



# Energy Market Policy

This policy is designed to preserve the operational efficiency and integrity of Energy products and provide a clear, consistent and consolidated interpretation of the operational management of Energy Products.

Participants should continue to refer to the ASX 24 Operating Rules for further detail and to the extent of any inconsistency the ASX 24 Operating Rules prevail.

## Energy Wholesale Trading Policy<sup>1</sup>

### 1. Operating Rules of the Australian Securities Exchange Limited (the Exchange)

The Exchange will manage the operation of the Energy Market subject to the ASX 24 Operating Rules.

Strategy (Strip) Trading	ASX 24 Operating Rules Procedure	4402
Pre Negotiated Trading	ASX 24 Operating Rules Procedure	4401
Block Trades	ASX 24 Operating Rules Procedure	4820
Exchange for Physical	ASX 24 Operating Rules Procedure	4800

### 2. Participant Registration of Block Trades

Please refer to ASX 24 Operating Rules Procedure 4820.

### 3. Procedures for Pre-negotiated Business

The procedure for transaction of pre-negotiated business in Energy Products in the outright market is;

- Pre-negotiate business between counterparties
- Immediate release a Request for Quote (RFQ)
- Wait 30 seconds for market response
- Within a further 90 seconds bring pre-negotiated orders to market for execution

The procedure for transaction of pre-negotiated business in Energy Products in the Custom Market is;

- Pre-negotiate business between counterparties
- Immediate release a Custom Market Request for Quote (CRFQ)
- Wait 30 seconds for market response
- Within a further 90 seconds bring pre-negotiated orders to market for execution

### 4. Participant Registration of Exchange For Physical (EFPs)

Participants are required to present to the Exchange EFPs for registration by 5.00pm. EFPs presented after 5.00pm will be processed on the next business day.

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<sup>1</sup> Where Wholesale Trading is a defined term that encompasses Block Trades, Strategy (Strip) Trading and Exchange for Physical (EFP) trades.

## 5. Participant Registration of Strip Trade Leg Prices - Energy

Upon execution of an electricity or gas strip, the Exchange will apply the algorithm outlined below to calculate the component futures prices<sup>2</sup>. The Exchange will present the details of the strip with the associated leg prices to Participants via email for Participants record keeping. The Exchange will register the allocated price levels resulting from the Strip trade in the Clearing system (Secur).

### Year-long Strips:

1. The previous official daily settlement prices (ODSPs) of the underlying futures contracts will be used as a starting point and adjusted by a Price Adjustment Factor<sup>3</sup> to achieve an implied Strip price which approximates the price of the executed underlying futures contracts;
2. Price adjustments will be made via a consistent proportional price movement from ODSPs (rounded to \$0.01/MWh for electricity and \$0.01/GJ for Gas); with the exception that
3. The underlying futures contract with the longest dated expiry will be further adjusted up or down in increments of \$0.01/MWh for electricity and \$0.01/GJ for gas to the extent that such adjustment will achieve a more accurate implied Strip price as calculated to 4 decimal places (e.g. \$109.2995/MWh or \$3.6045/GJ).

### Off-peak Year-long Strips (Australian Electricity only)

1. Underlying Base futures contracts: The previous ODSPs of the underlying Base futures contracts will be held constant for allocation purposes;
2. Underlying Peak futures contracts: The previous ODSPs of the underlying Peak futures contracts will be used as a starting point, adjusted via a consistent proportional price movement (rounded to \$0.01/MWh) from ODSPs to achieve an implied Peak strip price which, when subtracted from the implied ODSP Base strip price (on an MWh-weighted basis) creates an implied Off-peak strip price approximately equal to the Strip trade Price; with the exception that
3. The underlying Peak futures contract with the longest dated expiry will be further adjusted up or down in increments of \$0.01/MWh to the extent that such adjustment will achieve an implied Strip price as calculated to 4 decimal places (e.g. \$49.0008) which more closely approximate the Off-peak Strip trade Price.

The Participants, OTC brokers and market users are responsible for developing their own spreadsheets or other tools should they wish to replicate the futures prices as per the defined process.

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<sup>2</sup> Final futures price allocations will be rounded to the nearest \$0.01/MWh.

<sup>3</sup> Price Adjustment Factors used for preliminary calculation purposes will be expressed as a % rounded to 4 decimal places (e.g. a Price Adjustment Factor of -0.1554%). See Examples for more details.

