

Impact of FERC MOPR Order on Maryland Clean Energy Programs

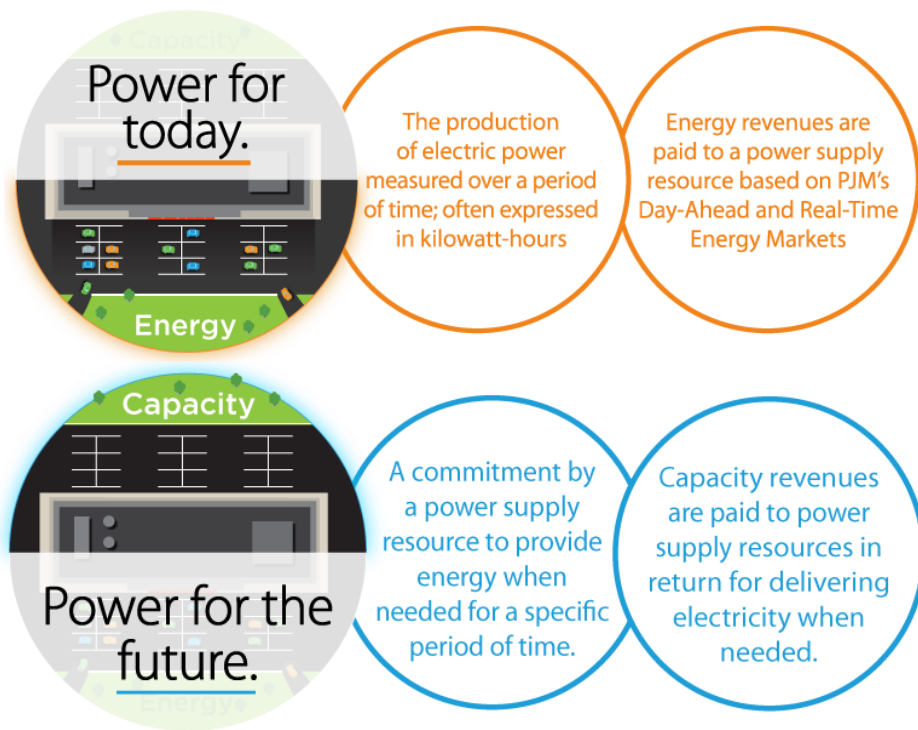
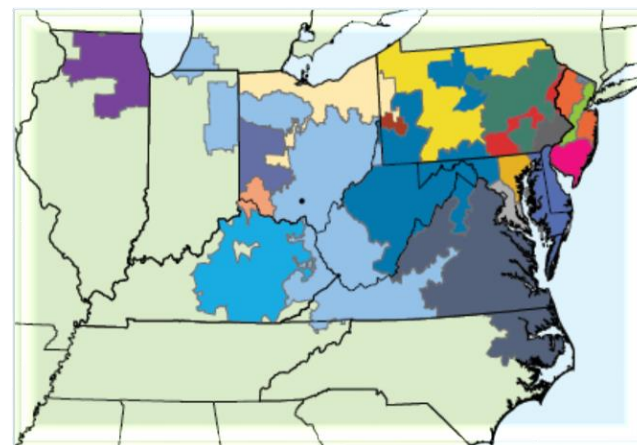
Maryland Commission on Climate Change and Mitigation Work Group
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PJM Procures Electricity without Consideration of Generator Emissions

- PJM is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia
- PJM procures energy and capacity
 - Energy is the electricity produced by power plants on a daily basis
 - Capacity is the promise to be available to provide energy in the future (such as on a hot summer day)
- Prices for energy and capacity are determined through competitive auctions run by PJM
 - Energy market auctions are run daily in 5-minute intervals
 - Capacity market auctions occur once a year for a commitment 3-years forward
- PJM selects generators on a least-cost basis without distinguishing between emissions-free and polluting power plants

