

# **Auction rules**

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## Outline

- Auction format
- Eligibility conditions
- Activity rules
- Provisional winning bidders
- Price increments
- Closing conditions
- Round scheduling and extensions
- Information policy
- Changes specific to the BWA auction

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## Auction format

- The 3G and BWA Auctions will have two stages:
  - In **Stage I - the clock stage** - the winners of a generic lot in each circle are determined
  - In **Stage II - the assignment stage** - the specific frequencies allocated to winning bidders in each circle are determined (where there is more than one frequency block available)
- The clock stage determines a **common winning price** for a generic lot in each circle where spectrum is available
- The assignment stage allows winners to bid for specific frequency blocks in circles in which they have won a generic lot in the clock stage. This allows bidders to state their relative preferences for different frequency blocks.
- Price paid is the sum of the common winning price and any winning assignment stage bid.

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## Clock stage - overview

- There will be **simultaneous bidding** for generic lots in each of the 22 circles where spectrum is available
- The clock stage will consist of a number of **clock rounds**
- The first clock round will begin with all lots in a circle being offered at the **reserve price**
- For each circle, bidders will be asked to state whether they wish to bid for **one lot**
- The ability to make bids is subject to the number of **eligibility points** held by bidders and **activity rules** (explained later)
- When the clock round finishes, the bids in each circle will be **ranked** (methodology explained later)
- Where there are  $n$  lots available in a circle, the bidders ranked 1 to  $n$  will be declared **provisional winning bidders**
- If **total demand** in a circle is *not less* than the number of lots available, the price of a lot will be increased in the following clock round, with the **price increment** linked to the level of **excess demand**
- In the following clock round, bidders state whether they want a generic lot in each circle at the new prevailing prices
- Clock rounds continue until the demand for lots in each circle at the current clock price is less than or equal to the number of lots available in that circle (the **closing rule** is explained in detail later)
- Once the clock stage closes, the current provisional winners will be declared **winning bidders**
- The lowest winning bid will determine the common **winning price** for all winners in that circle

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## Eligibility to make bids

- Each lot has been assigned a specific number of **eligibility points**, based on the reserve price of licences in that circle:

<i>Service area type</i>	<i>Eligibility points</i>
Delhi, Mumbai and Category A	16
Kolkata and Category B	8
Category C	3

- Each bidder has an initial number of eligibility points in the first round based on its approved bidder application and associated deposit/bank guarantee
- A bidder will maintain or lose part or all of its eligibility to bid in subsequent clock rounds depending on its bid in the current clock round and on the auction **activity rules**
- These rules allow bidders flexibility to switch between circles (except if they are currently a provisional winner in any circle, in which case, they can switch from that circle only after they are overbid)

