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Maryland CO₂ Budget Trading Program COMAR 26.09

Air and Radiation Management Administration

Climate Change Division

March 12, 2018

Background

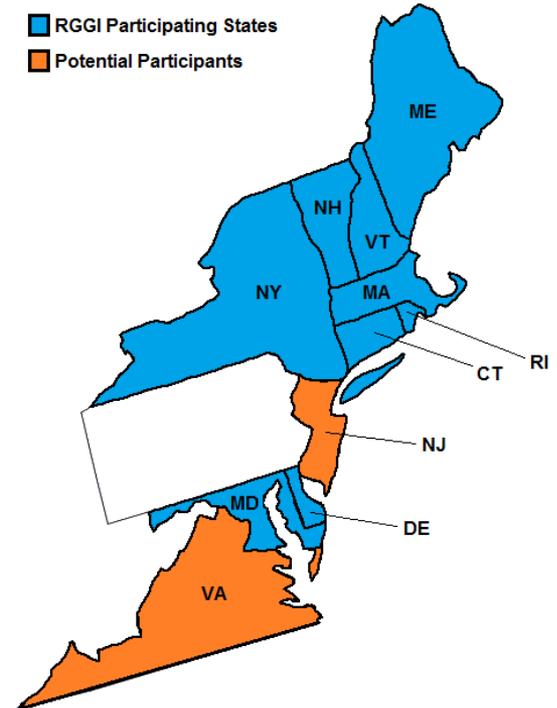
Regional Greenhouse Gas Initiative (RGGI)



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RGGI Basics

- Maryland officially became the 10th member of RGGI on April 20, 2007
- RGGI is a regional cap and invest program focused on reducing carbon dioxide (CO₂) emissions from power plants
 - Cooperative 9 state effort
 - Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, Rhode Island, Vermont
 - New Jersey was originally a member but left the program
 - New Jersey and Virginia are currently potential participants
- Not your “typical” cap and invest program
 - CO₂ reductions achieved by reduced demand, not “scrubbers” or other end-of-the-pipe pollution control technologies
 - RGGI reductions to be achieved by
 - Setting a cap for the region
 - Auctioning allowances
 - Using auction proceeds to create incentives for energy efficiency and reduced demand
- Will result in a small, but positive benefit to Maryland electricity consumers



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RGGI Regulations

- The 9 states work together to write a Model Rule
 - <http://www.rggi.org/design>
- Each state writes its own regulations to match the Model Rule
 - <http://www.rggi.org/design/regulations>



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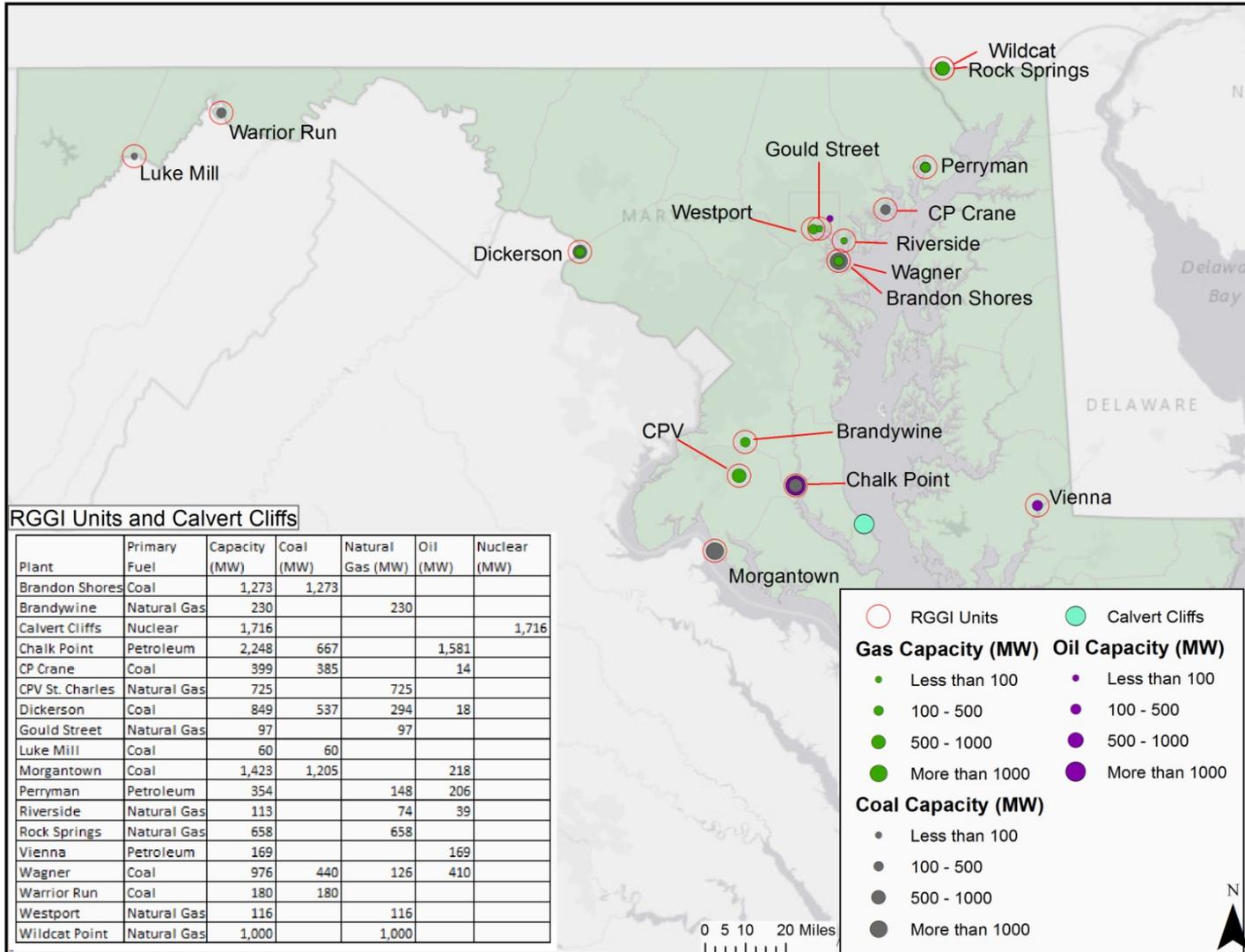
Original RGGI Goals

