



Nuclear Regulatory Commission
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ERCOT Protocols Section 6: Ancillary Services

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Where:

URC_{iz}	Uninstructed Resource Charge for that QSE per zone per Settlement Interval
ZUD_{izq}	Zonal Uninstructed Deviation for that QSE per zone per Settlement Interval
$MCPE_{iz}$	Market Clearing Price for Energy in that zone of that Settlement Interval
UF_i	Uninstructed Factor determined in accordance to deployed regulation

6.8.2 *Capacity and Energy Payments for Out-of-Merit or Zonal OOME Service*

6.8.2.1 **Resource Category Generic Costs**

To properly calculate Local Congestion costs, it is necessary to establish certain generic costs associated with Resources that will be used to calculate production costs incurred when the Resource(s) provides Out of Merit Order (OOM) or Zonal Out of Merit Energy (OOME) Service. These generic Resource costs include generic fuel costs and generic startup costs.

- (1) Each ERCOT Generation Resource will be assigned to one of the following Resource Categories for the purpose of determining generic fuel costs:

- Nuclear
- Hydro
- Coal and Lignite
- Combined Cycle greater than 90 MW**
- Combined Cycle less than or equal to 90 MW**
- Gas-Steam Supercritical Boiler
- Gas-Steam Reheat Boiler
- Gas-Steam Non-reheat or boiler without air-preheater
- Simple Cycle greater than 90 MW
- Simple Cycle less than or equal to 90 MW
- Diesel (and all other diesel or gas-fired Resources)
- Renewable (i.e., non-Hydro renewable Resources)
- Block Load Transfer (BLT)
- DC Tie with non-ERCOT Control Area

** Determined by capacity of largest simple cycle combustion turbine in the train

The category of each Resource will be reported to ERCOT by the Generation Entity. Each Generation Entity shall ensure that each of its Resources is in the correct Resource category.

- (2) The FIP shall be the Midpoint price, expressed in \$/MMBtu, published in Gas Daily, in the Daily Price Survey, under the heading “East-Houston-Katy, Houston Ship Channel” for the day of the Out of Merit Capacity (OOMC) or OOME deployment. The FIP for Saturdays, Sundays, holidays and other days for which there is no FIP published in Gas Daily, shall be the next published FIP after the day of the OOMC or OOME deployment.

In the event that the FIP is not published for more than two (2) days, the previous day published FIP will be used for Initial Settlement and the next day published FIP will be used for the Final Settlement Statement.

(3) Resource Category Generic Fuel Costs

Each ERCOT Generation Resource will be assigned a Resource Category Generic Fuel Cost (RCGFC) based on the Resource Category to which it is assigned. For Nuclear, Hydro, Coal and Lignite Resources, the RCGFC will be a fixed dollar/MWh amount as shown below. For the remaining Resource categories (except Renewable), the RCGFC will be the product of a heat rate (based on the heat rates used for the Capacity Auction) and a FIP. The RCGFC for Renewable Resources will be \$0/MWh.

The RCGFC for each type of Resource for upward instructions will be:

Nuclear = \$15.00/MWh

Hydro = \$10.00/MWh

Coal and Lignite = \$18.00/MWh

Combined Cycle greater than 90 MW** = FIP * 9 MMBtu/MWh

Combined Cycle less than or equal to 90 MW** = FIP * 10 MMBtu/MWh

Gas-Steam Supercritical Boiler = FIP * 10.5 MMBtu/MWh

Gas-Steam Reheat Boiler = FIP * 11.5 MMBtu/MWh

Gas-Steam Non-reheat or boiler without air-preheater = FIP * 14.5 MMBtu/MWh

Simple Cycle greater than 90 MW = FIP * 14 MMBtu/MWh

Simple Cycle less than or equal to 90 MW = FIP * 15 MMBtu/MWh

Diesel = FIP * 16 MMBtu/MWh

Block Load Transfer = FIP * 18 MMBtu/MWh

DC Tie with non-ERCOT Control Area = FIP * 18 MMBtu/MWh

Renewable = \$0/MWh

LaaR = FIP * 18 MMBtu/MWh

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The RCGFC for each type of Resource for downward instructions will be:

Nuclear = \$0.00/MWh

Hydro = \$0.00/MWh

Coal and Lignite = \$3.00/MWh

Combined Cycle greater than 90 MW** = FIP * 5 MMBtu/MWh

Combined Cycle less than or equal to 90 MW** = FIP * 6.5 MMBtu/MWh

Gas-Steam Supercritical Boiler = FIP * 7.5 MMBtu/MWh

Gas-Steam Reheat Boiler = FIP * 9.5 MMBtu/MWh

Gas-Steam Non-reheat or boiler without air-preheater = FIP * 10.5 MMBtu/MWh

Simple Cycle greater than 90 MW = FIP * 10.5 MMBtu/MWh

Simple Cycle less than or equal to 90 MW = FIP * 12 MMBtu/MWh

Diesel = FIP * 12 MMBtu/MWh

Block Load Transfer = Not Applicable
 DC Tie with non-ERCOT Control Area = Not Applicable
 Renewable = \$0/MWh

