Alberta Watt Exchange Limited
Ancillary Services Price & Index Statistics

December 12, 2011

The terms defined below (all expressed in $/MWh) only apply to trades on the Alberta Watt Exchange (Watt-Ex) under the terms and conditions of the Ancillary Services Customer Agreement for trades made in the Alberta-Ancillary Active-Idx market.

Ancillary Active Trade Index:
The Ancillary Active Trade Index (*Trade Index*) displayed on the Watt-Ex website refers to the weighted average index price of all trades in the Ancillary Active market. The index is the premium (discount) to the Power Pool Price (*Pool Price*) for the listed instrument.

Ancillary Active Clearing Price:
The Ancillary Active Clearing Price (*Clearing Price*) is the weighted average price paid for each MW for each hour.

The calculation involves several steps:
1. Once hourly Pool Prices are determined for the performance day, a Trade Value is calculated for each trade for each hour. The Trade Value is the trade index price plus that hour's Pool Price, multiplied by the trade volume. If the calculated Trade Value is negative, it is adjusted to zero.
2. The Trade Values for all the trades for each hour are then summed to obtain the hourly Total Trade Value.
3. The Clearing Price for each hour is then the Total Trade Value for that hour divided by the total volume of all trades for that hour.

Super Peak trades are included in the calculation for the hours that are defined in the Super Peak instruments:

SPk AM trades are included in the Clearing Price calculation for HE06 – HE08
SPk WR PM trades are included in the Clearing Price calculation for HE17 – HE24 between the dates of November 1st through January 31st.
SPk SM PM trades are included in the Clearing Price calculation for HE16 – HE24 between the dates of February 1st to October 31st.

Ancillary Active Clearing Index:
The Ancillary Active Clearing Index (*Clearing Index*) is the weighted average premium (discount) to the Pool Price for the hour. The Clearing Index for each hour can be calculated as the Clearing Price for the hour minus the Pool Price.

To sum up:
The Trade Index is the average price *traded* (index to the Pool Price).
The Clearing Price is the average price *paid* (actual dollars).
The Clearing Index is the average price *paid* (index to the Pool Price). This will differ from the Trade Index if any Trade Value is adjusted to zero, and for any hour where there is a super peak trade used in the calculation.

See examples on following two pages.

Example:

The following (fictious) trades were for Regulating Ancillary Services to be performed on December 7

Table 1 - Example Trades

TRADE DATE	TRADE ID	MARKET	COMMODITY	INSTRUMENT	Mw/H	TRADE PRICE
06-Dec-11	A	Ancillary Active-Idx	Regulating	Dec 07-Off Peak	25	$-10
06-Dec-11	B	Ancillary Active-Idx	Regulating	Dec 07-Off Peak	15	$-10
06-Dec-11	C	Ancillary Active-Idx	Regulating	Dec 07-On Peak	80	$-84
06-Dec-11	D	Ancillary Active-Idx	Regulating	Dec 07-On Peak	45	$-84
06-Dec-11	E	Ancillary Active-Idx	Regulating	Dec 07-SPk AM(HE06-08)	65	$-70
06-Dec-11	F	Ancillary Active-Idx	Regulating	Dec 07-SPk AM(HE06-08)	20	$-70

Power Pool Prices for HE 05-09 were:

Table 2 - Example Power Pool Prices

HOUR	POOL PRICE
HE05	$15
HE06	$65
HE07	$72
HE08	$85
HE09	$90

<u>Ancillary Active Trade Index:</u>

For On Peak trades, the Trade Index is a weighted average of Trades C, and D.
= [(80 * -$84) + (45 * -$84)] ÷ [80 + 45]
= [-$6,720 + -$3,780] ÷ [125] = **-$84.00**
*For all On-Peak trades, sum of Volume * Trade Price, divided by sum of Volume.*

For Off Peak trades, the Trade Index is a weighted average of Trades A and B.
= [(25 * -$10) + (15 * -$10)] ÷ [25 + 15]
= [-$250 + -$150] ÷ [40] = **-$10**
*For all Off-Peak trades, sum of Volume * Trade Price, divided by sum of Volume.*

For SPk AM(HE06-08) trades, the Trade Index is a weighted average of Trades E and F.
= [(65* -$70) + (20 * -$70)] ÷ [65 + 20]
= [-$4,550 + -$1,400] ÷ [85] = **-$-70**
*For all Super Peak AM trades, sum of Volume * Trade Price, divided by sum of Volume.*

<u>Trade Value:</u>

The Trade Value is calculated for every trade for every hour that applies

For Trade F, the Trade Values are as follows:

HE 05 = does not apply to this trade
HE 06 = ($65 + -$70) * 65 = -$5 * 65 = -$325 BUT since the Trade Value is negative, it is adjusted to **$0**
HE 07 = ($72 + -$70) * 65 = $2 * 65 = **$130**
HE 08 = ($85 + -$70) * 65 = $15 * 65 = **$975**
HE 09 = does not apply to this trade
*Trade Value = (Pool Price + Trade Price) * Volume, to a minimum value of $0.*

<u>Ancillary Active Clearing Prices and Clearing Indices:</u>
Using HE 08 as an example.

The Total Trade Value is the sum of the Trade Value calculated for each trade (see highlighted columns in Table 3).
= $80 + $45 + $975 + $300 = **$1,400**
The total volume of all trades for the hour is the sum of the volume for trades C, D, E, and F.
= 80 + 45 + 65 + 20 = **210**
Note that trades A and B are all Off Peak trades, and therefore do not apply for HE 08.

The Clearing Price equals the Total Trade Value divided by the total trade volume.
= $1,400 ÷ 210 = **$6.67**

The Clearing Index equals the Clearing Price minus the Pool Price.
= $6.67 - $85.00 = **-$78.33**

Table 3 - Example Calculations of Clearing Prices and Clearing Indices

Trade ID	MW/h	TRADE PRICE	HE05 Price	Trade Value	HE06 Price	Trade Value	HE07 Price	Trade Value	HE08 Price	Trade Value	HE09 Price	Trade Value
A	25	-$10	$15	$125	$65	$1,375	$72	$1,550	N/A		N/A	
B	15	-$10	$15	$75	$65	$825	$72	$930	N/A		N/A	
C	80	-$84	N/A		N/A		N/A		$85	$80	$90	$480
D	45	-$84	N/A		N/A		N/A		$85	$45	$90	$270
E	65	-$70	N/A		$65	$0	$72	$130	$85	$975	N/A	
F	20	-$70	N/A		$65	$0	$72	$40	$85	$300	N/A	
TOTAL TRADE VALUE				$200		$2,200		$2,650		$1,400		$750
CLEARING PRICE				$5.00		$17.60		$21.20		$6.67		$6.00
CLEARING INDEX				-$10.00		-$47.40		-$50.80		-$78.33		-$84.00