



Maryland
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The Regional Greenhouse Gas Initiative

PJM Carbon Pricing Task Force

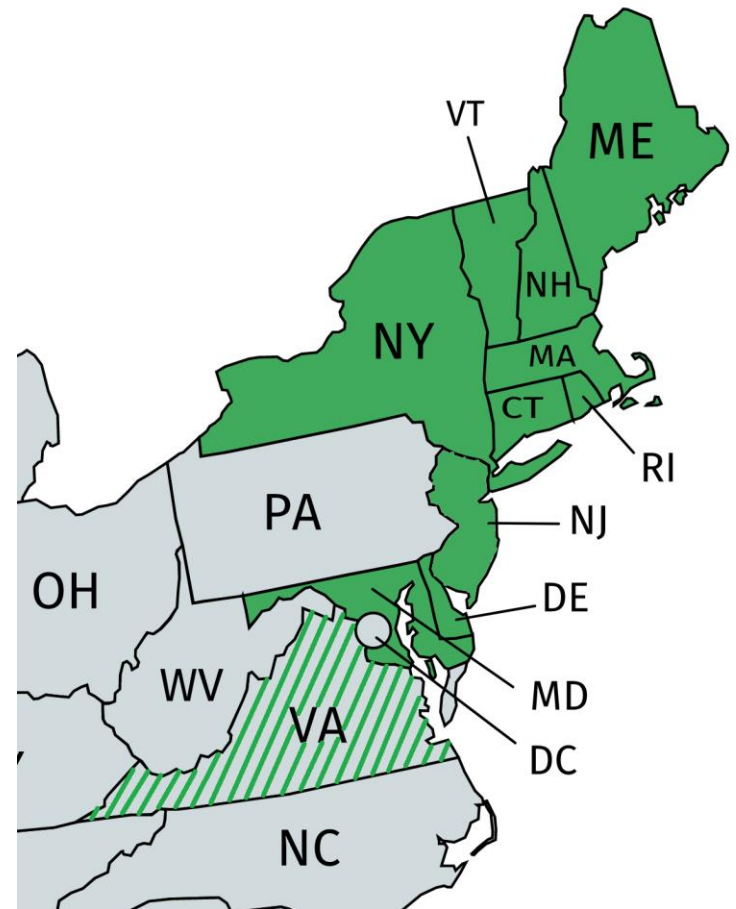
Chris Hoagland

Maryland Department of the Environment

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The Regional Greenhouse Gas Initiative

- Carbon Cap on Power Plants
- 10 States Participate
 - NJ now participating
 - VA promulgated regulation but not participating
- Most allowances sold at auction
- Auction proceeds fund energy programs