- Original RGGI goal was to show that a cap and invest program for CO₂ was possible
 - Modest reduction goal
 - Proactive concept to provide revenue for energy efficiency programs and to cover cost of program through sale of allowances
- Generation-based Program
 - Each state apportionment set at average 2000 – 2002 emissions
- 10% Reduction Goal
 - Offset growth in emissions and make a small reduction



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MD RGGI Units



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Auctions

- Primary and Secondary market auction platform
- Participation in all 38 quarterly auctions to date
- Total amount of proceeds from RGGI auctions more than \$2.84 billion
 - \$584.6 million for Maryland
- Strategic Energy Investment Fund (SEIF)
- Cost Containment Reserve
- Auction 39 to be held on March 14, 2018



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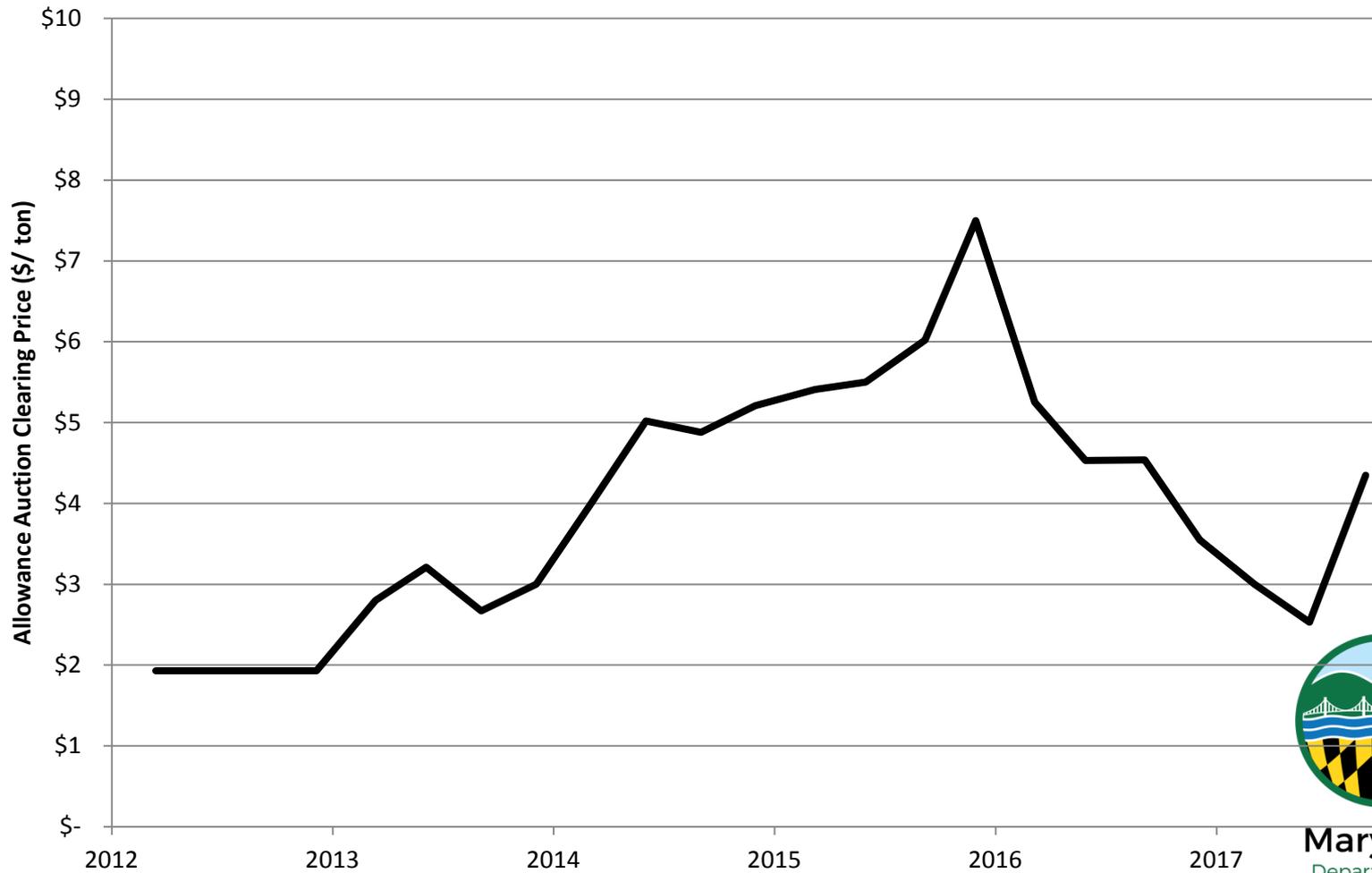
Auction Design Principles

- Fair, transparent, and understandable to participants and the public
- Promotes accurate price discovery
 - Where price reflects a measure of marginal cost to reduce emissions
- Guards against collusion and/or market manipulation
- Minimizes price volatility
- Promotes a liquid allowance market



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RGGI Prices



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Cap and Invest

1. Require power plants to turn in **allowances** for CO₂ emissions.
2. Only issue a limited number of allowances.
3. Let plants trade allowances.
4. Invest proceeds from allowance auctions into energy programs.

“Cap and Trade”

“Cap and Invest”



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Strategic Energy Investment Fund (SEIF)