## Examples.

### 1. Peak Strip Example – Australian Electricity

On 23rd May 2007 a Peak Strip (DNZ8) trades at a price of \$109.30.

1. The Peak futures allocation prices will be allocated as follows:
  - a. Strip MWh = PNH8 MWh + PNM8 MWh + PNU8 MWh + PNZ8 MWh = 3,795;
  - b. Strip price using ODSP = (Sum of: Peak futures price x Peak futures MWh) ÷ Peak Strip MWh.  
= (\$166 x 915 + \$88 x 945 + \$95.00 x 990 + \$90.00 x 945) ÷ 3,795 = \$109.1304
  - c. Strip Trade price = \$109.30
  
2. Adjust each peak futures price proportionally to achieve the target implied strip price:  
Peak price adjustment factor = (Strip Price - Strip price using ODSP) ÷ Strip price using ODSP  
= (\$109.30 - \$109.1304) ÷ 109.1304  
= 0.1554%

Quarter	ODSP Peak Futures price 22 <sup>nd</sup> May 07	Adjustment Factor - 0.1554%	Allocated Peak Futures Price (Preliminary)	Allocated Peak Futures Price (Final)
Q108	\$166.00	X (1 + 0.1554%) =	\$166.26	\$166.26
Q208	\$88.00	X (1 + 0.1554%) =	\$88.14	\$88.14
Q308	\$95.00	X (1 + 0.1554%) =	\$95.15	\$95.15
Q408	\$90.00	X (1 + 0.1554%) =	\$90.14	\$90.13

#### Notes.

1. An adjustment of the final (i.e. Q4 08) futures price by a (negative) \$0.01/MWh improves the accuracy of allocated strip price, hence the final allocated price for Q4 08 is \$90.13;
2. An equivalent methodology will be applied to allocate Base strips (e.g. HNZ9)

### 2. Off-peak Example – Australian Electricity

On 23rd May 2007 an Off-peak strip (ONZ8) executes at a price of \$49.00.

The Base futures allocation prices will equal the ODSPs of Base futures: BNH8 \$96.00, BNM8 \$65.60, BNU8 \$71.25, BNZ8 \$67.00.

The Peak futures allocation prices will be allocated as follows:

1. Calculate the implied peak strip price which when deducted (on an average MWh-weighted basis) from the implied Base strip price yields the Off-peak Strip Price.
  - a. Base Strip MWh = BNH8 MWh + BNM8 MWh + BNU8 MWh + BNZ8 MWh = 8,784;
  - b. Peak Strip MWh = PNH8 MWh + PNM8 MWh + PNU8 MWh + PNZ8 MWh = 3,795;
  - c. Off-peak Strip MWh = Base Strip MWh – Peak Strip MWh = 4,989;
  - d. Peak Strip price using ODSP = (Sum of: Peak futures price x Peak futures MWh) ÷ Peak Strip MWh.  
= (\$166 x 915 + \$88 x 945 + \$95.00 x 990 + \$90.00 x 945) ÷ 3,795 = \$109.1304
  - e. Target Implied peak strip price = [(Sum of: Quarter Base futures price x Quarter Base futures MWh) – (Off-peak Strip trade price x Off-peak Strip MWh)] ÷ Peak Strip MWh  
= \$109.0196
2. Adjust each peak futures price proportionally to achieve the target implied strip price:

Peak price adjustment factor = (Target Implied peak strip price - Peak Strip price using ODSP) ÷ Peak Strip price using ODSP  
= (\$109.0196 - \$109.1304) ÷ 109.1304  
= - 0.1016%

Quarter	ODSP Peak Futures price 22 <sup>nd</sup> May 07	Adjustment Factor 0.1016%	Allocated Peak Futures Price	Allocated Base Futures Price
Q108	\$166.00	X (1 - 0.1016%) =	\$165.83	\$96.00
Q208	\$88.00	X (1 - 0.1016%) =	\$87.91	\$65.60
Q308	\$95.00	X (1 - 0.1016%) =	\$94.90	\$71.25
Q408	\$90.00	X (1 - 0.1016%) =	\$89.91	\$67.00

Note. The allocated Peak and Base futures prices create a MWh-weighted implied Off-peak strip price of \$49.0008. No adjustment of the final (i.e. Q4 08) Peak futures price by an increment of \$0.01/MWh could improve the accuracy of allocated prices and is therefore not required in this example.

