



Market Operations Bulletin 10-01 - November 18, 2010

Adjustments to Approved Verifiable Cost

Purpose

Market Participants who have approved verifiable costs for a Generation Resource can expect those costs to be adjusted twice a month. The purpose of this Market Bulletin is to detail the timing of those adjustments, where to find the adjusted values, data to be used for Nodal Go-Live, and an example of the adjustments.

Please refer to the Verifiable Cost Manual for additional details regarding the process and calculations for verifiable costs. The VC Manual exists at <http://nodal.ercot.com/readiness/golive>.

Background

There are three separate adjustments to approved verifiable costs, they are:

- Proxy Heat Rate (PHR) - Adjustments to Verified Startup Fuel Consumption per Start (AFCRS)
- Value of “x” - Adjustments to Verified Startup Fuel Consumption per Start (AFCRS) and Verified Fuel Consumption at LSL (VFCLSL)
- Emissions Costs - Adjustments to Verifiable Operation and Maintenance Expenses (VOMS, VOMLSL, and VOM above LSL)

Proxy Heat Rate

The ***first*** adjustment was approved by the Board of Directors on 9/15/2009 with NPPR 168 “Change the Definition of “Start-up” and Include the Fuel from Breaker Close to LSL in Startup Costs”. The adjustment to decrease the verified fuel consumption is based on a Proxy Heat Rate that approximates Real Time revenues received by Resources while ramping between breaker close and LSL.

The Proxy Heat Rate is calculated as follows:

$$\text{Proxy Heat Rate} = \text{Average ERCOT Hub Price} / \text{Average Fuel Index Price}$$

Variable	UOM	Comments
Proxy Heat Rate	MMBtu/MWh	
Average ERCOT Hub Price	\$/MWh	The simple average of the Day-Ahead ERCOT Hub Prices over a 14 calendar day period.
Average Fuel Index Price	\$/MMBtu	The simple average of the FIP over a 14 calendar day period.

These are the guidelines for determining the prices and posting timelines for the Proxy Heat Rate:

1. ERCOT calculates the Proxy Heat Rate for the next period based on the Average ERCOT Day-Ahead Hub prices and the Average Fuel Index Price published for a 14 day period. The 14 day period is determined based on the posting date for the new PHR. The 14 day period includes the 14 calendar days leading up to the 5 business days prior to the defined post date. In other words, count back 5 business days from the defined post date; from there count back 14 days to derive the dates of Hub prices period.
2. ERCOT is required to publish the Proxy Heat Rate on the Market Information System (MIS) Settlements Public area by the first and third Tuesdays of each month. The PHR that becomes effective on the first Tuesday of a month must be posted by the third Tuesday of the previous month. The PHR that becomes effective on the third Tuesday of a month must be posted by the first Tuesday of that month.
3. The effective days for the Proxy Heat Rate are the first and third Tuesdays of each month. Therefore there are two effective periods for the PHR within each month: the first Tuesday of the month through the Monday before the third Tuesday of the month, and the third Tuesday of the month through the Monday before the first Tuesday of the next month.
4. The PHR will be in the Public Reference Data Extract (PRDE) as the PRH Factor and Factor Value.

Value of "X"

The **second** adjustment was approved by the Board of Directors on 10/20/2009 with NPRR 174 "FIP Modifications in Verifiable Startup and Minimum Energy Cost and Recovery of Exceptional Fuel Costs during RUC Intervals". The adjustment is based on

a \$.50 fuel adder to account for the difference between spot gas prices and FIP as described in the Nodal Protocols. Because the ERCOT systems do not accommodate the increase to FIP on a daily basis, ERCOT will increase the Resource’s verified fuel consumption at Start Up and Minimum Energy by the value of “x”.

The Value of “x” is calculated as follows:

$$X = \$0.50 / \text{Fuel Index Price}$$

Variable	UOM	Comments
x	MMBtu	Fuel modification
FIP	\$/MMBtu	Fuel Index Price as defined by Section 2 of the ERCOT Protocols

These are the guidelines for determining the value and posting timelines for the Value of “x”:

1. The Fuel Index Price that is used to calculate the Value of “x” is the FIP from the Tuesday prior to the Value of “x” effective date.
2. The effective days for the Value of “x” are the first and third Tuesdays of each month. Therefore there are two effective periods for the Value of “x” within each month: the first Tuesday of the month through the Monday before the third Tuesday of the month, and the third Tuesday of the month through the Monday before the first Tuesday of the next month.
3. The Value of “x” will be in the Public Reference Data Extract (PRDE) as the VOX Factor and Factor Value.