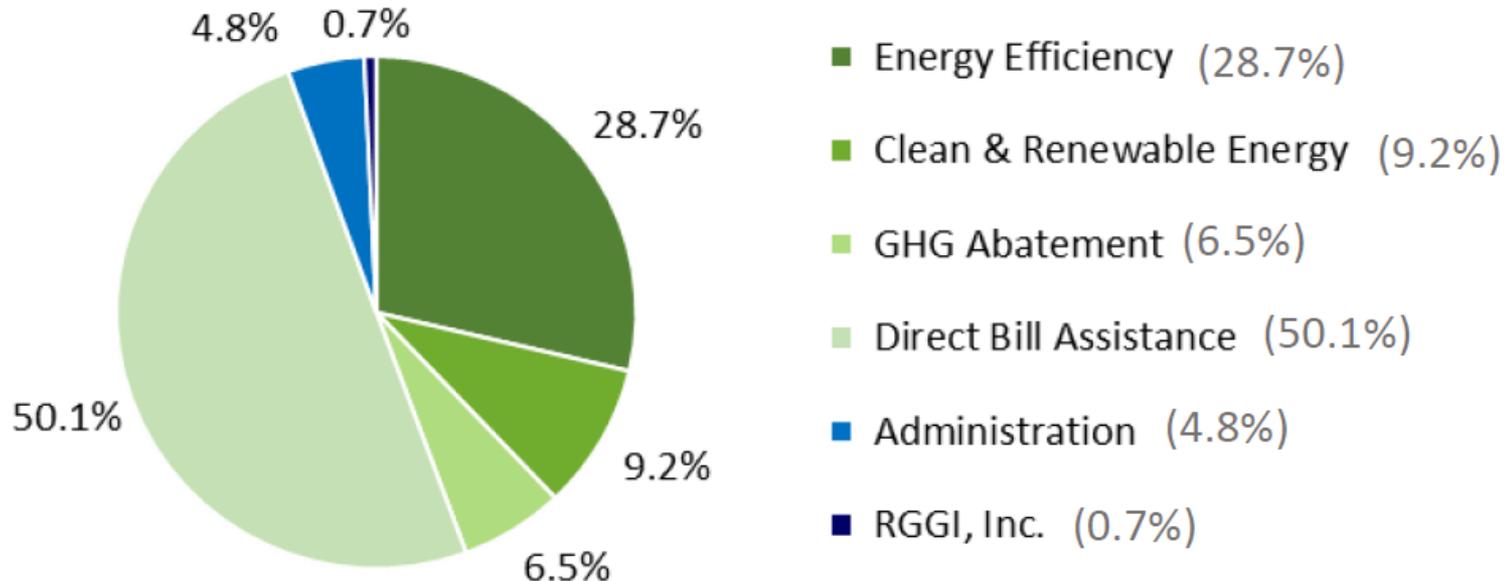
- Maryland Legislature granted administration of the Maryland RGGI revenues to the Maryland Energy Administration
 - Revenues are deposited in SEIF
- Maryland Legislature apportioned the revenue to a number of different uses
 - Low income bill payment
 - Low and moderate income energy efficiency
 - Rate payer relief
 - Renewable energy and climate programs
 - Administration of the program



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Allowance Allocation

- Most allowances sold at quarterly auctions
- Anyone can purchase allowances
- States receive the proceeds and fund energy programs.
- Maryland has historically devoted most funds to Bill Assistance and Energy Efficiency. Proceeds allocation is set in statute.



Offsets

- An offset project may compensate for a fraction of the required emission reductions from a CO₂ budget source
- Very strict eligibility criteria



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Offset Categories

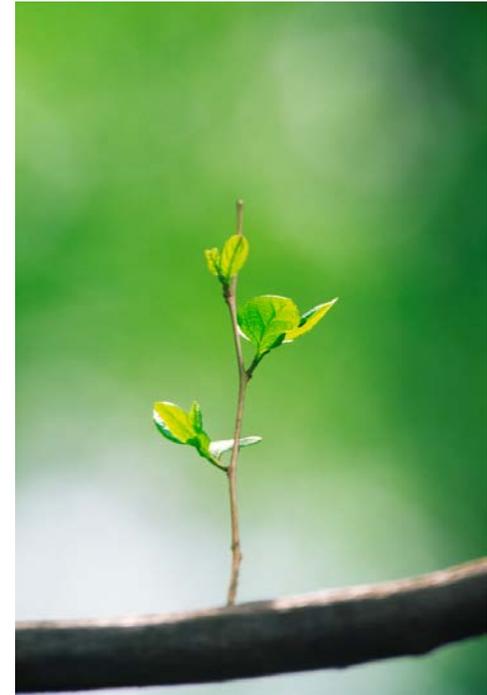
- Landfill Methane Capture and Destruction
- Reduction in Emissions of Sulfur Hexafluoride (SF₆)
 - To be removed
- Sequestration of Carbon due to Reforestation, Improved Forest Management, or Avoided Conversion
- Reduction or Avoidance of CO₂ Emissions from Natural Gas, Oil, or Propane End-Use Combustion due to End-Use Energy Efficiency
 - To be removed
- Avoided Methane Emissions from Agricultural Manure Management Operations



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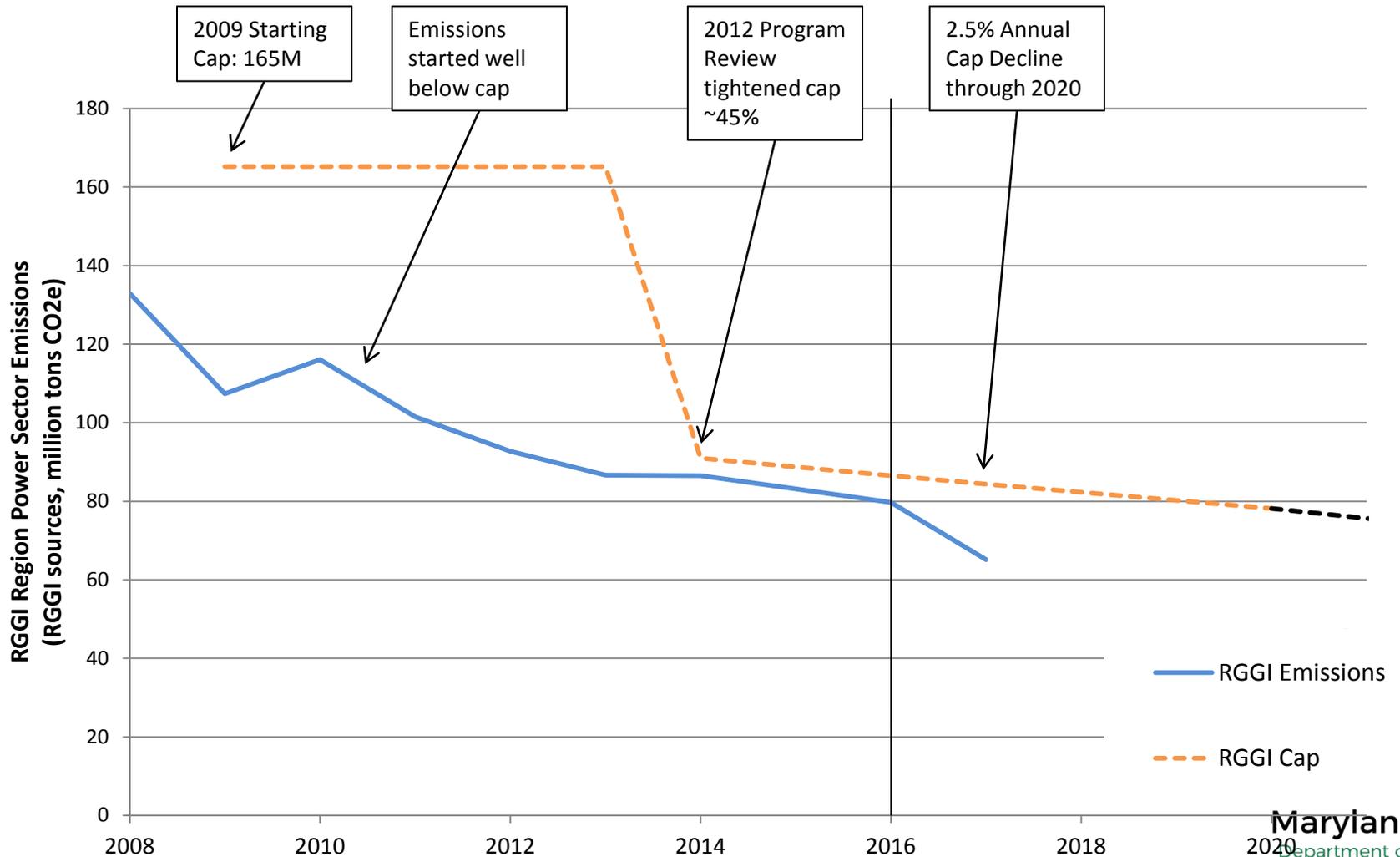
2010/2012 Program Review