Cap and Invest

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

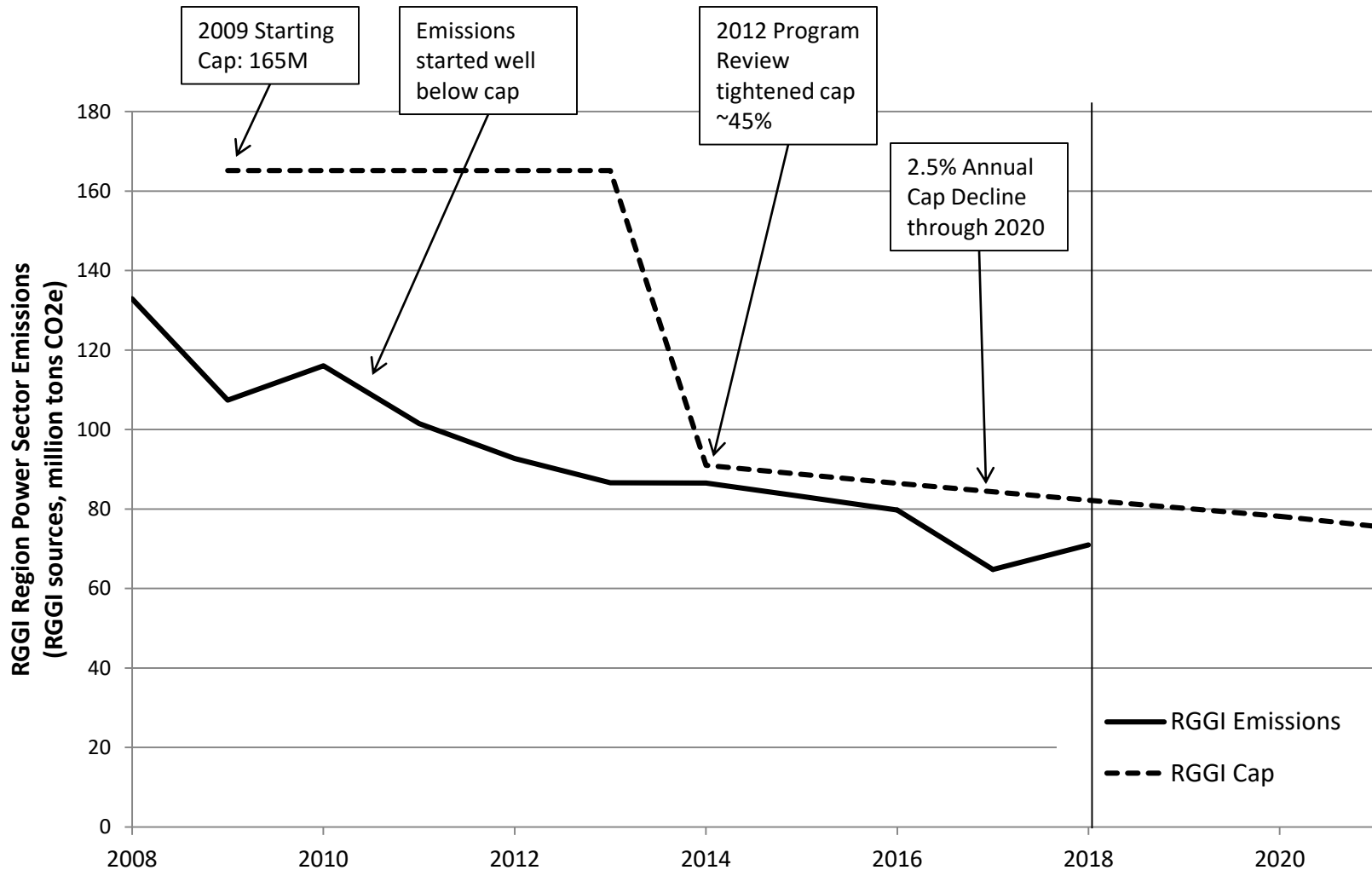
“Cap and Trade”

“Cap and Invest”