Emissions Cost

The **third** adjustment implements ERCOT’s recalculation of each Resource’s emissions costs which is a portion of their approved Operation and Maintenance Expenses as allowed by the Nodal Verifiable Cost Manual. The Nodal Protocols allow Generation Resources to recover the costs of acquiring emission credits to comply with State and Federal environmental rules and regulations. These costs are allowed by the Protocols to be included in the O&M cost component of Verifiable Startup Costs, Verifiable Minimum Energy Costs and Verifiable Costs above LSL if the Resource elects to use the Incremental Heat Rate Curve for Real Time mitigation. The adjustment is based on the previous month’s average monthly emissions prices for SO₂ and NO_x, which are published by Argus Air Daily on the last business day of the previous month. ERCOT will replace the emission costs in the previously approved O&M verifiable costs totals.

Emissions costs are calculated as follows:

$$\text{SO}_2 = \text{PR/Allowance}$$

$$\text{NO}_x = \text{PR/Allowance}$$

Variable	UOM	Comments
PR	\$	Index Price per Allowance for NOx or SO ₂
Allowance	ton	Allowable by Federal regulation for NOx
Allowance	½ ton	Allowable by Federal regulation for SO ₂

1. The Emissions cost adjustment is calculated using the average monthly emissions prices for SO₂ and NOx as published by Argus Air Daily on the last business day of the month prior to the effective start date.
2. The new approved O&M Verifiable Costs will be made available to Filing Entities via their settlement extracts by the 5th Business Day of each month following the date of publication of the last of the index numbers being used for the month.
3. The effective period for use of these new emission costs will be the 3rd Tuesday of each month through the 3rd Monday of the following month.
4. The Emissions price per allowance (PPA) will be in the Public Reference Data Extract (PRDE) as PPASO and PPANO as a Factor and Factor Value.

Nodal Go-Live Process

ERCOT will follow the posting requirements according to the normal operating conditions schedule. However, the following two exceptions will be made:

1. The Proxy Heat Rate will be calculated using the normal condition timeline but ERCOT will calculate using zonal ERCOT Hub Prices until such time that nodal ERCOT Day-Ahead Hub Prices are available.
2. The QSE will receive the adjusted Verifiable Costs for the Go-Live sequence by email, as soon as practicable before 12/1/2010. After 12/1/2010 all the QSE's will receive their adjusted Verifiable Costs through the Settlement Input Data (SID) extract.

Schedule

Proxy Heat Rate

Post Date	Effective Operating Dates	Dates of Hub Prices
11/2 *	12/1 – 12/6	10/12 – 10/25
11/16 *	12/7 – 12/20	10/26 - 11/8
12/7	12/21 – 1/3	11/16 – 11/29
12/21	1 /4 - 1/17	11/30 – 12/13
1/4	1 /18 - 2/1	12/13 – 12/26

Note: From **POST** date, count back 5 business days. From there you count back 14 days to derive the Dates of Hub Prices period. This schedule is based on the normal operating procedures timeline, however the value did not actually post on 11/2 or 11/16. The Proxy Heat Rate value for the periods of 12/1-12/6 and 12/7-12/20 will be posted to MIS before 12/1/2010.

Value of “x”

Post Date	Effective Operating Dates	Date of Fuel Price
N/A	12/1 – 12/6	11/9
N/A	12/7 – 12/20	11/30
N/A	12/21 – 1/3	12/14
N/A	1/4 – 1/17	12/18
N/A	1/18 – 1/31	1/11

Note: Fuel Price is derived from the Tuesday prior to the first effective operating day.

Emissions

Extracts Date	Effective Operating Dates	Emission Prices
12/1	12/1 – 12/20	Average October
12/7	12/21 – 1/17	Average November
1/7	1/18 – 2/14	Average December

Note: Emission Price is derived from the average price which is posted on the last business day of the prior month.

Examples of Adjustment Calculations

Example of the Proxy Heat Rate as follows:

Proxy Heat Rate (MMBtu/MWh) = Average ERCOT Hub Price (in period)/Average Fuel Price Index (FIP)(\$/MMBtu)

Average ERCOT Hub Price 10/12-10/25 = \$27.85

Average Fuel Price Index 10/12-10/25 = \$3.432143

Proxy Heat Rate = \$27.85/\$3.432143 = 8.114876

Example of Fuel Adjustment to a Resource as follows:

Approved Fuel Rates

Billing Det	Description	Type	Fuel	Average Generation
AFCRS	Actual Fuel Consumption Rate per Start - Hot (MMBtu)	1	800.00	30.00
AFCRS	Actual Fuel Consumption Rate per Start - Intermediate (MMBtu)	2	900.00	35.00
AFCRS	Actual Fuel Consumption Rate per Start - Cold (MMBtu)	3	1000.00	46.00
VFCLSL	Verified Fuel Consumption Rate at LSL (MMBtu/MWh)	0	9.50	

PHR =
8.114876

Adjustment to Fuel Rate for PHR

Billing Det	Description	Type	Fuel - PHR * Avg Gen
AFCRS	Actual Fuel Consumption Rate per Start - Hot (MMBtu)	1	556.55
AFCRS	Actual Fuel Consumption Rate per Start - Intermediate (MMBtu)	2	615.98
AFCRS	Actual Fuel Consumption Rate per Start - Cold (MMBtu)	3	626.72