### 3. Base Strip Example - NZ Electricity

On 1<sup>st</sup> October 2008 a Benmore Base Strip (EFZ9) trades at a price of \$55.15

1. The Base futures allocation prices will be allocated as follows:

- Strip MWh = EEH9 MWh + EEM9 MWh + EEU9 MWh + EEZ9 MWh = 8,760;
- Strip price using ODSP = (Sum of: Base futures price x Base futures MWh) ÷ Base Strip MWh.  
= (\$59.40 x 2160 + \$50.34 x 2184 + \$73.49 x 2208 + \$36.80 x 2208) ÷ 8,760 = \$55.00
- Strip Trade price = \$55.15

2. Adjust each base futures price proportionally to achieve the target implied strip price:

Base price adjustment factor = (Strip Price - Strip price using ODSP) ÷ Strip price using ODSP  
= (\$55.15 - \$55.00) ÷ 55  
= 0.2727%

Quarter	ODSP Base Futures price 30 <sup>th</sup> Sep 08	Adjustment Factor - 0.2727%	Allocated Base Futures Price (Preliminary)	Allocated Base Futures Price (Final)
Q109	\$59.40	X (1 + 0.2727%) =	\$59.56	\$59.56
Q209	\$50.34	X (1 + 0.2727%) =	\$50.48	\$50.48
Q309	\$73.49	X (1 + 0.2727%) =	\$73.69	\$73.69
Q409	\$36.80	X (1 + 0.2727%) =	\$36.90	\$36.90

### 4. Gas Strip Example - Victorian Gas

On 1<sup>st</sup> October 2008 a Victorian Gas Strip (GYZ9) trades at a price of \$4.10

1. The Gas futures allocation prices will be allocated as follows:

- Strip GJ = GXH9 GJ + GXM9 GJ + GXU9 GJ + GXZ9 GJ = GXH9 days x 100 + GXM9 days x 100 + GXU9 days x 100 + GXZ9 days x 100 = 36,500 GJ;
- Strip price using ODSP = (Sum of: Base futures price x Base futures GJ) ÷ Base Strip GJ.

$$= (\$4.06 \times 9000 + \$4.05 \times 9100 + \$4.08 \times 9200 + \$4.12 \times 9200) \div 36,500 = \$4.08$$

c. Strip Trade price = \$4.10

2. Adjust each Gas futures price proportionally to achieve the target implied strip price:

Gas price adjustment factor = (Strip Price - Strip price using ODSP) ÷ Strip price using ODSP

$$= (\$4.10 - \$4.08) \div 4.08$$

$$= 0.4902\%$$

Quarter	ODSP Gas Futures price 30 <sup>th</sup> Sep 08	Adjustment Factor - 0.4902%	Allocated Gas Futures Price (Preliminary)	Allocated Gas Futures Price (Final)
Q109	\$4.06	X (1 + 0.4902%) =	\$4.08	\$4.08
Q209	\$4.05	X (1 + 0.4902%) =	\$4.07	\$4.07
Q309	\$4.08	X (1 + 0.4902%) =	\$4.10	\$4.10
Q409	\$4.12	X (1 + 0.4902%) =	\$4.14	\$4.15

Notes.

1. An adjustment of the final (i.e. Q4 09) futures price by a \$0.01/GJ improves the accuracy of allocated strip price, hence the final allocated price for Q4 09 is \$4.15;

## 6. Publication of Market Data resulting from Wholesale Trading

Once Block Trade Orders are accepted, the Exchange will publish details of the contract, price and volume (e.g. Block Trade Reg d: BOZ1 50 Lots @ 30.05) of all Block Trades via the message facility within 2 hours of registration of the Block Trade with ASX Clear (Futures). For Strip Trades registered by the Block Trades Facility the Exchange will only publish the quantity and price of the components legs.

The Exchange will publish EFP details in the following format (e.g. EFP Regd @ 09.55 50 BNH7 @ 47.50) via the ASX 24 Message Facility within 1 hour of the registration of the EFP deal with ASX Clear (Futures)

The Exchange will publish Strip Trade details (exact details below) via the Exchange's website within 2 hours of the registration of the Strip Trades deal with ASX Clear (Futures).

- Trade Date
- Trade Time
- Strip Contract
- Strip Price
- Strip Contract Components
- Strip Component prices
- Strip Component Volume

## 7. Acceptable Construction of Energy EFPs

For further details on the Exchange's EFP Trading please refer to Operating Rules Procedure 4800

With respect to EFP transactions in the Electricity and Gas contracts, where the Over The Counter (OTC) component of an EFP is within 10% of the size (eg MWhs / GJ ) or value, the Exchange will accept the following construction in relation to Electricity and Gas EFPs:

- OTC Swaps, Caps and / or Options against Electricity and Gas Futures and / or Futures Options.