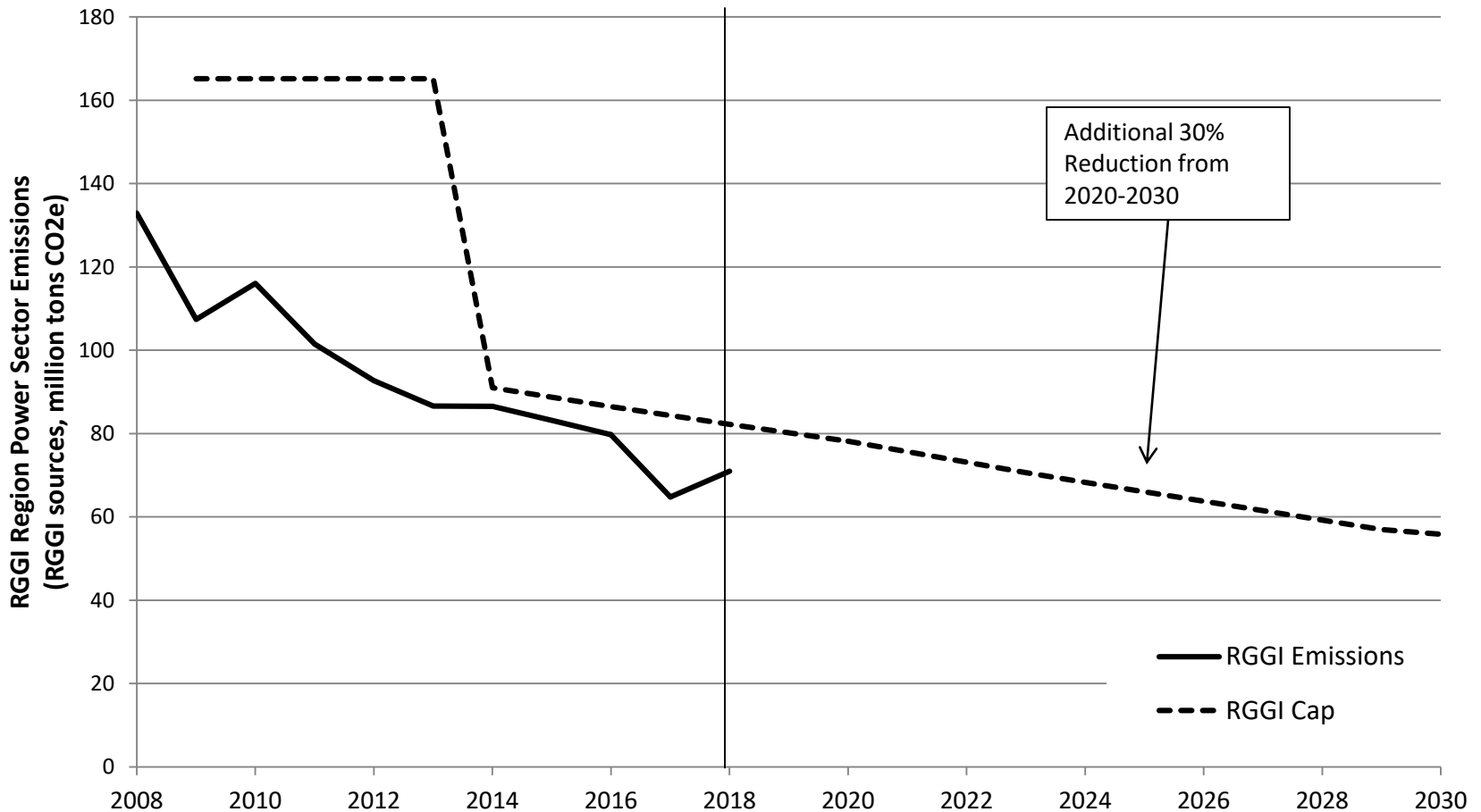
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RGGI Caps & Emissions: through 2020



NOTE: Does not include New Jersey, which participated from 2009-2011.

RGGI Caps & Emissions: through 2030



NOTE: The addition of New Jersey will increase the cap & covered emissions starting in 2020.

Flexibility Mechanisms

The Cost Containment Reserve is...

A reserve from which allowances are released

If prices are high

The Emissions Containment Reserve is...