FIP
3.23

Where Fuel price is fuel index price for the Tuesday prior to effective day.

x
0.154798762

Value of X = \$0.50/ fuel price

Adjustment to Fuel Rate for value of x

Billing Det	Description	Type	Fuel * x
AFCRS	Actual Fuel Consumption Rate per Start - Hot (MMBtu)	1	123.84
AFCRS	Actual Fuel Consumption Rate per Start - Intermediate (MMBtu)	2	139.32
AFCRS	Actual Fuel Consumption Rate per Start - Cold (MMBtu)	3	154.80
VFCLSL	Verified Fuel Consumption Rate at LSL (MMBtu/MWh)	0	1.47

Final Adjusted Fuel Rates

Billing Det	Description	Type	Fuel adjusted for PHR + value of x adjustment
AFCRS	Actual Fuel Consumption Rate per Start - Hot (MMBtu)	1	680.39
AFCRS	Actual Fuel Consumption Rate per Start - Intermediate (MMBtu)	2	755.30
AFCRS	Actual Fuel Consumption Rate per Start - Cold (MMBtu)	3	781.51
VFCLSL	Verified Fuel Consumption Rate at LSL (MMBtu/MWh)	0	10.97

Example of Emission as follows:

Resource Name = **Unit 1**
 Month = **Any month**
 SO₂ (\$/allowance) = **6** (PR)

SO₂ Allowance = 1/2 Short Ton (lbs) = 1000 (A)

Calculate SO₂

Operating level

	Fuel Rate (MMBtu/start)	SO ₂ Emissions Rate (lb/MMBtu)	SO ₂ Emissions Cost (\$/start)
	(F)	(E)	F x E x PR / A
Hot Start	800	0.0006	0.0029
Intermediate Start	900	0.0006	0.0032
Cold Start	1000	0.0006	0.0036

Operating level

	Fuel Rate (MMBtu/MWh)	SO ₂ Emissions Rate (lb/MMBtu)	SO ₂ Emissions Cost (\$/MWh)
Min Energy @ LSL	10	0.0006	0.000036

1	9	0.0006	0.00
2	9.5	0.0006	0.0000
3	10	0.0006	0.0000
4	10.5	0.0006	0.0000
5	11	0.0006	0.0000
6	11.5	0.0006	0.0000
7	12	0.0006	0.0000
8	12.5	0.0006	0.0000
9	13	0.0006	0.0000
10	13.5	0.0006	0.0000

Resource Name = **Unit 1**

Month = **Any month**
 NO_x (\$/ton) = **300** (PR)

Allowance = Short Ton (or Ton) (lbs) = 2000 (A)

Calculate NO_x

Operating level

	Fuel Rate (MMBtu/start)	NO _x Emissions Rate (lb/MMBtu)	NO _x Emissions Cost (\$/start)
Hot Start	F 800	NO _x E 0.012	F x E x PR / A 1.4400
Intermediate Start	900	0.012	1.6200
Cold Start	1000	0.012	1.8000

Operating level

	Fuel Rate (MMBtu/MWh)	NO _x Emissions Rate (lb/MMBtu)	NO _x Emissions Cost (\$/MWh)
Min Energy @ LSL	10	0.012	0.0000

Operating > LSL

Point	IHR (MMBtu/MWh)	NO _x Emissions Rate (lb/MMBtu)	NO _x Emissions Cost (\$/MWh)
1	9	0.012	0.0162
2	9.5	0.012	0.0171
3	10	0.012	0.0180
4	10.5	0.012	0.0189
5	11	0.012	0.0198
6	11.5	0.012	0.0207
7	12	0.012	0.0216
8	12.5	0.012	0.0225
9	13	0.012	0.0234
10	13.5	0.012	0.0243

Increasing the O&M:

Operating level	Initial O&M (\$/start)	SO2 Emissions Cost (\$/start)	NOX Emissions Cost (\$/start)	Final O&M (\$/start)
	Initial + SO ₂ + NO _x			
Hot Start	2000	0.0029	1.4400	2001.44
Intermediate Start	2000	0.0032	1.6200	2001.62
Cold Start	2000	0.0036	1.8000	2001.80

Operating level	Initial O&M (\$/MWh)	SO2 Emissions Cost (\$/MWh)	NOX Emissions Cost (\$/MWh)	Final O&M (\$/MWh)
Min Energy @ LSL	4.85	0.000036	0	4.85

Operating > LSL	Point	Initial O&M (\$/MWh)	SO2 Emissions Cost (\$/MWh)	NOX Emissions Cost (\$/MWh)	Final O&M (\$/MWh)
	1	4.85	0.00	0.0162	4.87
2	0.0000		0.0171		
3	0.0000		0.0180		
4	0.0000		0.0189		
5	0.0000		0.0198		
6	0.0000		0.0207		
7	0.0000		0.0216		
8	0.0000		0.0225		
9	0.0000		0.0234		
10	0.0000		0.0243		
Average =			0.0203	Initial + Average	