

**Draft Fuel Cost Policy/Cost Based-Offer Revisions - For Discussion Purposes Only**  
**Special MIC, August 4, 2016**

**Operating Agreement, Schedule 1**

(a) Each Market Participant obligated to sell energy on the PJM Interchange Energy Market at cost-based rates may include the following components or their equivalent in the determination of costs for energy supplied to or from the PJM Region:

For generating units powered by boilers

Firing-up cost

Peak-prepared-for maintenance cost

For generating units powered by machines

Starting cost from cold to synchronized operation

For all generating units

Incremental fuel cost

Incremental maintenance cost

No-load cost during period of operation

Incremental labor cost

Other incremental operating costs

For a generating unit that is subject to operational limitations due to energy or environmental limitations imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff), the Market Participant may include in the calculation of its “other incremental operating costs” an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant’s Energy Market Opportunity Cost.

For a generating unit that is subject to operational limitations because it only has a limited number of starts or available run hours resulting from (i) the physical equipment

limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, or (ii) a fuel supply limitation, for up to one year, resulting from an event of Catastrophic Force Majeure, the Market Participant may include in the calculation of its “other incremental operating costs” an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time in which the unit is bound by the referenced restrictions, and subtract therefrom the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Non-Regulatory Opportunity Cost shall be zero.

(b) All fuel costs shall employ the marginal fuel price experienced by the Member.

(c) The PJM Board, upon consideration of the advice and recommendations of the Members Committee, shall from time to time define in detail the method of determining the costs entering into the said components, and the Members shall adhere to such definitions in the preparation of incremental costs used on the Interconnection.

(d) A Market Seller may only submit a cost-based offer into the PJM Interchange Energy Market above \$0/MWh for a generation resource if it has a PJM-approved Fuel Cost Policy for such generation resource. PJM shall not accept cost-based offers for a generation resource that does not have a PJM-approved Fuel Cost Policy. If a Market Seller does not have a PJM-approved Fuel Cost Policy for a generation Capacity Resource, such resource will not be permitted to submit cost-based offers into the PJM Interchange Energy Market, and the Market Seller will be subject to the greater of the Capacity Resource Deficiency Charge or Non-Performance Charge pursuant to Tariff, Attachment DD, sections 8 and 10A.

(e) A Market Seller shall provide a Fuel Cost Policy to PJM and the Market Monitoring Unit for each generation resource that it intends to offer into the PJM Interchange Energy Market, for each fuel type utilized by the resource. The Market Seller shall submit the initial Fuel Cost Policy for a generation resource to PJM and the Market Monitoring Unit for review by no later than 45 days prior to the unit’s initial submittal of a cost-based offer. PJM shall consult with the Market Monitoring Unit, and consider any input and advice received from the Market Monitoring Unit, in its determination of whether to approve a Market Seller’s Fuel Cost Policy. After it has completed its evaluation of the request, PJM shall notify the Market Seller in writing, with a copy to the Market Monitoring Unit, whether the Fuel Cost Policy is approved or rejected. If PJM rejects a Market Seller’s Fuel Cost Policy, PJM must include an explanation for why the Fuel Cost Policy was rejected in its written notification.

- (f) PJM shall review and approve a Fuel Cost Policy if it:
- (i) Provides information sufficient for the verification of the Market Seller's fuel procurement practices, as further described below and in PJM Manual 15, and how those practices are utilized to determine cost-based offers the Market Seller submits into the PJM Interchange Energy Market;
  - (ii) Reflects the Market Seller's applicable commodity and/or transportation contracts to the extent it holds such contracts, and sets forth all applicable indices as a measure that PJM can use to verify how anticipated spot market purchases are utilized in determining fuel costs;
  - (iii) Provides a detailed explanation of the basis for and reasonableness of any applicable adders included in determining fuel costs in accordance with PJM Manual 15;
  - (iv) Accounts for situations where applicable indices or other market measures are not sufficiently liquid by documenting the alternative means actually utilized by the Market Seller to price the applicable fuel used in the determination of its cost-based offers, such as documented quotes for the procurement of natural gas; and
  - (v) Adheres to all requirements of PJM Manual 15 applicable to the generation resource.
- (g) To the extent a Market Seller proposes alternative measures to document its fuel costs in its Fuel Cost Policy for a generation resource, the Market Seller shall explain how such alternative measures are comparable or superior to the above standard, accounting for the unique circumstances associated with procurement of fuel to supply the generation resource.
- (h) If PJM determines that a Fuel Cost Policy does not contain adequate support for any portion of such policy, PJM shall reject the Fuel Cost Policy, in whole or in part. A Market Seller shall not include in its Fuel Cost Policy any cost, methodology or calculation that PJM has not approved.
- (i) If after PJM has approved a Fuel Cost Policy, it determines that such policy is no longer consistent with this Schedule and PJM Manual 15, PJM may revoke its approval of a Fuel Cost Policy and Market Seller shall be required to submit a new Fuel Cost Policy for approval.
- (j) Each Market Seller shall include in its Fuel Cost Policy the following information, as further described in the applicable provisions of PJM Manual 15:
- (i) For all Fuel Cost Policies, regardless of fuel type, the Market Seller shall provide a detailed explanation of the Market Seller's established method of calculating fuel costs,