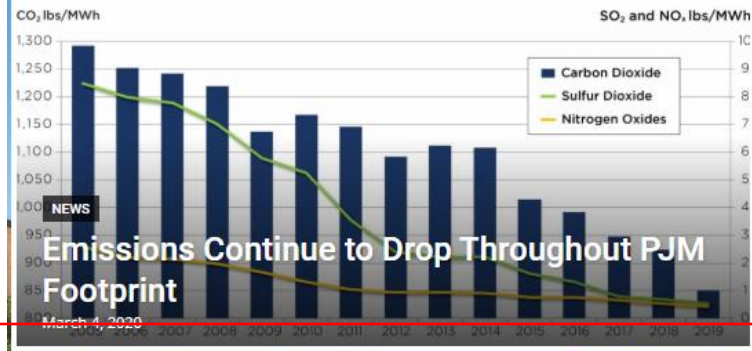


Sources: PJM Learning Center; [Energy](#) and [Capacity](#) pages

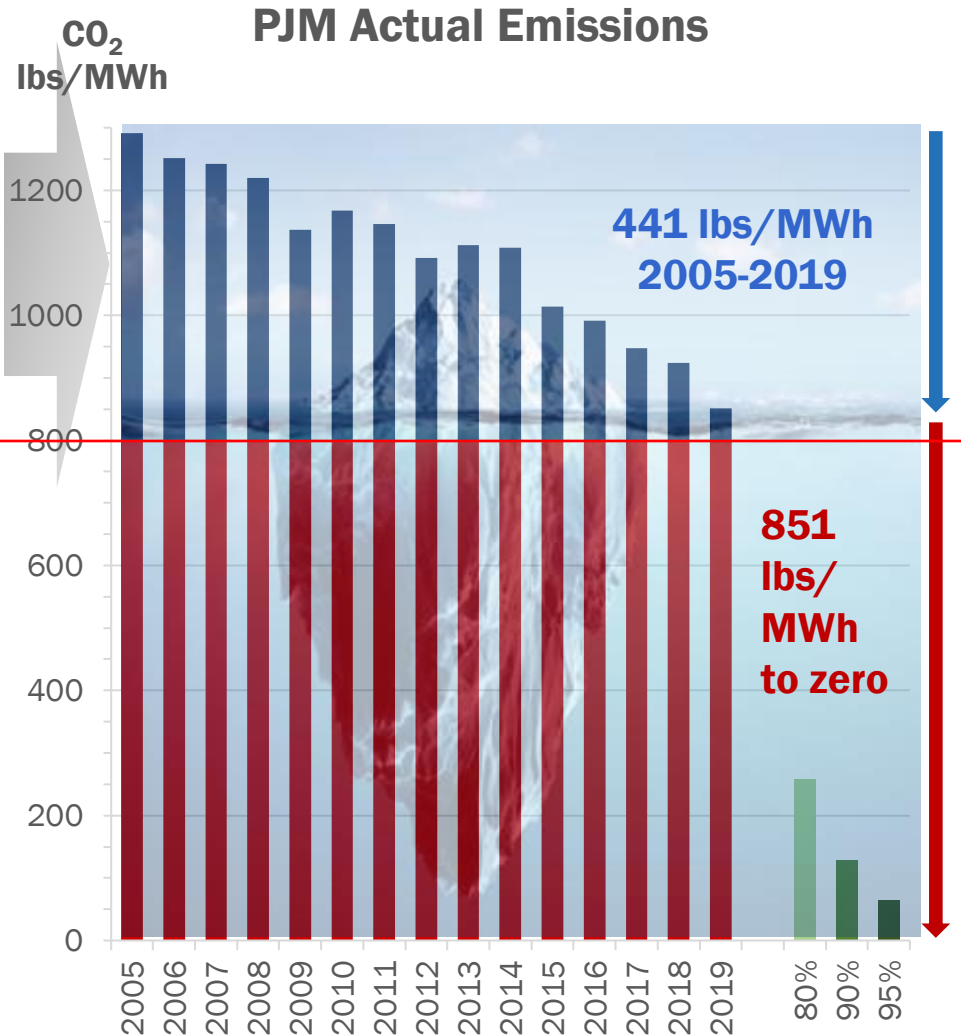
Emission Reductions in PJM are Inadequate to Meet Maryland's GHG Goals

PJM's Published Data

Inside Lines - March 4, 2020



- EIA projections indicate PJM region emission reductions will level out by 2025
- Premature retirement of nuclear plants would reverse emission declines
- Backfilling generation from Illinois, New Jersey, and Ohio PJM nuclear plants with new CCGT's would increase PJM's rate by ~127 lbs./MWh
- Backfilling them with the marginal PJM unit would increase the rate by ~212 lbs/MWh, undoing half the progress of the last 15 years



