



Enerdata (CGPR) Price Index and Assessment Methodologies

Canadian Enerdata Ltd. (Enerdata) is an independent energy information and consulting firm established in 1984. The company conducts confidential natural gas pricing surveys and calculates and publishes various price indices in the industry benchmark *Canadian Gas Price Reporter (CGPR)*.

Price Indices

Enerdata applies a set of criteria to each location to determine whether the price index calculated at that location is based on a reasonable number and volume of transactions. Enerdata monitors total volume and number of transactions at each location and applies the minimum threshold criteria as set out by FERC. (FERC set out conditions for a “flexible test” in a 2004 report, “Report On Natural Gas And Electricity Price Indices” PL03-3-004 Page 62, <http://www.ferc.gov/EventCalendar/Files/20040505135203-Report-Price-Indices.pdf>)

Enerdata may determine that more than one criterion must be met in certain circumstances to protect the privacy of data providers.

Day-ahead indices should meet at least one of the following conditions:

1. Daily volume traded of at least 25,000 mmBtu.
2. Daily number of transactions of five or more.
3. Daily number of counterparties of five or more.

Monthly indices should meet at least one of the following conditions:

1. Average daily volume traded of at least 25,000 mmBtu.
2. Average number of transactions of ten or more per month.
3. Average number of counterparties of ten or more per month.

In many cases, criterion 3 above is difficult, if not impossible, to apply as most of Enerdata’s Data Providers do not report counterparty information, citing trading contract confidentiality. Enerdata continues to encourage these Data Providers and their counterparties to sign a Counterparty Waiver.

Price Assessments

Enerdata notes that if at a given location reported in CGPR, there is consistently less than the minimum transaction and volume provided above, the published price should be considered by the user as an ‘assessment’ rather than an index. Such ‘price assessments’ are arrived at by Enerdata price editors using market information that are not based exclusively on actual transactions and include bids and offers, settlement prices, prices at comparable locations and information obtained from informed market participants. Locations reporting zero volume and transactions are based exclusively on such assessments. Locations reporting greater than zero volume and transactions but less than the minimums provided in the FERC guidelines may or may not include such price assessments.

A. NGX Price Indices

All AECO/AB-NIT Same Day, Month-Ahead and Month-Ahead Bidweek Price and Next Day Price Indices are calculated using physical, fixed price trades done exclusively on the Natural Gas Exchange (NGX) trading system based in Calgary. Price Indices for all other trading points are derived from a combination of physical fixed price data, Nymex basis data and transport basis data provided to Enerdata by various Data Providers in a confidential price survey.

In general, all Price Indices utilize volume-weighted averages either in the calculation of the Index or as a component of the calculation of the Index. Weighted averages are utilized in an effort to minimize any trading anomalies or distress trading activity that might otherwise distort the data sample. However, in some cases (such as the AECO (NGX AB-NIT) Same Day Indices), monthly arithmetic averages are reported along with the weighted averages based on established industry convention.

The volume weighted average price is calculated using the following methodology:

- a) Multiply the Transaction price by the Transaction quantity for each trade in the source data file.
- b) Sum the product(s) achieved in step (a).
- c) Sum the Transaction quantity for each trade in the source data file.
- d) Divide the sum from step (b) by the sum from step (c).

Volume Weighted Average Price = $\text{Sum (Price x Quantity) / Sum (Quantity)}$

The weighted average prices are calculated first by automated electronic routines and subsequently crosschecked against a manual calculation for accuracy. Once verified, the weighted average prices are used in the generation of the Price Indices.

Price Indices and assessments are published in the Canadian Gas Price Reporter Monthly and Daily and on the Enerdata website at www.enerdata.com

1. AECO (NGX AB-NIT) Same Day Indices

Enerdata publishes various Price Indices from the trading activity in the current intraday ("Same Day") and other short-term physical Products at AECO (or NGX AB-NIT). Trading information from such Products is used to populate the "NGX AB-NIT Same Day Index Table", which is published on p. 2 in the monthly edition of the Canadian Gas Price Reporter "CGPR"..

1.1 Index Diversity

The methodology by which the various Price Indices are established is contained in the summaries in section 1.4 below. The varied array of methodologies used in many of the Price Indices are the result of the diverse set of market participants that utilize them and are also a result of the gradual changes that the marketplace has made in the way that they

enter into Transactions in the spot markets.

