DRAFT 2017 Model Rule Policy Scenario Overview

September 25, 2017

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Contents

- 2017 Model Rule Policy Scenario and Sensitivities

DRAFT 2017 Model Rule Policy Scenario and Sensitivity Projections

- The following slides present select projections from the draft 2017 RGGI Model Rule Policy Scenario and Sensitivities, with and without national CO_2 policy (NP) in the rest of the U.S.
- Projections are based on assumptions in place as of August 11, 2017.
- These projections are draft and may change as ICF makes refinements based on review and input by the States.

IPM Model Design

- The following projections were developed using the Integrated Planning Model (IPM), the same model used by EPA in analyzing power sector impacts of environmental regulation.
- Models are schematic representations which are used to project trends.
- Model design features will impact projected results.
- One key feature of IPM is that it optimizes across the time horizon of the analysis, so it will act in the near-term in response to long-term requirements and costs.
- This optimization has two implications for the projections:
  - The projections assume that any allowance bank is exhausted within the timeframe of the analysis.
  - Projections in the near term including generation, emissions, and allowance pricing, can be a function of projections in later years of the analysis.

2017 Model Rule Policy Scenario

DRAFT 2017 RGGI Model Rule Policy Scenario - Assumptions

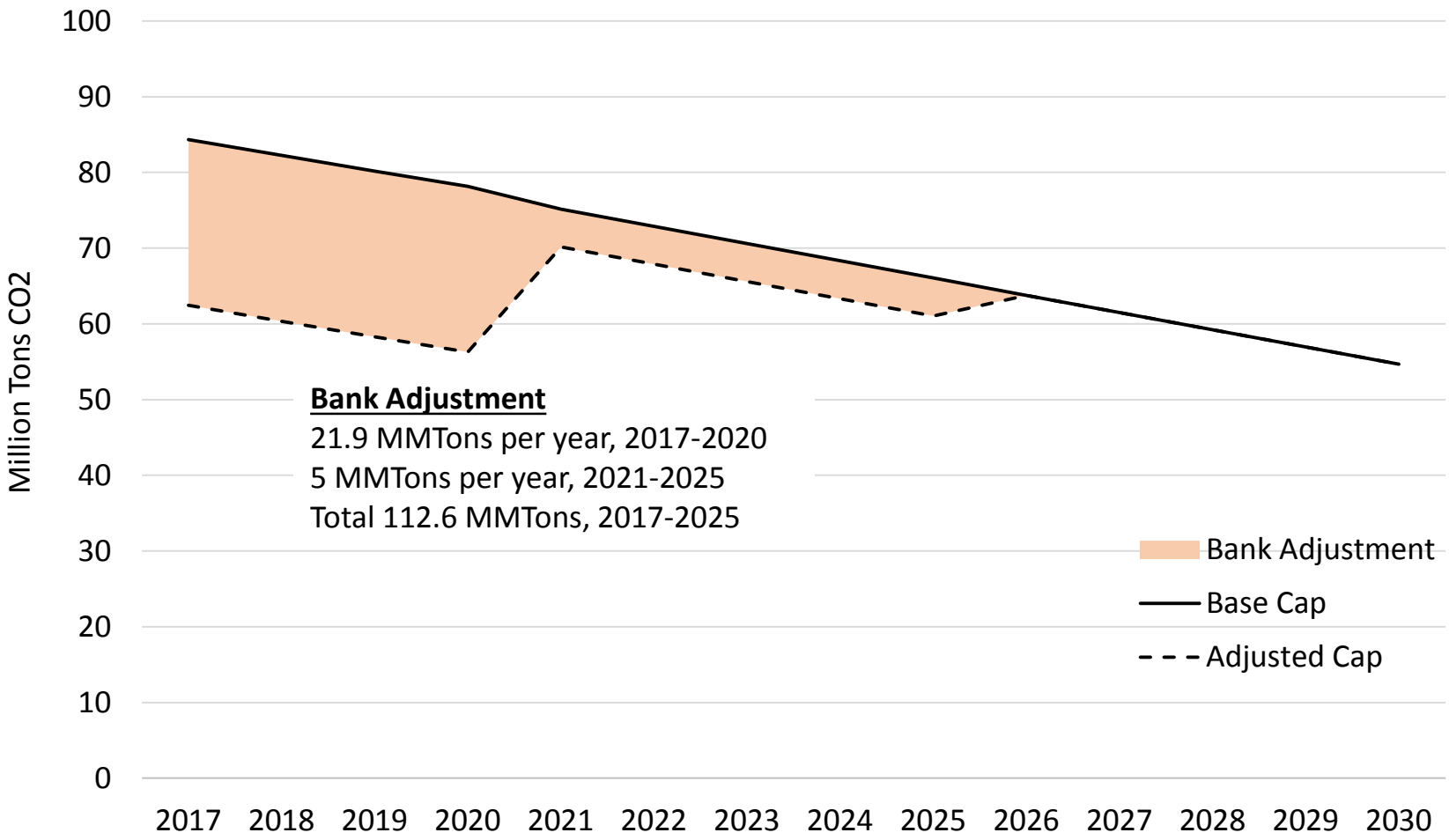
Assumption*	Model Rule Policy Scenario – Base & Sensitivity Cases
RGGI Cap	Cap declines 3MM in 2021 and then 2.275MM per year thereafter through 2030 (adjusted cap in 2017-2025)
Bank Adjustment	21.9MM per year in 2017-2020 and then 5MM per year in 2021-2025**
CCR Quantity	10MM allowances in 2017-2020 and then 10% of the annual base cap in 2021 onwards
ECR Quantity	9.1% of the annual base cap in 2021 and onwards
RGGI Trading	Trading of RGGI allowances among RGGI states
Banking	Unlimited banking across the model horizon

