Net E&AS Details

Market Implementation Committee
June 16, 2025

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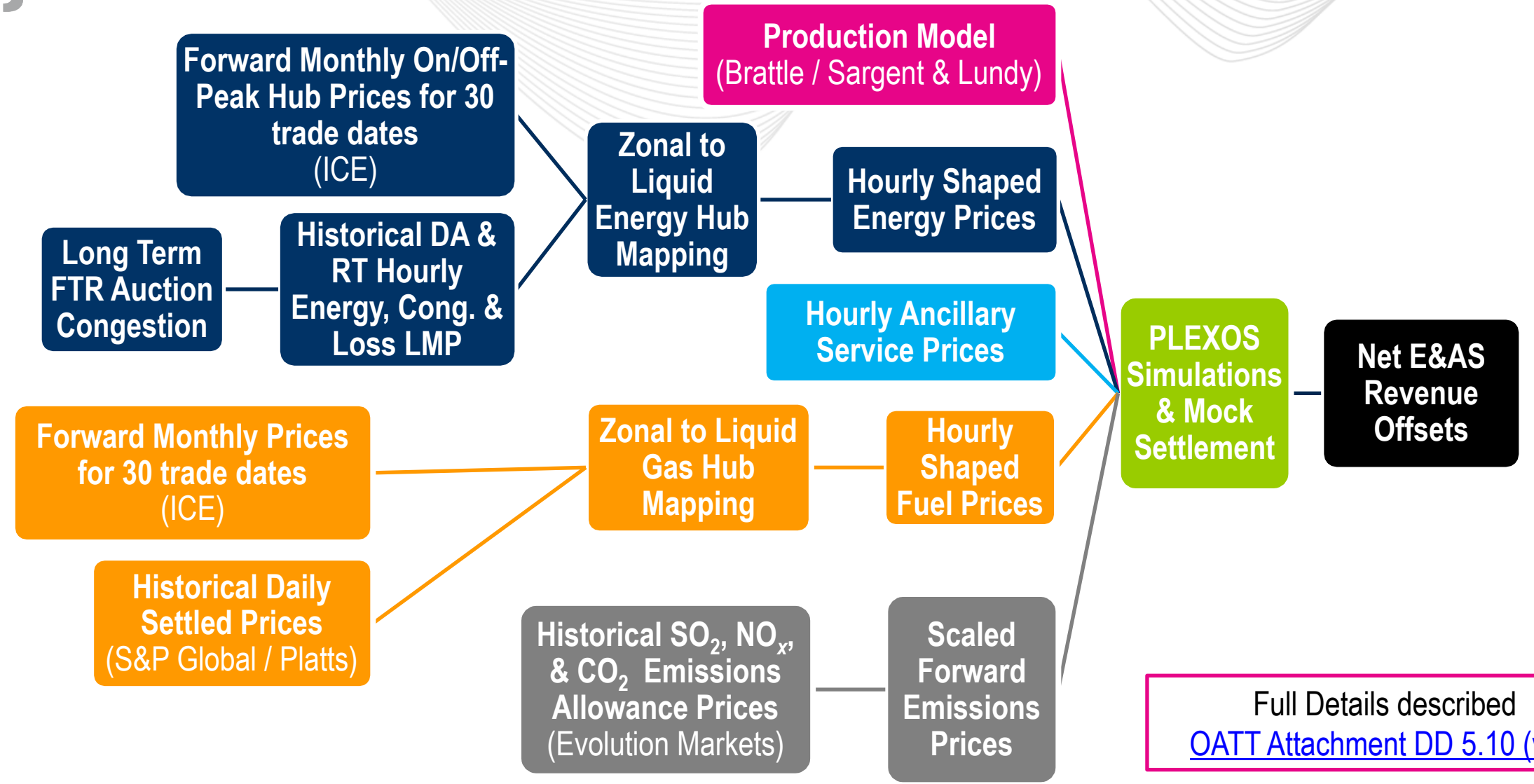
Market Design

Forward Net E&AS Process



Inputs: Zonal Mapping

- RGGI CO2 allowance costs are included for all zones within participating states
- Fuel Hub and Energy Hub definitions are found in Manual 18 § 3.3.2 Net Energy and Ancillary Services Offset

