

Existing Generation Gross ACRs and Energy Efficiency Net CONE Updated Results

PRESENTED TO
Market Implementation Committee

PRESENTED BY
Brattle and S&L Project Teams

March 11, 2020

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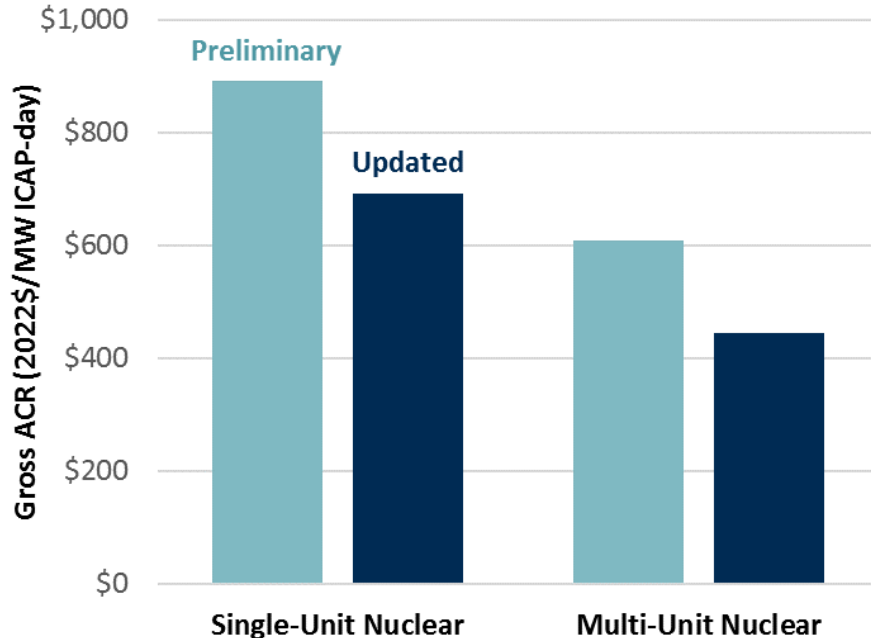
Modifications to Gross ACR Values

- We received additional guidance from PJM concerning the costs that are includable in the Gross ACR versus Variable Costs.
 - The combination of Gross ACR and Variable Costs should include all avoidable costs to operate the resource for another year.
 - Costs incurred infrequently to extend the asset's life or enhance its performance for over a year should not be included in either.
 - PJM's Tariff and Operating Agreement provide details on which costs are includable in Gross ACR.
- All maintenance costs *for systems* directly related to electric production can be included in the operating costs maintenance adder for cost-based energy offers, and thus are excluded from the ACRs.
- We modified our estimates for nuclear plants and coal plants to align with this interpretation of the tariff, which resulted in a shift in costs from the Gross ACRs to Variable Costs.

