DRAFT 2017 Policy Scenario Overview

June 27, 2017

Disclaimer – *This presentation, prepared by ICF International under contract with RGGI, Inc., is designed to support ongoing evaluation of state RGGI programs. The opinions, data and analysis contained in this report do not necessarily reflect those of RGGI, Inc. or any of the RGGI Participating States.*

Contents

- 2017 Policy Scenarios
- 2017 Policy Scenario Sensitivities

DRAFT 2017 Policy Scenario and Sensitivity Projections

- The following slides present select projections from the draft 2017 RGGI Policy Scenarios and Sensitivities, with and without national CO_2 program (NP) in the rest of the U.S.
- Projections are based on assumptions in place as of June 2, 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 Policy Scenarios

DRAFT 2017 RGGI Policy Case Assumptions

Assumption	2.5% Cap (PS#1)	3.5% Cap (PS#2)	3.0% Cap NP (PS#3)
RGGI Base Cap	Cap declines 2.5% from 2021-2030	Cap declines 3.5% from 2021-2030	6.52% cap reduction in 2019; Cap declines 3.0% from 2021-2030
Bank Adjustment	15 M Additional Bank Adjustment 2021-2023	25 M Additional Bank Adjustment 2021-2025	25 M Additional Bank Adjustment 2021-2025
CCR Quantity	No CCR allowances available throughout the modeling horizon		
Offsets	No offsets available throughout the modeling horizon		
RGGI Trading	Trading of RGGI allowances among RGGI states		
Banking	Unlimited banking across the model horizon		

Policy Scenario #1 (2.5%)

Policy Scenario #1			
	Base Cap	Bank Adjustment*	Adjusted Cap
2019	80,179,708	21,891,408	58,288,300
2020	78,175,215	21,891,408	56,283,807
2021	76,220,835	5,000,000	71,220,835
2022	74,266,455	5,000,000	69,266,455
2023	72,312,075	5,000,000	67,312,075
2024	70,357,695		70,357,695
2025	68,403,315		68,403,315
2026	66,448,935		66,448,935
2027	64,494,555		64,494,555
2028	62,540,175		62,540,175
2029	60,585,795		60,585,795
2030	58,631,415		58,631,415
TOTAL	832,616,173	15,000,000	773,833,357

*This proposal includes an additional bank adjustment of 15 million allowances in 2021-2023, which corresponds to the amount of CCR allowances released in 2014 and 2015.

Policy Scenario #2 (3.5%)

Policy Scenario #2			
	Base Cap	**Bank Adjustment***	**Adjusted Cap**
2019	80,179,718	21,891,408	58,288,310
2020	78,175,215	21,891,408	56,283,807
2021	75,439,082	5,000,000	70,439,082
2022	72,702,949	5,000,000	67,702,949
2023	69,966,816	5,000,000	64,966,816
2024	67,230,683	5,000,000	62,230,683
2025	64,494,550	5,000,000	59,494,550
2026	61,758,417		61,758,417
2027	59,022,284		59,022,284
2028	56,286,151		56,286,151
2029	53,550,018		53,550,018
2030	50,813,885		50,813,885
TOTAL	789,619,768	25,000,000	720,836,952

