 MHz	Number of A lots chosen by bidders in 900 MHz	Number of A lots that have not been assigned	B lots	C lots
0	0	3	0	6
0	1	2	2	4
0	2	1	4	2
0	3	0	6	0
1	0	2	0	6
1	1	1	2	4
1	2	0	4	2
2	0	1	0	6
2	1	0	2	4
3	0	0	0	6

**7.2.3 Bids**

A package is a combination of lots specified as a number of lots in each lot category.

A bid in the second auction stage must specify:

- the package for which the bid is made; and
- the price that the bidder would be required to pay if the bid were a winning bid.

A bid in the second auction stage must be at least the reserve price of all the lots included in the package and must be expressed in whole DKK thousands.

All bids must satisfy the spectrum caps set out in section 1.5. Therefore, bidders cannot bid for a package that includes more lots than the bidder is allowed to acquire by the spectrum caps. Any A lots assigned in the first auction stage are included in the spectrum cap.

Notice that the spectrum cap for spectrum in the 700 MHz and 900 MHz bands is a cap on the number of lots that a bidder can acquire. Therefore, the total bandwidth that a bidder can acquire depends on the combination of A and other lots that the bidder bids for. Specifically:

- A bidder who is assigned an A lot in the first auction stage will be able to bid for up to three lots across categories A1, A2, A3, B and C in the second auction stage. Therefore:
  - if no A lots are offered in the second auction stage, then the bidder might be able to acquire up to 2x25 MHz across the 700 MHz and 900 MHz bands, if it bids for three lots across categories B and C;
  - if one A lot is offered in the second auction stage, then the bidder might be able to acquire up to 2x30 MHz across the 700 MHz and 900 MHz bands, if it bids for the A lot in the second auction stage along with two other lots across categories B and C;
  - if two A lots are offered in the second auction stage, then the bidder might be able to acquire up to 2x35 MHz across the 700 MHz and 900 MHz bands, if it bids for both of the A lots in the second auction stage along with one lot in category B or C; and
  - regardless of the number of A lots offered in the second auction stage, the bidder will only be able to acquire up to 2x25 MHz across the 700 MHz and 900 MHz bands, if it only bids for lots in categories B or C, and not for any A lots;
- A bidder who is not assigned an A lot in the first auction stage will be able to bid for up to four lots across categories A1, A2, A3, B and C in the second auction stage. Therefore:
  - if no A lots are offered in the second auction stage, then the bidder might be able to acquire up to 2x20 MHz across the 700 MHz and 900 MHz bands, if it bids for four lots across categories B and C;
  - if one A lot is offered in the second auction stage, then the bidder might be able to acquire up to 2x25 MHz across the 700 MHz and 900 MHz bands, if it bids for the A lot in the second auction stage along with three other lots across categories B and C;
  - if two A lots are offered in the second auction stage, then the bidder might be able to acquire up to 2x30 MHz across the 700 MHz and 900 MHz bands, if it bids for both of the A lots in the second auction stage along with three other lots across categories B and C;
  - if all three A lots are offered in the second auction stage, then the bidder might be able to acquire up to 2x35 MHz across the 700 MHz and 900 MHz bands, if it bids for both all three A lots in the second auction stage along with one lot in category B or C; and
  - regardless of the number of A lots offered in the second auction stage, the bidder will only be able to acquire up to 2x20 MHz across the 700 MHz and 900 MHz bands, if it only bids for lots in categories B or C, and not for any A lots;

Bidders will not be assigned a package if they have not specifically made at least one bid for that package. If a bidder is assigned a package, then the bidder will be required to pay the highest amount across all the bids it has made for the package in the second auction stage.

All bids submitted in the second auction stage are binding and will be taken into account in determining the winning bids for this stage, unless they are voided by the Danish Energy Agency (under the provisions in section 7.6).

The EAS will not allow bidders to submit bids that do not comply with these requirements.

#### **7.2.4 Bidding rounds**

The second auction stage proceeds in bidding rounds. Each bidding round is a time window set by the Danish Energy Agency for bidders to submit their bids.

In each bidding round, the Danish Energy Agency will set a round price per lot, and bidders submit their bids for the round, as explained below.

##### ***Scheduling of rounds***

The Danish Energy Agency will set the schedule for carrying through the bidding rounds and the round prices that will apply to each bidding round.

The Agency does not anticipate to schedule bidding rounds with a duration of less than 30 minutes or more than 2 hours.

The bidding rounds will be scheduled to start between 09.00 and 17.00 hours on Danish business days. The Danish Energy Agency does not anticipate running more than 10 bidding rounds in a single day.

The Danish Energy Agency will schedule bidding rounds at least 15 minutes before the scheduled start of the round.

When a bidding round is scheduled, the EAS interface of each bidder will display:

- the scheduled start time of the round;
- the scheduled end time of the round;

- the scheduled duration of the round;
- the round prices;
- the bidder's eligibility (see section 7.2.7); and
- the number of extension rights still available for the bidder, see section 7.2.6.

### ***Round prices***

The round prices define the price per lot in each lot category, and determine the bids that a bidder may submit in the round. Round prices may increase from bidding round to bidding round in accordance with the provisions set out in section 7.2.8.

In any given bidding round, the round price of a package is the sum of round prices of all the lots included in the package.

### **7.2.5 Submission of bids**

During a bidding round, bidders connected to the EAS will be provided with a bid form by the EAS interface. The bid form will show to each bidder the applicable round prices and the bidder's eligibility for the bidding round in question.

Bidders may only submit their bids using the bid form provided by the EAS interface.

### ***Types of bids***

There are two types of bids:

- headline bids; and
- additional bids.

A headline bid must be at the prevailing round prices. To make a headline bid, a bidder will need to specify a bid package and the bid amount will be automatically calculated as the round price of the package.

In each bidding round, each bidder may submit at most one headline bid. If in a given bidding round a bidder does not make a headline bid, or if the bidder specifies an empty package for its headline bid, then its headline bid for that round is a bid for an empty package (i.e. containing zero lots in each category), with a bid amount of zero. Headline bids are particularly relevant for the application of the activity rules and the calculation of price increments in the event that a further bidding round is needed.

Additional bids can be made at or below the prevailing round prices. Bidders can make multiple additional bids along with their headline bid but are not required to do so. To make an additional bid, bidders need to specify the bid package, and the bid amount. Bid amounts of additional bids cannot exceed the round price of the package, and must satisfy any constraints arising from the activity rules and the other bids made by the bidder. Bidders can make an additional bid for an empty package, which will make it possible for the second auction stage to end without the bidder winning any lots.

### ***Submission of headline bids***

To submit a headline bid the bidder must specify, in the relevant fields of the bid form, the corresponding package. The bid amount will then be automatically calculated by the EAS as the round prices of the package, and will be reported in the bid form.

A bidder will only be able to submit a headline bid for a non-empty package if it is eligible to do so under the activity rules, as set out in section 7.2.7.

If the bidder does not submit a headline bid in a given round, then the bidder will be deemed to have made a 'zero bid', which is a bid for an empty package with a bid amount of zero.

If a bidder submits, or is deemed to have submitted, a zero bid, then the bidder's headline bid for any subsequent rounds will be the zero bid (in accordance with the activity rules set out in section 7.2.7).

### ***Submission of additional bids***

To submit an additional bid the bidder must specify, in the relevant fields of the bid form, the package and the amount.

Bidders may submit additional bids for any package that they could acquire without violating the spectrum cap.

The amount of an additional bid cannot be lower than the greater of:

- the reserve price of the package; and
- the amount of any bid for the same package that the bidder may have submitted previously.

The amount of an additional bid cannot exceed the smaller of:

- the round price of the package; and

- any applicable relative cap on the amount arising from the activity rules set out in section 7.2.7.

### ***The bid submission process***

The submission of bids through the EAS involves two steps:

- In the first step, the bidder should specify all the bids (headline bid and additional bids) it wishes to submit in the round. This is done using the bid form provided by the EAS. Upon submission of the bid form, the EAS will check the completed form.
- If all the bids in the bid form are valid, the bidder will be presented with a summary of the bids and any applicable warnings (for example, the bidder will be warned if it is about to submit an eligibility-reducing bid – see section 7.2.7). The bidder may then confirm this submission, or alternatively revert to the bid form to revise or amend its bids for the round in question. If one or more of the bids are invalid (for example, if any bids specify amounts below the reserve price or fail to satisfy the constraints arising from the activity rules), the bidder will automatically be returned to the bid form and will be required to revise or amend the bid(s) to correct the errors.

Once a bidder has confirmed its bid submission in a given bidding round the bidder will not be able to withdraw or modify its bids for that bidding round. Upon confirmation of a bid submission, the EAS will show a summary of the bids submitted.