*Other assumptions not listed here remain consistent with most recent assumptions previously presented.
**Note that the program review proposal is for a full bank adjustment determined by a formula; modeling requires placeholder values.

DRAFT 2017 RGGI Model Rule Policy Scenario - Sensitivity Assumptions

Assumption	2017 Base Model Rule Policy Case	2017 High Sensitivity Model Rule Policy Case	2017 Low Sensitivity Model Rule Policy Case
Non-RGGI National CO_2 Program (NP) Targets	No NP	NP: States outside of RGGI subject to mass-based goals covering existing and new sources	No NP
Gas Prices (2017-2031 Avg., 2015$/MMBtu)	Average of AEO 2017 Reference Case and High Resource Case ($3.84)	AEO 2017 Reference Case ($4.30)	AEO 2017 High Resource Case ($3.39)
Nuclear Retirements	Pilgrim retires in 2019; Indian Point retires in 2020/2021	50% reduction of NY and NE generation by 2024, incl. Pilgrim and Indian Point	Pilgrim retires 2019; Indian Point retires 2024-2025
Transmission	Includes 1,050 MW line from Canada to New England starting in 2022	Removes Base Case's 1,050 MW line from Canada to New England	Include transmission in Base Case, plus additional 1,050 MW line from Canada to New England starting in 2025
Renewable Costs	NREL 2016 Base Case	NREL 2016 High Case	NREL 2016 Low Case
Firm Builds	Reference Case Assumptions as released in Feb. 2017		Add 1,600 MW Offshore wind