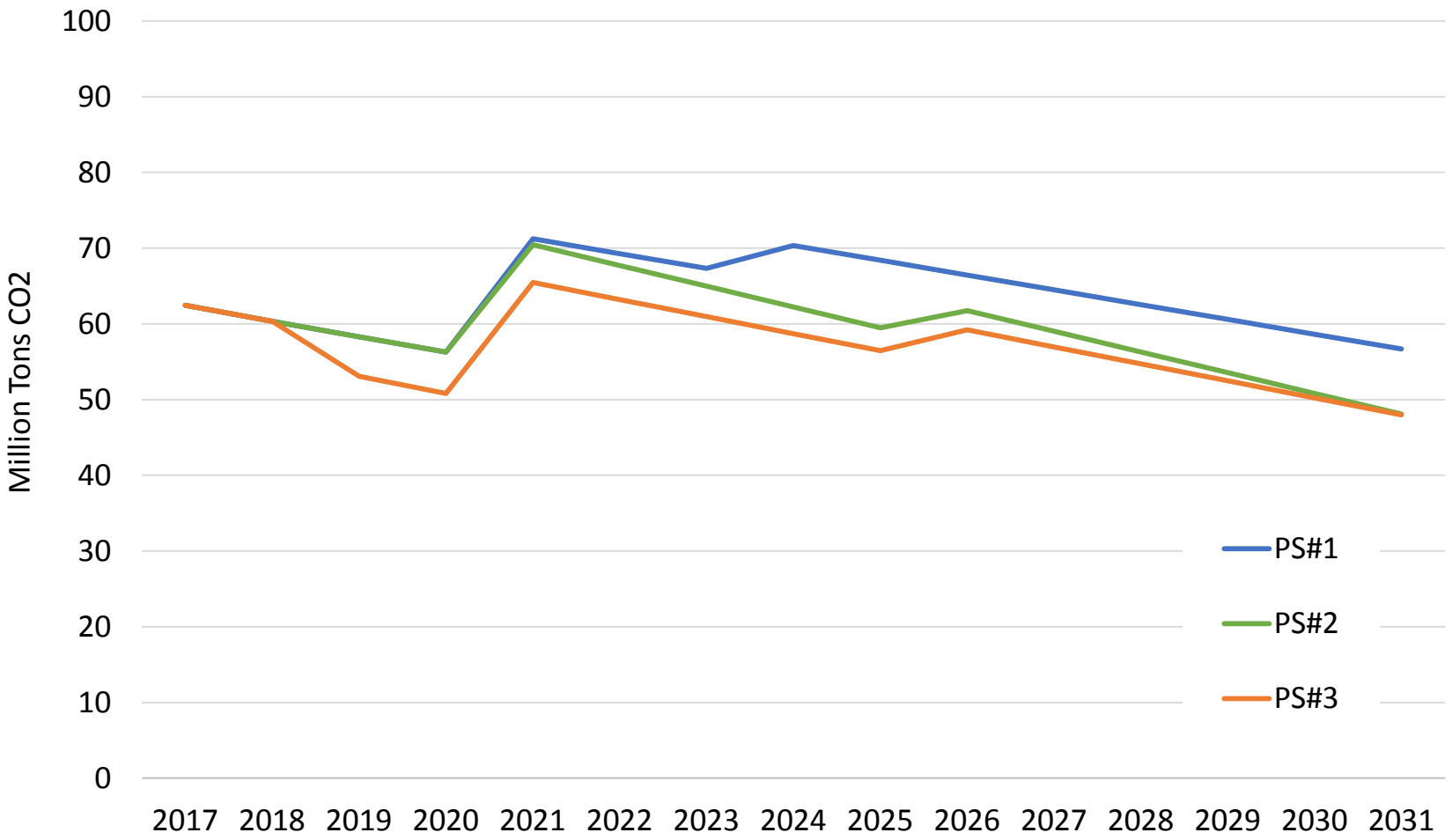
*This proposal includes an additional bank adjustment of 25 million allowances in 2021-2025. This represents an estimate of a full post-2020 bank adjustment for modeling purposes. It assumes 2017-2020 emissions are equal to the 2017-2020 RGGI base cap, no additional CCR allowances are released, and there is 100% compliance for 2015-2020. The actual post-2020 bank is yet to be determined; a “full bank adjustment” would adjust for the actual post-2020 amount.

Policy Scenario #3 (3.0%)

Policy Scenario #3			
	Base Cap	Bank Adjustment*	Adjusted Cap
2019	74,951,991	21,891,408	53,060,583
2020	72,703,431	21,891,408	50,812,023
2021	70,454,872	5,000,000	65,454,872
2022	68,206,312	5,000,000	63,206,312
2023	65,957,752	5,000,000	60,957,752
2024	63,709,192	5,000,000	58,709,192
2025	61,460,633	5,000,000	56,460,633
2026	59,212,073		59,212,073
2027	56,963,513		56,963,513
2028	54,714,953		54,714,953
2029	52,466,394		52,466,394
2030	50,217,834		50,217,834
TOTAL	751,018,950	25,000,000	682,236,134