A reserve into which allowances are diverted

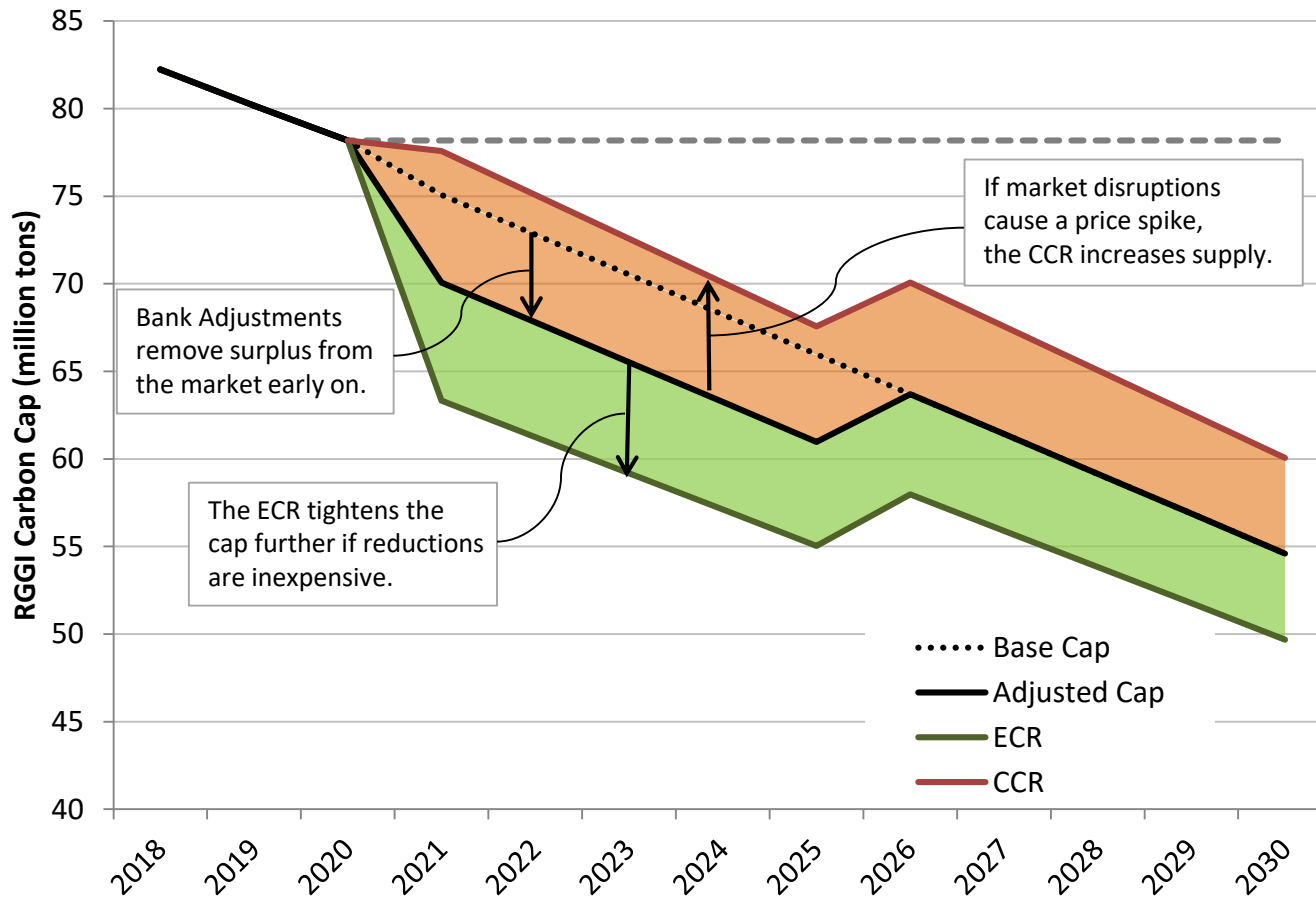
If prices are low

Both act during the auction