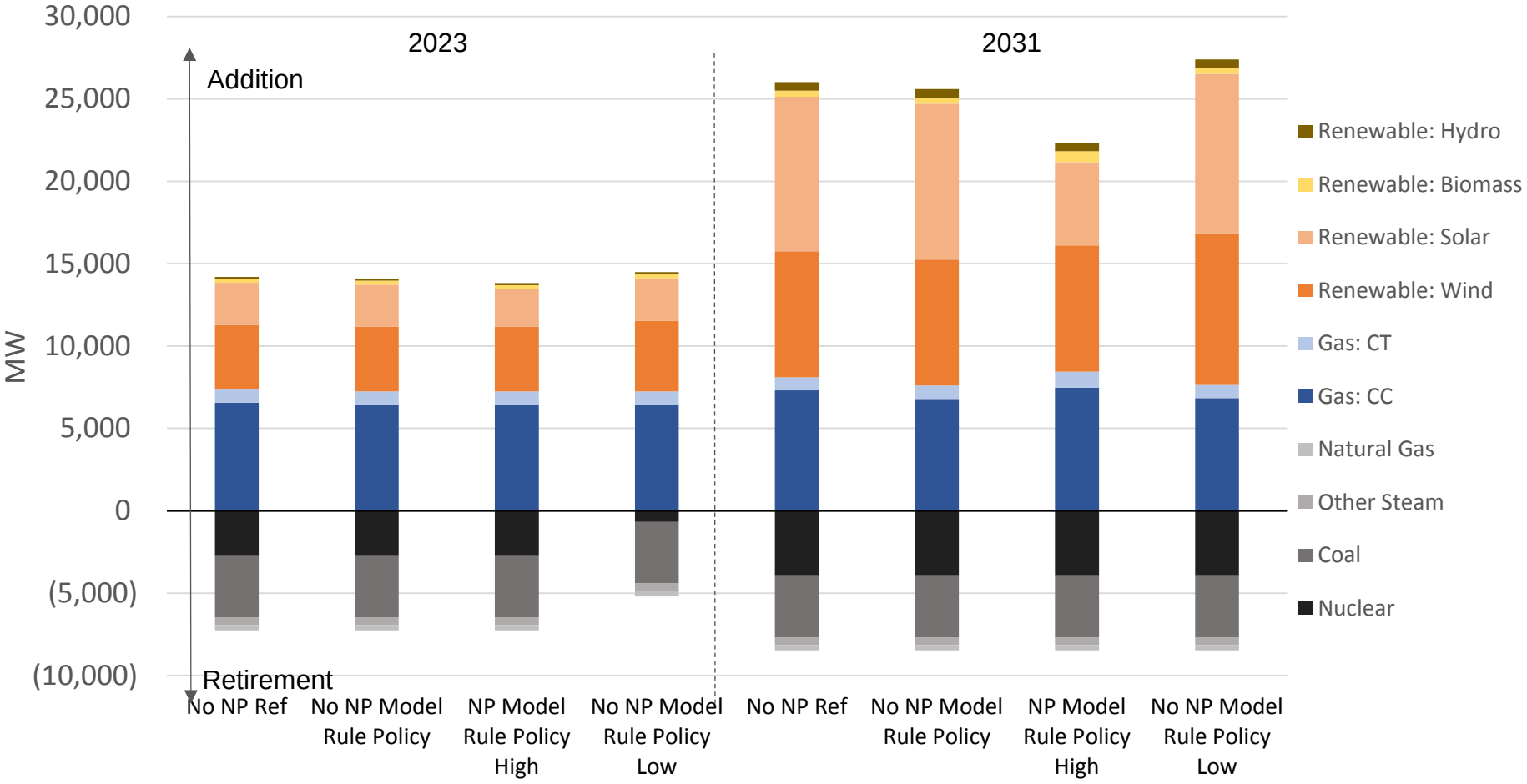
RGGI CO_2 Model Rule Policy Scenario Cap



Note that the program review proposal is for a full bank adjustment determined by a formula; modeling requires placeholder values.

