

By Email (bwa3con@ofta.gov.hk)

July 18, 2007

Office of the Telecommunications Authority
29/F, Wu Chung House
213 Queen's Road East
Wan Chai, Hong Kong
Attention: Senior Telecommunications Engineer (R11)

Re: BTconsultancy LLC and Wrege Associates comments on the third consultation paper, "Providing Radio Spectrum for Broadband Wireless Access Services."

Wrege Associates and BTconsultancy welcome the opportunity to comment on the Hong Kong Telecommunications Authority's (TA) consultation for providing Broadband Wireless Access spectrum in the 2.3 GHz and 2.5 GHz bands. Karen Wrege, founder of Wrege Associates, and Brett Tarnutzer, founder of BTconsultancy LLC, were responsible for designing, developing and managing the auction software systems that have supported more than 70 spectrum auctions for the United States Federal Communications Commission (FCC), as well as providing auction-related consultations with international governments and bidders.

Ms. Wrege served as Deputy Chief of the Wireless Telecommunications Bureau, Spectrum Management Resources and Technologies Division at the FCC until January 2006 when she formed Wrege Associates. In addition to serving as Chief of the Operations Branch of the FCC's spectrum auction program, Mr. Tarnutzer most recently served as Project Manager for the FCC's auctions research and spectrum auction software development teams. BTconsultancy

LLC was formed in 2007. Both firms are consultancies specializing in the practical implementation of auction policy and strategic bid consulting to international spectrum authorities and spectrum auction bidders.

While at the FCC, Ms. Wrege and Mr. Tarnutzer managed the design, programming and implementation of numerous spectrum auction software systems. These include auction systems for simultaneous multiple round ascending (SMR) and SMR package bidding (SMRPB) auctions and a research simulation tool that implemented a combinatorial clock auction with a final proxy round.

Our comments support the market-based approach the TA set forth in the consultation, and offer a spectrum auction design proposal for the TA to consider. Specifically, we recommend that the TA employ a simultaneous multiple round ascending auction and allow bidders to submit "last and best" or "exit" bids on a license-by-license basis. Additionally, we recommend that the TA limit the information available to bidders before and during the auction in circumstances when competition is thin to prevent anti-competitive behavior among bidders.

The Simultaneous Multiple Round Ascending Auction

Having developed the world's first spectrum auction system for the FCC in 1994, we have seen firsthand the benefits that a well-designed auction can bring to the spectrum assignment process. Since the first implementation of spectrum auctions, incredible advances have been made in the areas of auction theory and implementation. While there are many new and innovative means of auctioning spectrum, in the case of the BWA services, we advocate a simple simultaneous multiple round ascending auction format (SMR), which has had great success in the US and many other countries.

The SMR auction involves offering all spectrum blocks at the same time and conducting a series of distinct timed bid rounds in which bidders can place their bids electronically. During each round, the bid information will be sealed, that is, bidders will only see their own bids. At the conclusion of each round, information about the bids will be revealed, allowing bidders to review the bids that were placed and prepare for the next round of bidding. We will advocate later for the TA to consider limiting the information that is revealed during the auction.

The SMR auction offers the advantages of simplicity and transparency. The simultaneous nature allows bidders to aggregate spectrum to meet business needs, with simple mechanisms such as limited withdrawals being implemented to allow for failed aggregations. Activity rules can easily be implemented to require bidders to bid activity during the auction rather than holding back until the end. A simple bid increment of a set percentage applied to the high bid from the last round will set the minimum bid for the next round.

The SMR auction format described above has been used successfully in numerous spectrum auctions around the globe and can be easily adapted to suit the needs of the TA.¹ We have considerable experience with implementation of the SMR auction mechanism in the US, Canada and Mexico and offer two enhancements to the SMR implementation in these countries, namely last and best bids and limiting bidder information.

Last and Best Bids

The practice of allowing bidders to place last and best bids has gained popularity in recent years. Last and best bids provide a bidder with an opportunity to fine tune its final bid price in clock auctions and SMR auctions by placing a bid below the current minimum acceptable bid amount but above the most recent high bid

¹ Recent implementation examples of the SMR auction format can be found on the FCC's auction web site at: <http://wireless.fcc.gov/auctions>.

amount. The FCC adopted last and best bids in 2000 for auctions with package bidding. Last and best bids were also proposed by NEXTOR² and by NERA³ for take-off and landing slots for the Federal Aviations Administration (FAA) auction and for the European Commission respectively. NERA also proposed "exit" bids for central resource adequacy markets for ISO New England, the New York ISO and the PJM ISO.⁴ The practice is used widely in energy auctions.

