

Surrey Technology Centre
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To: Ofcom Auction Team

14 February 2013

Dear All

Following receipt of the principal stage bids (pas_bids.xml), the Smith Institute can confirm that the numbers of different packages on which each bidder submitted a bid during the principal stage are as follows:

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EE	48	packages
HKT	9	packages
H3G	17	packages
MLL	9	packages
Niche	89	packages
Telefonica	11	packages
Vodafone	94	packages
Total	277	packages

We further confirm that our independent implementation gives the following result for the winning packages and base prices. The winning bidders are EE, H3G, Niche, Telefonica and Vodafone. There is a unique combination of principal stage bids that achieves the maximum total bid value, and so the breaking of ties is not required. There were no unsold lots.

bidderName	A1	A2	C	D1	D2	E	bidAmount (£K)	basePrice (£K)
EE	1	0	7	0	0	0	1,049,500	588,876
H3G	1	0	0	0	0	0	565,500	225,000
Niche	0	0	3	0	0	4	340,431	186,476
Telefonica	0	1	0	0	0	0	1,219,003	550,000
Vodafone	2	0	4	0	0	5	2,075,044	790,761
Total	4	1	14	0	0	9	5,249,478	2,341,113

Having also received the files pas_wdp_results.xml and actual1-wdp_PBids_PResults_Ties_P.tsv, we further confirm that our independent implementation, the DotEcon EAS and the Cramton Associates implementation are in agreement as regards the identity of the winning bidders, their winning bids and their base prices.

Regards



Dr Robert Leese
Director

SUMMARY: REPORT ON WINNERS AND PRICES FOR THE SPECTRUM AWARD AT 800 MHz AND 2.6 GHz

Introduction

This workbook contains a report on the outcome of the Ofcom spectrum award at 800MHz and 2.6GHz

There were 7 participating bidders:

1. EE
2. HKT
3. H3G
4. MLL
5. Niche
6. Telefonica
7. Vodafone

The workbook includes a record of all principal stage bids which are either opt-in bids or for which there are no principal stage bids by the same bidder on the same package with a higher bid amount.

This workbook follows the methodology for reporting on the results of the 800 MHz and 2.6 GHz auction set out in *Correctness of auction results for the 800MHz and 2.6GHz spectrum award* (Owen Jones and Robert Leese, 1 February 2013).

The rules for the auction are set out in The Wireless Telegraphy (Licence Award) Regulations 2012 and The Wireless Telegraphy (Licence Award) (Amendment) Regulations 2012.

NB All bid amounts and prices in this workbook are in £ 000s

Winner Determination

The candidate solution to the auction rules on winner determination, as identified by the electronic auction system, appears in the 'Candidate Winners' sheet.

We have checked the identity of the winners and their allocation of lots in the candidate solution against the auction rules and we consider that:

- a) the candidate solution is a valid combination of principal stage bids for the purposes of and as defined in regulation 67 of The Wireless Telegraphy (Licence Award) Regulations 2012 ;
- b) in accordance with regulation 67(2) the candidate solution is the valid combination of principal stage bids in respect of which the total value, calculated in accordance with regulation 67(9), is the highest (or equal highest);
- c) in accordance with regulation 67(3) and 67(5) the candidate solution has the same or greater total number of eligibility points associated with it than any other valid combination of principal stage bids that has the same total value as the candidate solution.

Price Determination

The candidate solution to the price determination problem appears in the 'Candidate Prices' sheet

We consider that the candidate prices satisfy each constraint that defines the core of the price determination problem, as laid out in the Annex to the Statement issued by Ofcom on 24 July 2012

We consider that these constraints are equivalent to the conditions laid out in Schedule 7 of the Regulations (see Appendix B of *Correctness of auction results for the 800MHz and 2.6GHz spectrum award* , Owen Jones and Robert Leese, 1 February 2013)

We further consider that:

- a) the candidate prices are no less than the reserve prices and no greater than the relevant bid amounts;
- b) the candidate prices achieve minimum total revenue among all prices in the core;
- c) the candidate prices are nearest-Vickrey among all prices that achieve minimum revenue in the core.

Conclusion

Therefore we consider that the candidate solutions for winners and prices are in accordance with the The Wireless Telegraphy (Licence Award) Regulations 2012.