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## Activity rules

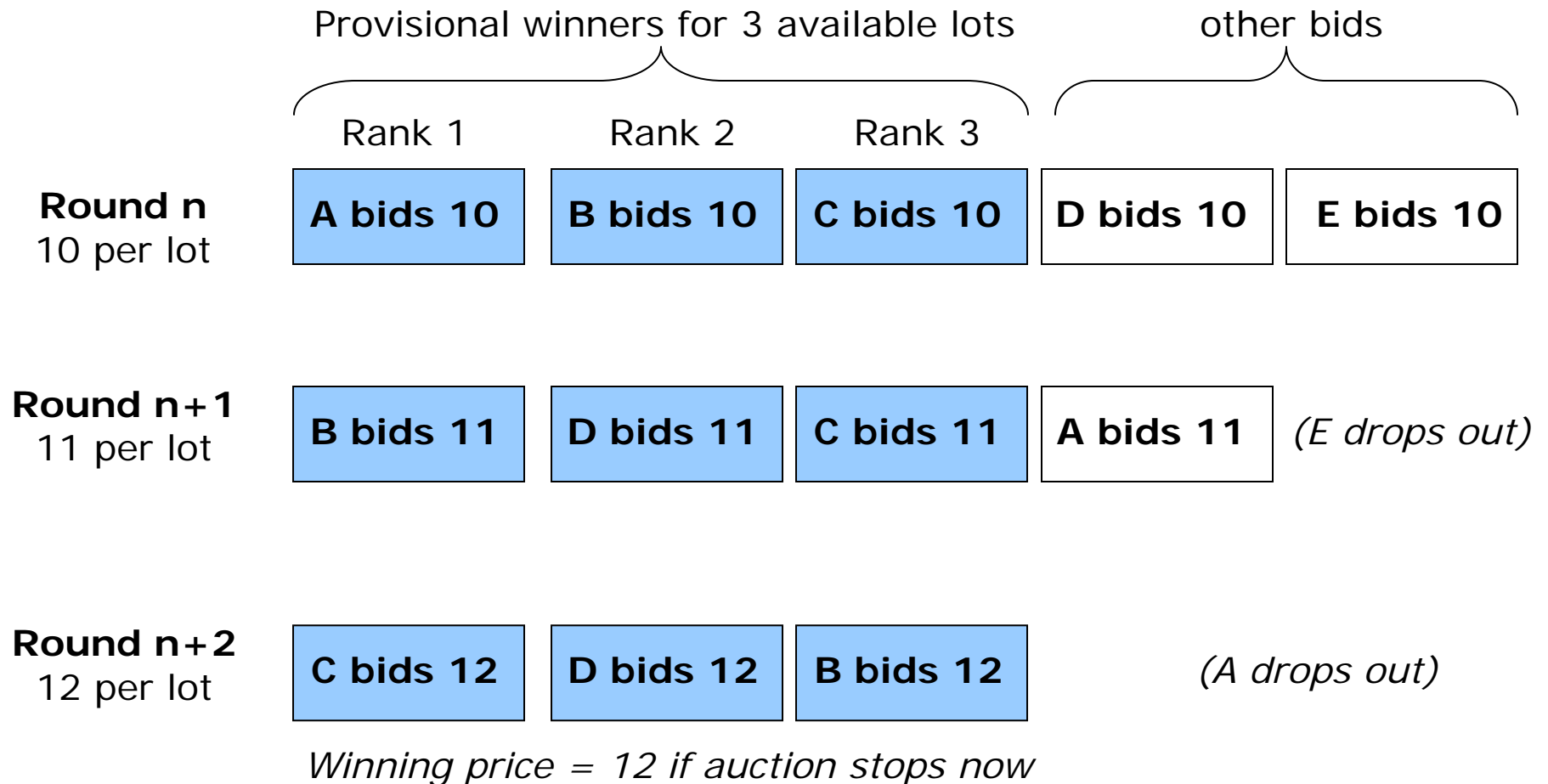
- A bidder's **activity** in a clock round is the sum of:
  - the number of eligibility points associated with circles in which the bidder has been determined to be a **provisional winner** at the end of the last completed clock round; and
  - the eligibility points associated with circles where the bidder has made **new bids** (i.e. bids where it was not a provisional winner in the previous round)
- A bidder must demonstrate bid activity in each clock round that equals or exceed a certain percentage of its eligibility, otherwise its eligibility will be reduced proportionately in the following round
- This percentage (the **auction activity requirement**) will increase over the duration of the clock stage, moving from 80% to 90% and then to 100%
- These increases will be made by the auctioneer as overall bidding activity across all circles declines

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## Provisional winning bidders and prices

- At the end of a clock round, and for each circle, each bidder's highest bid made *so far in any round* is taken and these bids are ranked by the following criteria (listed in precedence):
  - value of bid in that circle
  - round in which bid was made (earlier ranked higher)
  - total value of bids across all circles
  - randomly
- The relative ranking of any bids carried over from previous rounds will be preserved
- Where there are  $n$  lots available in a circle, bidders ranked 1 to  $n$  will be declared provisional winning bidders
- The provisional winning price associated with these bids will be equal to the lowest clock round price at which the provisional winning bidders submitted their bids

# Stylised example of round dynamics (I)





## Stylised example of round dynamics (II)



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## Price increments

- **Excess demand** in a circle is defined as
  - the total demand for lots in that circle at the *current* clock round price in the last completed clock round **minus**
  - the number of lots available in that circle
- If excess demand is **negative**, the clock round price in the following clock round will remain **unchanged**
- If excess demand is **zero or positive**, the price set for the following clock round will be the current clock round price plus a **price increment** related to the level of excess demand
- Increments will typically follow rule below, but subject to variation by auctioneer to ensure auction proceeds smoothly

<i>Excess demand</i>	<i>Price increment</i>
0	2%
1 or 2	5%
3 or more	10%

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## Closing rule

- The final clock round will be the first clock round in which
  - for each circle, the number of bids at the current clock round price is less than or equal to the number of lots available in that circle; **and**
  - the auction activity requirement is 100%.
- This rule means that a current provisional winner is not guaranteed to become a winner unless:
  - it raises its bid to the next clock price; **or**
  - there is another provisional winner with a strictly lower bid.
- *(In the latter case, there is no excess demand and the next round will have the same clock price as the current round.)*