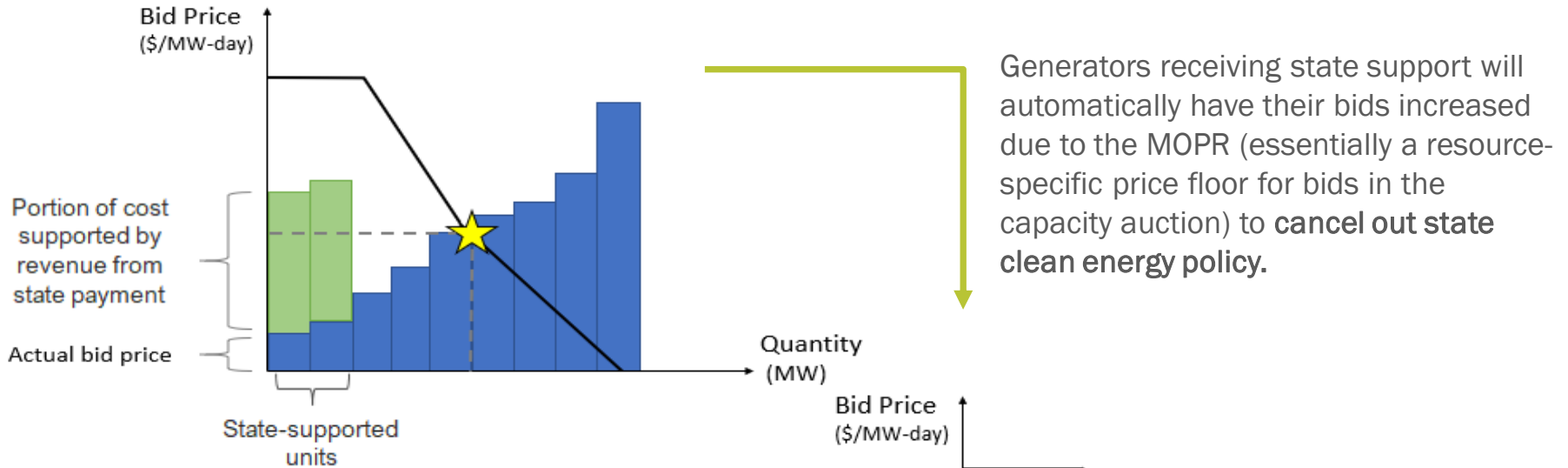
Despite reductions since 2005, GHG emissions in PJM need to fall dramatically in order to meet Maryland's climate targets, but instead are projected to level out or increase

FERC MOPR Order: Thumb on the Scale for Fossil Generation

- In response to expanding state clean energy programs, fossil generators and the PJM Market Monitor have argued to FERC that state actions are unfairly lowering prices paid in the wholesale electricity markets run by PJM and other regional grid operators
- States and clean energy providers argue that the regional markets overseen by FERC are flawed for failing to value the clean attributes of zero-emission generation and that state programs make regional markets more efficient by internalizing the cost of pollution
- FERC agreed with the fossil supporters in June 2018, proposing to expand the MOPR so that it applies to any resource receiving state support that participates in PJM's capacity market
- On December 19, FERC expanded the MOPR as suggested by the Market Monitor, concluding that state support for clean generation is growing and presents an immediate threat to the federally-regulated multi-state capacity market
 - FERC imposed the MOPR not only on wind, solar and nuclear, but also on state-supported energy efficiency, demand response, and storage resources, as well as utility-owned generation
- The only responsive option made available by FERC for states seeking to avoid the punitive effect of the MOPR is the Fixed Resource Requirement
 - A utility using the FRR alternative meets its future supply obligations with preferred resources (either through contract or ownership) subject to state oversight, while otherwise remaining in PJM's energy and other markets
 - FERC considered, but rejected, an accommodation that would have allowed state-supported generators to exit the capacity market on a resource-specific basis