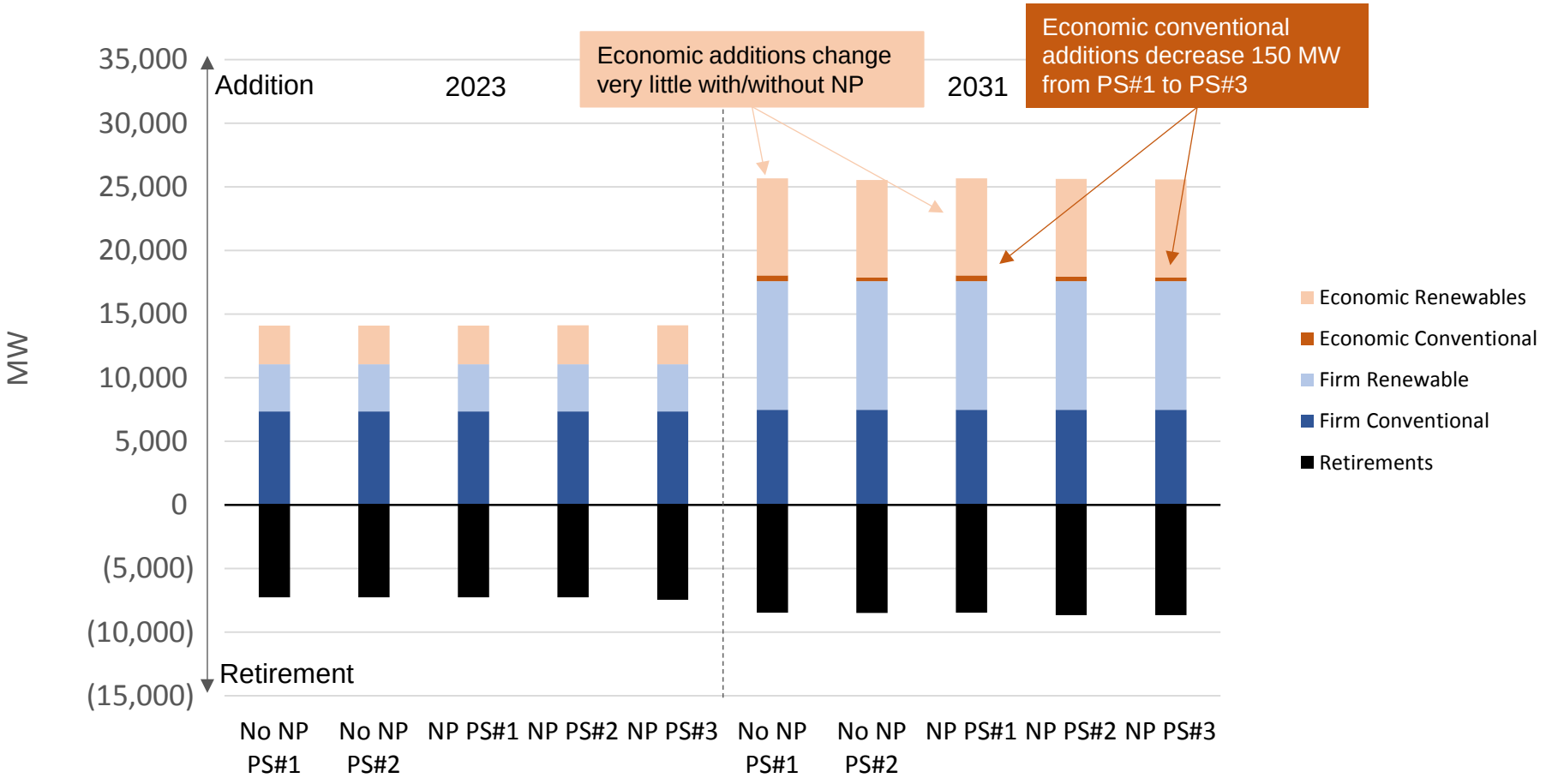
*This proposal includes an additional bank adjustment of 25 million allowances in 2021-2025. This represents an estimate of a full post-2020 bank adjustment for modeling purposes. It assumes 2017-2020 emissions are equal to the 2017-2020 RGGI base cap, no additional CCR allowances are released, and there is 100% compliance for 2015-2020. The actual post-2020 bank is yet to be determined; a “full bank adjustment” would adjust for the actual post-2020 amount.