- 2010 review required by COMAR 26.09.02.02E
- Contract with Regional Economic Studies Institute (RESI) to conduct review
 - Reviewed auctions, auction prices, electricity generation in MD, set-aside accounts, COATS, and an overall impact analysis
 - Draft delivered August 1, 2010
- 2012 review required by RGGI MOU
 - Required a review of all components of the RGGI program
 - Determined that a future program review would occur no later than 2016



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2012 Program Review Cap Change



Reasons for 2012 Review

- RGGI was the first cap and invest CO₂ program in the nation, a good state that can be made better
- Analyses indicated that proposed changes would:
 - Preserve significant reductions that have already occurred in power sector CO₂ emissions, and drive further reductions
 - 91 cap projected to generate:
 - ~80 - 90 million tons of cumulative emission reductions by 2020
 - ~14 - 20 million tons less of annual emissions in 2020
 - Result in a modest increase in allowance prices
 - ~\$4 (\$2010) per allowance in 2014
 - ~\$10 (\$2010) per allowance in 2020
 - Have minimal net impact to consumer's electricity bills
 - Average electricity bill for MD residential, commercial, and industrial customers projected to increase by less than 1%
 - Generate an additional \$2.67 billion (\$2010) regionally for reinvestment into energy efficiency (through 2040)



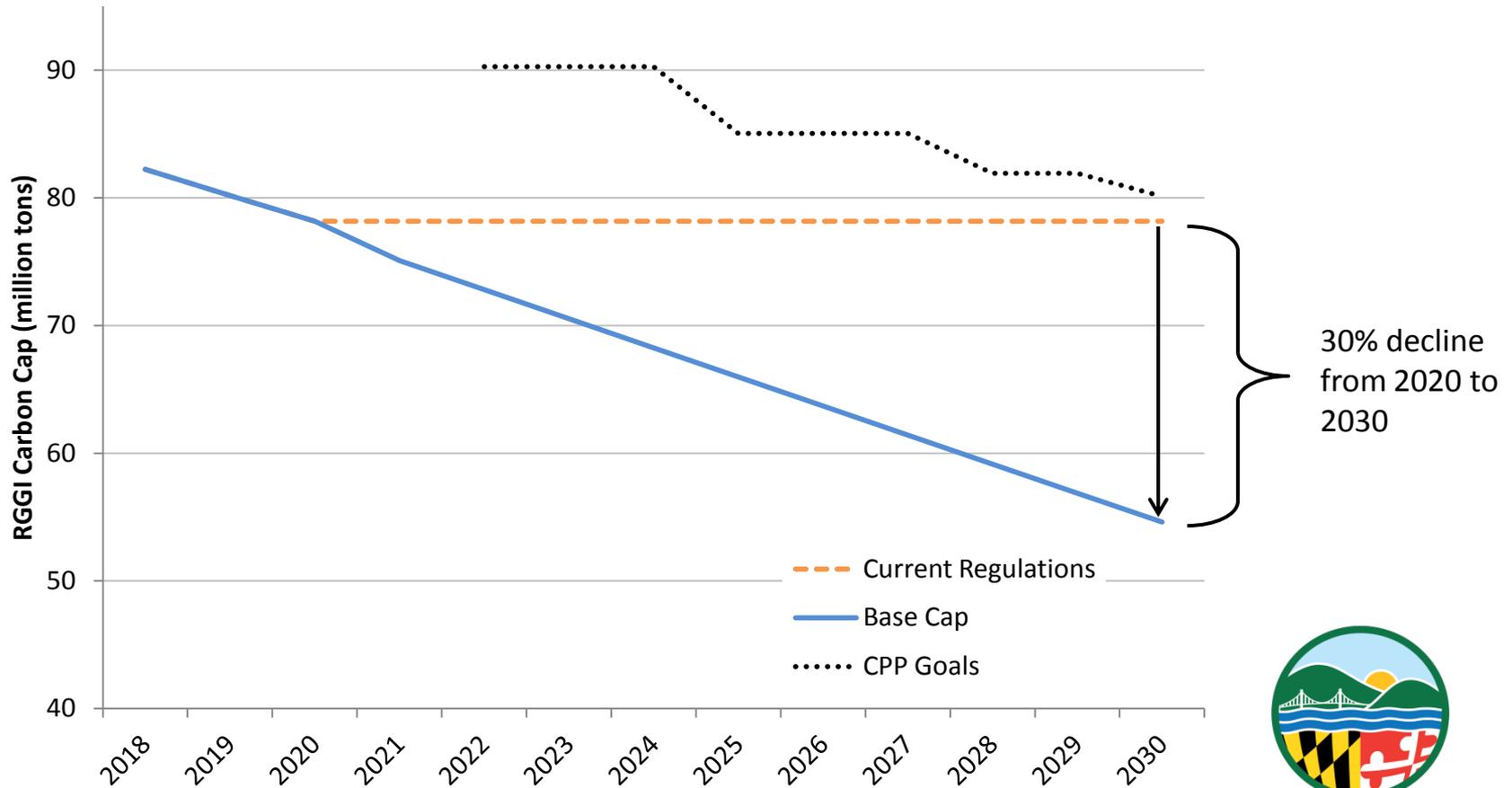
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2016 Program Review