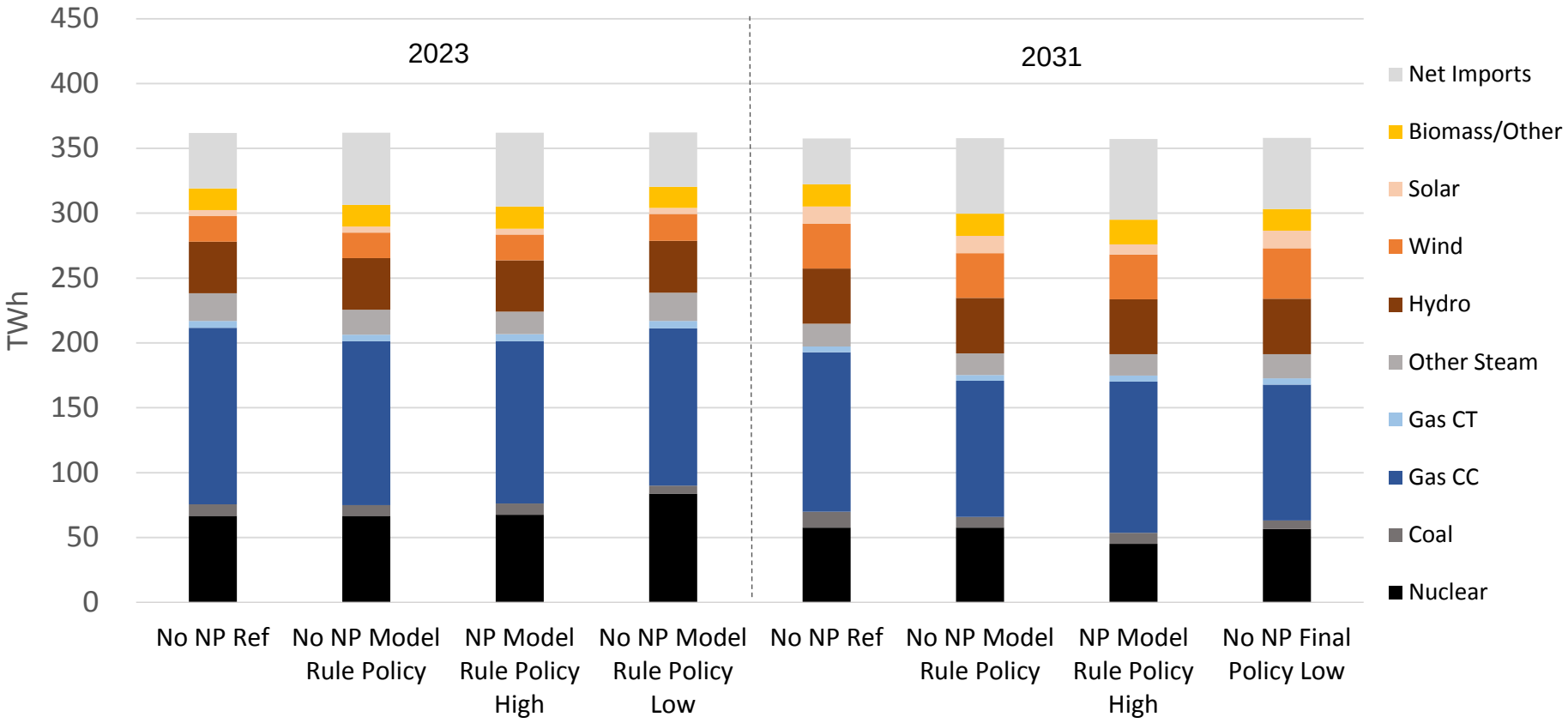
RGGI Cumulative Capacity Additions

- The chart shows the distribution of capacity additions and retirements by capacity type.

