Fuel Cost Policy Guidelines

Annual Review Period PJM Interconnection Version 2:
8/16/2019

Review Date_____ Fuel Cost Policy ID # _____ Replacement FCP ID # _____

□ Contact Information (Name, phone number, email, unit information including ID and name)

Unit Name: _____ Unit ID #: _____

Unit type: _____ Fuel Type:_____

□ $0 Cost Policy (Section X) (Remainder of checklist is not needed)

□ Fuel Costs (Section II)
- □ Power Purchase Agreement (PPA)
- □ Affiliate Supplier(s)_____
- □ Inventory (AND/OR) □ Replacement Cost
- □ Spot (AND/OR) □ Contract
- □ Transportation
- □ Natural Gas – Define Liquidity, GD1/GD2 regardless of IDO optionality
- □ Wind – RECs and PTCs information must be included
- □ Hydro – Pumped Storage Cost may be > $0 / Run of River Hydro Cost =$0
- □ Solid Waste, Biomass, Landfill Gas – Cost includes negative fuel prices if applicable

□ Offer update methodology and triggers (Section II)
- □ Day-Ahead □ Re-bid
- □ Intra-day □ Multi-day

□ Start-up, No-load, and Incremental Heat Input Value (Section III)
- □ Source of values
- □ Frequency of update
- □ Unit-specific Performance Factor (value other than 1)

□ Emissions Rates and Allowances - for all non-zero polices, state if included (Section IV)
- □ Not Utilized
- □ Source and update frequency of rates
- □ Source and update frequency of allowances

□ Maintenance Adders and Operating Costs - for all non-zero polices, state if included (Section V)
- □ Not Utilized
- □ "Costs are calculated in accordance with…"
- □ Update frequency

□ 10% Adder (Section VII)
- □ Not Utilized
- □ Usage specified in policy

□ Intraday Optionality (Section VIII)
- □ Opt-out
- □ Opt-in
- □ Intra-day validation (required)
- □ Secondary trigger (optional)

□ Documentation Language (Section IX)

□ Numerical Example – not required for $0 offers (Section X)

I. INTRODUCTION

This document is intended to provide general guidance for the level of detail requested in submitted Fuel Cost Policies. Detailed guidelines are contained in Manual 15 "Cost Development Guidelines".

Fuel Cost policies are used by PJM and the MMU to review and verify a unit's cost based offer. Fuel Cost Policies define the method used by the Market Seller to determine Total Fuel Related Costs. Fuel Cost policies shall include the method used by the Market Seller to calculate:

- Fuel Cost
- Fuel additives
- Emission allowance cost (if applicable), and;
- Approved Maintenance Adder
- Approved Operating Cost Adder

Fuel Cost policies should also include other items necessary to verify a unit's cost based offers. These can include:

- Performance Factor, Heat Rate, or Heat Input information
- Start Costs
- No Load Costs

Fuel Cost policies shall be submitted to PJM and the MMU through the MIRA application, or other system(s) made available for submission of such data.

II. FUEL COST CALCULATIONS

Market Sellers are responsible for establishing their own method of calculating delivered fuel costs, limited to inventoried cost, replacement cost, or a combination thereof. A Market Seller may elect to calculate fuel cost using actual cost (i.e. contract price), spot price, or a combination of actual cost and spot price. PJM expects the following information to be included in a fuel cost policy (whether the Market Seller is using inventoried cost, replacement cost, or a combination).

- The contract price must include the locational cost of fuel for the generating unit.
    - Fuel supplier contract must be supplied if contract fees are included in addition to the commodity cost
    - Entering into a new fuel supplier contract requires an update to the Market Sellers Fuel Cost Policy
- The pricing index used for spot price must be publicly available and reflect the locational cost of fuel for the generating unit.
- Detailed numerical example of the process, methodologies, and calculations used for determining a unit's fuel cost. (separate document)
    - A Market Seller will maintain and supply supporting documentation that would allow PJM or the MMU to confirm a specific day's Total fuel Related Costs, if requested.

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Additionally, Market Sellers must provide information on how fuel costs are estimated in the day-ahead market, whether offers are updated in the rebid period and intra-day period, as well as if offers are updated on non-business (weekends and holidays) days, and what the methodology and triggers for each of those offer updates include.

Details pertaining to information needed for the intra-day offer updates are contained in section XIII of this document.