RGGI CO_2 Policy Scenario Caps



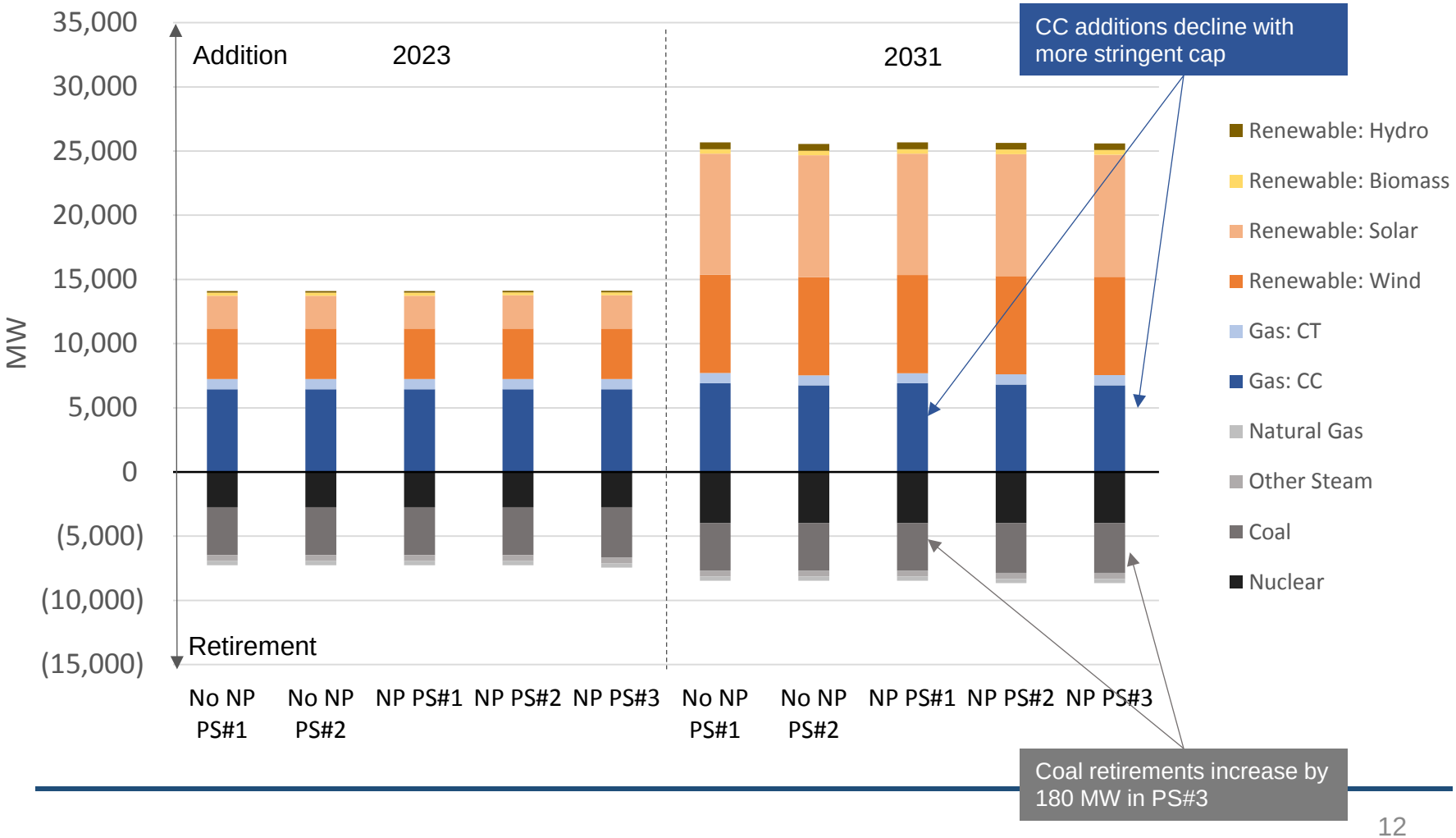
RGGI Cumulative Capacity Additions

- The chart shows the distribution of capacity additions and retirements across firmly planned ("Firm") and model-projected ("Economic") types.