- 2016 Program Review followed the same format as the 2012 Program Review
- On behalf of the RGGI states, RGGI, Inc. facilitated public stakeholder meetings to gather stakeholder input for the states' 2016 Program Review
- 2016 Program Review solicited stakeholder input on RGGI program design elements, including considerations for compliance under the EPA Clean Power Plan
- RGGI states also held state-specific stakeholder meetings
- RGGI states engaged in routine private conferences to review and reach a consensus on any changes to the RGGI program
 - A review of all components of the RGGI program occurred



2016 Program Review Cap Changes



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Consensus Agreement

The RGGI states recently announced an agreement to improve the program in the 2020s:

1. Reduce the cap by 30% from 2020 to 2030
2. Adjust for excess allowances remaining in 2020
3. Improve and maintain the Cost Containment Reserve (CCR)
4. Implement a new Emissions Containment Reserve (ECR)



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Proposed Amendments

RGGI Model Rule and Maryland CO₂ Budget Trading Program Updates



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RGGI Model Rule Update to Cap and Base Budget

- **Size and Structure of Cap and Allowance Apportionment:**
 - 2021 regional emissions cap = 75,147,784 tons
 - Will decline by 2.275 million tons of CO₂ per year thereafter
 - A total 30% reduction in the regional cap from 2020 to 2030



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Maryland Base Budget

- **COMAR 26.09.02.03A**
 - Maryland CO₂ Budget Trading Program
- **The Maryland base budget has been changed to reflect the new RGGI cap and decline**
 - The Maryland base budget has been calculated for years 2018 through 2030



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Maryland Base Budget

Maryland Base Budget by Year	
Year	Allowances
2018	18,671,045
2019	17,931,922
2020	17,483,623
2021	16,790,271
2022	16,281,475
2023	15,772,679
2024	15,263,882
2025	14,755,086
2026	14,246,290
2027	13,737,494
2028	13,228,698
2029	12,719,902
2030 and each succeeding calendar year	12,211,106

RGGI Model Rule Update to Cost Containment Reserve (CCR)

- The Model Rule contains language for the continued use of a CCR
 - Provides flexibility and cost containment for the program
 - Consists of a fixed quantity of allowances, in addition to the cap
 - Held in reserve
 - Only made available for sale if allowance prices exceed predefined price levels



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RGGI Model Rule Update to CCR cont.

- The Model Rule contains language for an annual CCR allowance quantity of 10% of the regional cap beginning 2021 and each succeeding year thereafter.
- The CCR allowances would be made available immediately in any auction in which demand for allowances at prices above the CCR trigger price exceeds the supply of allowances offered for sale in that auction prior to the addition of any CCR allowances.
- If the CCR is triggered, the CCR allowances would only be sold at or above the CCR trigger price.
- The CCR Trigger Price will be \$13.00 in 2021 and rise at 7% per year, so that the CCR will only trigger if emission reduction costs are higher than projected.



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Maryland CCR Allocation

- **COMAR 26.09.02.03C**
 - Cost Containment Reserve CCR Allocation.
- **On or before January 1, 2021, and each calendar year thereafter, the Department shall allocate current vintage year CCR allowances.**
 - The CCR allocation has been calculated for years 2018 through 2030.



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Maryland CCR Allocation

Maryland Cost Containment Reserve (CCR) Allocation by Year	
Year	Allowances
2018	2,236,466
2019	2,236,466
2020	2,236,466
2021	1,679,027
2022	1,628,147
2023	1,577,267
2024	1,526,388
2025	1,475,508
2026	1,424,629
2027	1,373,749
2028	1,322,869
2029	1,271,990
2030 and each succeeding calendar year	1,221,110

Maryland CCR Trigger Price

- **COMAR 26.09.01.02B(34-1)**
 - “CO₂ cost containment reserve trigger price, or CCR trigger price”
- **Definition added explaining how the CCR trigger price is calculated and what the CCR trigger price shall be for years 2017 through 2030.**
 - 2017: \$10.00
 - 2018 to 2020: 1.025 multiplied by the CCR trigger price from the previous calendar year (rounded to the nearest whole cent)
 - 2021: \$13.00
 - 2022 to 2030: 1.07 multiplied by the CCR trigger price from the previous calendar year (rounded to the nearest whole cent)



Maryland CCR Trigger Prices

Cost Containment Reserve (CCR) Trigger Price by Year	
Year	CCR Trigger Price Amount
2017	\$10.00
2018	\$10.25
2019	\$10.51
2020	\$10.77
2021	\$13.00
2022	\$13.91
2023	\$14.88
2024	\$15.93
2025	\$17.04
2026	\$18.23
2027	\$19.51
2028	\$20.88
2029	\$22.34
2030	\$23.90

RGGI Model Rule Update to Emissions Containment Reserve (ECR)

- The Model Rule contains language for the creation and use of an ECR
 - Responds to supply and demand in the market if emissions reduction costs are lower than projected
 - States will withhold allowances from circulation to secure reductions if prices fall below established trigger prices
 - Allowances withheld will not be reoffered for sale



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RGGI Model Rule Update to ECR cont.

- The Model Rule contains language for an annual ECR allowance withholding limit of 10% of the budgets of states implementing the ECR.
- The ECR trigger price will be \$6.00 in 2021, and rise at 7% per year, so that the ECR will only trigger if emission reduction costs are lower than projected.