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To: Ofcom Auction Team

27 February 2013

Dear All

The Smith Institute's independent implementation has calculated the assignment stage results in each of spectrum categories A, C and E. In each of the three categories there is a unique winning combination of assignment bids.

In category A, the total bid amount of the winning combination is £73,512,448 and the total of the additional prices is £8,060,020.

In category C, the total bid amount of the winning combination is £71,906,139 and the total of the additional prices is £19,100,302.

In category E, the total bid amount of the winning combination is £14,128,101 and the additional prices are both zero.

Having received the files `assignment_wdp_results.xml` from the DotEcon EAS and `actual1-assign_ABids_AResults_Ties_P.tsv` from Cramton Associates, we confirm that both of these sets of results agree with our independent implementation, with regard to the selection of winning bids and the calculation of additional prices, in each of spectrum categories A, C and E.

Regards



Dr Robert Leese
Director

SUMMARY: REPORT ON WINNERS AND PRICES FOR THE ASSIGNMENT STAGE OF THE SPECTRUM AWARD AT 800 MHz AND 2.6 GHz

Introduction

This workbook contains a report on the outcome of Assignment Stage of the Ofcom spectrum award at 800MHz and 2.6GHz

There were 5 winning bidders in the Principal Stage, in the following spectrum categories:

Category A1 (4 lots)

EE	1 lot
H3G	1 lot
Vodafone	2 lots

Category A2 (1 lot)

Telefonica (no assignment stage needed)

Category C (14 lots)

EE	7 lots
Niche	3 lots
Vodafone	4 lots

Category E (9 lots)

Niche	4 lots
Vodafone	5 lots

The workbook includes a record of all bids that were submitted in the Assignment Round.

This workbook follows the methodology for reporting on the results of the 800 MHz and 2.6 GHz auction set out in *Correctness of auction results for the 800MHz and 2.6GHz spectrum award* (Owen Jones and Robert Leese, 1 February 2013).

The rules for the auction are set out in The Wireless Telegraphy (Licence Award) Regulations 2012 and The Wireless Telegraphy (Licence Award) (Amendment) Regulations 2012.

NB All bid amounts and prices in this workbook are in £s

Winner Determination

The candidate solution to the auction rules on winner determination, as identified by the electronic auction system, appears in the 'Candidate Solution' sheet for each category

We have checked the winning assignments in the candidate solution for Category A1 against the auction rules and we consider that:

- the candidate solution in Category A1 is a valid combination of assignment stage bids for the purposes of and as defined in regulation 103(3) of The Wireless Telegraphy (Licence Award) Regulations 2012 ;
- in accordance with regulations 103(2) and 103(4) the candidate solution is a valid combination of assignment stage bids in respect of which the total value is the highest.

We have checked the winning assignments in the candidate solution for Category C against the auction rules and we consider that:

- the candidate solution in Category C is a valid combination of assignment stage bids for the purposes of and as defined in regulation 104(3)-104(7) of The Wireless Telegraphy (Licence Award) Regulations 2012 ;
- in accordance with regulationS 104(2) and 104(8) the candidate solution is a valid combination of assignment stage bids in respect of which the total value is the highest .

We have checked the winning assignments in the candidate solution for Category E against the auction rules and we consider that:

- the candidate solution in Category E is a valid combination of assignment stage bids for the purposes of and as defined in regulation 105(3) of The Wireless Telegraphy (Licence Award) Regulations 2012 ;
- in accordance with regulations 105(2) and 105(4) the candidate solution is a valid combination of assignment stage bids in respect of which the total value is the highest .

Price Determination

The candidate solution to the price determination problem appears in the 'Candidate Solution' sheet

We consider that the candidate prices satisfy each constraint that defines the core of the price determination problem, as laid out in the Annex to the Statement issued by Ofcom on 24 July 2012

We consider that these constraints are equivalent to the conditions laid out in Schedule 8-10 of the Regulations (see Appendix B of *Correctness of auction results for the 800MHz and 2.6GHz spectrum award* , Owen Jones and Robert Leese, 1 February 2013)

We further consider that in each of Category A1, Category C and Category E:

- the candidate prices are no greater than the relevant bid amounts;
- the candidate prices achieve minimum total revenue among all prices in the core;
- the candidate prices are nearest-Vickrey among all prices that achieve minimum revenue in the core.

Conclusion

Therefore we consider that the candidate solutions for winners and prices are in accordance with the The Wireless Telegraphy (Licence Award) Regulations 2012.