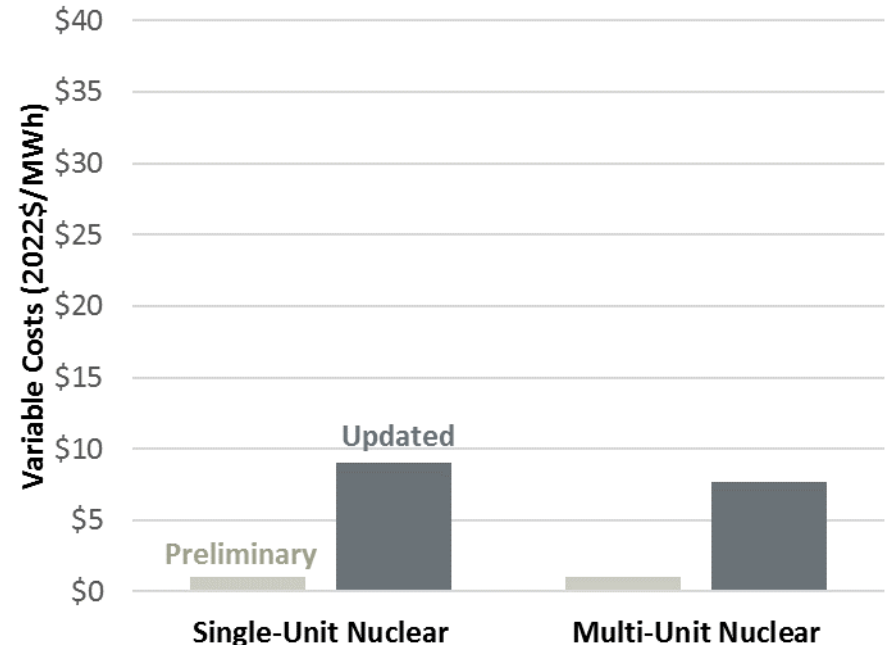
Updated Nuclear Gross ACRs

- Lower Gross ACR primarily due to shifts of fuel costs (-\$112 for single-unit), sustaining capital costs (-\$55), and materials & services operating costs (-\$10) to Variable Costs
- Removed enhancement and capital spares costs (-\$24), decreased fuel costs (-\$18), and added property taxes (+\$20) to the Gross ACR
- Total Costs included in Gross ACR & Operating Costs decreased by about \$20/MW-day

Nuclear Gross ACRs (\$/MW ICAP-day)



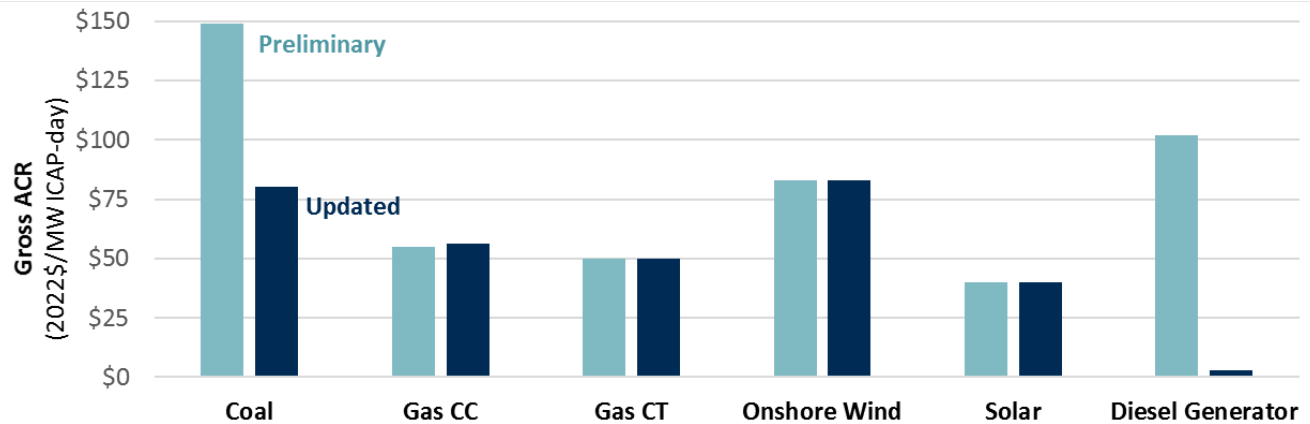
Nuclear Operating Costs (\$/MWh)