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Maryland ECR Allocation

- **COMAR 26.09.02.03D**
 - Emissions Containment Reserve (ECR) Withholding.
- **ECR allowances are only withheld if the conditions in COMAR 26.09.04.06B(4) are met:**
 - “CO₂ ECR allowances shall only be withheld from an auction if the demand for allowances would result in an auction clearing price that is less than the ECR trigger price prior to the withholding from the auction of any ECR allowances”



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Maryland ECR Allocation

Maryland Emission Containment Reserve (ECR) Allocation by Year

Year	Allowances
2021	1,679,027
2022	1,628,148
2023	1,577,268
2024	1,526,388
2025	1,475,509
2026	1,424,629
2027	1,373,749
2028	1,322,870
2029	1,271,990
2030 and each succeeding calendar year	1,221,111

Maryland ECR Trigger Price

- **COMAR 26.09.01.02B(34-3)**
 - “CO₂ emissions containment reserve trigger price, or ECR trigger price”
- **Definition added explaining how the ECR trigger price is calculated and what the ECR trigger price shall be for years 2021 through 2030.**
 - 2021: \$6.00
 - 2022 to 2030: 1.07 multiplied by the ECR trigger price from the previous calendar year (rounded to the nearest whole cent)

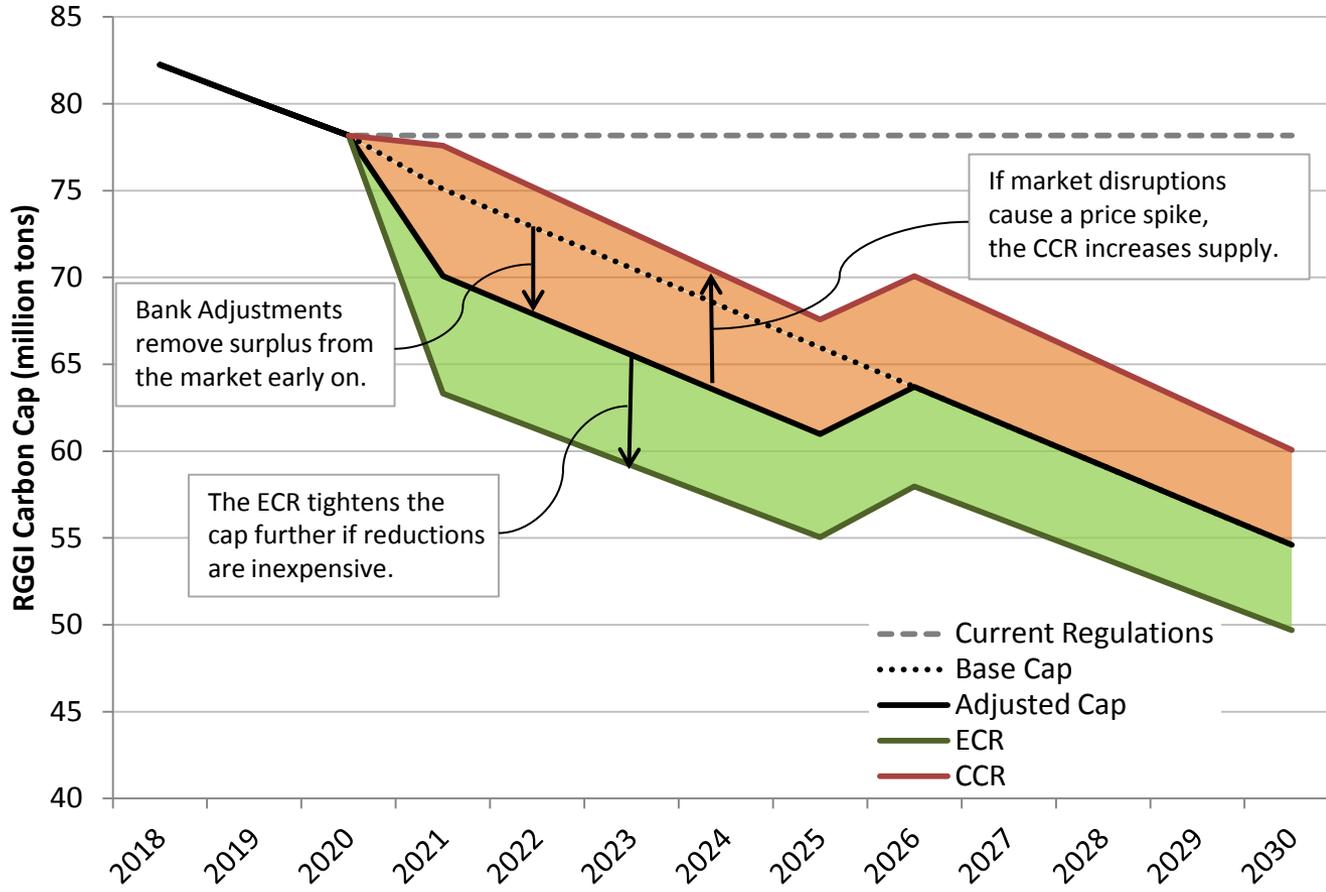


Maryland ECR Trigger Prices

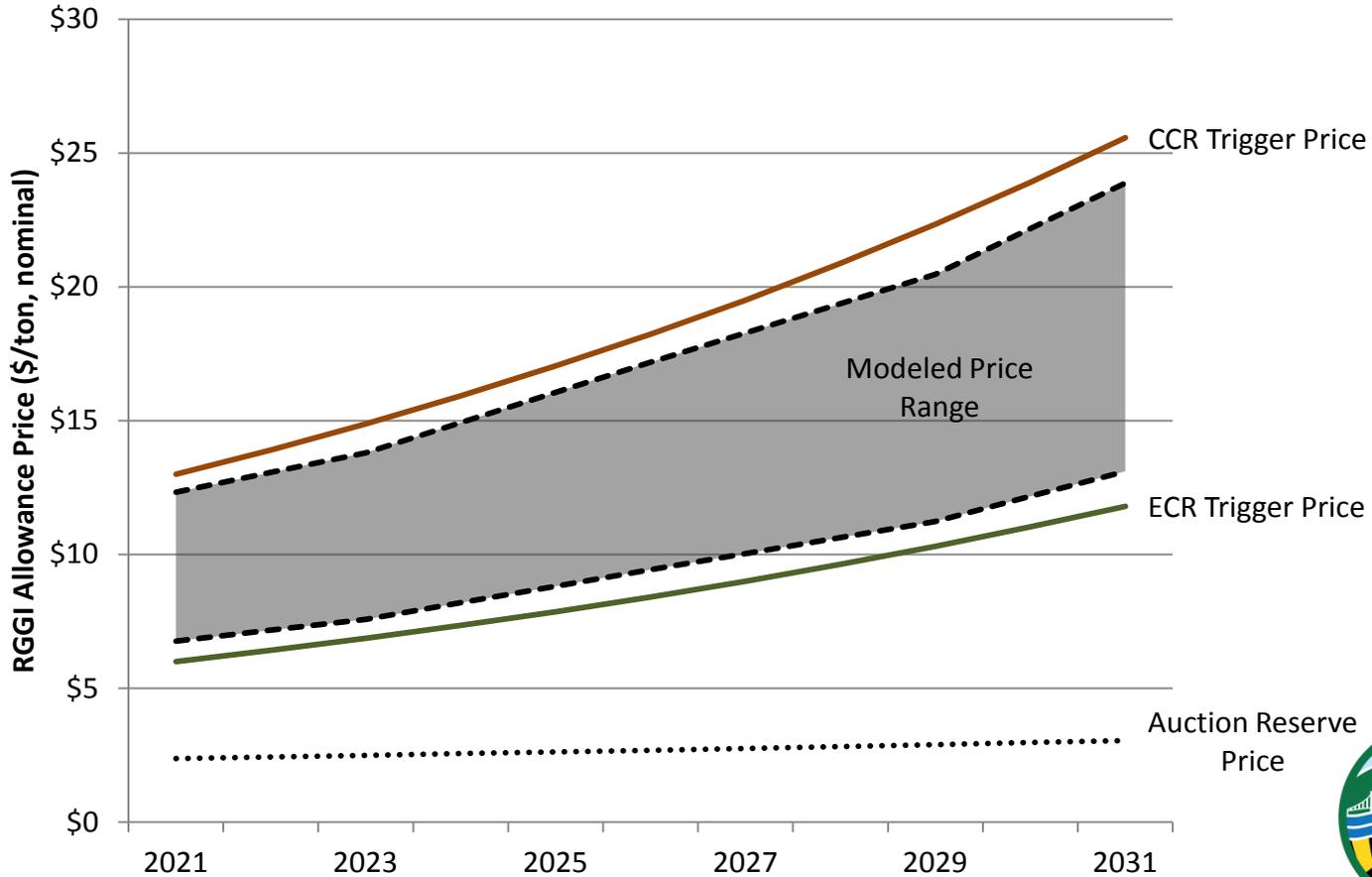
Maryland Emissions Containment Reserve (ECR) Trigger Price by Year

Year	ECR Trigger Price Amount
2021	\$6.00
2022	\$6.42
2023	\$6.87
2024	\$7.35
2025	\$7.86
2026	\$8.42
2027	\$9.00
2028	\$9.63
2029	\$10.31
2030	\$11.03

Adaptive Cap



CCR and ECR Price Triggers



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RGGI Model Rule Update to Budget Adjustments

- The Model Rule contains language to address the private bank of allowances through one additional, distinct budget adjustment.
- The Third Adjustment for Banked Allowances, would adjust the base budget for 100 percent of the pre-2021 vintage allowances held by market participants as of the end of 2020, that are in excess of the total quantity of 2018, 2019, and 2020 emissions.
- The third adjustment timing and algorithm is spelled out in the Model Rule and would be implemented over the 5-year period, 2021-2025, after the actual size of the 2020 vintage private bank is determined.



Maryland Budget Adjustments

- **COMAR 26.09.02.03F**
 - Adjustment for First Control Period Banked Allowances.
- **By January 15, 2014, the Department shall establish the adjustment for first control period banked allowances as 1,863,361 allowances applicable to allocation years 2014 through 2020.**
 - Previous formula removed.



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Maryland Budget Adjustments

- **COMAR 26.09.02.03G**
 - Adjustment for Second Control Period Banked Allowances.
- On March 15, 2014, the Department shall establish the adjustment for second control period banked allowances as 3,106,578 allowances applicable to allocation years 2015 through 2020.