The bid submission will only be completed if the bidder confirms the bid submission before the end of the round (either as scheduled or as a result of an extension as set out in section 7.2.6). Therefore, if a bidder submits its bid form for checking, but fails to confirm its bid submission before the end of the round, it will be deemed not to have submitted any bids in this round, and its headline bid for that round (and for all subsequent rounds in accordance with the activity rules set out in section 7.2.7) will be the zero bid.

### **7.2.6 Extension rights**

An extension right provides a bidder with an additional 30 minutes (‘the extension period’) to complete its bid submission if it has not done so before the scheduled end of the round. Bidders cannot use more than one extension right for a given round.

Each bidder will start the second auction stage with two extension rights.

If a bidder has one or more extension rights remaining and fails to complete its bid submission in a round before the scheduled end of the round, then:

- an extension period will be automatically triggered for that bidder; and
- the number of extension rights available to the bidder for subsequent rounds will be reduced by one.

A bidder who had an extension period triggered will be able to complete its bid submission during this period.

Bidders who fail to complete their bid submission in a round before the scheduled end of the round but have no extension rights left will not have an extension period triggered (regardless of whether an extension period is triggered for another bidder) and thus will not be able to complete their bid submission after the scheduled end of the round.

If an extension period is triggered for any bidder, the EAS will notify bidders of the end time for the extension period. The bidder who has triggered the extension period will be able to submit bids until the extension period ends. Other bidders will only be able to see that the round has been extended but will not be able to submit new bids or amend their existing bid. The extension period lasts at most 30 minutes but may terminate earlier if all bidders for whom an extension period has been triggered complete their respective bid submissions before the end of the extension period.

### 7.2.7 Activity rules

#### ***Eligibility points***

Each lot is associated with a number of eligibility points. The eligibility points correspond to the number of 5 MHz blocks included in the lot. The eligibility points associated with each lot in the various categories are shown in Table 5.

*Table 5: Spectrum lots and eligibility points*

Lot category	Lot bandwidth	Eligibility points per lot
A1	2x10 MHz	4
A2	2x10 MHz	4
A3	2x10 MHz	4
B	2x5 MHz	2
C	2x5 MHz	2
D	5 MHz	1
E	40 MHz	8
F	10 MHz	2

**Package eligibility**

The eligibility of a package is calculated as the sum of eligibility points of all lots included in the package.

**Activity**

The activity of a bidder in a round is equal to the eligibility of the package contained in the bidder's headline bid in that round.

A reduction in activity may limit the bidding capability of the bidder in subsequent rounds. This is explained below.

**Bidder eligibility**

A bidder's initial eligibility for the second auction stage is set to allow the bidder to bid for the maximum amount of spectrum permitted under the spectrum caps. It will therefore take into account the the outcome of the first auction stage and the lots offered in the second auction stage. The initial eligibility will be set as follows:

- if the three A lots are offered in the second auction stage, then all bidders will be given an initial eligibility of 30;
- if only two A lots are offered in the second auction stage, then bidders who have not been assigned an A lot in the first auction stage will be given an initial eligibility of 28, and the bidder who has been assigned an A lot in the first auction stage will be given an initial eligibility of 26;
- if only one A lots is offered in the second auction stage, then bidders who have not been assigned an A lot in the first auction stage will be given an initial eligibility of 26, and the bidders who have been assigned an A lot in the first auction stage will be given an initial eligibility of 24; and
- if no A lots are offered in the second auction stage, then bidders who have not been assigned an A lot in the first auction stage will be given an initial eligibility of 24, and the three bidders who have been assigned an A lot in the first auction stage will be given an initial eligibility of 22.

The eligibility of a bidder will be adjusted as follows:

- in the first bidding round, the bidder's eligibility will be equal to its initial eligibility; and
- in all subsequent bidding rounds, the bidder's eligibility will be equal to the smaller of the its eligibility and its activity in the preceding round.



Therefore:

- If in bidding round  $r$  a bidder makes a headline bid with activity smaller than the bidder's eligibility, then the bidder's eligibility will be reduced going forward. Specifically, the bidder's eligibility in bidding round  $r+1$  will be set to its activity in bidding round  $r$ .
- If in round  $r$  a bidder makes a headline bid with activity greater than or equal to the bidder's eligibility, then the bidder's eligibility will be maintained for the following round. Specifically, the bidder's eligibility in bidding round  $r+1$  will be set to its eligibility in round  $r$ .

Given this, the submission of a headline bid with activity smaller than the bidder's eligibility at the start of the round will result in a reduction of the bidder's eligibility. We call such bids eligibility-reducing bids. Eligibility-reducing bids create constraints for the bidder in subsequent bidding rounds. This is explained below.

*Example 2: Calculation of bidder eligibility as the auction progresses*

Suppose that a bidder with an initial eligibility of 24 makes a headline bid in the first round for the package containing two B lots, two D lots and four F lots. Therefore, the bidder's activity in the first round is 14 (two points for each of the two B lots, one point for each of the two D lots and two points for each of the four F lots). The bidder's activity is smaller than its eligibility, and therefore, its eligibility for the following round will be set to its activity in round one, i.e. 14.

In the second bidding round the bidder makes a headline bid for the package containing two B lots, two D lots and the E lot. The bidder's activity in the second round continues to be 14 (two points for each of the two B lots, one point for each of the two D lots and eight points for the E lot), as the E lot has the same number of eligibility points as four F lots. The bidder's activity is equal to its eligibility, and thus its eligibility in the third bidding round will continue to be 14.

Suppose now that in the third bidding round the bidder stops including D lots in its headline bid. Thus it makes a headline bid for the package containing two B lots and the E lot. The bidder's activity in the third round is therefore 12 (two points for each of the two B lots and eight points for the E lot). In this case the bidder's activity is smaller than its eligibility in the bidding round, and therefore its eligibility for the fourth bidding round will be set to its activity in the third bidding round, i.e. 12.

In the fourth bidding round the bidder makes a headline bid for the package containing two B lots and five F lots. The bidder's activity in the fourth bidding round is again 14 (two points for each of the two B lots, and two points for each of the five F lot). Therefore, the bidder's eligibility is smaller than its activity in this bidding round, and thus its eligibility for the following round will be set to its eligibility, i.e. 12.

***Constraints arising from a bidder's initial eligibility***

Bidders are not allowed to bid for packages with eligibility greater than their initial eligibility.

***Constraints arising from eligibility-reducing bids***

Eligibility-reducing bids imply a reduction in activity relative to the preceding bidding round. An eligibility-reducing bid will limit, in all future bidding rounds, what a bidder may bid for packages with eligibility between the bidder's previous eligibility and the bidder's future eligibility.

These constraints are called relative caps, and will constrain the bids that the bidder can make for packages with an eligibility that is:

- greater than the eligibility of the package of the eligibility-reducing bid; but
- not greater than the bidder's eligibility in the bidding round where the bidder submitted the eligibility-reducing bid.

The bid amount of any bid that is subject to a relative cap cannot exceed:

- the highest bid amount across all the bids that the bidder has made for the bid package of the eligibility-reducing bid (including bids submitted in previous bidding rounds and any bids that the bidder may submit in the current bidding round for this package along with the bid subject to the cap); plus
- the difference between the round prices of the package of the bid subject to the cap and the round price of the package of the eligibility-reducing bid in the round in which the bidder submitted the eligibility-reducing bid.

The cap is relative in that it constrains the bid amount that the bidder can specify for the constrained bid *relative* to the highest bid amount across all the bids that the bidder submits for the package of the eligibility-reducing bid that generated the relative cap. This means that the bidder may be able to increase its bid for a package subject to a relative cap if it can (and does) increase its highest amount for the package of the eligibility-reducing bid that generated the cap.

*Example 3: Relative caps*

Suppose that in round  $r$  a bidder has eligibility  $n$  and submits an eligibility-reducing bid for package  $X$ , with eligibility  $m$ .

Then this will create a relative cap on any bid that the bidder may submit for packages whose eligibility is greater than  $m$ , but not greater than  $n$ .

Suppose that package  $Y$  is one of these packages. From round  $r+1$  onwards, any bid that the bidder makes for package  $Y$  will be constrained by this relative cap.

When calculating the value of the relative cap for bids for  $Y$ , we need:

- the bidder's highest bid amount across all the bidder's bids for  $X$  (the package of the eligibility-reducing bid that generated the cap) – denote this by  $B_X$ ; and
- the difference between the round price of  $Y$  and the round price of  $X$  in the round in which the bidder made the eligibility-reducing bid (round  $r$ ) – denote this as  $P_Y - P_X$ .

Then the relative cap requires that the bid amount of a bid for  $Y$  must not exceed  $B_X + P_Y - P_X$ .