1.2 Weekend#

The methodologies in section 1.4 below utilize the concept of the “Weekend#”, which refers to a row contained in the “NGX AB-NIT Same Day Index Table”. Weekend# is a value that is derived from trading on the Friday immediately preceding the weekend in the Product (the default Product is a three day instrument) that represents the daily gas delivery for the current Friday to the following Sunday (ie. A three-day Product that begins on the current Friday).

1.3 Month ending on a weekend or Statutory and Other Holidays

Various Products may be substituted as a suitable replacement for the default Product (“F3”) for the Weekend# during certain holidays in Canada and in the United States or because the month begins or ends on a weekend. Prior to any change that may significantly impact trading in Canada, which would require a change to the default for the Weekend#, NGX will publish a revised methodology regarding how the holiday will be treated with respect to the generation of the Indices.

1.4 Same Day Index Methodologies

NGX AB-NIT Same Day Index 1

The NGX AB-NIT Same Day Index 1 (“Index 1”) is determined by calculating the volume-weighted average of all the rows contained in the “NGX AB-NIT Same Day Index Table”. This includes all rows representing Same Day Product Transactions and rows representing the Weekend#.

NGX AB-NIT Same Day Index 1A

The NGX AB-NIT Same Day Index 1A (“Index 1A”) is determined by calculating the arithmetic average of the weighted average rows used in Index 1.

NGX AB-NIT Same Day Index 2

The NGX AB-NIT Same Day Index 2 (“Index 2”) is determined by calculating the volume-weighted average of the rows representing Same Day Product Transactions contained in the “NGX AB-NIT Same Day Index Table”. This index excludes the Weekend# rows.

NGX AB-NIT Same Day Index 2A

The NGX AB-NIT Same Day Index 2A (“Index 2A”) is determined by calculating the arithmetic average of the weighted average rows used in Index 2.

NGX AB-NIT Same Day Index 3

The NGX AB-NIT Same Day Index 3 (“Index 3”) is determined by calculating the volume-weighted average of selected rows contained in the “NGX AB-NIT Same Day Index Table”. The selected rows are those that represent Same Day Product Transactions on business days, and the Weekend# row once for each weekend. Saturday and Sunday trades are excluded from the calculation.

NGX AB-NIT Same Day Index 3A

The NGX AB-NIT Same Day Index 3A (“Index 3A”) is determined by calculating the arithmetic average of the weighted average rows used in Index 3.

NGX AB-NIT Same Day Index 4

The NGX AB-NIT Same Day Index 4 (“Index 4”) is determined by calculating the volume-weighted average of selected rows contained in the “NGX AB-NIT Same Day Index Table”. The selected rows are those that represent Same Day Product Transactions on business days, and the Weekend# row as a proxy for each day of the weekend. It is important to note that the Weekend# is typically counted twice in this calculation, once for Saturday and again

for Sunday.

NGX AB-NIT Same Day Index 4A

The NGX AB-NIT Same Day Index 4A (“Index 4A”) is determined by calculating the arithmetic average of the weighted average rows used in Index 4.

- A. for each Gas Day (Monday to Friday, inclusive) the daily weighted average for all same day Physical Transactions executed through the NGX Trading System at NGX AB-NIT; and
- B. the weighted average for Weekend # Physical Transactions executed through the NGX Trading System as a proxy for each Saturday and Sunday at NGX AB-NIT.

NGX AB-NIT Same Day Index 5

The NGX AB-NIT Same Day Index 5 (“Index 5”) is determined by calculating the volume-weighted average of selected rows contained in the “NGX AB-NIT Same Day Index Table”. The selected rows are those that represent Same Day Product Transactions Monday through Thursday, and the Weekend# row as a proxy for Friday and for each day of the weekend. It is important to note that the Weekend# is typically counted three times in this calculation, once for Friday, once for Saturday and again for Sunday.

NGX AB-NIT Same Day Index 5A

The NGX AB-NIT Same Day Index 5A (“Index 5A”) is determined by calculating the arithmetic average of the weighted average rows used in Index 5. In the event that the CGPR or Exchange does not report the required information to determine the NGX AB-NIT Same Day Index 5A hereunder, or the NGX AB-NIT Same Day Index 5A is otherwise not determinable, the price will be the price determined by Exchange based on the arithmetic average of:

- A. for each Gas Day (Monday to Thursday, inclusive) the daily weighted average for all same day Physical Transactions executed through the NGX Trading System at NGX AB-NIT; and
- B. the weighted average for all Weekend # Physical Transactions executed through the NGX Trading System as a proxy for Friday, Saturday or Sunday plus any Canadian statutory holidays that are included in the weekend Physical Transactions at NGX AB-NIT.