** Determined by capacity of largest simple cycle combustion turbine in the train

(4) Resource Category Generic Startup Costs

Resource Category Generic Startup Costs (RCGSC) represents the startup cost of capacity used for Replacement Reserve Service. The RCGSC for each type of Resource will be:

Nuclear = \$0.00/MWh

Hydro = \$0.00/MWh

Coal and Lignite = \$0.00/MWh

Combined Cycle – when there are five hours or more between shutdown and startup for an OOMC instruction:

Combined Cycle greater than 90 MW** = \$6,810 + (FIP * 2,200 MMBtu)

Combined Cycle less than or equal to 90 MW** = \$5,310 + (FIP * 1,200 MMBtu)

Combined Cycle – when there are less than five (5) hours between shutdown and startup for an OOMC instruction:

Combined Cycle greater than 90 MW** = \$6,810 + (FIP * 1,100 MMBtu)

Combined Cycle less than or equal to 90 MW** = \$5,310 + (FIP * 600 MMBtu)

Gas-Steam Supercritical Boiler = \$4,800 + (FIP * 16.5 MMBtu/MW * RMCu)

Gas-Steam Reheat Boiler = \$3,000 + (FIP * 9.0 MMBtu/MW * RMCu)

Gas-Steam Non-reheat or boiler without air-preheater = \$2,310 + (FIP * 2.30 MMBtu/MW * RMCu)

Simple Cycle greater than 90 MW = \$5,000 + (FIP * 1.1 MMBtu/MW * RMCu)

Simple Cycle less than or equal to 90 MW = \$2,300 + (FIP * 1.1 MMBtu/MW * RMCu)

Diesel = \$487

Renewable = \$0

Where:

RMC	Resource Maximum Capacity (in MW)
u	unit

** Determined by capacity of largest Simple Cycle combustion turbine in the train

(5) Resource Category Generic Minimum Energy Cost

Resource Category Generic Minimum Energy Cost (RCGMEC) is the heat rate of a unit, in one of these categories, at its LSL as set forth in the Resource Plan for that unit (as required by Section 4.4.15, QSE Resource Plans) when the Resource is selected to provide Out-of-Merit Service multiplied by the FIP as defined in Section 6.8.2.1,

Resource Category Generic Costs, item (2). The RCGMEC for each type of Resource will be:

Nuclear Units = zonal MCPE for the units location

Hydro Units = zonal MCPE for the units location

Coal & Lignite Units = zonal MCPE for the units location

Combined Cycle greater than 90 MW** = 10 MMBtu/MWh * FIP

Combined Cycle less than or equal to 90 MW** = 10 MMBtu/MWh * FIP

Gas-Steam Supercritical Boiler = 16.5 MMBtu/MWh * FIP

Gas-Steam Reheat Boiler = 17.0 MMBtu/MWh * FIP

Gas-Steam Non-reheat or boiler without air-preheater = 19.0 MMBtu/MWh * FIP

Simple Cycle greater than 90 MW = 15.0 MMBtu/MWh * FIP

Simple Cycle less than or equal to 90 MW = 15.0 MMBtu/MWh * FIP

Diesel = 16.0 MMBtu/MWh * FIP

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6.8.2.2 Capacity and Minimum Energy Payments

- (1) OOMC Service may be used by ERCOT as a procured Replacement Reserve Resource in the Adjustment Period where necessary to support emergency operations and provide voltage support, stability, or to manage localized transmission limitations. All Generation Resources that are available as set forth in the Resource Plan and plan to be Off-line as set forth in the Resource Plan during the Settlement Interval for which Ancillary Services are being procured are eligible to be selected to provide OOMC Service. ERCOT shall not issue an OOME Up Dispatch Instruction for the energy associated with the LSL as set forth in the Resource Plan, or as specified for Quick Start Units in paragraph (7) below and paragraph (25) of Section 6.5.2, Balancing Energy Service, (as required by Section 4.4.15, QSE Resource Plans) for which it has issued an OOMC Dispatch Instruction. Zonal OOME Service will only be provided from Resources that are already On-line at the time of the Zonal OOME Dispatch Instruction and will not receive a capacity payment.
- (2) The QSE for a Generation Resource that provides OOMC Service and produces less than 0.25 MWh of net metered generation for more than three (3) consecutive 15-minute Settlement Intervals within twenty-seven (27) 15-minute Settlement Intervals preceding the OOMC Dispatch Instruction is eligible for startup costs and Minimum Energy costs, and may be charged a clawback against startup costs unless the Generation Resource is a Quick Start Unit as defined in Section 2, Definitions and Acronyms. If the Generation Resource is a Quick Start Unit and it is Off-line at any time during at least one (1) 15-minute Settlement Interval within the four (4) 15-minute Settlement Intervals preceding the OOMC Dispatch Instruction, then it is eligible for startup costs and minimum energy costs and may be charged a clawback against startup costs.
 - (a) Startup costs are calculated as the RCGSC for starting the Generation Resource.