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## Round scheduling and extensions

- Default timetable for clock rounds:
  - Clock round start times Monday - Friday, between 09.00 and 17.30
  - Minimum round length of 30 minutes
  - Minimum time between rounds of 30 minutes
- Given this, bidders will have the ability to extend rounds
  - Extension budget of 2 hours held by each bidder
  - Extension budget reduced in 10-minute intervals
  - Bidders can extend any one clock round by a maximum of 30 minutes

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## Information policy for the clock rounds

- Limited transparency of bids during the auction
- Before the relevant auction the following information will be made public about each bidder
  - Ownership structure
  - Amount of bank guarantee submitted/ initial eligibility
- At the end of each clock round (and for each circle) information circulated to all bidders will be confined to:
  - Clock round price in the round
  - Aggregate demand in the round
  - Excess demand in the round
  - Clock round price in the following round
- At the end of the clock round, the Auctioneer will announce the winning bidders and the common winning price in each circle
- At the end of the auction, all information about bids, bidders and frequencies awarded will be released

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## Assignment stage

- The assignment stage will consist of a single round
- Only winners of the clock stage participate
- For circles with two or more available lots, each winner may place an assignment bid for a specific frequency block
- Pattern of frequency assignment will be taken that maximises the sum of winning assignment bids
- No relationship between bids in different circles and assignment in each circle will be determined separately
- No requirement to place assignment bids (in which case all assignment options will be deemed to have received a bid of zero)
- Winners pay common winning price from clock stage plus accepted assignment bid

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## Example of assignment bids

- Circle with two lots
- Bidders A and B have already won one lot each in the clock stage
- Both prefer the low frequency assignment

Low frequency    High frequency

**A bids 20**

**A bids 0**

**B bids 10**

**B bids 0**

- A wins low frequency lot

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## Changes specific to the BWA auction

- The BWA and the 3G auctions have almost identical rules
- Differences are created solely by the nature of the lots
- The number of categories of lot are different:
  - In the 3G auction there is only one category of generic lot available in each circle. Therefore, during a given clock round, a bidder faces the decision of whether to bid or not for a generic lot in each circle
  - In the BWA auction, there are two distinct categories of generic lot available to bid on in each circle. Bidders may choose whether to bid on the 2.3GHz or 2.5GHz band, but can bid for at most one lot in each circle in either band.
- One of the two lots available in the 2.5GHz band has been reserved for BSNL and MTNL and the frequency range for this reservation has already been specified
- Therefore, the bidder declared the winning bidder in each circle for the available block in the 2.5GHz band will be awarded the block available at the end of the clock rounds
- The frequencies assigned in the 2.3GHz band will be determined by an assignment stage



# **An illustration**

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## Assumptions

- Seven bidders: A - G
- Service areas: I, II, III, IV
  - All service areas have the same eligibility points per lots
- Focus on service area I in the illustration
  - Three lots available
  - Six bidders (A-F) competing, but drop out as price rises
- Service areas II
  - Three competitors (B,F and G) for two lots
- Service area III
  - Bidder F only bids with two lots available
  - Illustrates the role of the total bid across service areas in determining the ranking of bidders
- Ignore service area IV until the last round

# Service Area I bids

Clock Round	Clock Round price	Bids submitted by	Provisional Winning Bidders and bids	Provisional Winning Price	Excess Demand	Price Increment
1	160.0	A, B, C, D, E, F	F (160.0), B (160.0) , A (160.0)	160.0	3	10%
2	176.0	A, B, D, C	B (176.0), D (176.0) , C (176.0)	176.0	1	5%
3	184.8	A, F, E	F (184.8), A (184.8) , E (184.8)	184.8	0	2%
4	188.5	B, D	B (188.5), D (188.5) , F (184.8)	184.8	-1	0%
5	188.5	F, E	B (188.5), D (188.5) , F (188.5)	188.5	1	5%
6	197.9	E	E (197.9), B (188.5) , D (188.5)	188.5	-2	0%
7	197.9	F, D	E (197.9), F (197.9) , D (197.9)	197.9	0	2%
8	201.9	F	F (201.9), E (197.9) , D (197.9)	197.9	-2	0%
9 (Final Clock Round)	201.9	E, B	F (201.9), E (201.9) , B (201.9)	201.9	0	No further Price Increments