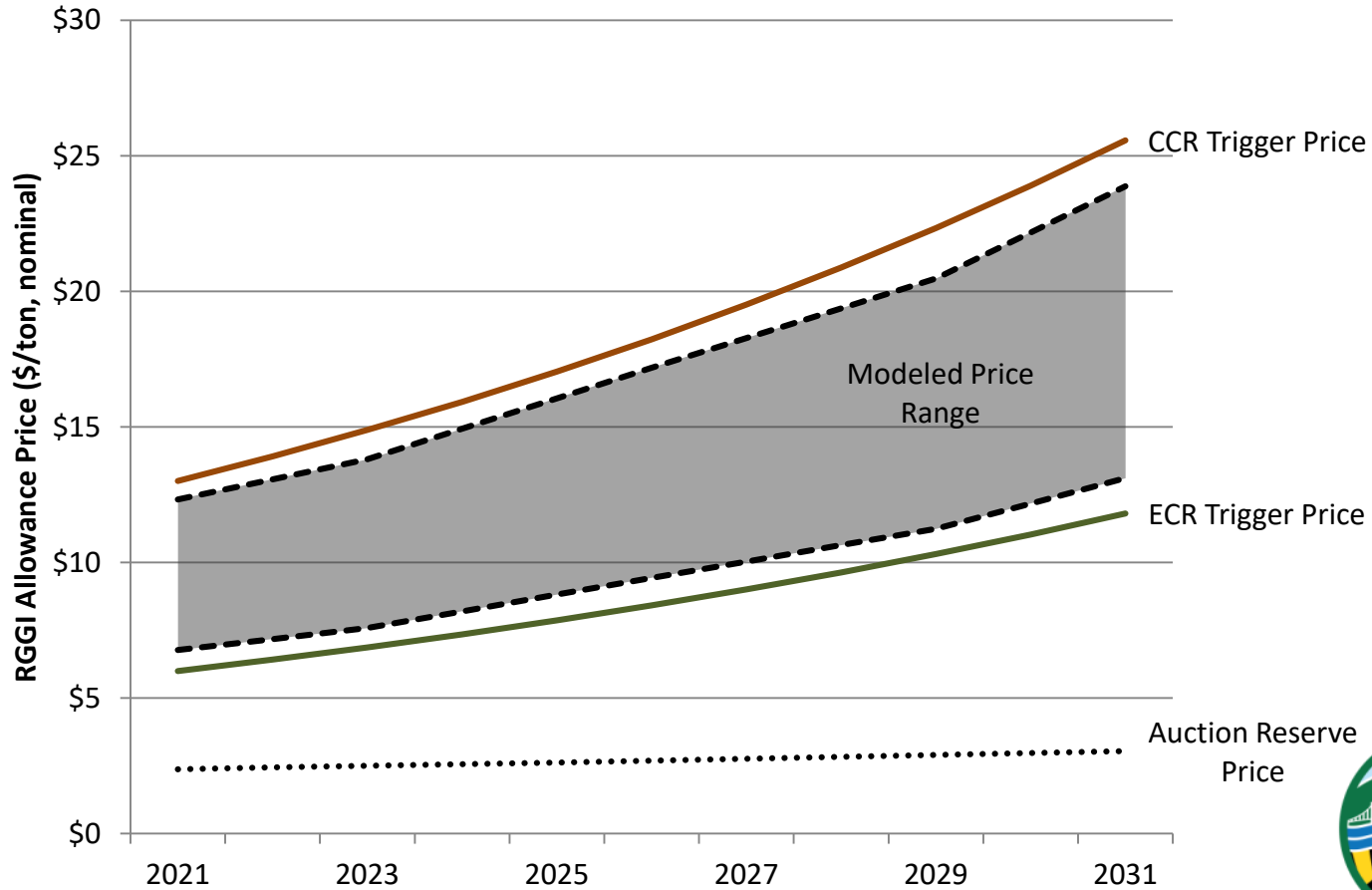


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2017 Agreement: An Adaptive Cap