No proposed changes to RGGI, Fuel Hub, or Energy Hub mappings

	RGGI	Forward Fuel Hub	Historic Fuel Hub	Energy Hub
AECO	Yes	Transco-Z6 (non-NY)	Transco-Z6 (non-NY)	Western
AEP		Columbia-Appalachia TCO	Columbia-Appalachia TCO	AEP-Dayton
APS		Dominion South	Dominion South	Western
ATSI		Mich Con	Mich Con	AEP-Dayton
BGE	Yes	Transco-Z6 (non-NY)	Transco-Z6 (non-NY)	Western
COMED		Chicago Citygates	Chicago Citygates	N. Illinois
DAY		Mich Con	Mich Con	AEP-Dayton
DEOK		Mich Con	Mich Con	AEP-Dayton
DOM		Transco-Z6 (non-NY)	Transco Z5 Dlv	Western
DPL	Yes	Transco-Z6 (non-NY)	Transco-Z6 (non-NY)	Western
DUQ		TETCO M3	TETCO M3	AEP-Dayton
EKPC		Mich Con	Mich Con	AEP-Dayton
JCPL	Yes	Transco-Z6 (non-NY)	Transco-Z6 (non-NY)	Western
METED		TETCO M3	TETCO M3	Western
OVEC		Columbia-Appalachia TCO	Columbia-Appalachia TCO	AEP-Dayton
PECO	Yes	TETCO M3	TETCO M3	Western
PENELEC		Dominion South	Dominion South	Western
PEPCO	Yes	Transco-Z6 (non-NY)	Transco Z5 Dlv	Western
PPL		TETCO M3	TETCO M3	Western
PSEG	Yes	Transco-Z6 (non-NY)	Transco Z6 (NY)	Western
RECO	Yes	Transco-Z6 (non-NY)	Transco Z6 (NY)	Western

Inputs: General

Topic	Source	Details
Forward Monthly On/Off-Peak Hub Prices for 30 trade dates	ICE	30 most recent trade day average concluding 180 days prior to the applicable BRA
Long Term FTR Auction	PJM	Most recent LT FTR auction as of 180 days prior to the applicable BRA
Historical DA & RT Hourly Energy, Congestion & Loss LMP	PJM	Previous 3 calendar years
Historical Hourly Ancillary Service Prices	PJM	Previous 3 calendar years
Forward Natural Gas Monthly Prices for 30 trade dates	ICE	30 most recent trade day average concluding 180 days prior to the applicable BRA
Historical Natural Gas Daily Settled Prices	S&P Global Platts	Previous 3 calendar years, gas day begins 10:00 EPT
Historical SO_2, NO_x, & CO_2 Emissions Allowance Prices	Evolution Markets	Escalate with inflation rate from the historic year of the data to the applicable delivery year. Utilize Group 3 prices for summer emissions

Reference Resource Operating Parameters: Combustion Turbine

Parameter	Value	Notes
Configuration	GE Frame 7HA.03 CT with evaporative cooling, SCR/CO, dual fuel	
Max Capacity	403.2 MW 389.7 MW	at ISO conditions (59ºF, 14.7 psia) average at Max Summer conditions; average of 5 CONE areas
Min Stable Level	170 MW	Sargent & Lundy
Ramp Rate	20 MW/min	Estimated S&L Note: confirm unit offers referenced are specific to technology (CT vs CC) and size (MW).
Heat Rate	12,400 Btu/kWh 9,038 Btu/kWh 9,150 Btu/kWh	at Min Stable Load at ISO conditions (59ºF, 14.7 psia); average of 5 CONE areas at Max Summer conditions; average of 5 CONE areas
Min Run	2 hr	Minimum Unit-Specific Operating Parameters for Generation Capacity Resources
Min Down	1 hr	
Time to Start	21 min	Per GE published data, assumes Rapid Response start on a hot unit. Actual time to reach min load from warm, cold, or ambient conditions will be longer.
VO&M	$1.00/MWh	Consumables & major maintenance; 2025 Quadrennial Review (2025$)
Start Cost	$33,007	Sargent & Lundy 2024 Quadrennial Review ($2025)
Start Fuel	502 MMBtu/start	Average fuel use of CONE Area units per S&L 2025 Quadrennial Review
Fuel Pricing Points	See Manual 18, Section 3.3.2	
NOx	0.0093 lb/MMBtu 55 lb/start	2018 CONE Study; historical allowance prices escalated for forward
SO2	0.0006 lb/MMBtu	EPA; historical allowance prices escalated for forward
CO2	117 lb/MMBtu	EPA; RGGI ECR trigger price applied to RGGI units
Forced Outages (EFORd)	6.33%	PJM 2015 - 2019 Weighted Average EFORd by Fuel Type, Class Average Values Effective June 1, 2020 S&L Note: S&L 2022 CONE Study Update assumed 2.2% EFORd for CTs
Maintenance Outages	First two weeks in October	