indicating whether fuel purchases are subject to a contract price and/or spot pricing, and specifying how it is determined which of the contract prices and/or spot market prices to use. The Market Seller shall include its method for determining commodity, handling and transportation costs.

(ii) For Fuel Cost Policies applicable to generation resources using a fuel source other than natural gas, the Market Seller shall adhere to the following guidelines:

1. Fuel costs for solar, Energy Storage Resources and run-of-river hydro resources shall be zero.
2. Fuel costs for nuclear resources shall not include in-service interest charges whether related to fuel that is leased or capitalized.
3. For Pumped Storage Hydro resources, fuel cost shall be determined based on the amount of energy necessary to pump from the lower reservoir to the upper reservoir.
4. For wind resources, the Market Seller shall identify how it accounts for renewable energy credits and production tax credits.
5. For solid waste, bio-mass and landfill gas resources, the Market Seller shall include the costs of such fuels even when the cost is negative.

(iii) For emissions costs, Market Sellers shall report the emissions rate of each generation resource, the method for determining the emissions allowance cost, and the frequency of updating emission rates.

(iv) A Fuel Cost Policy may include any applicable Maintenance Adders. Such adders must be reviewed at least annually by the Market Seller and be changed if they are no longer accurate. Maintenance Adders cannot include any costs that are included in the generation resource's Avoidable Cost Rate.

(v) Market Sellers shall report, for all of the generation resource's operating modes, fuels, and at various operating temperatures, the incremental, no load and start heat requirements, the method of developing heat inputs, and the frequency of updating heat inputs.

(vi) A Fuel Cost Policy shall include any applicable unit specific performance factors, and the method used to determine them, which may be modified seasonally to reflect ambient conditions.

(vii) A Fuel Cost Policy shall include the cost-based Start Cost calculation for the generation resource, and identify for each temperature state the starting fuel (MMBtu), station service (MWh), start Maintenance Adder, and any Start Additional Labor Cost.

(viii) A Fuel Cost Policy shall also include any other incremental operating costs included in a Market Seller's cost-based offer for a resource, including but not limited to the consumables used for operation and the marginal value of costs in terms of dollars per MWh or dollars per unit of fuel, along with all applicable descriptions, calculation methodologies associated with such costs, and frequency of updating such costs.

(k) On an annual basis, all Market Sellers will be required to either submit to PJM and the Market Monitoring Unit an updated Fuel Cost Policy that complies with this Schedule 2 and PJM Manual 15, or confirm that their currently effective Fuel Cost Policy remains compliant, pursuant to the procedures and deadlines specified in PJM Manual 15. Market Sellers must submit such information by no later than June 15 of each year. PJM shall consult with the Market Monitoring Unit, and consider any input received from the Market Monitoring Unit, in its determination of whether to approve a Market Seller's updated Fuel Cost Policy. After it has completed its evaluation of the request, PJM shall notify the Market Seller in writing, with a copy to the Market Monitoring November 1. If PJM rejects a Market Seller's updated Fuel Cost Policy, in its written notification, PJM must provide an explanation for why the Fuel Cost Policy was rejected. If a Market Seller desires to update its Fuel Cost Policy, or PJM determines that the Market Seller must update its Fuel Cost Policy, outside of the annual review process, the Market Seller shall follow the applicable processes and deadlines specified in PJM Manual 15.