 - Previous formula removed.



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Maryland Budget Adjustments

- **COMAR 26.09.02.03H**
 - Third Adjustment for Banked Allowances.
- On March 15, 2021, the Department shall establish the third adjustment for banked allowances quantity for allocation years 2021 through 2025.
 - Formula included to account for potential future changes to program/budgets.



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Maryland Budget Adjustments

- COMAR 26.09.02.031
 - CO₂ Budget Trading Program Adjusted Budgets
- On April 15, 2014, the Department shall establish the Maryland CO₂ Budget Trading Program adjust budgets for allocations years 2018 through 2020.
 - Previous calculations removed
 - 2018: 13,701,106 allowances
 - 2019: 12,961,983 allowances
 - 2020: 12,513,684 allowances
- On April 15, 2021, the Department shall establish the Maryland CO₂ Budget Trading Program adjust budgets for allocations years 2021 through 2025.
 - Formula included to account for potential future changes to program/budgets



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Maryland Budget Adjustments

- **COMAR 26.09.02.03J**
 - General Distribution of CO₂ Allowances.
- Changes reflect recent regulatory updates to the allocations of the Voluntary Renewable Set-Aside Account and Clean Generation Set-Aside Account.



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Limited Industrial Exemption Set-aside Account Allocation (not in draft)

- **COMAR 26.09.02.03J(3)(a)**
 - The allocation of CO₂ allowances to the Limited Industrial Exemption Set-aside Account will change to the following values:
 - 2018: 3,465,101 allowances
 - 2019: 2,976,734 allowances
 - 2020: 2,488,367 allowances
 - 2021 and each succeeding calendar year: 2,000,000 allowances
- **26.09.02.06G**
 - “After the Department has retired CO₂ allowances from the Limited Industrial Set-aside Account for the preceding calendar year, the Department shall supplement the remaining allowances in the account by transferring from the Consumer Energy Efficiency Account the number of allowances needed to restore the balance of the Limited Industrial Set-aside Account to the amount described in Regulation .03J(3)(a) of this chapter for that calendar year.”



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Long Term Contract Set-aside Account Purchase Limitation (not in draft)

- 26.09.02.07C
 - “The number of allowances purchased from the Long Term Contract Set-aside Account by an applicant may not exceed the equivalent tons of CO₂ that the applicant emits in the prior calendar year.”



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RGGI Model Rule Update to Offsets

- The Model Rule contains language that eliminates two offset categories:
 - SF₆ Offset Category
 - End-Use Energy Efficiency Offsets Category
- Updates and retains three categories that some States may continue to implement
- Any awarded offset allowances would remain fully fungible across the states.