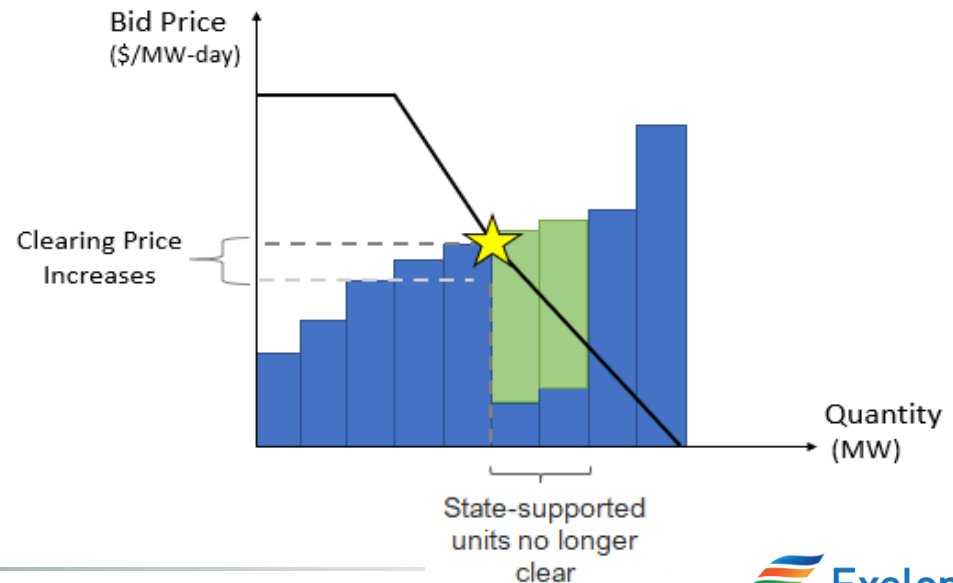
Minimum Offer Price Rule (MOPR) Explained

PJM contracts for electricity on a three-year forward basis through its Reliability Pricing Model (RPM) capacity market. In the past, renewable and clean energy generators have been allowed to bid into these capacity auctions at whatever price needed to turn a profit, taking into account revenue from the market and their state clean energy payments in light of their specific operational costs and performance risks. Now...



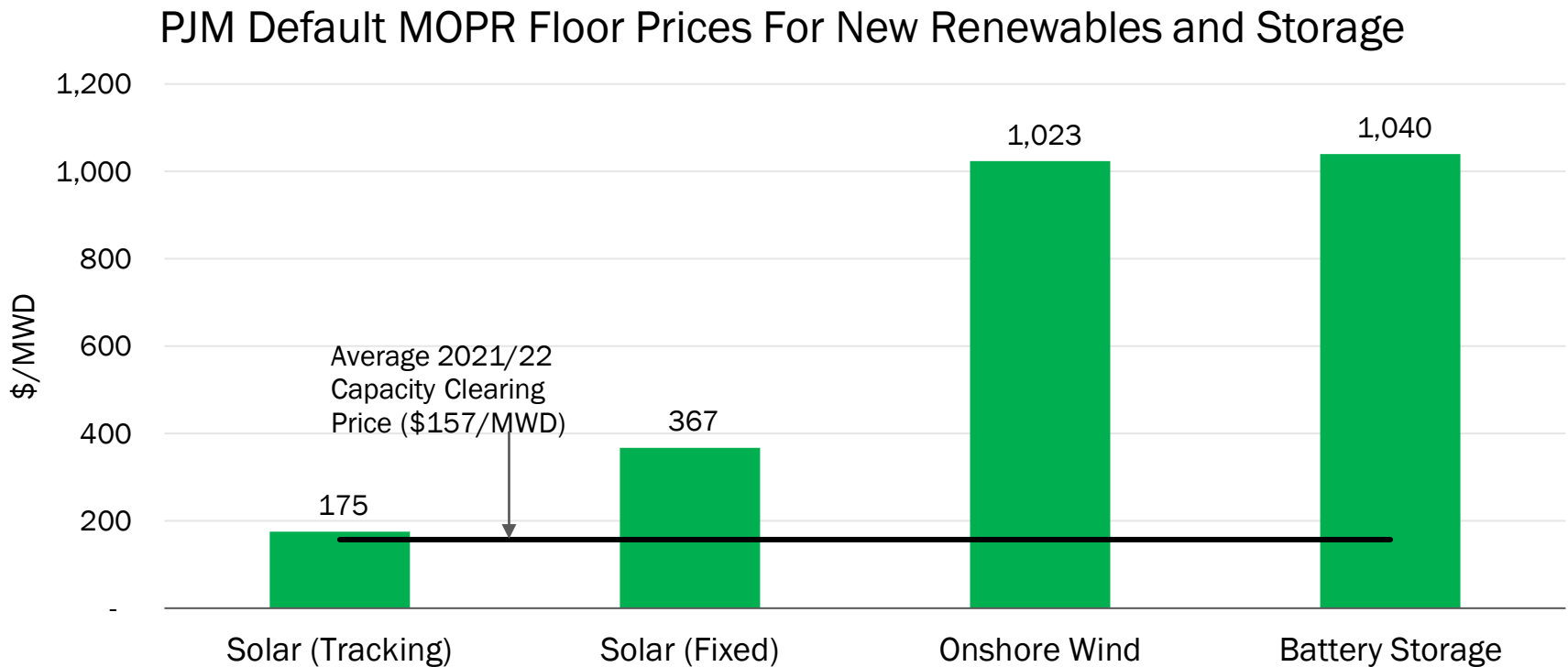
Why is this option bad for customers?