Reference Resource Operating Parameters: Combined Cycle

Parameter	Value	Notes
Configuration	Two Trains of 1x1 GE Frame 7HA.03 single shaft CC with evaporative cooling and SCR - Dry ACC, Firm Gas	
Max Capacity	1,185.6 MW w/o Duct Burner; 1,358.2 MW w/ Duct Burner 1,118.5 MW w/o Duct Burner; 1,282.4 MW w/ Duct Burner	at ISO conditions (59ºF, 14.7 psia); average of 5 CONE areas at Max Summer conditions; average of 5 CONE areas
Min Stable Level	194 MW	S&L Note: this is the Min Stable Load for one1x1x1 CC train = 33% single train MCR (assumes the 2nd train is not operating)
Ramp Rate	40 MW/min	Estimated (20 MW/min per turbine) S&L Note: confirm existing unit offers referenced are appropriately scaled to technology (class of CT) and number of trains (two trains should ramp 2x faster than one).
Heat Rate	7,804 Btu/kWh 6,142 Btu/KWh w/o Duct Firing; 6,389 Btu/kWh w/ Duct Firing 6,315 Btu/KWh w/o Duct Firing; 6,594 Btu/kWh w/ Duct Firing	at Min Stable Load at ISO conditions (59ºF, 14.7 psia); average of 5 CONE areas at Max Summer conditions; average of 5 CONE areas
Min Run	4 hr	Minimum Unit-Specific Operating Parameters for Generation Capacity Resources
Min Down	3.5 hr	
Time to Start	120 min	Time from ignition to base load, assumes appropriate steam cycle design. S&L Note: GE published startup time for these units is 60 min which assumes rapid response hot and optimal conditions. 120 min has been suggested as a more realistic time to be expected for a 1x1x1 single-shaft CC.
VO&M	$2.42/MWh	Consumables & major maintenance; 2025 Quadrennial Review (2025$)
Start Fuel	4,412 MMBtu/start/train (double to account for 2nd train)	Average fuel use of CONE Area units Sargent & Lundy 2025 Quadrennial Review (adjusted for 120 min assumed Time to Start)
Fuel Pricing Points	See Manual 18, Section 3.3.2	
NOx	0.0074 lb/MMBtu 160 lb/start	2018 CONE Study; historical allowance prices escalated for forward
SO2	0.0006 lb/MMBtu	EPA; historical allowance prices escalated for forward
CO2	117 lb/MMBtu	EPA; RGGI ECR trigger price applied to RGGI units
Forced Outages (EFORd)	3.05%	PJM 2015 - 2019 Weighted Average EFORd by Fuel Type, Class Average Values Effective June 1, 2020 Note: S&L Assumed 2.0% EFOR for 1x1x1 CC in cost estimate assumptions
Maintenance Outages	First two weeks in October	

Reference Resource Operating Parameters: Battery Energy Storage

Parameter	Value	Notes
Configuration	50 MW utility scale, Li, 200 MWh rating – EIA (Case 18) – - https://www.eia.gov/analysis/studies/powerplants/capitalcost/	
Max Capacity	Modeled as 1 MW / 4 MWh resource	
Charged Efficiency*	92.2%	*Used to represent an 85% round trip efficiency in the dispatch model Wesley Cole & A. Will Frazier, Cost Projections for Utility-Scale Battery Storage: 2020 Updated, National Renewable Energy Laboratory (June 2020), https://www.nrel.gov/docs/fy20osti/75385.pdf
Discharge Efficiency*	92.2%	
State of Charge	Between 95% and 5%	
Forced & Maintenance Outages	None at this time	

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Quadrennial Review Update

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