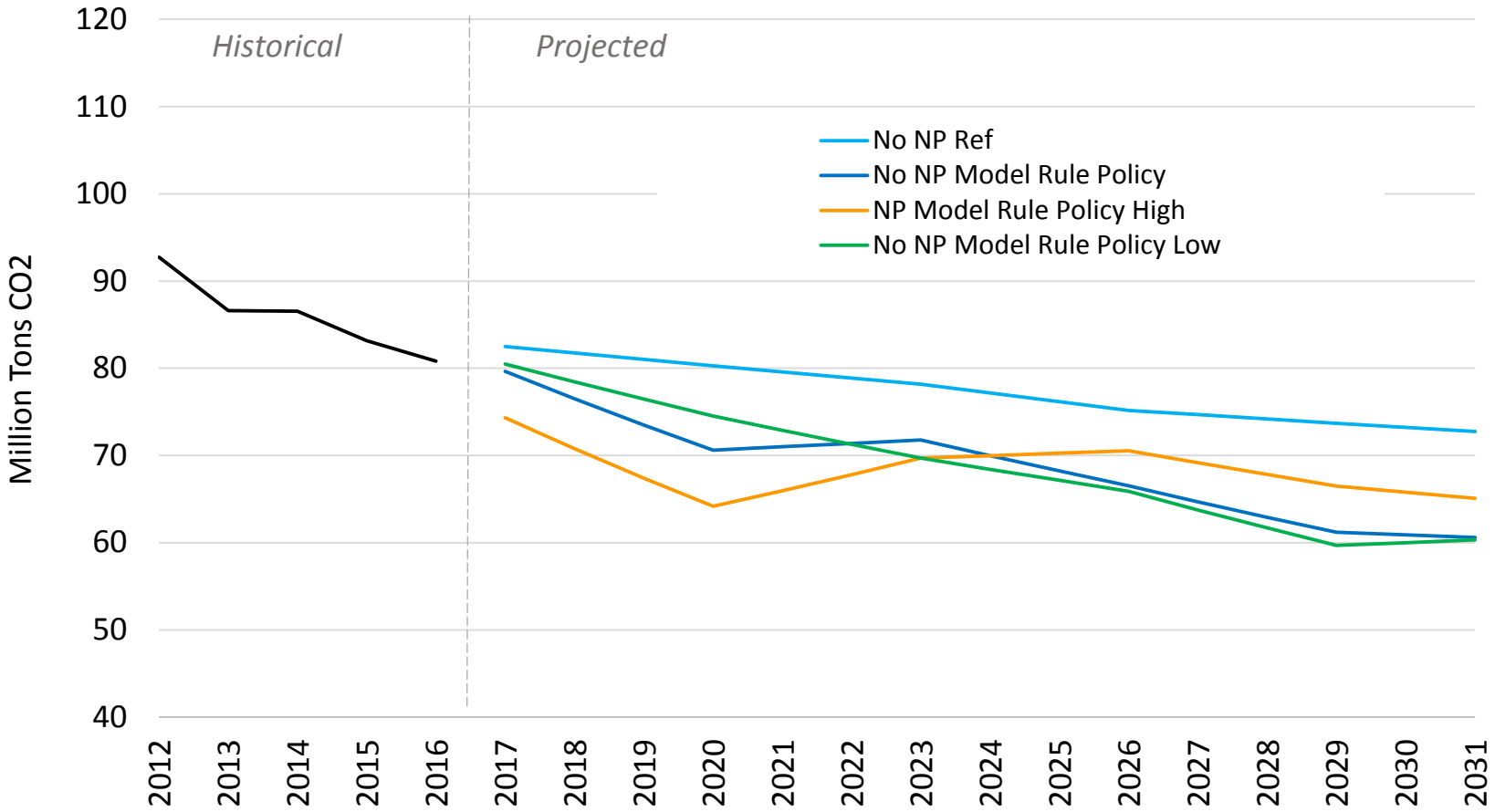


RGGI Generation Mix

- The chart shows generation by type and net imports for the RGGI states.



RGGI CO_2 Emissions



Note: Model assumes that any allowance bank is fully exhausted in 2031 and in 2032, emissions would immediately drop to cap levels shown on slide #11.