## 8. Available Trading Hours for Energy Wholesale Trading

All Wholesale Trades in Energy Products may be registered during Open trading hours and up to 1 hour after close of trading for clearing in the same business day.

## 9. Daily Settlement Price determination process for Energy Futures

### Electricity and Victorian Wholesale Gas

The determination of the Daily Settlement Prices will comply with all of the below procedures.

- Daily Settlement Price (DSP) will not be generated at levels less competitive than outright orders at market close
- DSP will be generated from last traded price (including strip leg prices) where more competitive than orders at market close
- If last traded price is outside closing bid / ask spread DSP will be the extreme of the bid / ask spread closest to the last traded price

- Strip leg prices (excluding off-peak strip prices) traded at levels less than the minimum tick increment will be rounded to the closest full tick for settlement purposes.
- Off Peak Strip leg prices will not be used for DSP purposes
- In absence of trades or valid orders DSP will be prior settlement price
- On Listing Date, in the absence of trades or valid orders, the DSP will be equal to the DSP of the nearest same calendar month contract
- Block Trade prices will not be used for DSP determination

### Adjustments for Australian Electricity Cal Year Strip Strategy

- Daily settlement price (DSP) of calendar year strip strategies will not be generated at levels less competitive than the most competitive outright order or last trade.
- The implied calendar year price is derived using the hourly-weighted average price of each unadjusted daily settlement price from each of the underlying quarters which is determined based on the procedures described in 9 above, with the exception that unlike DSP's, the unadjusted Daily Settlement Prices are not rounded to the nearest 5c/MWh tick.
- If the implied calendar year price (as derived above) is less competitive than the most competitive outright order in the relevant strip, then the DSP of the relevant quarterly futures contracts will be adjusted in accordance with the following methodology:
  - Determine Adjusted Futures Leg Price (AFP) using an adjustment factor (A)<sup>4</sup> calculated as follows:
    - $A = (H-I)/I$ ; where
    - H = the DSP for the relevant calendar year strip
    - I = the implied calendar year strip price as defined in point 2 above.

For each relevant quarterly futures contract:

AFP = the unadjusted settlement price derived from the most competitive outright orders in a quarterly futures contract \* (1+A).

- Where an outright market order for a quarterly futures contract is more competitive than the AFP:
  - The AFP of the relevant quarterly futures contract will be readjusted as required to meet the most competitive outright order; and
  - The AFP of other relevant quarterly futures contracts will be proportionally adjusted as uniformly as possible (without breaching outright market orders) to achieve an *implied* calendar year price which is approximately equal to the DSP of the futures strip strategy; notwithstanding
  - If outright market orders in both (i) the futures strip strategy and (ii) the underlying quarterly futures contracts prevent the conditions above from being met (due to the existence of an arbitrage constraint), the DSP for all contracts will be set at the prices of the most competitive outright market orders.

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<sup>4</sup> The Adjustment Factor used for preliminary DSP purposes will be expressed as a % rounded to 4 decimal places (e.g. - 0.1554%).

### Adjustments for Cal Year Strips: Example 1 – Implied Calender Year Price is more competitive than the outright orders in the relevant strip strategy

Assuming the following hypothetical market orders were present as at market close on a particular trading day:

#### Calender Year Contract

Product Code	Contract Hours	Description	Bid	Offer	Last Trade	Previous DSP	Unadjusted Daily Settlement Price	Daily Settlement Price (DSP)
HQZ2	8784	QLD Electricity – Calender Year Strip,	53.40	53.80		53.23	53.40	53.58

#### Quarterly Contracts

Product Code	Contract Hours	Description	Bid	Offer	Last Trade	Previous DSP	Unadjusted Daily Settlement Price	Daily Settlement Price (DSP)
BQH2	2184	QLD Electricity – Quarter 1, 2012	69.00	70.50	69.75	69.70	69.75	69.75
BQM2	2184	QLD Electricity – Quarter 2, 2012	47.90	48.00	47.20	47.20	47.90	47.90
BQU2	2208	QLD Electricity – Quarter 3, 2012	49.00	49.40	49.30	49.05	49.30	49.30
BQZ2	2208	QLD Electricity – Quarter 4, 2012	47.00	47.60	47.50	47.10	47.50	47.50
<b>Implied Calender Year Price</b>							53.584	

In the above example, the calculated Implied Calender Year Price is within the Bid / Offer range of the outright market orders in the Calender Year Strip strategy, therefore the Calender Year Strip strategy will have a DSP set to the Implied Calender Year Price from the quarters of: **53.58**. The quarters do not need to be adjusted further.