- Day Ahead
  - Describe process for estimating fuel cost in the day-ahead market
  - Natural Gas units must indicate if GD1 and GD2 are used, or if a weighted average gas price is used across the entire electric day
- Rebid
  - Market Sellers must indicate if they are updating offers in the rebid period
  - Triggers for update and process for estimating fuel cost must be defined
- Intra-day
  - Market Sellers must indicate if they are updating offers in the intra-day period
  - Triggers for update and process for estimating fuel cost must be defined
- Non-business (multi-day)
  - Market Sellers must indicate if offers are updated on non-business days
  - Triggers for update and process for estimating fuel cost must be defined

Additional guidelines are also provided below for specific fuel types.

A) Natural Gas

Market Sellers shall provide the following additional information for natural gas fired units:

- Contract terms, if applicable, for gas procurement including any variations for timing and procurement.
- Spot price details, if applicable, such as index or broker quotes that would be used for cost determination.
  - Identify if using timely or intraday pricing (GD1/GD2) for Day-Ahead, Rebid, and Intraday (if applicable)
  - If using ICE, identify timeline of the observation on ICE
- Transportation and supply details such as relevant pipeline(s) or LDC(s), transportation charges or basis, types of transportation service used (firm/interruptible), and source points and intermediary points.
- Document any process changes used to address varying conditions such as weekends/holidays, change in season, extreme temperatures, and pipeline restrictions.
- Define liquidity standards for using pricing indices.
- Define the process or methodology for pricing natural gas during times of illiquidity.

B) Dual-Fuel

- A policy for each fuel type is required
- Units that co-fire more than one fuel shall weight average the cost of the fuel on a per MMBtu basis.

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C) Nuclear

Nuclear fuel costs shall be based on the dollars in FERC Account 518, less in-service interest charges (whether related to fuel that is leased or capitalized). This quantity shall be calculated in units of dollar per MMBtu, as forecasted for the applicable cycle.

D) Hydro and Pumped Storage

- Fuel costs for a Run-of-River hydro unit are typically zero.
- Pumped Storage fuel cost shall be calculated on a seven (7) day rolling basis by multiplying the real time LMP at the plant node by the actual power consumed when pumping divided by the pumping efficiency. The pumping efficiency is determined annually based on actual pumping operations or by Original Equipment Manufacturer (OEM) curves if annual data is not available.

E) Wind

Market Seller shall identify how they account for Renewable Energy Credits (RECs) and Production Tax Credits (PTCs).

F) Solar

The fuel costs for solar units are zero.

G) Energy Storage

The fuel costs for energy storage units are zero.

H) Solid waste, Bio-mass or Landfill gas

Market Seller shall include the costs of such fuels when calculating a fuel cost even when the cost of such fuel is negative. However, cost offers for such units are not required to be less than zero.

III. HEAT RATE AND PERFORMANCE FACTOR

The Marker Seller shall indicate the source and frequency of update for start-up, no-load, and incremental Heat Rates. Performance factors shall be provided to PJM. The Market Seller shall also indicate the method used in determining the performance factor and the frequency with which performance factors are updated. Performance factors can be modified by a seasonal performance factor to reflect ambient conditions.

IV. EMISSION ALLOWANCE COSTS

Market Seller must state its method for determining the cost of CO_2/ SO_2/NO_x emissions adders. This shall include:

- The type of emissions adders that are included in the cost-based offer.
- The source and frequency of updates for emissions rates.
- The source and frequency of updates for emissions allowances.
- Units with dual-fuel firing capability should use different emission allowance factors based on the CO_2/ SO_2/NO_x emitted for each particular fuel or fuel mix.
- Emission allowance calculation must be provided to PJM each year during the Annual Review period using by updating COA.

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V. OPERATING COSTS AND MAINTENANCE ADDERS

Market Sellers must indicate if they include Operating Costs &/or Maintenance Adders in their cost-based offer. If using a maintenance or Operating Cost adder, the policy must state the frequency of update for these costs and that the costs are calculated in accordance with Manual 15 and Schedule 2 of the Operating Agreement. Operating Cost & Maintenance Adder calculations must be provided to PJM each year during the Annual Review period using the template provided by PJM.