As demonstrated in the right chart, the MOPR is likely to push state-supported units out of the market and therefore receive no capacity revenues. These **lost capacity revenues must be recouped by higher state clean energy payments** or clean energy goals will not be met. Further, **capacity prices could increase** as redundant, emitting capacity is procured.



MOPR Pushes Clean Resources Out of the PJM Capacity Market

- As FERC ordered, PJM set the MOPR default floor prices for most new renewables and storage at extremely high prices and, as a result, these new resources will not be selected by PJM
- This will increase customer costs in two ways:
 - Increased cost of procuring clean resources because lost capacity revenues must be replaced (through higher REC prices, higher contract prices, or some other mechanism)
 - Higher prices for capacity as the renewable generation is “replaced” in the PJM market with fossil capacity



Source: PJM MOPR compliance filing at FERC (March 18, 2020)

Maryland MOPR Impacts

- Without responsive state action, the MOPR will raise consumer costs in Maryland by \$650 to \$950 million over the next nine years as resources supported by the existing 50% RPS are pushed out of the PJM capacity market and payments are transferred to fossil generators (with PJM-wide costs ranging from \$9.7 to \$23.9 billion)
 - This unnecessary cost to consumers – paying for polluting capacity they don’t need - undermines Maryland’s environmental goals and discourages the growth of new renewable energy in the state
- FERC’s MOPR order also will have a significant impact on Maryland’s offshore wind program
 - The 368 MW of approved offshore wind projects would not have passed the net ratepayer impact test as currently structured had anticipated capacity market revenues been excluded from consideration
 - In future solicitations, foregoing capacity revenues means Maryland will procure roughly 20% less offshore wind in the future or ratepayers will pay roughly 25% more to achieve the target quantities

TABLE 2. MOPR consumer cost by auction year *with* nuclear units clearing

(\$ millions)

AUCTION YEAR	TOTAL COST	PARTS OF NJ, DE, MD, AND PA (EMAAC)	PART OF IL (COMED)	PART OF OH (ATSI)	REST OF PJM
22/23	\$722	\$472	\$9	\$40	\$201
23/24	\$1,255	\$764	\$15	\$74	\$402
24/25	\$1,790	\$1,057	\$21	\$108	\$603
25/26	\$638	\$233	\$39	\$14	\$352
26/27	\$779	\$277	\$46	\$17	\$441
27/28	\$917	\$318	\$52	\$19	\$529
28/29	\$1,052	\$356	\$57	\$21	\$617
29/30	\$1,186	\$395	\$63	\$23	\$705
30/31	\$1,314	\$429	\$67	\$25	\$793
TOTAL	\$9,652	\$4,301	\$368	\$340	\$4,643
AVERAGE PER YEAR	\$1,072	\$478	\$41	\$38	\$516

TABLE 3. MOPR consumer cost by auction year *without* nuclear units clearing (\$ millions)