## Service Area II bids

<b>Clock Round</b>	<b>Clock Round price</b>	<b>Bids submitted by</b>	<b>Provisional Winning Bidders and bids</b>	<b>Provisional Winning Price</b>	<b>Excess Demand</b>	<b>Price Increment</b>
1	160.0	B, F, G	F (160.0), B (160.0)	160.0	1	5%
2	168.0		F (160.0), B (160.0)	168.0	-2	0%
3	168.0	G	G (168.0), F (160.0)	168.0	-1	0%
4	168.0	B	G (168.0), B (168.0)	168.0	0	2%
5	171.4	F, G	F (171.4), G (171.4)	171.4	0	2%
6	174.8	F	F (174.8), G (171.4)	171.4	-1	0%
7	174.8		F (174.8), G (171.4)	171.4	-1	0%
8	174.8		F (174.8), G (171.4)	171.4	-1	0%
9 (Final Clock Round)	174.8		F (174.8), G (171.4)	171.4	-1	No further Price Increments

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## Service Area III bids

<b>Clock Round</b>	<b>Clock Round price</b>	<b>Bids submitted by</b>	<b>Provisional Winning Bidders and bids</b>	<b>Provisional Winning Price</b>	<b>Excess Demand</b>	<b>Price Increment</b>
1	160.0	F	F (160.0)	160.0	-1	0%
2	160.0		F (160.0)	160.0	-1	0%
3	160.0		F (160.0)	160.0	-1	0%
4	160.0		F (160.0)	160.0	-1	0%
5	160.0		F (160.0)	160.0	-1	0%
6	160.0		F (160.0)	160.0	-1	0%
7	160.0		F (160.0)	160.0	-1	0%
8	160.0		F (160.0)	160.0	-1	0%
9 (Final Clock Round)	160.0		F (160.0)	160.0	-1	No further Price Increments

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## Round 1 ranking for Service Area I

<b>Bidder</b>	<b>Clock round at which bid was submitted</b>	<b>Clock round price associated with bid (Rs Crore)</b>	<b>Total value of bids submitted plus unraised provisional winning bids held by bidder when the bid was submitted (Rs Crore)</b>	<b>Random Index</b>
A	1	160.0	160.0	1
B	1	160.0	320.0	5
C	1	160.0	160.0	6
D	1	160.0	160.0	3
E	1	160.0	160.0	2
F	1	160.0	480.0	4

**Ranking of provisional winners at the end of round 1 is: F (1) B(2) A(3)**

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## Round 2 for Service Area I

- F, B and A are provisional winners at end of round 1 with bids at Rs. 160.0 crore
- New bids invited at Rs. 176.0 crore
- A, B, C and D make bids at the new level
- Tie-break amongst A, B, C and D
- B, D and C become provisional winners

<b>Bidder</b>	<b>Clock round at which bid was submitted</b>	<b>Clock round price associated with bid (Rs Crore)</b>	<b>Total value of bids submitted plus unraised provisional winning bids held by bidder when the bid was submitted (Rs Crore)</b>	<b>Random Index</b>
A	2	176.0	176.0	5
B	2	176.0	336.0	1
C	2	176.0	176.0	3
D	2	176.0	176.0	2

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## What happens in subsequent rounds?

- The price per lot continues to rise for service area I, but competitors fall away as the price increases
- We will skip forward to the last two rounds to look at the auction closing conditions



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## Round 8 (penultimate) for Service Area I

- Round price now at Rs. 201.9 crore per lot
- Only F submits a bid at this new level
- Provisional winners are:
  - F at Rs. 201.9 crore
  - E at Rs. 197.9 crore (the previous round price)
  - D at Rs. 197.9 crore (the previous round price)
- No excess demand as only one bid at the current round price
- Round 9 will have the same price as round 8
- If there was no excess demand in any other circle, the auction would close and the winning price would be Rs. 197.9 crore
- Suppose, to the contrary, that the auction did not end in this round because of competition elsewhere (say excess demand in some service area IV)

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## Round 9 (last round)

- Price for service area 9 still at Rs. 201.9 crore as no excess demand in round 8
- Bids submitted at this price by:
  - E (raising its provisional winning bid from round 8)
  - B (say, switching activity from some other service area)
- Three bids now at the current price
  - E, B this round
  - F from last round
- Auction can close as, by assumption no excess demand in other circles
- Although D had a provisional winning bid in round 8, it does not win and will not have an opportunity to bid again