### ***Activity rules for the submission of headline bids***

A bidder with zero eligibility will not be able actively to submit a headline bid that is not the zero bid. The zero bid will also be automatically submitted by the EAS on behalf of the bidder if the bidder chooses not to make a bid in the round.

Subject to not violating the spectrum cap, a bidder with eligibility greater than zero may submit a headline bid for:

- any package with eligibility not greater than the bidder's eligibility in the bidding round; or
- a package with eligibility greater than the bidder's eligibility in the round (but not greater than the bidder's initial eligibility), if the bid does not violate the relative caps.

Where relevant, the bidder may be able to submit additional bids besides its headline bid in order to ensure compliance with the relative cap (subject to such bids being permitted under the activity rules for the submission of additional bids).

### ***Activity rules for the submission of additional bids***

Subject to not violating the spectrum cap, a bidder may submit additional bids for any packages with eligibility no greater than the bidder's initial eligibility, subject to the following constraints:

- the bid cannot exceed the round price of the package; and
- if the bid package has an eligibility greater than the bidder's eligibility in the round, then the bid must satisfy the relative cap.

Where relevant, the bidder may be able to submit further additional bids in order to ensure compliance with the relative caps, provided that such bids also satisfy the constraints above. See the example below.

*Example 4: Activity rules for headline bids and additional bids*

Suppose that a bidder submits the headline bids shown in the table below. The round prices also appear in the table.

Round	Eligibility	Prices (DKK million)					Headline bid		Activity
		B	C	D	E	F	Package	Amount	
1	24	95	95	25	0	25	4F	100	8
2	8	100	100	25	5	30	2F	60	4
3	4	105	105	25	5	35	E	5	8
4	4	110	110	25	10	40	E	10	8

The activity rules applicable to this bidder's headline bids are as follows.

Round 1

In the first round the bidder has an initial eligibility of 24, and submits a headline bid for a the package of four F lots. The activity of the bidder is thus eight. This is an eligibility-reducing bid that will set a relative cap for all packages with eligibility greater than eight and up to 24.

Round 2

In the second round, the bidder's eligibility is eight, which is the smaller of the its eligibility and its activity in the preceding round. In response to an increase in the price of F lots the bidder reduces its demand, submitting a headline bid for the package of two F lots. The bidder's activity is now four. This is an eligibility-reducing bid that will set a relative cap for all packages with eligibility greater than four and up to eight.

Round 3

In the third round, the bidder's eligibility is four (the smaller of the its eligibility and its activity in the preceding round). Suppose now that in response to the further increase in the price of F lots the bidder now is willing to switch from bidding on two F lots to bidding for the E lot. This brings the bidder's demand back to 40 MHz but at an overall lower price. However, the eligibility of this package is above the bidder's eligibility for the round, and thus the bidder will only be able to submit a headline bid for the E lot if this does not imply a violation of the relative caps.

Suppose that the bidder has not submitted any additional bids. The relative cap on the package consisting of the E lot, assuming that the bidder does not submit any additional bids this round, is calculated as follows:

- First we identify the eligibility-reducing bid that generated the relative cap (the 'constraining bid'). In this case it is the bidder's headline bid for the package of two F lots, which it submitted in the second round.
- Then we identify the highest bid amount across all the bids that the bidder has made so far for the package of the constraining bid. Given that the bidder has not made any other bids for this package, the highest bid amount is that of the eligibility-reducing bid, which is 60.
- The next step is to identify the difference between the round price of the package of the bid which is subject to the relative cap (the E lot) and the round price of the bid package of the constraining bid (two F lots) in the bidding round when the constraining bid was made (the second round). The

price of the E lot in the second round was five, and the price of two F lots in the second round was 60. Thus the difference is 55.

- Finally, we can calculate the relative cap on the package consisting of the E lot as:  $60 - 55 = 5$ . The relative cap will apply if the bidder makes no other bids for the package of the constraining bids.

Therefore, the current relative cap for any bids for the package consisting of the E lot is five. As the round price for the E lot is five, then the bidder can make a headline bid for the package consisting of the E lot, as the bid amount of this bid does not exceed the relative cap on this bid. Thus this headline bid does not imply a violation of the relative caps.

#### Round 4

In the fourth round, the bidder's eligibility is four (the smaller of the its eligibility and its activity in the preceding round). Suppose that with the equal increase in the price of E and F lots, the bidder wishes to continue bidding for the E lot. As before, the eligibility of this package is above the bidder's eligibility for the round. Thus the bidder will only be able to submit a headline bid for the E lot if this does not imply a violation of the relative caps.

The relative cap on the package consisting of the E lot is five, assuming that the bidder does not make any additional bids. Therefore, the bidder cannot submit a headline bid for the E lot, as the price for the E lot in this round is ten (and hence greater than five), and such a bid would therefore imply a violation of the relative caps.

However, the bidder will be able to make a headline bid for the E lot if it makes an additional bid for the constraining package of 65, as this will also increase the relative cap on the E lot by five. Indeed, if the highest bid that the bidder makes for the constraining package is 65, then the relative cap on the package consisting of the E lot will be  $65 - 55 = 10$ . Thus, the bidder can submit a headline bid for the E lot *if* it also submits an additional bid for the package of two F lots with a bid amount of at least 65.

However, we also need to check if the bidder can make an additional bid for the package of two F lots with a bid amount of 65:

- The first activity rules constraint on additional bids is that the bid amount of the additional bid cannot exceed the round price of the package. The round price of the package of two F lots is 80, which is greater than the bid amount for the intended additional bid (65), and thus the first constraint is satisfied,
- The second activity rules constraint on additional bids only applies if the bid package of the additional bid has eligibility that exceeds the bidder's eligibility in the round. The eligibility of the package of two F lots is four, which does not exceed the bidder's eligibility in the round, and thus this constraint does not apply.

In fact, the bidder would be able to raise the bid amount of an additional bid for the package of two F lots up to 80.

Given this, the bidder can make a headline bid for the E lot, provided that it also makes an additional bid for the package of two F lots with an amount of at least 65 and not exceeding 80.

Now suppose that the bidder also considers submitting an additional bid of 120 for the package of four F lots (for which it had made a headline bid in the first round). To check if this additional bid is allowed by the activity rules:

- the first activity rules constraint requires that the bid amount cannot exceed the round price of the bid package – the round price of the package of four F lots is 160, which is greater than the bid

- amount for the intended additional bid (120), and thus the first constraint is satisfied;
- the second activity rules constraint would now apply, as the eligibility of the package of four F lots is eight. This exceeds the bidder's eligibility in the round (which is four). To submit the bid, it is therefore necessary that the bid does not involve a violation of the relative caps.

To check if the relative cap on the package of four F lots is satisfied, we first identify the constraining bid (which is the headline bid for two F lots in the second round), the highest bid for the bid package of the constraining bid (which would be a least 60, as the bidder made this bid in the second round, and could be higher if the bidder submits an additional bid for two F lots in the round, e.g. a bid of 65 if it were to make a headline bid for the E lot) and the difference between the round price of four F lots and two F lots in the second round (60). Therefore, the bidder would be able to submit an additional bid of 120 for the package of four F lots even if it did not submit any additional bids for the package of two F lots.

However, if the bidder wanted to make a bid for four F lots with a higher bid amount, then it would also need to make an additional bid for the package of two F lots. For instance, if the bidder wishes to make a bid for four F lots with a bid amount of 130, then it would also need to make an additional bid for two F lots with a bid amount of at least 70. The bidder could raise the bid amount for four lots as high as 140, which would require a corresponding additional bid for two F lots with a bid amount of up to 80. Higher bid amounts would not be possible, as these would imply that the bid amount of the additional bid exceeds the round price of the package.

### ***Managing relative caps and activity rules***

The EAS will check compliance with the activity rules and all relative caps, identifying any violations of the relative cap rule and providing bidders with information that will help them to remedy such violations.

#### **7.2.8 Evaluation of bids and closing of the second auction stage**

After each round, the Danish Energy Agency will evaluate bids in order to determine whether the second auction stage can close or whether a further round is required. If a further round is required, the Agency will also determine for which lot categories round prices need to increase.

#### ***Evaluation of bids***

A feasible bid combination in the second auction stage is a combination of bids which includes at most one bid (which may be a headline bid or an additional bid) from each bidder, and where the demand expressed in these bids can be met with the lots available in the second auction stage.

The assignment that corresponds to a feasible combination involves:

- assigning to each bidder who has a bid included in the feasible combination only the lots included in this package; and
- not assigning any lots to bidders who do not have a bid included in the feasible combination.

The value of a feasible bid combination is the sum of amounts of the bids included in the combination plus the sum of reserve prices of any lots that would remain unassigned if the feasible combination is selected as the winning combination.

A feasible bid combination is value-maximising if it achieves the highest value across all feasible combinations.