AUCTION YEAR	TOTAL	PARTS OF NJ, DE, MD, PA (EMAAC)	PART OF IL (COMED)	PART OF OH (ATSI)	REST OF PJM
22/23	\$4,124	\$2,303	\$125	\$1,495	\$201
23/24	\$4,650	\$2,594	\$132	\$1,522	\$402
24/25	\$5,177	\$2,887	\$138	\$1,548	\$603
25/26	\$1,315	\$554	\$205	\$204	\$352
26/27	\$1,456	\$597	\$212	\$207	\$441
27/28	\$1,594	\$639	\$218	\$209	\$529
28/29	\$1,728	\$677	\$223	\$211	\$617
29/30	\$1,863	\$716	\$229	\$213	\$705
30/31	\$1,990	\$750	\$233	\$215	\$793
TOTAL	\$23,898	\$11,717	\$1,715	\$5,823	\$4,643
AVERAGE PER YEAR	\$2,655	\$1,302	\$191	\$647	\$516

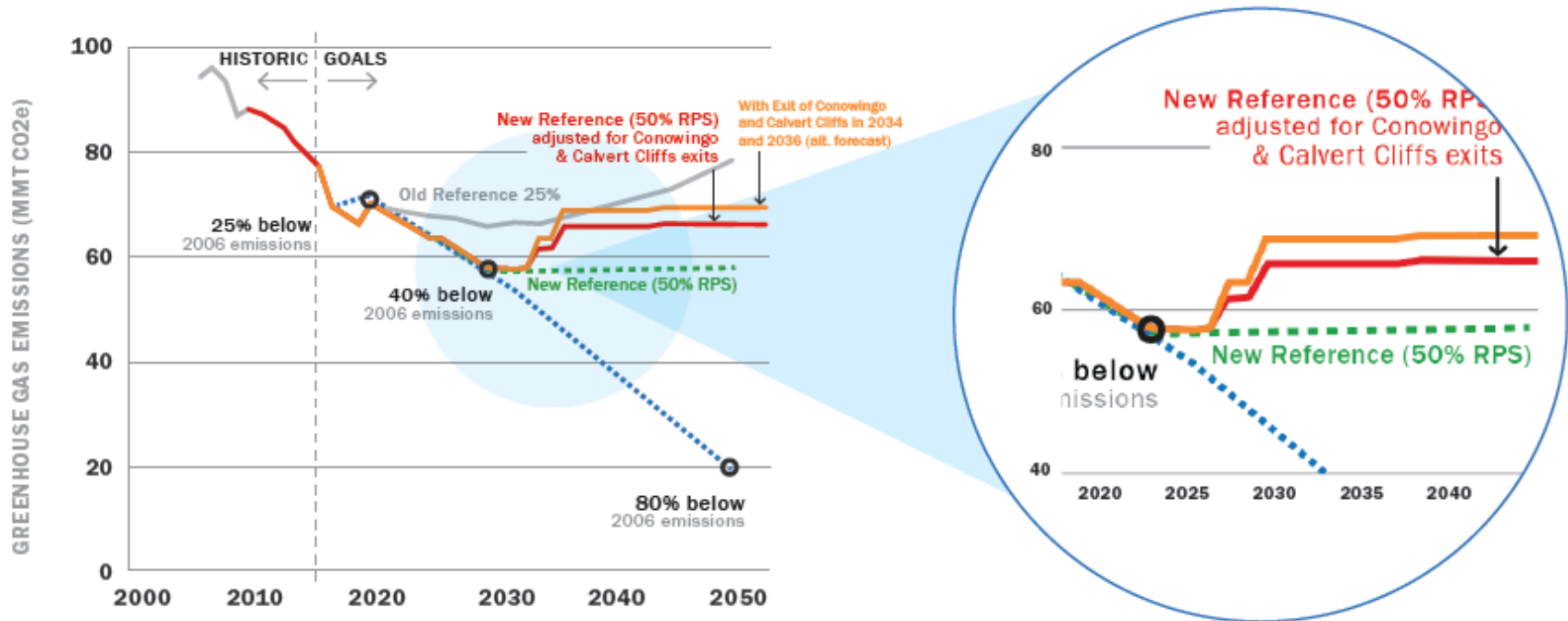
Source: Michael Goggin and Rob Gramlich, *A Moving Target: An Update on the Consumer Impacts of FERC Interference with State Policies in the PJM Region*, May 2020 (available at <https://gridprogress.files.wordpress.com/2020/05/a-moving-target-paper.pdf>)