(l) If PJM determines that a Market Seller is not following any of the processes or deadlines outlined in PJM Manual 15, PJM will notify the Market Seller of such determination in writing. If the Market Seller continues to not follow such processes or deadlines, the Market Seller shall be assessed a penalty of \$5,000 per generation resource for each Operating Day in which it is not adhering to such processes or deadlines.

(m) If upon review of a Market Seller's cost-based offer, PJM determines that the offer is not in compliance with the Market Seller's PJM-approved Fuel Cost Policy, or the Market Monitoring Unit determines that the offer is not in compliance with any provision of the Market Seller's PJM-approved Fuel Cost Policy and PJM agrees with the Market Monitoring Unit's determination, the Market Seller shall be subject to the following penalties:

(i) If PJM is able to determine what the cost-based offer would have been if it had been submitted in compliance with the approved Fuel Cost Policy, and there were no instances in which the Market Seller received compensation under any applicable PJM rules in excess of that which would have been received under a compliant cost-based offer, PJM shall issue the Market Seller a formal written warning for the first non-compliant cost-based offer, and shall penalize

the Market Seller \$5,000 per resource for every additional non-compliant cost-based offer submitted during the same Delivery Year. All charges collected pursuant to this provision shall be allocated pursuant to PJM Tariff, Schedule 9.

(ii) If PJM is able to determine what the cost-based offer would have been if it had been submitted in compliance with the approved Fuel Cost Policy, and there were instances in which the Market Seller received compensation under any applicable PJM rules in excess of what would have been received under a compliant cost-based offer, the Market Seller shall be assessed a penalty equal to \$5,000 per resource, per occurrence, plus 1.5 times the difference between what the Market Seller was paid for each instance and what it would have been paid if its cost-based offer had been submitted in accordance with its approved Fuel Cost Policy. All charges collected pursuant to this provision shall be allocated pursuant to PJM Tariff, Schedule 9.

(n) Nothing in this Schedule 2 is intended to give PJM authority to make market power determinations, nor abrogate or in any way alter the responsibility of the Market Monitoring Unit to make determinations about market power pursuant to PJM Tariff, Attachment M and Attachment M-Appendix.

## **Tariff, Section 1**

Maintenance Adder: “A ‘Maintenance Adder’ is an adder that may be included to account for variable operation and maintenance expenses in a Market Seller’s Fuel Cost Policy. The Maintenance Adder is calculated in accordance with the applicable provisions of PJM Manual 15, and may only include expenses incurred as a result of electric production.”

Heat Rate Curve: “A Heat Rate Curve equals the MBTU content of the heat input divided by the MWh of power output.”

Start Additional Labor Costs: “Additional labor costs for startup required above normal station manning levels.”

Fuel Cost Policy: Fuel Cost Policy is the document provided by a Market Seller to PJM and the Market Monitoring Unit in accordance with PJM Manual 15 which reflects the Market Seller’s methodologies used to price fuel and compute the Market Seller’s total fuel-related costs applicable to cost-based offers for a generation resource.

## **Tariff, Attachment DD**

### **8. CAPACITY RESOURCE DEFICIENCY CHARGE**

#### **8.1**

A Capacity Resource Deficiency Charge shall be assessed on any Capacity Market Seller that commits a Capacity Resource, and on any Locational UCAP Seller that sells Locational UCAP for a Delivery Year based on a Generation Capacity Resource, for a Delivery Year that is unable or unavailable to deliver Unforced Capacity for all or any part of such Delivery Year for any reason, including but not limited to the following, and that does not obtain replacement Unforced Capacity meeting the same locational requirements and same or better temporal availability characteristics (i.e., Annual Resource, Extended Summer Demand Resource, or Limited Demand Resource) in the megawatt quantity required to satisfy the capacity committed from such resource by such seller as a result of all cleared Sell Offers from such seller based on such resource in any RPM Auctions for such Delivery Year, the reduction in any such commitment for such resource to the extent and for the time period of any replacement capacity committed in lieu of such resource, and the increase in any such commitment for such resource to the extent and for the time period that such resource is committed as replacement capacity for any other resource:

a) Unit Derating – Such Capacity Resource is a Generation Capacity Resource and its capacity value is derated prior to or during the Delivery Year;

b) EFORD Increase – Such Capacity Resource is a Generation Capacity Resource and the EFORD value determined for such resource at least two (2) months prior to the Third