A feasible bid combination is inclusive if it includes exactly one bid from each bidder (such bid may be a zero bid for bidders who have submitted a zero bid, or have stopped making headline bids).

If none of the value-maximising feasible combinations is inclusive, then a further round of bidding is required. Otherwise, if at least one value-maximising feasible combination is inclusive, then the second auction stage ends.

### ***Price increments***

If a further bidding round is required, then the round prices for some (or all) lot categories need to increase.

The rationale for increasing prices is that if there is a conflict between the demand from different bidders, then it is necessary to establish whether the bidders in question are willing to raise their bids, switch or reduce their demand in the following round.

Therefore, the first step to determine the lots that require a price increment is to identify which bidders are outbid in at least one value-maximising feasible bid combination that does not simply leave the lots that the bidder had included in a bid at the reserve price unassigned. We call these the 'omitted' bidders. Each of these bidders should face a price increase for the package they bid for in the most recent round.

It is possible that competition between omitted bidders may focus on some specific lot categories. Therefore it may not be necessary to increase the price for all of the lots included in the headline bid package of omitted bidders. To identify the individual lot categories in which there is a demand conflict, we isolate, in turn, the omitted bidder's demand for individual categories included in the bidder's headline bid, and we assess whether the bidder's demand for that lot category is in conflict with that of other bidders. For each of the omitted bidders the following process is applied:

- Taking the headline bid from the bidder in the most recent round, we look at the lot categories for which the number of lots in the package is greater than zero.



- Taking each of these categories in turn, we construct a hypothetical bid for a package that includes only the lots in the category under consideration included in the headline bid and nothing else (with the price adjusted accordingly).
- We then re-evaluate the bids, replacing the headline bid from the omitted bidder with this hypothetical bid. If the bidder would still be an omitted bidder with this hypothetical bid, then we increase the price of this lot category.
- If none of these lot categories required a price increment when considered individually, then we increase the price of all the lot categories included in the headline bid.

The Danish Energy Agency will determine the level of price increments with a view to supporting price discovery and promoting an efficient auction outcome.

*Example 5: Evaluation of bids*

There are four B lots, two C lots, four D lots, one E lot block and six F lots available. Round prices are:

	B	C	D	E	F
Round price (DKK million)	110	110	25	0	35

It is assumed that at the end of a given round we have the following bids:

Bidder	Bid type	Package					Bid amount (DKK million)
		B	C	D	E	F	
Bidder 1	Headline bid	2			1	2	290
Bidder 1	Additional		2		1	2	290
Bidder 1	Additional	2	2		1	2	510
Bidder 2	Headline bid	2				6	430
Bidder 2	Additional		2			6	430
Bidder 2	Additional	2			1	2	290
Bidder 3	Headline bid	2	2				440

In order to find the feasible bid combinations we need to select combinations that include at most one bid from each bidder and check if the demand in these bids can be met. For instance:

- a combination including the headline bid from each bidder is not feasible, as the demand for B lots across these three bids is six, but we only have four B lots available; at the same time, the demand for F lots is eight, but we only have six F lots available;
- a combination including the headline bids from bidder 1 and bidder 2 is not feasible either, as the demand for F lots across these bids is eight, but we only have six F lots available.

There are many other combinations which are not feasible either, but these are not relevant to how the bids are evaluated.

However:

- a combination including the headline bids from bidder 1 and bidder 3 is feasible, as the demand across these bids can be satisfied with the lots available in all lot categories;
- a combination including the headline bids from bidder 2 and bidder 3 is also feasible, as the demand across these bids can be satisfied with the lots available in all lot categories; and
- all combinations which include only one bid from one of the bidders are also feasible.

We then calculate the value of feasible combinations. For example:

- the value of the combination including the headline bids from bidder 1 and bidder 3 is DKK 930

million (290 from bidder 1's headline bid, 440 from bidder 3's headline bid, and 200 from the reserve price of lots that remain unassigned);

- the value of the combination including the headline bids from bidder 2 and bidder 3 is DKK 970 million (430 from bidder 2's headline bid, 440 from bidder 3's headline bid, and 100 from the reserve price of lots that remain unassigned); and
- the value of a combination including only the second additional bid from bidder 1 is DKK 900 million (510 from bidder 1's additional bid and 390 from the reserve price for lots that remain unassigned).

We then take the highest value across all feasible bid combinations, and find that there is only one value-maximising combination, which is the one including the headline bids from bidder 2 and bidder 3. This combination is not inclusive, as it does not include a bid from bidder 1. Therefore, a further round is needed.

Given that a further round is needed, we need to determine which lot categories should have their round price increased.

To do so, we first identify the omitted bidders. In this example, where there is only one unique value-maximising bid combination, it is easy to identify bidder 1 as the only omitted bidder. If we had several value-maximising combinations we would need to identify the bidders who are omitted in *at least* one of these combinations (excluding those bid combinations where it is still possible to include a bid from the bidder including the lots that are not assigned without any need to remove the bids already included in the bid combination). By contrast, a bidder would not be omitted if it has a bid included in each and every one of the value-maximising combinations (excluding those bid combinations where it is still possible to include a bid from the bidder including the lots that are not assigned without any need to remove the bids already included in the bid combination).

Taking the headline bid of the omitted bidder, we consider the lot categories for which the number of lots in the bid package is positive:

- We start with B lots. We construct a hypothetical headline bid for the omitted bidder which only includes the two B lots included in its actual headline bid. The amount of this hypothetical bid would be DKK 220 million. We replace the bidders' actual headline bid with this hypothetical bid, and check again for the value-maximising feasible combinations. In this hypothetical scenario it would be feasible to accept bidder 1's hypothetical headline bid alongside bidder 2's actual headline bid, or alongside bidder 2's first additional bid. However, the value of these combinations would be DKK 940 million, which is still lower than the value achieved by the combination including the headline bids from bidder 2 and bidder 3. Therefore, bidder 1 would continue to be omitted with this hypothetical headline bid, and thus we conclude that the price for B lots must increase.
- We now check the E lot. The hypothetical headline bid would now only include the E lot, and would have a bid amount of DKK 0. In this hypothetical scenario it would be feasible to accept

bidder 1's hypothetical headline bid alongside the actual headline bids from bidder 2 and bidder 3. The value of this combination would be DKK 970 million, which is the highest possible value across all combinations. Furthermore, the only other combination that achieves this highest value leaves lot E unsold, which is the package of bidder 1's hypothetical headline bid. Therefore, bidder 1 would cease to be omitted with this hypothetical headline bid. So on the basis of this check there is no need to increase the price for the E lot.

- Finally we check the F lots. The hypothetical headline bid would now only include two F lots, and would have a bid amount of DKK 70 million. In this hypothetical scenario it would be feasible to accept bidder 1's hypothetical headline bid alongside bidder 2's second additional bid and alongside bidder 3's actual headline bid. However, the value of this combination would be DKK 950 million, which still falls short of the maximum of DKK 970 million achieved with the headline bids from bidder 2 and bidder 3. Therefore, bidder 1 would continue to be omitted with this hypothetical headline bid, and thus we conclude that the price for F lots must increase.
- Given that when considering lot categories individually we have identified two lot categories which require a price increment, we stop here for this omitted bidder.

As there are no more omitted bidders, we stop the process for identification of lots categories which require a price increment. Therefore, for the following round we only increase the round price for B lots and F lots.

### ***End of the second auction stage***

At the end of the second auction stage, one of the inclusive, value-maximising feasible combinations will become the winning combination of the second auction stage. In case of a tie, the following criteria are applied to determine the winning bid combination:

- if there are several combinations which meet the criteria above, only those which maximise the number of A lots assigned will be considered;
- if there are several combinations which meet the criteria above, the combinations that assign the E lot (if such combination exists) are selected;
- if there are several combinations which meet the criteria above, the combinations that maximise the sum of eligibility points for the lots assigned are selected;
- if there are several combinations which meet the criteria above, the combinations that maximise the number of bidders that win spectrum in the auction are selected;

- if several further combinations remain, one of these will be randomly selected by the auction system.

Then:

- non-zero bids included in the winning combination will become the winning bids of the second auction stage;
- the bidders who have submitted these bids will become the winners of the second auction stage; and
- the second auction stage price to be paid by each winner will be the bid amount of its winning bid (and the second auction stage price for bidders who are not winners will be zero).

### ***Information disclosed to bidders with round results***

If a further round is required, the Danish Energy Agency will inform each bidder of the following:

- the lot categories that will have their price incremented for the following round;
- the bidder's eligibility for the following round; and
- the number of extension rights still available for the bidder.

If no further round is required, the Danish Energy Agency will inform each bidder of the lots assigned to the bidder, what price in the second auction stage the bidder must pay, and, if required, a provisional schedule for the bidding round of the third auction stage, which will not start earlier than one clear business day from the announcement of results of the second auction stage.