The FRR: A Solution to the MOPR

- Since the inception of the capacity market, PJM has allowed locally-managed procurement of capacity through the FRR as an alternative to the PJM centralized procurement. FRR has a 5-year minimum term and has been used nine times
- Benefits of using FRR :
 - **Lowers costs to achieve clean energy goals:** State-supported clean resources will receive capacity revenue, resulting in reduced costs recovered through state programs
 - **Eliminates duplicate capacity purchases:** Amount of fossil capacity that customers must purchase is reduced since clean capacity gets full credit
 - **Provides flexibility for capacity payment structures:** PJM centralized procurement is a single clearing price, but FRR payments can be differentiated for clean and non-clean resources to further state environmental goals
 - **Includes structural customer cost savings:** The PJM-required FRR capacity quantity is about 5% less than the quantity paid for by customers from the PJM central procurement
 - **Allows for capacity performance penalty mitigation:** Capacity resources in an FRR can be pooled during emergency periods, reducing the risk of penalties due to underperformance, particularly for renewables that might not otherwise choose to be a capacity resource

The FRR mechanism allows states to retain the efficiency of PJM's regional dispatch while making their own investment decisions in generation, demand response, efficiency and storage

All Zero-Carbon Generation is Needed to Meet Maryland GHG Targets



New Reference (50% RPS) meets Maryland's 50% RPS by 2030

Emissions Impacts from E3 Analysis for MWG (7/16/19) and PPRP Interim Report on MD RPS (12/2018)

EMISSIONS ABATEMENT OPTIONS IN MARYLAND	Calvert Cliffs Nuclear Plant	Conowingo Hydroelectric Plant	Planned Offshore Wind*	Other Maryland Zero-Carbon Renewables (wind, thermal and photovoltaic solar, other hydro)	New electricity generation incentivized or avoided by MEA's Clean Energy Grant Program **
MILLION MWh/year	14.988	2.788	1.369	1.039	0.030

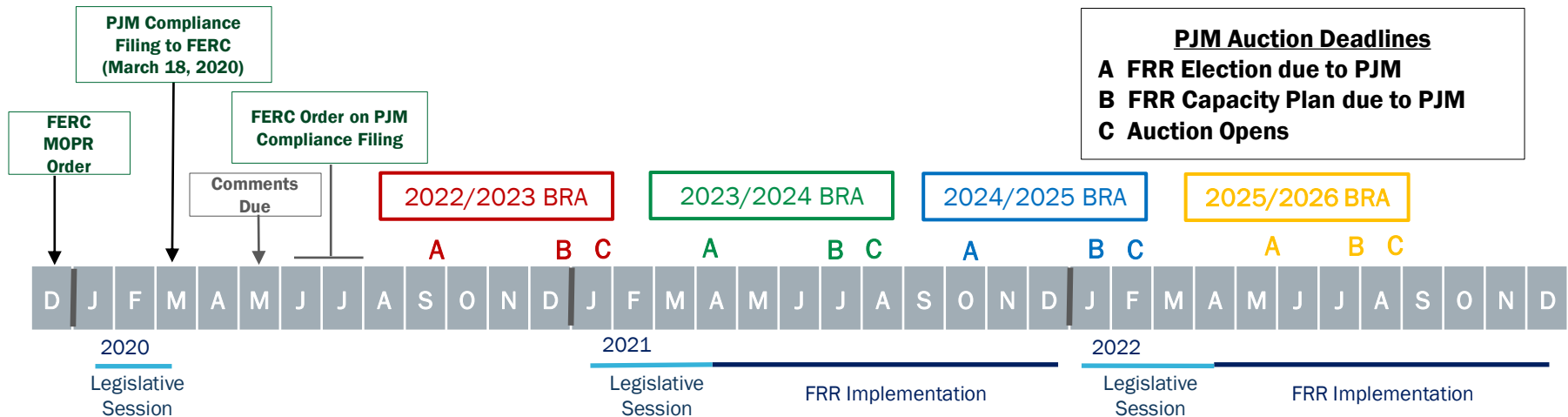
* U.S. Wind and Skipjack

** Electricity savings estimates from MD Strategic Energy Investment Fund Report for FY 2018

Retaining and expanding zero-carbon generation is the cornerstone of Maryland's electrification efforts to support affordable decarbonization