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Maryland Offset Changes

- Reduction in Emissions of Sulfur Hexafluoride (SF_6) offset category removed
 - Previously COMAR 26.09.03.04
- Reduction or Avoidance of CO_2 Emissions from Natural Gas, Oil, or Propane End-Use Combustion Due to End-Use Energy Efficiency offset category removed
 - Previously COMAR 26.09.03.06



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Summary of RGGI Model Rule Updates

- **Miscellaneous**
 - **COMAR 26.09.01.02B(72-2)**
 - **Minimum Reserve Price**
 - The Model Rule retains language to increase the minimum reserve price by 2.5 percent each year



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Bill Impacts

RGGI Average Monthly Bill Impact for Years 2017-2031

<u>Customer Class</u>	<u>Reference Case</u>	<u>Model Rule Policy Scenario</u>	
	<u>Average Monthly Bill (\$2015)</u>	<u>Monthly Difference (\$2015)</u>	<u>Percent Difference</u>
Residential	\$ 54.83	\$ 0.14	0.3%
Commercial	\$ 322.32	\$ 2.69	0.8%
Industrial	\$ 3,998.19	\$ 13.21	0.3%

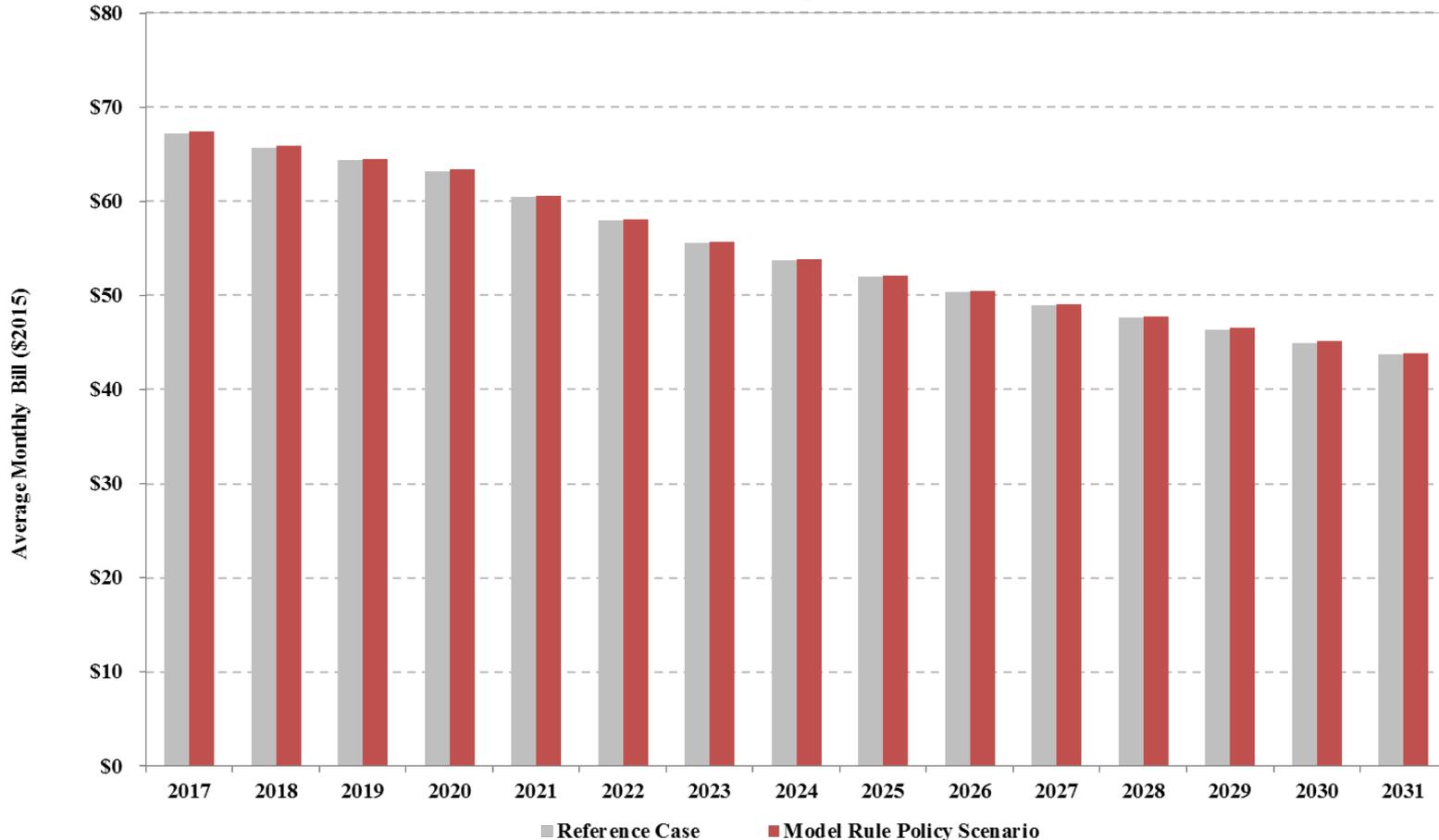
Source: RGGI Customer Bill Analysis performed by the Analysis Group on behalf of the RGGI states. Available at <https://www.rggi.org/program-overview-and-design/program-review>



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Bill Impacts, cont.

Average Electric Monthly Bills (\$2015)
Residential Customers
RGGI Average



Notes:

- [1] Usage and Delivery rates based on 5-year historical averages from EIA.
- [2] Energy rates and avoided load totals based on ICF modeling.



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Economic Impacts

- Positive economic impact across the region

Cumulative RGGI Results (2017-2046)	
Economic Indicator	3% Discount Rate*
Total Employment (Job-Years)	130,119
% Change from BAU	0.016%
BAU Level	820,000,000
Gross State Product (Billion Fixed 2015\$)	\$9.50
% Change from BAU	0.013%
BAU Level	\$72,000
Disposable Personal Income (Billion Fixed 2015\$)	\$6.21
% Change from BAU	0.011%
BAU Level	\$55,000

*Employment numbers are undiscounted

Source: RGGI Economic Impact Analysis performed by ICF on behalf of the RGGI states. Available at <https://www.rggi.org/program-overview-and-design/program-review>



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Questions?



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