No information will be released about the lots assigned to other bidders, their second stage prices, or the individual bids submitted by other bidders.

## **7.3 The third auction stage**

### **7.3.1 Overview**

The third auction stage determines the specific frequencies that will be assigned to winners of spectrum. As a result, only winners of the preceding stages may participate in this stage.

The process is run independently for each of the bands, but simultaneously.

The first step in this stage is the determination of:

- the placement options that are consistent with the assignment of spectrum in the preceding stages and with the requirement that in each band each bidder will be assigned all its spectrum as a contiguous frequency range;<sup>23</sup> and
- the individual placements available to each bidder in the various frequency bands, where alternative placements are possible.

The second step is a sealed bid, second-price, combinatorial bidding process for each of the bands available, which will identify the winning placement combination:

- each bidder with alternative individual placements available in that band can make mutually exclusive bids for these alternative placements;
- the value of each placement option is calculated as the sum of bids made by bidders for the individual placements they would get;
- the winning placement combination is the combination of individual placements with the highest overall value (in case of a tie, a combination is selected randomly by the EAS), and the bids for the individual placements in the winning placement combination become the winning bids; and
- the prices that winners will be required to pay for their individual placements in the winning placement combination are determined using an opportunity cost rule, and might be lower than the winning bids.

Bidders participating in the third auction stage must submit their bids using the EAS provided by the Danish Energy Agency.

### **7.3.2 Determination of placement options and individual placements**

The process is run separately for each frequency band. This means that the determination of bidder placement in the 700 MHz band will not affect the determination of placements in the 900 MHz or 2300 MHz bands.

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<sup>23</sup> If Hi3G wins frequencies in the 900 MHz band, Hi3G's existing 2x5 MHz will be included in Hi3G's contiguous amount of spectrum in the third auction stage.

The available frequencies for assignment in the 900 MHz band depend on whether Hi3G wins spectrum in this band, and are determined as follows:

- if Hi3G wins spectrum in the 900 MHz band, the available frequencies in the 900 MHz band will be 880 MHz to 915 MHz, paired with 925 MHz to 960 MHz;
- otherwise, the available frequencies in the 900 MHz band will be 880 MHz to 910 MHz, paired with 925 MHz to 955 MHz.

The placement options for a given frequency band are an assignment of frequencies in which:

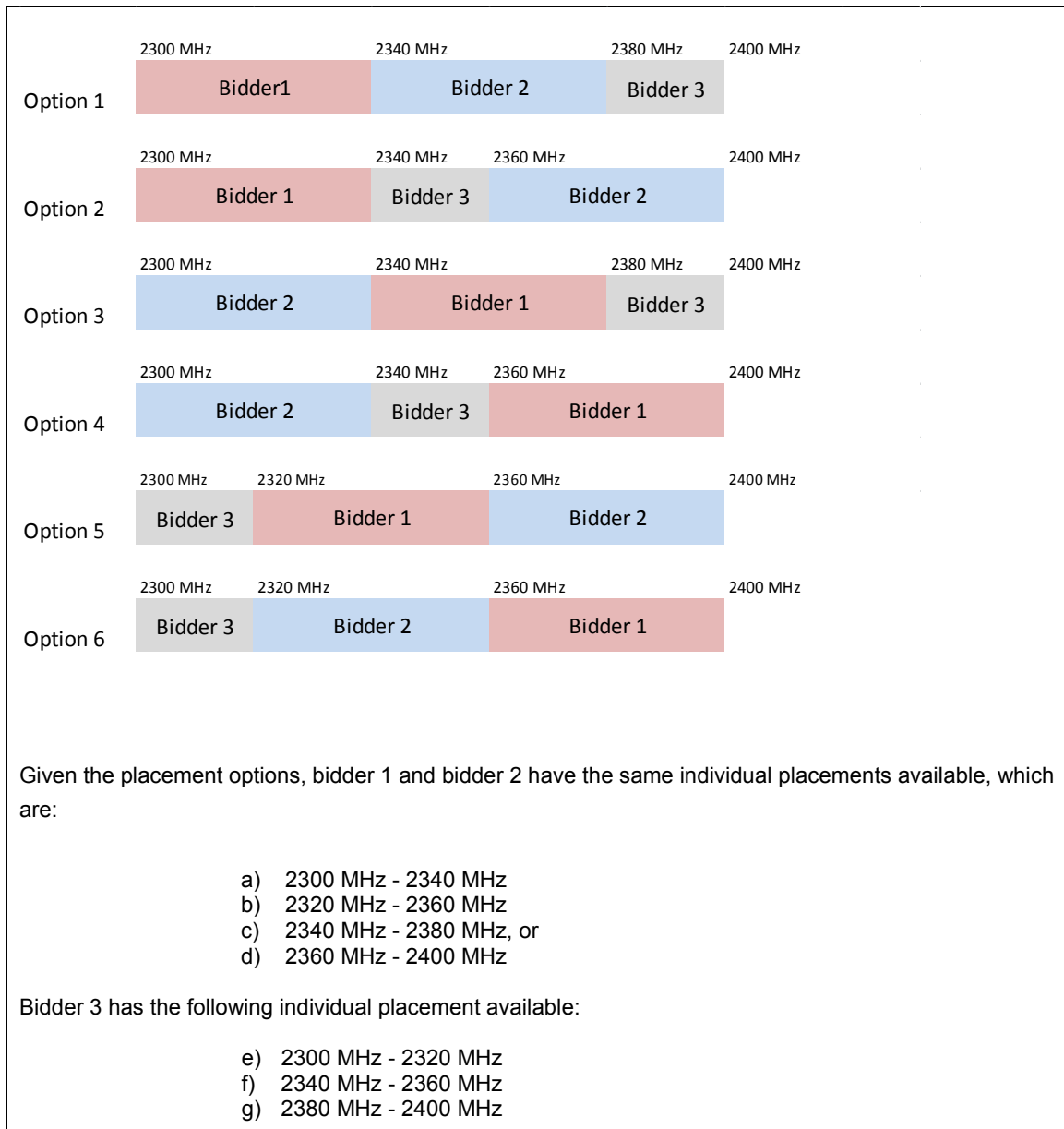
- each winner of spectrum in that band is assigned a frequency range that is contiguous and with the bandwidth that corresponds to the lots the winner has been assigned in this band; in the case of Hi3G, this will include the 2x5 MHz lot it already holds before the auction and any additional spectrum it wins in the auction;
- the frequencies assigned to different bidders do not overlap; and
- any frequencies that remain unassigned form a contiguous frequency range.

The individual placements that are available to each bidder in the bands concerned are the frequency ranges that the bidder would be assigned in at least one of the placement options.

*Example 6: Determination of placement options and individual placements*

Consider the 2300 MHz band. Suppose that three bidders have been assigned spectrum in this band. Bidder 1 has been assigned the E lot (so it must be assigned a contiguous block of 40 MHz), while bidder 2 has been assigned four F lots (so it must be assigned a contiguous block of 40 MHz), and bidder 3 has been assigned two F lots (a contiguous block of 20 MHz).

Graphically, the different placement options can be illustrated as follows:



### 7.3.3 Bids

An assignment bid is an offer for being assigned a specific individual placement in the frequency band.

An assignment bid reflects the maximum price that the bidder would be willing to pay for being assigned that specific individual placement.

Bids must be for zero DKK or more and must be expressed in whole DKK thousands.



Assignment bids simply allow bidders to express specific preferences regarding their individual placements, but bidders are not required to make assignment bids. A bidder may submit an assignment bid for every one of its individual placements, though its bid for some or all of its individual placements can be zero.

#### **7.3.4 Scheduling the bidding round for the third auction stage**

If any of the bidders has alternative individual placements available in any of the bands, then a bidding round will be required. In this case, the Danish Energy Agency will set the schedule for the bidding round in the third auction stage. The round will not start earlier than one clear business day after the announcement of results of the second auction stage. The Danish Energy Agency anticipates that the bidding round will last for at least two hours and take place between 10.00 and 16.00 hours on a single business day.

When the bidding round is scheduled, the EAS interface of each bidder will display:

- the scheduled start time of the round;
- the scheduled end time of the round;
- the scheduled duration of the round; and
- the individual placements available to the bidder.

#### **7.3.5 Submission of bids**

Assignment bids are submitted using a bid form provided by the EAS during the specified round time. The EAS will provide a form, which will list the individual placements available to the bidder, and bidders will be able to enter their bid for each of the individual placements.

By default, the bid for each individual placement is zero DKK.