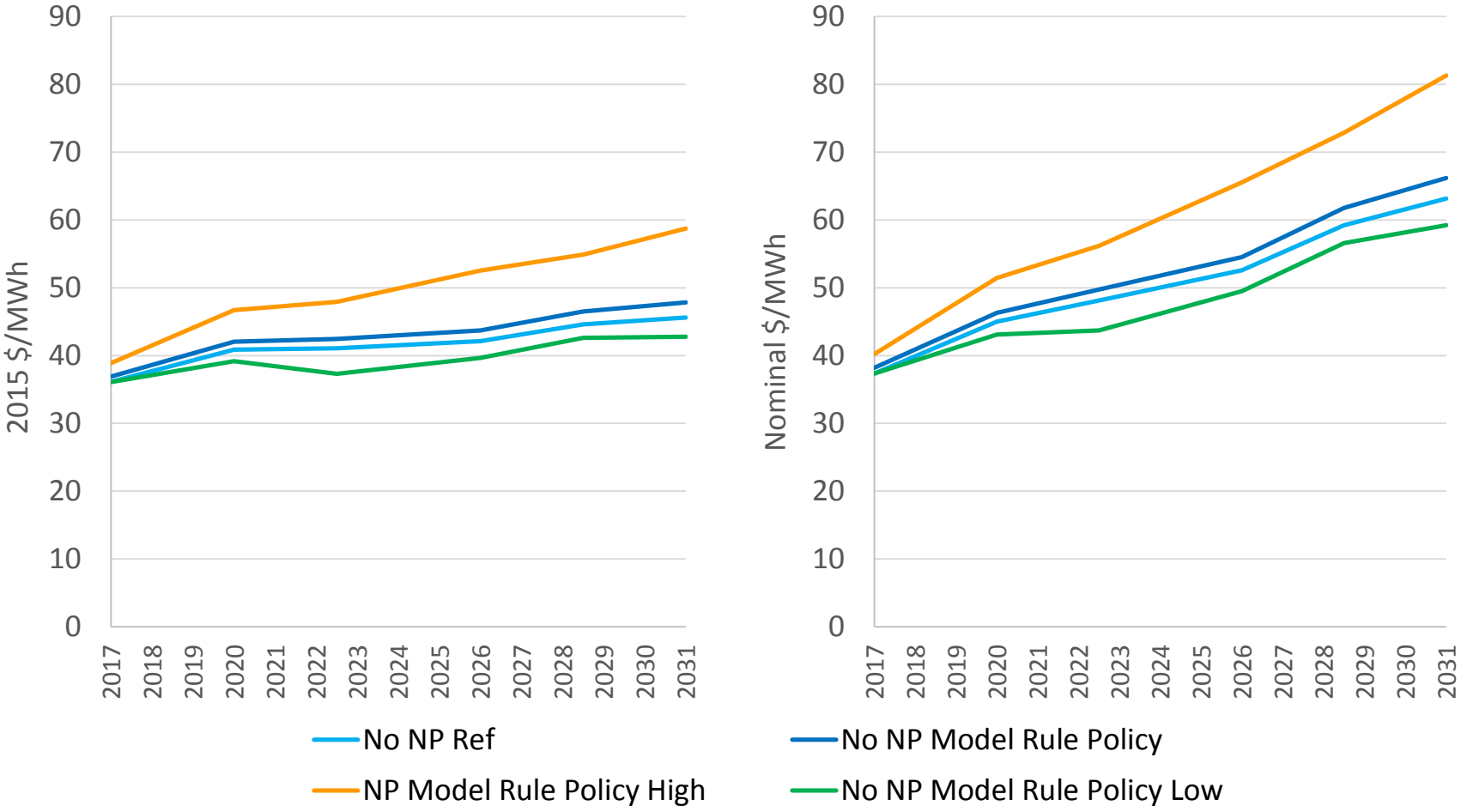
RGGI Emissions (Million of Tons)

Case	Cumulative Emissions				Average Emissions, 2017-2031	2031 Projected Emissions	2032 Cap*
	2017-2021	2022-2031	2022-2029	2030-2031			
No NP Ref	407	774	620	154	78	74	78
No NP Model Rule Policy	371	658	536	122	69	61	55
No NP Model Rule Policy - High	341	688	556	131	69	65	55
No NP Model Rule Policy - Low	384	644	524	120	69	60	55
NP Goals (Aggregate for RGGI States)		*850*	*690*	*160*			

* The time horizon of this analysis is 2017 through 2031. As discussed in slide 7, IPM will optimize use of allowance banking over that time period and carry no bank beyond 2031. To illustrate the impact of the banking behavior on long-term emissions in an analysis with a longer time horizon, the 2032 cap value can be compared to the 2031 emissions.

RGGI Firm Power Prices

- The chart shows the projected RGGI average annual firm (energy + capacity) prices in constant 2015 and nominal dollars.



RGGI Allowance Prices

- The chart shows the projected RGGI allowance prices in constant 2015 and nominal dollars.