DRAFT 2016 RGGI Program
Review CPP Reference Case and
Model Run #1 Results

April 29, 2016

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The following slides present select projections from two cases that RGGI specified for evaluation:

- The CPP Nationally Reference Case, assuming Clean Power Plan in states outside of RGGI. This CPP assumption is the same for Model Run #1.
- The Model Run #1, assuming a reduction in the number of CCR allowances available to limit available allowances each year in RGGI to the CPP mass based goals

- Projections are based on assumptions in place as of April 15, 2016.

- These projections are draft and may change as ICF makes refinements based on review and input by the States.

- Detailed assumptions are summarized in accompanying materials.
The cases rely on some assumptions that have been updated since they were published and previously reviewed with stakeholders:

- Natural gas transportation costs are based on recent historical weather-normalized delivered prices but no longer adjusted over time to reflect cost trends from the Annual Energy Outlook (AEO) 2015.

- Incremental renewable capacity and energy efficiency have been assumed for New York consistent with the proposed Clean Energy Standard (CES).

- Some state-specific changes to economic biomass builds.
## CPP Nationally Reference Case and Model Run #1 Specifications

<table>
<thead>
<tr>
<th>Assumption</th>
<th>CPP Nationally (CPP) Reference Case</th>
<th>Model Run #1 (MR1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGGI Cap</td>
<td>2020 cap extended through end of modeling horizon</td>
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</tr>
<tr>
<td>RGGI Cost Containment Reserve (CCR)</td>
<td>10 million tons available in each year through end of modeling horizon</td>
<td>10 million tons available in each year, limited each year by RGGI CPP mass based goal. CCR declines from 10 M in 2022 to 1.9 M in 2031.</td>
</tr>
<tr>
<td>RGGI CCR Trigger Price</td>
<td>Trigger price rising at 2.5% annually through end of modeling horizon</td>
<td></td>
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<tr>
<td>RGGI Offsets</td>
<td>Offsets allowed for up to 3.3% of compliance through end of modeling horizon at $25/ton</td>
<td></td>
</tr>
<tr>
<td>RGGI Trading</td>
<td>Trading of RGGI allowances among RGGI states</td>
<td></td>
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<tr>
<td>Banking</td>
<td>Unlimited banking across the modeling horizon</td>
<td></td>
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<tr>
<td>Clean Power Plan Goals</td>
<td>States outside of RGGI subject to mass caps covering existing and new units</td>
<td></td>
</tr>
<tr>
<td>Clean Power Plan Trading</td>
<td>Trading among all states outside of RGGI</td>
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</tbody>
</table>
Assumed RGGI CO₂ Caps and CCR Availability

**RGGI Emission Cap**

- Million Tons CO₂

**RGGI Maximum CCR Availability**

- Million Tons CO₂
- CCR (CPP Ref)
- CCR (MR1)
The chart shows the distribution of capacity additions and retirements across firmly planned (“Firm”) and model-projected (“Economic”) types.
The chart shows the distribution of capacity additions and retirements by capacity type.
The chart shows generation by type and net imports for the RGGI states.
**RGGI CO₂ Emissions**

- The chart shows projected CO₂ emissions from RGGI-affected sources.
- Emissions exceed the RGGI Cap when allowances are withdrawn from the bank or purchased at the CCR trigger price.

Note: Assumes that any allowance bank is fully exhausted in 2031.
## RGGI Emissions (Million of Tons)

<table>
<thead>
<tr>
<th>Case</th>
<th>Cumulative Emissions</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>2016-2021</td>
<td>2022-2031</td>
<td>2022-2029</td>
<td>2030-2031</td>
</tr>
<tr>
<td>CPP Nationally Reference Case</td>
<td>504</td>
<td>822</td>
<td>642</td>
<td>179</td>
</tr>
<tr>
<td>Model Run #1</td>
<td>504</td>
<td>807</td>
<td>634</td>
<td>173</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPP Goals (Aggregate for RGGI States)</th>
<th>2022-2031</th>
<th>2022-2029</th>
<th>2030-2031</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>850</td>
<td>690</td>
<td>160</td>
</tr>
</tbody>
</table>
The chart shows the projected CO₂ emissions relative to the cap and the use of banked allowances and CCR allowances used for compliance.
CO₂ Emission Reductions – MR1

- The chart shows the projected CO₂ emissions relative to the cap and the use of banked allowances and CCR allowances used for compliance.

![Chart showing projected CO₂ emissions relative to cap and use of banked allowances and CCR allowances for compliance.](chart)

- RGGI Adjusted Cap
- RGGI Emissions
- RGGI Cap

Bank Withdrawal (incl. CCR tons) vs. Incremental Banking (not incl. CCR tons)

CCR Purchases = 25.4 MM

Year: 2016-2031
The charts show the projected RGGI average annual firm (energy + capacity) prices in constant 2012 dollars.
RGGI Allowance Prices

- The charts show the projected RGGI allowance prices in constant 2012 dollars.

Price exceeds CCR trigger price in CPP Ref in 2029 and later, and in 2026 and later in the MR1 case.