#### ***The bid submission process***

As in the second auction stage, the procedure for submitting bids involves two steps:

- In the first step, bidders enter their assignment bids and submit them for checking by the EAS.
- If the assignment bids are valid, in a second step the bidder will be presented with a form displaying the bids. The bidder will then be able to confirm

submission of the bids or revert to the bid form to modify one or more bids if desired. If an assignment bid is invalid, the bidder is returned automatically to the bid form.

Bids are submitted simultaneously for all bands.

Once a bidder has confirmed its bid submission it will not be able to withdraw or modify its bids. Upon confirmation of a bid submission, the EAS will show a summary of the bids submitted.

The bid submission will only be completed if the bidder confirms the bid submission before the end of the round (the end of the round means either when the round ends as scheduled, or as a result of an extension, cf. section 7.3.6). Therefore, if a bidder submits its bid form for checking, but fails to confirm its bid submission before the end of the round, the bidder will be deemed not to have submitted any assignment bids, and thus its assignment bids will be zero DKK for all individual placements.

### **7.3.6 Extension rights**

An extension right provides a bidder with an additional 30 minutes ('the extension period') to complete its bid submission if it has not done so before the scheduled end of the round.

Each bidder who has alternative individual placements will have one extension right in the third auction stage, and failure by a bidder to confirm submission of bids before the scheduled end time of the round will trigger an extension in the same manner as in a round in the second auction stage.

A bidder who had an extension period triggered will be able to complete its bid submission during this period.

If an extension period is triggered for any bidder, the EAS will notify bidders of the end time for the extension period. The extension period lasts at most 30 minutes but may terminate earlier if all bidders for whom an extension period has been triggered complete their respective bid submissions before the end of the extension period.

### **7.3.7 Evaluation of bids**

Bids will be evaluated separately for each frequency band, where only the placement options for the relevant band are considered.

The value of a placement option is calculated as the sum of assignment bids for its individual placements.

The winning placement combination for each frequency band is a placement option that achieves the highest value among all placement options for the band. In case of a tie, a result is selected randomly by the EAS.

The third auction stage price for each bidder in a given band is the price the bidder will be required to pay for the individual placements it is assigned. The prices for the individual placements are calculated separately for each frequency band following an opportunity-based pricing rule. The bidder's overall assignment price is equal to the sum of the bidder's assignment prices for the different frequency bands.

The assignment opportunity cost for a subset of bidders for a given band is the difference between:

- the greatest sum of assignment bids from other bidders that could be achieved in any of the placement options; and
- the sum of winning bids from other bidders.

The assignment prices for the frequency band are defined by applying the following conditions:

- the sum of assignment prices for each proper subset of bidders<sup>24</sup> cannot exceed the sum of their winning bids;
- the sum of assignment prices for each proper subset of bidders<sup>25</sup> must be at least the assignment opportunity cost for the subset;
- the sum of band assignment prices must be the smallest possible subject to the band assignment prices satisfying the conditions above; and
- the sum of the squared differences between each bidder's band assignment price and its assignment opportunity cost<sup>26</sup> must be the smallest possible across all alternative band assignment prices that satisfy the conditions above.

These conditions yield a unique set of assignment prices for the frequency band in question.

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<sup>24</sup> A proper subset of bidders include all possible subsets of bidders, apart from the subset in which all bidders are included.

<sup>25</sup> As above.

<sup>26</sup> I.e. the opportunity cost of the assignment for the subset that only contains the bidder in question.

*Example 7: Evaluation of bids in the third auction stage*

Following from Example 6 (see page 89), suppose that the bidders make the following assignment bids:

- Bidder 1 bids:
  - For a): DKK 1 million
  - For b): DKK 0.6 million
  - For c): DKK 0.2 million
- Bidder 2 bids:
  - For a): DKK 1.2 million
- Bidder 3 submits no bid for placements

On the basis of these bid the value of each of the placement options can be calculated:

Placement options	Bidder 1		Bidder 2		Bidder 3		Value
	Individual placement	Bid	Individual placement	Bid	Individual placement	Bid	
Option 1	a	DKK 1 million	c	DKK 0	g	DKK 0	DKK 1 million
Option 2	a	DKK 1 million	d	DKK 0	f	DKK 0	DKK 1 million
<b>Option 3</b>	<b>c</b>	<b>DKK 0.2 million</b>	<b>a</b>	<b>DKK 1.2 million</b>	<b>g</b>	<b>DKK 0</b>	<b>DKK 1.4 million</b>
Option 4	d	DKK 0	a	DKK 1.2 million	f	DKK 0	DKK 1.2 million
Option 5	b	DKK 0.6 million	d	DKK 0	e	DKK 0	DKK 0.6 million
Option 6	d	DKK 0	b	DKK 0	e	DKK 0	DKK 0

Option 3 has the highest value and will be the final placement combination.

The assignment opportunity costs are calculated as follows:

Bidder	The greatest sum of assignment bids from other bidders that could be achieved among the placement options	Sum of winning bids from other winners	Opportunity cost of assignment
Bidder 1	DKK 1.2 million	DKK 1.2 million	DKK 0
Bidder 2	DKK 1 million	DKK 0.2 million	DKK 0.8 million
Bidder 3	DKK 1.4 million	DKK 1.4 million	DKK 0

The assignment prices must satisfy the following conditions:

- The price for each bidder cannot exceed the bidder's winning bid (therefore, the price cannot exceed DKK 0.2 million for bidder 1 and DKK 1.2 million for bidder 2), and the sum of prices for both bidders cannot exceed the sum of their bids (so the price cannot exceed DKK 1.4 million).
- The price for each bidder shall be at least the opportunity cost of the assignment (therefore, the price for bidder 1 shall be at least DKK 0 and the price for bidder 2 at least DKK 0.8 million).
- The total sum of prices shall as small as possible.
- The sum of the squared differences between each bidder's band assignment price and its assignment opportunity cost must be the smallest possible across all the assignment prices that satisfy the conditions above.

The only subset of assignment prices satisfying the first three conditions is the assignment prices that are equal to each bidder's assignment opportunity cost. As there is a unique number of assignment prices equal to each bidder's assignment opportunity cost, the fourth condition is satisfied automatically. The band assignment price for bidder 1 is therefore DKK 0, the assignment price for bidder 2 is DKK 0.8 million, and the assignment price for bidder 3 is DKK 0.

### 7.3.8 End of the third auction stage

At the end of the third auction stage, the Danish Energy Agency will notify each bidder of:

- the specific frequencies that the bidder will be assigned in each frequency band;

- the assignment prices for each frequency band;
- the provisional licence price in the third auction stage, i.e. the sum of licence prices after the first, second and third auction stages, and if necessary, a provisional time schedule for the bidding round in the fourth auction stage, which will not start earlier than one clear business day from the announcement of results of the third auction stage.

## 7.4 Fourth auction stage

### 7.4.1 Overview

The fourth auction stage provides an opportunity for bidders to offer to provide additional coverage in exchange for a reduction in the price they will be required to pay for the frequencies they have been assigned in the preceding stages (the sum of their first, second and third auction stage prices). Only those bidders who have been assigned spectrum in the preceding stages, and for whom the sum of their first, second and third auction stage prices is positive, can participate in the fourth auction stage.

The fourth auction stage consists of a first-price sealed bid auction process, where:

- each bidder can make bids for available address groups;
- bids are made for individual address groups;
- the bid indicates the reduction in price (up to the maximum price reduction) that the bidder finds necessary in order to take on the coverage obligation for the specific address group;
- each bidder can be assigned any subset of the address groups for which it has bid, provided that the total sum of its winning bids does not exceed the sum of its first, second and third auction stage prices (i.e. the bidder's final total licence price including any reductions cannot be negative).

Bidders participating in the fourth auction stage must submit their bids using the EAS provided by the Danish Energy Agency.

### 7.4.2 Address groups available

The lots available in the fourth auction stage are the following address groups. These are shown in Table 6 below.

Table 6: Address groups available

Address group	Maximum price reduction (DKK million)
T1	12
T2	7
T3	10
T4	8
T5	7
T6	11
T7	7
T8	8
T19	9
T10	8
T11	8
T12	5
T13	9
T14	6
T15	7
T16	7
T17	6
T18	4
T19	5
T20	8
T21	3

### 7.4.3 Bids

The provisional licence price for a bidder is the total sum of the bidder's first, second and third auction stage prices.

In the fourth auction stage:

- a reduction is a positive amount to be deducted from the bidder's provisional licence price;
- bids must be submitted for individual address groups;
- each individual bid is the reduction for which the bidder offers to take up the coverage obligation for the address group; if the bid is accepted, the reduction will be applied to the bidder's provisional licence price, and the corresponding additional coverage obligation will be added to the bidder's licence.

Thus, a bid of  $X$  for address group  $T_y$  indicates that the bidder is willing to cover the address group  $T_y$  in exchange for a reduction of  $X$  in the bidder's provisional licence

price. Notice that a bid of zero means that the bidder is willing to cover the address group without any reduction in the provisional licence price, and that the higher the bid the greater the reduction that the bidder would require in order to take on the additional coverage obligation.