Action is Needed in the 2021 Maryland Legislative Session

- PJM proposes to execute the next capacity auction (2022/2023) 6.5 months after FERC acts on its compliance filing, which could result in the auction being run as early as January 2021 with, subsequent procurements in rapid succession every 6.5 months
 - Maryland and other states have objected to PJM’s proposed schedule, requesting that the next auction occur between March and May 2021 with subsequent procurements on an 8 month cycle
 - In all cases, Fixed Resource Requirement (FRR) elections and capacity plans must be provided to PJM 120 days and 30 days prior to the start of the auction, respectively
- With the Maryland legislature out of session until 2021, PJM could make resource investment decisions through 2025 before Maryland has time to implement the FRR alternative

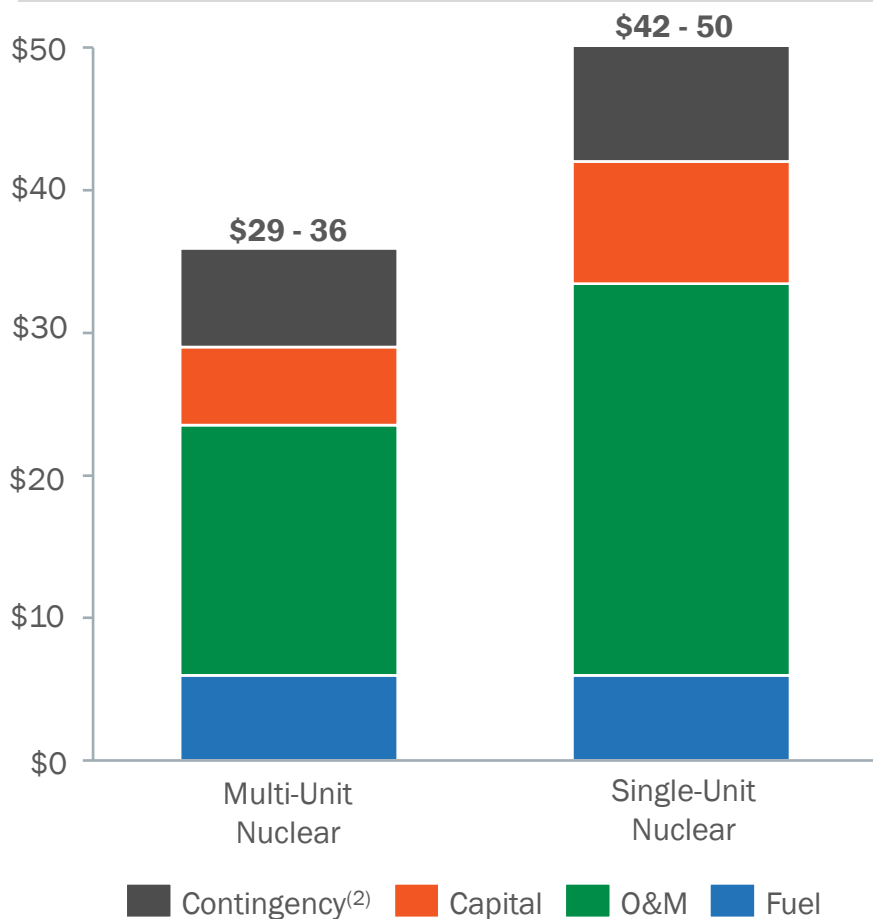


Without state action, PJM will quickly begin making generation investment commitments under FERC’s punitive MOPR rules that extend through the middle of the decade

Appendix

Nuclear Economics (Exelon GGRA Draft Plan Comments, page 5)

Average 2018 Nuclear Costs (\$/MWh)⁽¹⁾



2021 Energy Year Forward All-In Nuclear Market Prices (\$/MWh)⁽³⁾



(1) Source: Nuclear Energy Institute, "Nuclear by the Numbers," March 2019

(2) Contingency (or risk) is calculated as 10% of total costs plus \$4/MWh

(3) Based on 1/31/20 ICE forward energy prices from 6/2021 through 5/2022 for relevant hub less 2017-2019 average basis differential to nuclear plants