Incremental Auction is higher than the EFORD value submitted in the Capacity Market Seller's cleared Sell Offer;

c) External Generation Resource – Such Capacity Resource is an Existing Generation Capacity Resource that is located outside of the PJM Control Area and arrangements for the firm delivery of the output of such resource to the interface with the PJM Region are not in place for such resource prior to the start of the Delivery Year;

d) Planned Generation Resource – Such Capacity Resource is a Planned Generation Capacity Resource and Interconnection Service has not commenced as to such resource prior to the start of the Delivery Year;

e) Planned Demand Resource - Such Capacity Resource is a Planned Demand Resource or an Energy Efficiency Resource and the associated demand response program or energy efficiency measure is not installed prior to the start of the Delivery Year; or

f) Existing Demand Resource – Such Capacity Resource is an existing Demand Resource or Energy Efficiency Resource and, subject to section 8.4, is not capable of providing the megawatt quantity of load response specified in the cleared Sell Offer for the time periods of availability associated with the product type.

A Capacity Resource Deficiency Charge shall also be assessed on any Capacity Market Seller that commits a Capacity Resource, and on any Locational UCAP Seller that sells Locational UCAP for a Delivery Year based on a Generation Capacity Resource, that does not have a PJM-approved Fuel Cost Policy for all or any part of a Delivery Year.

#### **10A. CHARGES FOR NON-PERFORMANCE AND CREDITS FOR PERFORMANCE**

(a) For the 2018/2019 Delivery Year and any subsequent Delivery Year (and for certain purposes for the 2016/2017 and 2017/2018 Delivery Years as provided in subsections (h) and (i) hereof), each Capacity Market Seller that commits a Capacity Resource for a Delivery Year (whether through an RPM Auction, a bilateral transaction, or as Locational UCAP), and each Locational UCAP Seller that sells Locational UCAP from a Capacity Resource for a Delivery Year, shall be charged to the extent the performance of each of its committed Capacity Resources during all or any part of a clock-hour when an Emergency Action is in effect falls short of the expected performance of such resources (as determined herein) and the revenue from such charges shall be provided to Market Participants with generation or demand response resources that perform during such hour in excess of the level expected based on commitments (if any) of such resources.

(b) Performance shall be measured for purposes of this assessment during each Performance Assessment Hour.

(c) For each Performance Assessment Hour, the Office of the Interconnection shall

determine whether, and the extent to which, the actual performance of each Capacity Resource and Locational UCAP has fallen short of the performance expected of such committed Capacity Resource, and the magnitude of any such shortfall, based on the following formula:

Performance Shortfall = Expected Performance - Actual Performance

Where the result of such formula is a positive number and where:  
Expected Performance =

for Generation Capacity Resources (including external Generation Capacity Resources for any Performance Assessment Hour for which the Emergency Action was declared for the entire PJM Region) and Capacity Storage Resources: [(Resource Committed Capacity \* the Balancing Ratio)];

where

Resource Committed Capacity = the total megawatts of Unforced Capacity of the Capacity Resource committed by such Capacity Market Seller or Locational UCAP Seller; and

The Balancing Ratio = (All Actual Generation Performance, Storage Resource Performance, Net Energy Imports and Demand Response Bonus Performance) / (All Committed Generation and Storage Capacity); provided, however, that Net Energy Imports shall be included in the calculation of the Balancing Ratio only for any Performance Assessment Hour for which the Emergency Action was declared for the entire PJM Region; and provided further that the Balancing Ratio shall not exceed a value of 1.0.

for purposes of which

All Committed Generation and Storage Capacity = the total megawatts of Unforced Capacity of all Generation Capacity Resources (including external Generation Capacity Resources for any Performance Assessment Hour for which the Emergency Action was declared for the entire PJM Region) and all Capacity Storage Resources committed by all Capacity Market Sellers, FRR Entities, Locational UCAP Sellers;

All Actual Generation Performance and Storage Resource Performance = the total amount of Actual Performance for all generation resources (including external Generation Capacity Resources for any Performance Assessment Hour for which the Emergency Action was declared for the entire PJM Region) and storage resources during the interval;