A bid for an address group cannot exceed the maximum price reduction set by the Danish Energy Agency for the corresponding address group, and cannot exceed the provisional licence price of the bidder.

Bids must be for zero DKK or more and must be expressed in whole DKK thousands.

Notice that because bids are for price reductions, smaller bids are more competitive and therefore more likely to be selected by the Danish Energy Agency.

Each bidder can make bids for multiple address groups, and the bids might be accepted simultaneously. If multiple bids are accepted from the same bidder, all the reductions associated with the accepted bids will be applied. When determining which bids to accept, the Danish Energy Agency will ensure that the total number of bids accepted from each bidder does not exceed the bidder's provisional licence price.

#### **7.4.4 Scheduling the bidding round for the fourth auction stage**

The fourth auction stage takes place if there is at least one bidder with a provisional licence price greater than zero. In this case, the Danish Energy Agency will set the schedule for the bidding round in the fourth auction stage. The bidding round will not start earlier than one clear business day after the announcement of results of the third auction stage. The agency anticipates that the round will last for at least two hours and take place between 10.00 and 16.00 on a single business day.

When the bidding round is scheduled, the EAS interface of each bidder who is entitled to participate will display:

- the scheduled start time of the round;
- the scheduled end time of the round;
- the scheduled duration of the round;
- the bidder's provisional licence price; and
- address groups and their maximum price reduction.



#### **7.4.5 Submission of bids**

Bids for address groups are submitted using a bid form provided by the EAS during the specified round time. The EAS will provide a bid form, which will list all of the address groups and their maximum price reduction, and bidders will be able to enter their bid for each of the address groups for which they wish to bid.

Bidders can bid for all of the address groups they are interested in, but have no obligation to bid for all or any of the address groups. Therefore, bidders are not required to submit bids in the fourth auction stage.

A bidder may submit bids for multiple address groups such that the total sum of its bids is greater than the its provisional licence price. For the avoidance of doubt, it should be mentioned that if the total sum of a bidder's bids exceeds its provisional licence price, then it is not possible to accept all these bids simultaneously, as the final licence price cannot be negative.

#### ***The bid submission process***

The submission of bids through the EAS involves two steps:

- In the first step, bidders enter their bids in a bid form and submit them for checking by the EAS.
- If the bids are valid, in a second step the bidders will be presented with a confirmation form displaying the bids. Bidders will then be able to confirm submission of the bids or revert to the bid form to modify any bids. If a bid for an address group is invalid, the bidder is returned automatically to the bid form.

Bidders cannot make multiple submissions. Therefore, bidders should include all the bids they wish to make for address groups in a single submission.

Once a bidder has confirmed its bid submission for the round the bidder will not be able to withdraw or modify its bids. Upon confirmation of the bid submission, the EAS will show a summary of the bids submitted.

The bid submission will only be completed if the bidder confirms the bid submission before the end of the round (the end of the round means either when the round ends as scheduled, or as a result of an extension). If a bidder submits its bid form for checking, but fails to confirm its bid submission before the end of the round, the bidder will be deemed not to have submitted any bids for address groups.

#### **7.4.6 Extension rights**

An extension right provides a bidder with an additional 30 minutes ('the extension period') to complete its bid submission if it has not done so before the scheduled end of the round.

Each bidder who is able to bid in the fourth auction stage will have one extension right in this stage, and failure by a bidder to confirm submission of bids before the scheduled end time of the round will automatically trigger an extension in the same manner as in the third auction stage.

A bidder who triggers an extension will be able to complete its bid submission during the extension period.

If a bidder triggers an extension, the EAS will notify bidders of the end time for the extension period. The extension period lasts at most 30 minutes but may terminate earlier if all bidders who have triggered an extension period complete their respective bid submissions before the end of the extension period.

#### **7.4.7 Evaluation of bids**

All bids for address groups will be evaluated simultaneously, following a combinatorial approach.

A feasible bid combination in the fourth auction stage is a combination of bids that:

- does not include more than one bid for the same address group; and
- satisfies, for each bidder, the requirement that the total reduction for the bidder does not exceed the bidder's provisional licence price.

The value of a feasible bid combination is the sum of the maximum price reduction across all address groups for which a bid is accepted, minus the sum of all the accepted bids.

The winning combination of bids in the fourth auction stage is the feasible bid combination that achieves the greatest value. In case of a tie, the following criteria are applied to determine the winning combination:

- if there are several feasible bid combinations that achieve the greatest value, only those combinations which achieve the greatest sum of the maximum price reductions across all the address groups for which a bid is accepted will be considered;

- if there is still a tie, only those combinations which achieve the greatest sum addresses across the address groups for which a bid is accepted will be considered;
- if there is still a tie, only those combinations which achieve the smallest sum of the squares of the bidders' total reductions across all bidders will be considered;
- if there is still a tie, one of these will be randomly selected by the EAS.

A winning bid in the fourth auction stage is a bid included in the winning bid combination.

The total reduction in the fourth auction stage for each winner is the sum of bids accepted for the winner concerned.

*Example 8: Evaluation of bids in the fourth auction stage*

Consider a simplified example in which there are only the following three address groups:

Address group	Maximum price reduction (DKK million)
T1	12
T2	7
T3	10

Suppose that three bidders participate in the fourth auction stage. The bidders' provisional licence prices and bids are as follows:

Bidder	Provisional licence price (DKK million)	Bid		
		T1	T2	T3
Bidder 1	20	11	6	4
Bidder 2	14	8	4	3
Bidder 3	30	12	7	10

Given these bids, the best offer for each address group is from bidder 2. However, it is not possible to accept all of the bids from bidder 2, as the sum of bidder 2's bids exceeds its provisional licence price - thus the combination of bids that includes all bidder 2's bids is not feasible. At most two bids can be accepted simultaneously from bidder 2 as the sum of the three bids exceeds bidder 2's provisional licence price.

For address groups for which a bid from bidder 2 is not accepted, the next best offer is from bidder 1. Any combination of bids that includes two bids from bidder 2 and a bid for the remaining address group from bidder 1 is feasible. The value of these

feasible combinations is calculated as follows:

Combination			Sum of maximum price reduction across all address groups for which a bid is accepted (DKK million)	Sum of all bids accepted (DKK million)	Value (DKK million)
Bid for T1	Bid for T2	Bid for T3			
Bidder 2	Bidder 2	Bidder 1	29	16	13
Bidder 2	Bidder 1	Bidder 2	29	17	12
Bidder 1	Bidder 2	Bidder 2	29	18	11

The greatest value across these feasible combinations (and indeed across all feasible combinations) is DKK 13 million, and thus the winning combination is bidder 2's bids for T1 and T2, and bidder 1's bid for T3.

#### 7.4.8 End of the fourth auction stage

At the end of the fourth auction stage, the Danish Energy Agency will notify each bidder of:

- the address groups that the bidder has been assigned;
- the bidder's total reduction in the fourth auction stage; and
- the bidder's final licence price (which is the sum of the bidder's prices in the first, second and third auction stages minus the bidder's total reduction in the fourth auction stage).

#### 7.5 Information disclosed at the end of the auction

At the end of the auction, the Danish Energy Agency will notify the bidders in the EAS of:

- the frequencies assigned to each bidder;
- the coverage obligation assigned to each bidder; and
- each bidder's final licence price.

## **7.6 Exceptional circumstances during the Auction**

Whether exceptional circumstances exist during the auction is determined by the Danish Energy Agency. Exceptional circumstances could include, for example, widespread technical failure or concern about possible collusion among bidders.

If exceptional circumstances arise during the auction, the Danish Energy Agency has the discretion to:

- postpone the scheduled end time for a bidding round in progress;
- cancel a bidding round which has not yet started;
- postpone the scheduling of further bidding rounds;
- cancel a bidding round that is either underway or for which round results have not yet been released, and re-schedule the round again;
- void all bids received in the respective auction stage or restart the auction stage or auction; and/or
- cancel the auction.

The exclusion of a bidder from the auction will not provide a basis for the Danish Energy Agency to change the method of determining winning bids and prices.

## 8 Granting of Licences

At the Grant Stage, winning bidders are granted Licences for the frequencies assigned to them in the auction or as part of the Qualification Stage if there is only one bidder. Licences are only granted once bidders have fulfilled the payment terms.

### 8.1 Payment of Licence price

#### 8.1.1 Payment schedule

For each winning bidder, the auction will determine a specific licence price due for the licence or licences won by that bidder. The licence price will be the sum of the prices established in the first, second, third and fourth auction stages.