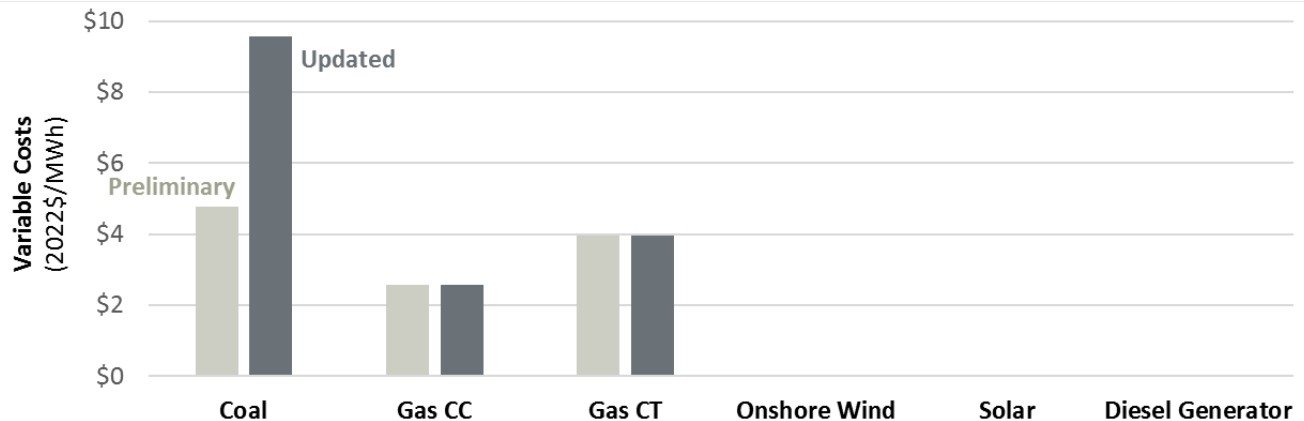
Updated Generation Gross ACRs

- **Coal:** Shifted necessary & routine expenditures to maintain performance from Gross ACR to Variable Costs
- **Diesel Generator:** Changed cost basis from a 12 MW wholesale resource to a 1 MW behind-the-meter resource at a commercial facility; updated Gross ACR only accounts for an annual maintenance contract

Existing Generation Gross ACRs (\$/MW ICAP-day)



Existing Generation Variable Costs (\$/MWh)



Existing Generation Gross ACRs Summary

Updated Existing Generation Gross ACRs (2022\$/MW ICAP-day)

Technology	Representative-Low	Representative Plant	Representative-High
Single-Unit Nuclear		\$693	
Multi-Unit Nuclear	\$405	\$444	\$477
Coal	\$74	\$80	\$166
Gas CC	\$55	\$56	\$79
Gas CT	\$42	\$50	\$65
Onshore Wind	\$76	\$83	\$128
Solar PV	\$29	\$40	\$60
Diesel Generator		\$3	

Existing Generation Variable Cost Summary

Updated Existing Generation Variable Costs (2022\$/MWh)

Technology	Representative-Low	Representative Plant	Representative-High
Single-Unit Nuclear	---	\$9.02	---
Multi-Unit Nuclear	\$7.56	\$7.66	\$9.14
Coal	\$9.17	\$9.56	\$9.20
Gas CC	\$2.24	\$2.57	\$2.53
Gas CT	\$3.96	\$3.96	\$4.98
Onshore Wind	\$0.00	\$0.00	\$0.00
Solar PV	\$0.00	\$0.00	\$0.00
Diesel Generator	---	\$0.00	---

Modifications to EE Net CONE

- The EE Net CONE value presented at the February 28 MIC meeting over-counted program incentive costs, and we have corrected that by relying directly on the Total Resource Cost (TRC) of each program.
- We continue to exclude programs listed in the EE program reports that do not participate in the capacity market, but now include all other programs, other than a single outlier (<1 MW) with much higher costs than the others.
- AEP, however, does not provide the TRC of its individual programs, so we excluded that utility from our sample.
- The resulting average EE programs costs thus decreased to \$1,761/kW, from \$2,179/kW in the prior version.

Net CONE for New Energy Efficiency

Updated New EE Net CONE

EE Impacts		
Customer Peak Savings	<i>Retail MW</i>	0.85
Losses Gross-Up	<i>%</i>	17.6%
Nominated EE Value	<i>MW ICAP</i>	1.00
Forecast Pool Requirement		1.087
UCAP Value of EE	<i>MW UCAP</i>	1.09
Annual Energy Savings	<i>MWh</i>	6,735
EE Costs and Benefits Assumptions		
Total Costs	<i>\$/kW ICAP</i>	\$1,761
Average Lifetime	<i>years</i>	11
PJM CONE ATWACC	<i>%</i>	8.2%
Energy Benefit	<i>\$/MWh</i>	\$29
Avoided T&D Costs	<i>\$/kW-yr</i>	\$41
Calculations		
Gross CONE	<i>\$/kW ICAP-yr</i>	\$230
Energy Savings	<i>\$/kW ICAP-yr</i>	\$178
T&D Savings	<i>\$/kW ICAP-yr</i>	\$35
Net CONE	<i>\$/kW ICAP-yr</i>	\$17
Net CONE	<i>\$/MW ICAP-day</i>	\$46
Net CONE	<i>\$/MW UCAP-day</i>	\$42

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