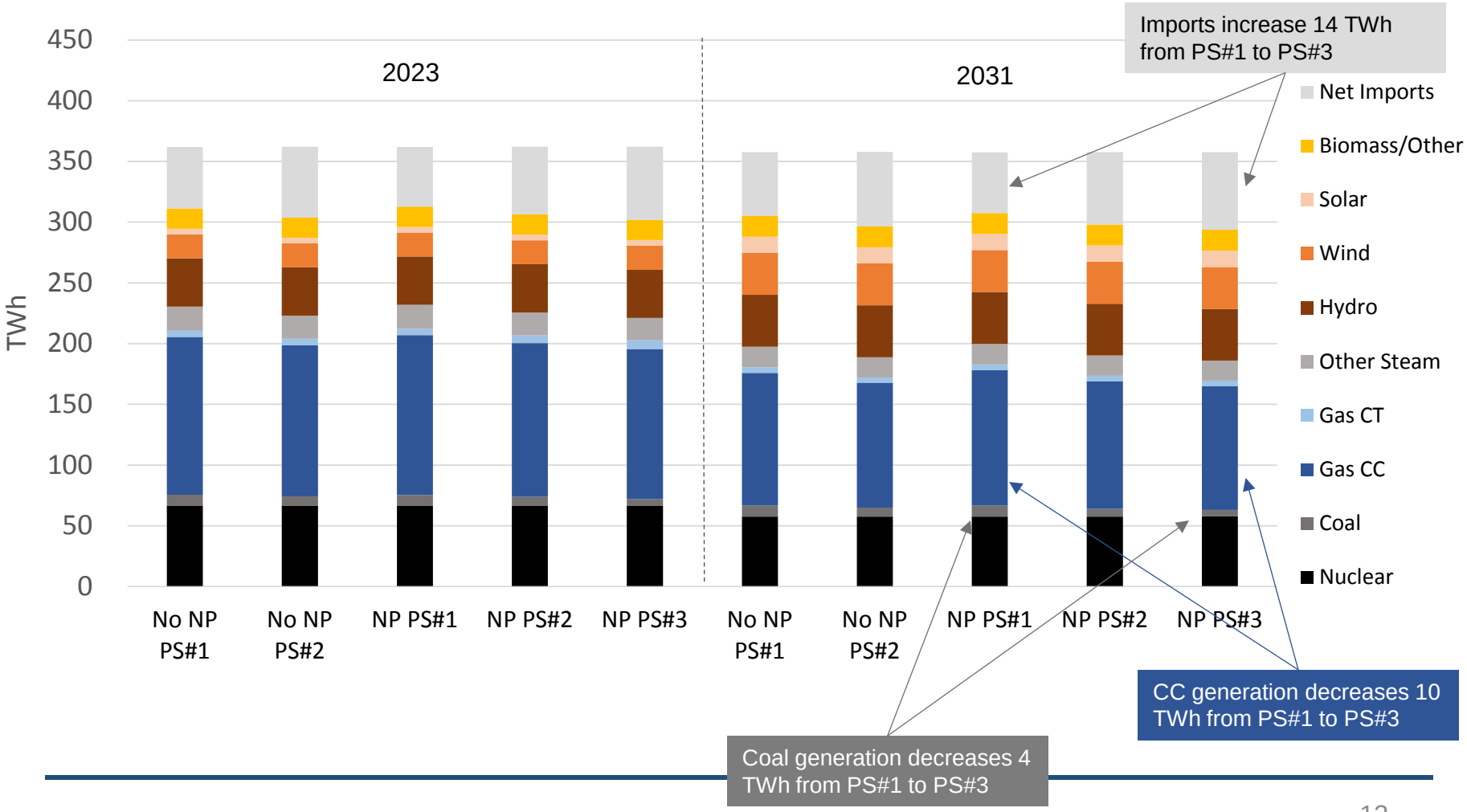
RGGI Cumulative Capacity Additions (2)