NGX AB-NIT Same Day Index 5A US

The NGX AB-NIT Same Day Index 5A US (“Index 5A US”) is determined by converting the daily Index 5A to US Dollars/MMBtu using the WM/Reuters 12NOON EST FX Benchmark.

2. AECO or NGX AB-NIT Month Ahead Indices

These indices are published in the Gas Price Summary Table on p. 11 of CGPR.

Three Price Indices are generated from the trading activity in the Product that represents daily gas delivery from the first day of the following month to the last day of the following month (i.e. “Near Month”, “Prompt Month”, or “One-Month Spot”) at AECO (NGX AB-NIT).

2.1 Index Data Source

All implied spread Transactions in the underlying Product will be included in the calculation of the Month Ahead Indices however all spread legs generated by the NGX Trading System as a result of time spread Transactions in the underlying Product will not be included in the calculation of the Month Ahead Indices.

2.2 Methodologies

NGX AB-NIT Month Ahead Index (7A)

The NGX AB-NIT Month Ahead Index (7A) is determined by calculating the volume-weighted average of all the Transactions during a calendar month in the Product that represents gas delivery for the following calendar month.

NGX AB-NIT Month Ahead Index (7A) US

The NGX AB-NIT Month Ahead Index (7A) US is determined by converting the NGX AB- NIT Month Ahead Index (7A) to US Dollars/MMBtu using the WM/Reuters 12NOON EST FX Benchmark as published on the first Canada/U.S. business day of the calendar month of the NGX AB-NIT Month Ahead Index (7A) US.

NGX AB-NIT Bidweek Index

The NGX AB-NIT Bidweek Index is determined by calculating the volume-weighted average of all the Transactions during the last five Canadian business days during a calendar month (“Bid Week”) in the Product that represents gas delivery for the following calendar month.

AB-NIT Bidweek Index US

The AB-NIT Bidweek Index US is determined by converting the NGX AB- NIT Bidweek Index to US Dollars/MMBtu using the WM/Reuters 12NOON EST FX Benchmark as published on the first Canada/U.S. business day of the calendar month of the AB-NIT Bidweek Index US.

3. Day Ahead or Next Day Indices

Enerdata publishes daily spot price indices from NGX daily trading activity, in the next-day Spot Day Product on Monday to Thursday and in the Weekend Product traded on Friday. These next day indices include:

- NGX Union-Dawn Day Ahead Index
- NGX AB-NIT Day Ahead Index
- NGX Spectra Station #2 Day Ahead Index
- NGX TCPL-Emerson Great Lakes Day Ahead Index
- NGX AB-NIT/TCPL-Empress Transport Day Ahead Index
- NGX APC-CREC Day Ahead Index, 4A

3.1 Day Ahead or Next Day Transport Indices

Daily spot Transport price indices from NGX daily trading activity, in the next-day Spot Day Product on Monday to Thursday and in the Weekend Product traded on Friday are also published. These next day indices are calculated by adding the NGX Transport Prices to NGX Union-Dawn Day Ahead Index:

- $\text{NGX Parkway Day Ahead Index} = (\text{NGX Union-Dawn-Parkway Transport Day Ahead Index} + \text{NGX Union-Dawn Day Ahead Index})$
- $\text{NGX TCPL-Iroquois Day Ahead Index} = (\text{NGX Union-Dawn-TCPL Iroquois Transport Day Ahead Index} + \text{NGX Union-Dawn Day Ahead Index})$
- $\text{NGX TCPL-St. Clair Day Ahead Index} = (\text{NGX TCPL-St.Claire-Union-Dawn Transport Day Ahead Index} + \text{NGX Union-Dawn Day Ahead Index})$
- $\text{NGX Enbridge CDA Day Ahead Index} = (\text{NGX Union Dawn/TCPL-ENBRG CDA Day Ahead Index} + \text{NGX Union-Dawn Day Ahead Index})$
- $\text{NGX TCPL-Niagara Day Ahead Index} = (\text{NGX Union-Dawn/TCPL-Niagara Transport Day Ahead Index} + \text{NGX Union-Dawn Day Ahead Index})$

A sample Next Day Price Index table for NGX Union-Dawn Spot Day Ahead Index is presented below:

NGX Union-Dawn Day Ahead Index						
June 2013 Clearing Date	Volume (BBtu)	Number of Transaction	Price (US\$/MMBtu)			Avg. Price C\$/GJ
			Low	High	Average	
Wkd Sat-Mon	1632.6	89	4.3500	4.4200	4.3942	4.3061
Tuesday 4	602.0	90	4.3100	4.3600	4.3285	4.2220
Wednesday 5	698.5	104	4.3000	4.3300	4.3113	4.2285
Thursday 6	685.8	99	4.2675	4.3150	4.2835	4.2000
Friday 7	762.5	97	4.1800	4.2600	4.2139	4.0891
Wkd Sat-Mon	2686.8	129	4.0875	4.1700	4.1230	3.9899
Tuesday 11	603.3	73	4.1325	4.1900	4.1583	4.0150
Wednesday 12	563.1	68	4.0750	4.0975	4.0853	3.9457
Thursday 13	457.3	65	4.0400	4.1000	4.0687	3.9343
Friday 14	774.5	109	4.0100	4.1000	4.0316	3.8862
Wkd Sat-Mon	2158.8	102	4.0525	4.1025	4.0840	3.9394
Tuesday 18	655.9	89	4.1050	4.1500	4.1229	3.9765
Wednesday 19	741.1	100	4.1900	4.2600	4.2105	4.0742
Thursday 20	951.1	118	4.2350	4.2800	4.2510	4.1045
Friday 21	619.2	73	4.1700	4.1975	4.1816	4.1168
Wkd Sat-Mon	1688.1	86	4.1050	4.1700	4.1182	4.0868
Tuesday 25	878.4	97	4.1200	4.1600	4.1351	4.1278
Wednesday 26	819.4	102	4.0600	4.1050	4.0831	4.0686
Thursday 27	630.1	76	4.0150	4.0700	4.0387	4.0075
Wkd Fri-Sun	2546.4	98	3.9500	4.0600	4.0314	4.0044
Total/Avg.	21154.9	1864	3.9500	4.4200	4.1585	4.0659

WKD Deals done on Friday to cover Saturday, Sunday and Monday and any statutory holidays that fall in conjunction with the weekend. @Denotes statutory holiday.

Source: Natural Gas Exchange

The next day spot gas price index tables such as the NGX Union-Dawn Spot Day Ahead Index table illustrated above provides a summary of the qualifying Transactions that comprise the Price Index. A volume-weighted average is calculated for each row. The monthly total for the daily spot gas price indices are determined by calculating the arithmetic average of the daily Product, weighted average rows (typically traded on Monday to Thursday), plus the weighted average of the WKD row typically traded on Friday. For Clarification, the row-representing weekend trading activity that occurred on Friday is not counted in the calculation. But the WKD row (representing the daily volume traded on Friday times the number of proxy days) is used in the calculation.

4. Statutory and Other Holidays

Prior to any Canadian statutory holiday, or prior to any U.S. holiday that significantly impacts trading in Canada, Enerdata publishes a methodology or holiday notices regarding how the holiday will be treated with respect to the generation of the Indices. Typically this will entail a substitution of the index that will represent the WKD in the table. Various Products may be substituted as a suitable replacement for the default Product (three day instrument) for the WKD during certain holidays in Canada and in the United States or because the month begins or ends on a weekend.

5. Enerdata Export and U.S. Price Indices

Enerdata directly receives Day Ahead and Month Ahead trading reports from market participants (Data Providers) at various Canadian/U.S. export/import locations and U.S. trading locations.

For the daily price survey, Data Providers report for each business day all firm, fixed-price physical deals completed for next day delivery at various locations in North America.

For the monthly price survey, bid-week is defined as the last five business days of each month. On each day of bid-week, Data Providers report all firm, fixed-price physical deals negotiated that day for next-month delivery. They also report all physical basis deals in which the basis value is negotiated and the price is set by the final closing value of the near-month NYMEX futures contract plus or minus the negotiated basis.

Data Providers list all transactions individually. In addition to the delivery point, Data Providers specify the price (US\$/MMBtu or, C\$/GJ), volume (MMBtu or GJ), source (company name), buy/ sell indicator, and trade date, start flow date, end flow date. Counterparty name and intermediary name (broker or trading platform) information is optional.

The U.S. bidweek and next day price indices appear in CGPR Monthly, (p. 13) and in CGPR Daily, respectively.