The bidder has to decide how to pay the licence price. The bidder has the following options:

1. An initial Payment comprising 10 % of the licence price which will be payable before the licence is issued and a deferred payment comprising 90 % of the licence price which will be payable in eight equal annual instalments, with the first instalment due on the date falling one year from issue of the licence; or
2. payment of the licence price in full.

Following the announcement of the auction result, the Danish Energy Agency will notify winning bidders of their schedule of payments, including a date by which their payment of the licence price in full or initial payment must be paid into the bank account of the Danish Energy Agency.

Any penalties incurred during the auction must be paid in full at the same time as the payment of the licence price in full or the initial payment is made.

The licence price in full or the initial payment must be paid into the Danish Energy Agency's bank account within the time stipulated. This will be at most 10 days after notification by the Danish Energy Agency. However, the Danish Energy Agency may, at its sole discretion, extend the time limit in order for the winning Bidder to fulfil these obligations. Interest will accrue on the amount outstanding in relation to the licence price from the due date until payment has been effected, at a rate of interest determined by the Interest Act.

Details of the Danish Energy Agency's bank account are as follows:

Bank: Danske Bank  
Registration number: 0216  
Account name: Danish Energy Agency  
Account number: 4069071767  
Swift number: DABADKKK  
IBAN number: DK3102164069071767

### 8.1.2 Demand guarantee for the Deferred Payment

Winning bidders are required to provide a demand guarantee for deferred payments within the time stipulated if they have chosen only to pay an upfront fee of 10 % of the licence price. This will be at most 10 days after notification by the Danish Energy Agency. The guarantee must be provided in the form set out in annex F of this Information Memorandum. In particular, the guarantee must be:

- Payable on demand to the Danish Government as represented by the Danish Energy Agency;
- issued by a bank or an insurance company which does not control the bidder, nor is controlled by the bidder nor is controlled by a person who controls the bidder, and which is registered in the European Economic Area and has, as a minimum, a long-term debt A rating from Standard & Poors or Fitch Rating of at least A or from Moody's Investors Service Limited of at least A2; and
- for an amount equivalent to the sum of three annual instalments payable on the licence price, cf. section **Fejl! Henvisningskilde ikke fundet.** in the Danish Energy Agency's decision, however in such a manner that the guarantee shall be reduced by the instalments that are paid over the last three years of the repayment period. The guarantee shall be effective from the date of issue of the licence and shall at any time be effective in the period where the following three instalments fall due for payment.

For the purpose of issue of the licence, the Winning Bidders can provide a demand guarantee with the necessary signatures without all signatures being original, i.e. the signatures can be scanned. If a Winning Bidder has chosen this solution, the Winning Bidder shall subsequently as soon as possible provide a demand guarantee with only original signatures.

A licensee is required to notify the Danish Energy Agency without undue delay in the event that the guarantor's credit rating falls below the required level. The licensee will then have two months in which to provide a new guarantee. If the licensee fails to put in place a new guarantee within this period, the Danish Energy Agency may revoke the licence in accordance with clause 89 in the Danish Energy Agency's Decision.

## 8.2 Costs of preparation and implementing the Auction

As stated in clause 76 in the Danish Energy Agency's Decision, the Danish Energy Agency shall charge a fee to bidders to whom licences have been issued, to cover the costs involved in the Danish Energy Agency's arrangement and implementation of the auction. The exact amount cannot be determined until the auction is finished. However, the current estimate is that the total cost will be about DKK 12 million.

The costs will be allocated proportionally among winning bidders based on the amount of spectrum won by the individual bidders in the auction seen in relation to the share of the total amount of spectrum offered.

The Danish Energy Agency will set the due date in respect of this payment following the auction. If the licensee does not pay this fee, the Danish Energy Agency may revoke the licence as specified in clause 89 in the Danish Energy Agency's decision, cf. annex B, subject to the principle of proportionality.

## 8.3 Default and return of the Licence

If a winning bidder fails to make a payment of the licence price or a part of the licence price on the due date, or any other amounts due, interest will be charged from that date onwards on the amount outstanding, in accordance with the Act on Interest. Failure to pay instalments or other amounts due could result in revocation of the licence, cf. clause 89 in the Danish Energy Agency's decision.

If a licence is revoked by the Danish Energy Agency, the licensee shall be under an obligation to pay on demand an amount equivalent to 30 % of the licence price, or, if payment of a smaller amount of the licence price is outstanding, then such smaller amount (see also Section 5.4.5).

A licensee may at any time return a licence. Upon return of its licence to the Danish Energy Agency, the licensee may terminate future rights and obligations not yet due by paying not later than the date of return an amount equivalent to 30 % of the licence price, or, if payment of a smaller amount of the licence price is outstanding, then such smaller amount.

If licences are revoked or returned, the licence price paid or other amounts paid in connection with the auction will not be refunded, and the obligation to pay any instalments due and interest thereon will still exist.

If Licences are revoked or returned during a calendar year for which the annual spectrum fee has been paid, a corresponding proportionate refund will be offered for the frequency charge.



## 8.4 Issue of Licences

Once the payment of the licence price in full or the Initial Payment and the demand guarantee have been received by the Danish Energy Agency, the licences will be granted to the winning bidders. This will be in the form similar to the draft licences shown in annexes C and D.

## 8.5 Announcement of results

Upon conclusion of the Grant Stage, the Danish Energy Agency will make a public announcement comprising:

- the number of bidders that participated in the auction;
- the identity of the winning bidders;
- the frequencies assigned to each of the winning bidders; and
- the licence price to be paid by each winning bidder.

The Danish Energy Agency also has discretion to publish full details of the bids submitted in the auction, including the identity of all bidders and the bids they submitted. The Danish Energy Agency will decide when and if it intends to publish this information following the conclusion of the Grant Stage.

It should be noted that the rules of the Public Administration Act and the Open Administration Act on access to documents will be applicable to information and documents submitted in connection with the auction.

## 9 Communication

Section 9 contains information about communication between the Danish Energy Agency and bidders before and during the auction, and procedures for exceptional circumstances.

### 9.1 Publication of information

The Danish Energy Agency will publish all necessary documents and updates on the auction of the 700 MHz, 900 MHz and 2300 MHz frequency bands on its website: <http://www.ens.dk>. Documents and updates will always be available in Danish. After publication of the final auction documents, an English version will be available at: <http://ens.dk/en>.

In the event of discrepancies between the Danish and English versions of the information published on the Danish Energy Agency's website, the Danish version shall prevail.

### 9.2 Process for enquires before the start of the auction process

Questions concerning the Information Memorandum and the auction process should be addressed to the Danish Energy Agency. Communication should be made in writing, by post or e-mail, to:

Danish Energy Agency  
Amaliegade 44  
DK-1256 Copenhagen K  
E-mail address: [tele@ens.dk](mailto:tele@ens.dk)

Questions should be clearly labelled "**700 MHz-, 900 MHz- og 2300 MHz - auktionen**". Questions should be submitted in Danish with an English translation.

All interested parties are entitled to submit questions to the Danish Energy Agency in writing up to eight calendar days prior to the application date. The Danish Energy Agency will produce an anonymous version of all questions and answers in Danish, which will be published on the Danish Energy Agency's website as far as possible 48 hours before expiry of the deadline for applications. It is estimated that the processing of responses to a series of questions could take up to five working days. As far as possible, a non-binding English translation of questions and answers will be provided.

### 9.3 Communication during the auction process

Following the submission of applications through to the conclusion of the Grant Stage, bidders may ask questions and contact the Danish Energy Agency via phone or e-mail at:

Center for Tele  
Phone number of auction telephone: 33 92 92 70  
E-mail address: [tele@ens.dk](mailto:tele@ens.dk)

The Danish Energy Agency will endeavour to answer questions as soon as possible. The Danish Energy Agency will produce an anonymous version of all questions and answers, which it will publish on its website.

During the second, third and fourth stages of the auction, the EAS has a one-way messaging system that allows the Danish Energy Agency to send messages and notices out to bidders. Examples of notices that might be sent out to bidders during the bidding phase include:

- the timetable for forthcoming rounds;
- price increments applicable in forthcoming bidding rounds; and
- the result of an auction stage at the end of this.

Note that to the extent possible, the timetable for the daily rounds will be announced one day in advance.

The Danish Energy Agency may use the EAS, phone or e-mail to send individual messages to bidders. Bidders cannot use the EAS to contact the Danish Energy Agency. They must use phone or e-mail as mentioned above.

### 9.4 Communication during exceptional circumstances

In the event of problems with the EAS or other exceptional circumstances, bidders should contact the Danish Energy Agency using phone or e-mail to discuss the problem.

In the event that the Danish Energy Agency decides to postpone or suspend the auction, or otherwise use its exceptional powers, the Danish Energy Agency will make all reasonable effort to notify bidders of its decision and update them on any changes to the auction status.