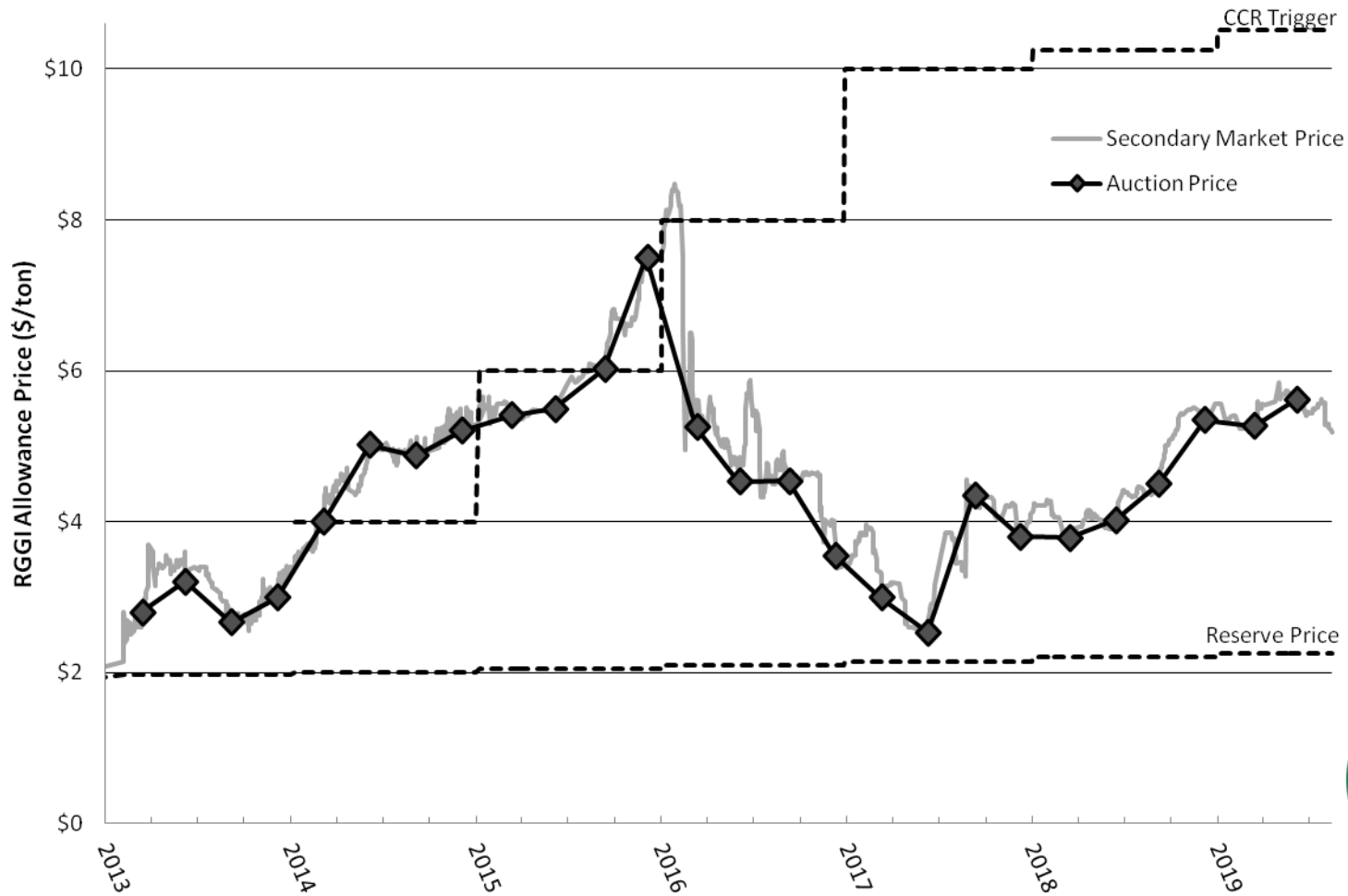


2017 Agreement: CCR and ECR Price Triggers



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RGGI Prices



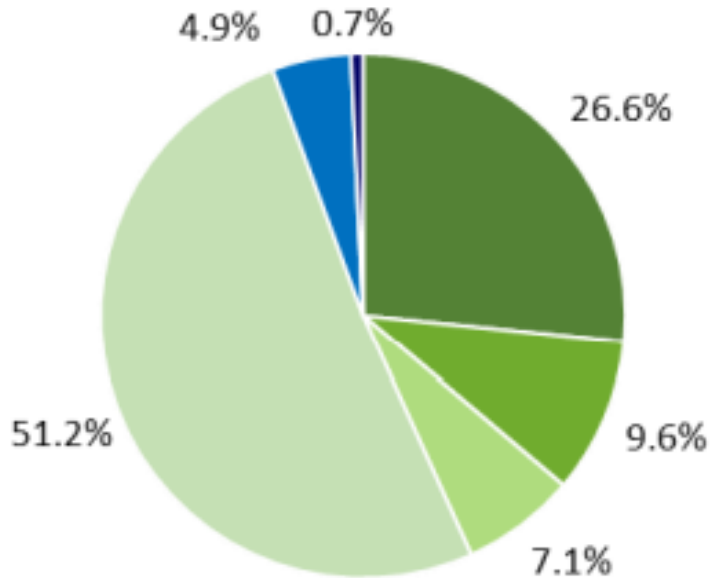
Allowance Allocation

- Most allowances sold at quarterly auctions
- Participating states receive the proceeds
- \$3.2 billion raised region-wide to-date
 - \$656 million in Maryland
- Each state receives proceeds from sale of its allowances
 - The regional cap is just the sum of individual state allowance budgets.