Net Energy Imports = the sum of interchange transactions importing energy into PJM (not including those associated with external Generation Capacity Resources and therefore included in All Actual Generation Performance) minus the sum of

interchange transactions exporting energy out of PJM, but not less than zero;

Demand Response Bonus Performance = the sum of Bonus performance provided by Demand Response resources as calculated in (g) below;

and for Demand Resources, Energy Efficiency Resources, and Qualifying Transmission Upgrades: Resource Committed Capacity;

where

Resource Committed Capacity = the total megawatts of capacity committed from such Capacity Resource committed capacity without making any adjustment for the Forecast Pool Requirement

and

Actual Performance =

for each generation resource **with a PJM-approved Fuel Cost Policy**, the metered output of energy delivered by such resource plus the resource's real-time reserve or regulation assignment, if any, during the Performance Assessment Hour;

**for each generation resource that does not have a PJM-approved Fuel Cost Policy, zero megawatt output;**

for each storage resource, the metered output of energy delivered by such resource plus the resource's real-time reserve or regulation assignment, if any, during the Performance Assessment Hour;

for each Demand Resource, the demand response provided by such resource, plus such resource's real-time reserve or regulation assignment, if any, during the Performance Assessment Hour, as established through the PJM demand response settlement procedure consistent with the standards specified in Schedule 6 of the RAA;

for each Energy Efficiency Resource, the load reduction quantity approved by PJM subsequent to the pre-delivery year submittal of a post-installation measurement and verification report; and

for each Qualified Transmission Upgrade, the megawatt quantity cleared by such Qualified Transmission Upgrade if it is in service during the Performance Assessment Hour, and zero if it is not in service during such Performance Assessment Hour.

Such calculation shall encompass all resources located in the area defined by the Emergency Action; provided, however, that Performance Shortfall shall be calculated for external

Generation Capacity Resources for any Performance Assessment Hour for which the Emergency Action was declared for the entire PJM Region. For purposes of this provision, Qualifying Transmission Upgrades shall be deemed to be located in the Locational Deliverability Area into which such upgrade increased the Capacity Emergency Transfer Limit, and a Qualifying Transmission Upgrade shall be included in calculations of Expected Performance and Actual Performance only if, and to the extent that, the declared Emergency Action encompasses the Locational Deliverability Area into which such upgrade increased the Capacity Emergency Transfer Limit. The Performance Shortfall shall be calculated for each Performance Assessment Hour, and any committed Capacity Resource for which the above calculation produces a negative number for a Performance Assessment Hour shall not have a Performance Shortfall for such Performance Assessment Hour. For any resource that is partially committed as a Capacity Performance Resource and partially committed as a Base Capacity Resource, the performance of such resource during a Performance Assessment Hour shall first be attributed to the resource's Capacity Performance Resource obligation; any performance by such resource in excess of the Capacity Performance Resource's Expected Performance shall be attributed to the resource's Base Capacity Resource obligation.

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### **Tariff, Attachment K-Appendix/Operating Agreement, Schedule 1**

#### **1.10.1A Day-ahead Energy Market Scheduling.**

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(d) Market Sellers wishing to sell into the Day-ahead Energy Market shall submit offers for the supply of energy (including energy from hydropower units), demand reductions, Regulation, Operating Reserves or other services for the following Operating Day. Offers shall be submitted to the Office of the Interconnection in the form specified by the Office of the Interconnection and shall contain the information specified in the Office of the Interconnection's Offer Data specification, this Section 1.10.1A(d), Schedule 2 of the Operating Agreement, and the PJM Manuals, as applicable. Market Sellers owning or controlling the output of a Generation Capacity Resource that was committed in an FRR Capacity Plan, self-supplied, offered and cleared in a Base Residual Auction or Incremental Auction, or designated as replacement capacity, as specified in Attachment DD of the PJM Tariff, and that has not been rendered unavailable by a Generator Planned Outage, a Generator Maintenance Outage, or a Generator Forced Outage, **and that is not prohibited from submitting cost-based offers in the PJM Interchange Energy Market for a resource because it does not have a PJM-approved Fuel Cost Policy for such resource**, shall submit offers for the available capacity of such Generation Capacity Resource, including any portion that is self-scheduled by the Generating Market Buyer.

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