When bid increments are large (10-20 percent of the standing high bid amounts), bidders are often forced to place multiple increment bids in order to make a bid that is close, but does not exceed their maximum valuation.⁵ This approach is at best an approximation of the bidder's final value. Last and Best bids are a limited exception to the minimum acceptable bid rule to allow bidders to express their maximum value for a license despite the fact that the minimum acceptable bid is above their maximum value. Generally, last and best bids can be made at any price between the previous round high bid and the highest acceptable bid for the license in the current round. Last and best bids count toward a bidder's activity requirements only if the amount is greater than or equal to the minimum acceptable bid amount. The eligibility points associated with the license count toward the bidder's maximum eligibility constraint. Once a last and best bid is entered into the system for a license, generally the bidder is not allowed to place a subsequent bid on that license for the remainder of the auction. If a last and best bid is submitted in a round in which no other bids or proactive waivers are placed, the auction remains open for a subsequent round.

² Interim Report: The Passenger Bill of Rights Game, NEXTOR Working Paper: NWP-2005-002 at 131.

³ National Economic Research Associates (NERA), Study to Assess the Effects of Different Slot Allocation Schemes, A Final Report for the European Commission, DG TREN, January 2004 at 304.

⁴ National Economic Research Associates (NERA), Central Resource Adequacy Markets for PJM, NY-ISO and NE-ISO Final Report, February 2003 at 63.

⁵ If a bid amount is nearing a bidder's budget for that license, by bidding a single increment, a bidder may risk having another bidder top that bid and be faced with having to bid yet another increment to stay competitive in that market. If the bidder's budget for the license is more than two increments but less than three increments, they may be priced out of that market.

With the implementation of last and best bids, the TA can keep bid increments high without the fear of shutting a bidder out of a market prematurely. Without a mechanism for bidders to express a final value, bid increments should be kept low in order to allow bidders to fully participate in the auction, but this may significantly extend the auction.

Limiting Bidder Information

In auctions where there is the potential for thin competition, the TA should consider limiting the information made available to bidders before and during the auction. In the FCC's Public Notice proposing procedures for its AWS auction, the FCC sought comment on such procedures and received a variety of comments on the issue.⁶ The FCC chose to limit bidder information before and during the auction if the level of competition (as measured by the eligibility of bidders) did not reach a certain threshold. The FCC reasoned that if the auction was highly competitive, there would be less risk of bidders successfully engaging in collusion, but if the auction was less competitive there would be greater risks of anticompetitive behavior.⁷ Given the large amount of spectrum in this auction, the TA should be especially mindful that demand reduction⁸ and market splitting can be exacerbated in SMR auctions with limited competition.

In the case of AWS, the eligibility threshold was met and the auction proceeded with full information revealed. Recently, however, in an auction for Broadband PCS Licenses, FCC Auction 71, the eligibility threshold was not met and the auction was the first the FCC conducted in limited information mode.⁹

⁶ Auction of Advanced Wireless Services Licenses Schedule for June 29, 2006, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedures for Auction No. 66, Public Notice, FCC 06-47 (rel. April 12, 2006).

⁷ Id. at 141.

⁸ See, for example, "Demand Reduction and Inefficiency in Multi-Unit Auctions," (Lawrence M. Ausubel and Peter Cramton) Working Paper, University of Maryland, July 2002.

⁹ < http://wireless.fcc.gov/auctions/default.htm?job=auCTION_summary&id=71>.

The limited information proposal need only apply before and during the auction. Once the auction has closed, the TA could, and should, reveal all of the information so that all bidders can validate the results.

Conclusion

In summary, the implementation of an SMR auction design is a simple, efficient and effective means of auctioning the spectrum in the 2.3 and 2.5 GHz bands. The introduction of last and best bids would allow bidders to express their true values for licenses while allowing the TA to move the auction along at a rapid pace by using larger increments without the risk of shutting bidders out of the auction too quickly. The use of limited information procedures before and during the auction if there is thin competition will reduce the ability of bidders to successfully engage in anticompetitive behavior. We are pleased to offer the TA these recommendations for the BWA services auctions and will closely watch the progress of the proceeding. We are available to answer any questions the TA may have about the auction design we have presented. We can be contacted via our web sites, set forth below.

Respectfully submitted,

/s/

Brett Tarnutzer
BTconsultancy LLC
www.btconsultancy.com

/s/

Karen Wrege
Wrege Associates
www.wregeassociates.com