VI. INCREMENTAL ADJUSTMENT PARAMETER COST

The Market Seller shall identify any other incremental costs associated with operating the unit that are included in the development of a unit's cost offer, and developed in accordance with Manual 15 and Schedule 2 of the Operating Agreement.

VII. 10% ADDER

Market Seller must specify if the 10% adder is included in the cost-based incremental offer.

VIII. INTRADAY OPTIONALITY

Market Sellers must specify in their Fuel Cost Policy if they elect to opt-in to Intraday Offers. If a Market Seller plans to opt-in and opt-out periodically throughout the year, then the Fuel Cost Policy must describe how the fuel is priced when opting-in.

Opt-In Language

(Market Seller) will opt-in to Intraday Offers for the unit(s) referenced in this Fuel Cost Policy. (Market Seller) will validate cost-based offers during the operating day, and update their cost-based offer intraday if costs change from original cost input used to create the day-ahead cost offer. The Intraday validation will be completed within the time period beginning (HH:MM time-zone) and ending (HH:MM time-zone). Cost-based offers may be increased but must be decreased based on the updated commodity cost at the time of validation.

(Market Seller) will validate and update the cost-based offer based on the following process: *(Describe Intraday validation and update process or refer to Monitoring Analytics template for guidance on update process).*

- *Intraday Validation – REQUIRED*
- *Secondary trigger, for a [% or $] change in commodity cost for a specified time period, if applicable – NOT REQUIRED*
  - *Hot or Cold weather alerts*
  - *RTO load forecast greater than 125,000 MW in the winter months;*

Dual-fuel units that opt-in with oil or coal as a secondary fuel, are not required to update the secondary fuel cost schedule intra-day.

- *(Market Seller) will opt-in to Intraday Offers but not update cost-based offers intraday for the oil and coal based fuels.*

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IX. DOCUMENTATION

The Market Seller will maintain all documentation needed to verify the development of cost-based energy offers and validate offers intraday. The documentation may include, but is not limited to, invoices, contracts, screenshots, instant messages, text messages, e-mails, or recorded phone calls. This information may be requested by PJM or the IMM to verify the development of cost-based energy offers. This information will be kept for a minimum of two years.

X. ZERO COST OFFERS

The submitted cost-based offers for starts, no-load, and incremental energy will always be less than or equal to zero ($0/MWh).

If the offer is less than zero, the Market Seller should provide a description for why the cost is negative. Example: RECs or other emission credits.

XI. NUMERICAL EXAMPLE

All fuel cost policies for non-$0 cost-based offers are required to provide a numerical example. Numerical examples shall include the following elements such that PJM or the IMM can accurately reconstruct the Market Seller's cost-based offer:

- **START COST**
  - The Market Seller shall provide an example of the Start Cost calculation in the numerical example. This example shall identify:
    - Start fuel (MMBtu)
      - Combined Cycle units shall demonstrate that they are subtracting the net energy output of the CTs prior to ST synchronozation.
    - Station Service (MWh)
    - Start Maintenance Adder ($)
    - Start Additional labor Cost ($)

- **NO-LOAD COST**
  - Each unit's No-Load fuel cost shall be developed using a regression analysis from the unit's heat input curve. The Market Seller shall provide PJM and the MMU the No-Load Fuel (MMBtu) calculated. The Market Seller shall also provide an example of the No-Load Cost calculation. Any No-Load cost adjustments necessary to create a monotonically increasing incremental offer curve shall also be identified.

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Revision History

Revision 1 (08/07/2019)
Author: Melissa Pilong
Reviewer: Glen Boyle

- To comply with FERC Order on VOM
  - VOM adder updated to Maintenance Adder and Operating Cost Adder
  - Other Fuel Related Cost Section removed from policies and replaced with submission of Operating Costs to PJM and the IMM via the VOM template
- Requirement added for fuel contract to be supplied when contract-related fees are added to the cost-based offer estimate (this is for validation of allowable costs)
- Requirement for a new Fuel Cost Policy to be submitted when entering into a new fuel supplier contract (this is so that PJM can verify that the fuel supplier is independent)

Revision 2 (08/16/2019)
Author: Jennifer Freeman
Reviewer: Melissa Pilong

- Rearrangement and additional clarity on each section
- Requirement for Combined Cycles to demonstrate that they are subtracting the net energy output of the CTs prior to ST synchronozation when calculating start-up cost