**Adjustments for Cal Year Strips: Example 2 – Implied Calender Year Price is less competitive than the outright orders in the relevant strip strategy.**

Assuming the following hypothetical market orders were present on a particular trading day:

Calender Year Contract

Product Code	Contract Hours	Description	Bid	Offer	Last Trade	Previous DSP	Unadjusted Daily Settlement Price	Daily Settlement Price (DSP)
HOZ2	8784	QLD Electricity – Calender Year Strip,	53.40	53.50		53.23	53.40	53.50

Quarterly Contracts

Product Code	Contract Hours	Description	Bid	Offer	Last Trade	Previous DSP	Unadjusted Daily Settlement Price	Daily Settlement Price (DSP)
BQH0	2184	QLD Electricity – Quarter 1, 2012	69.00	70.50	69.75	69.70	69.75	69.60
BQM0	2184	QLD Electricity – Quarter 2, 2012	47.90	48.00	47.20	47.20	47.90	47.90
BQU0	2208	QLD Electricity – Quarter 3, 2012	49.00	49.40	49.30	49.05	49.30	49.20
BOZ0	2208	QLD Electricity – Quarter 4, 2012	47.00	47.60	47.50	47.10	47.50	47.40
<b>Implied Calender Year Price</b>							53.5840	53.4964

In the above example, the calculated Implied Calender Year Price is outside the Bid / Offer range of the outright market orders in the Calender Year Strip strategy, therefore the Calender Year Strip strategy has had the DSP set to the current Offer in the Calender Year . The underlying Quarters were then adjusted in accordance with the rules defined above as follows:

H =	53.50
I =	53.5840
A =	-0.1568%

Quarter 1 – Adjusted down to 69.60.

Quarter 2 – Not adjusted as the unadjusted Daily Settlement Price is already set at the same price as the Bid (and therefore cannot be adjusted down further)

Quarter 3 – Adjusted down to 49.20.

Quarter 4 – Adjusted down to 47.40.

### Adjustment for financial year electricity strip strategy

Daily Settlement Price (DSP) of financial year strip strategies will not be generated at levels less competitive than the market orders for outright strip strategy orders at market close.

If the *implied* strip price using the hourly-weighted average DSP of underlying quarterly futures is more competitive than the market orders in the outright futures strip strategy, the futures strip strategy settlement price will be generated from the *implied* strip price, rounded to the closest \$0.01/MWh.

*Note: A reference price is deemed "More competitive" than a market order if is greater than the bid and less than the offer where an order (bid, offer or both) exists.*

## 10. Daily Settlement Price determination process for Energy Options – Electricity and Victorian Wholesale Gas

The determination of the Daily Settlement Prices will comply with all of the below procedures.

- Daily Settlement Price (DSP) will be generated from last traded price, where more competitive than orders at market close
- If last traded price is outside closing bid / ask spread DSP will be the extreme of the bid / ask spread closest to the last traded price
- DSP will be generated using the At-the-Money (ATM) Volatility and the Black and Scholes pricing model
- ATM Volatility will be generated from i) last traded price ii) if more competitive ATM orders at market close
- ATM orders include ATM outright and basis Futures Puts, Calls and Straddle Orders (orders that are not ATM at market close will not be considered for ATM DSP generation)
- DSP will not be generated that are less competitive than outright orders at market close
- On Listing Date the Volatility level for generating DSP will be equal to the Volatility of the nearest shorter dated Contract
- A movement in ATM Volatility will be reflected in all Contract exercise prices, subject to valid orders at market close in the individual exercise prices
- DSP of Strike Prices will not settle at premium levels above that of same contract strikes that are further In-the-Money (ITM)
- Flat Volatility skews, determined from the ATM Volatility, will be maintained prior to generation of DSP
- Block Trade prices will not be used for DSP determination

## 11. Trade Cancellations

Participants should refer to the ASX 24 Operating Rules and Procedures to understand how trade cancellations occur. Participants should note that each trade that results from contingent orders i.e. spread orders is assessed on an individual basis. Therefore, it is possible that one leg of an executed contingent order may be cancelled while other legs stand.

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