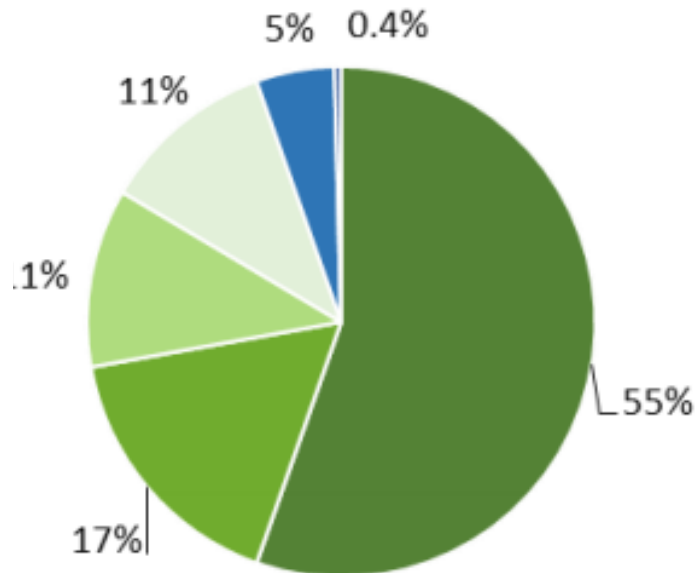


Auction Proceeds Investment

Maryland:



Region-wide:











- Energy Efficiency
- Clean & Renewable Energy
- GHG Abatement
- Direct Bill Assistance
- Administration
- RGGI, Inc.



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Auction Proceeds Impacts

Table 1: Benefits of 2016 RGGI Investments

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	182,135 (Programs)* 806,605 (Bill Assistance)	N/A
 Participating Businesses	2,680 (Programs)* 109,220 (Bill Assistance)	N/A
 Workers Trained	370	N/A
 Short Tons CO ₂ Avoided	382,266	6.4 million
 Equiv. Cars Off Road	74,258	1.2 million
 Megawatt-Hours Saved	409,630	7.0 million
 MMBtu Saved	1.6 million	30.4 million
 Energy Bill Savings	\$150.5 million	\$1.7 billion

*Participants in all programs other than direct bill assistance.



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RGGI Impacts (Independent Estimates)

1. RGGI has reduced emissions.

Murray, Brian C. and Peter T. Maniloff. “Why Have Greenhouse Emissions in RGGI States Declined? An Econometric Attribution to Economic, Energy Market, and Policy Factors.” *Energy Economics*. August 2015. <http://www.sciencedirect.com/science/article/pii/S0140988315002273>

2. RGGI has boosted economic growth & employment.

“The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeastern and Mid-Atlantic States.” Analysis Group. April 2018.
http://www.analysisgroup.com/uploadedFiles/Content/Insights/Publishing/analysis_group_rggi_report_april_2018.pdf

3. RGGI has improved public health.

“Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative.” Abt Associates, 2017. <http://abtassociates.com/reports/2017/rggi.aspx>



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Leakage

Leakage has been a concern since program design.

The states monitor for leakage through the annual electricity monitoring report.

Leakage cannot be directly measured.

Dispatch models will generally leak, even at low allowance prices (this may not always be realistic).



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Leakage

Current state strategies to counteract leakage:

- 1- Invest in reductions in-region
- 2- Expand state participation

Potential state strategies to counteract leakage:

- 1- ISO/RTO market rules to reflect carbon pricing & address leakage
- 2- Updating Output-based Allowance Allocation



RGGI Regulations

- The participating states work together to write a Model Rule
 - <http://www.rggi.org/design>
- Each state's RGGI program is consistent with the Model Rule
 - <http://www.rggi.org/design/regulations>
- The cap is the sum of participating state allowance budgets



My Info

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