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

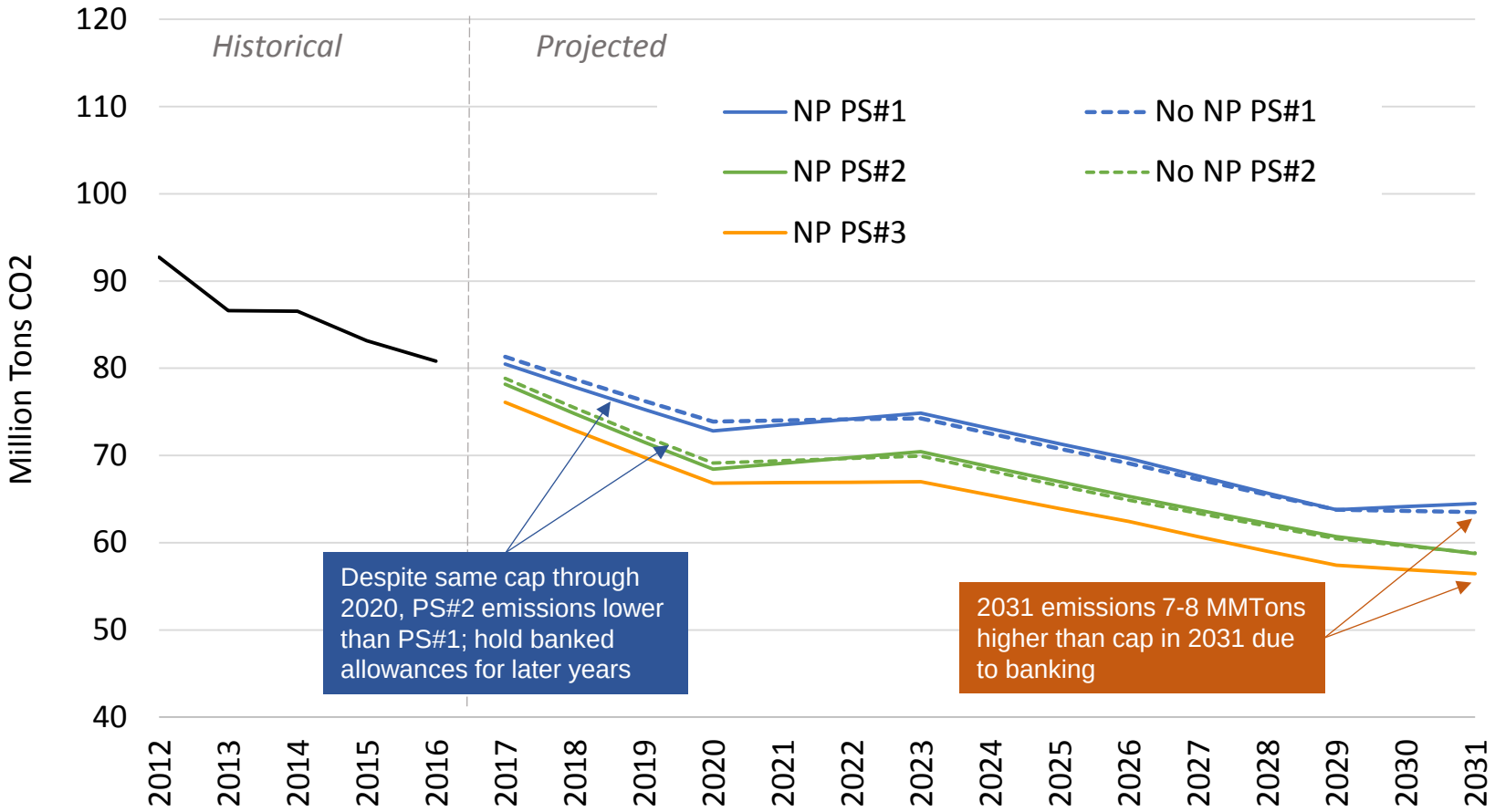


RGGI Generation Mix

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



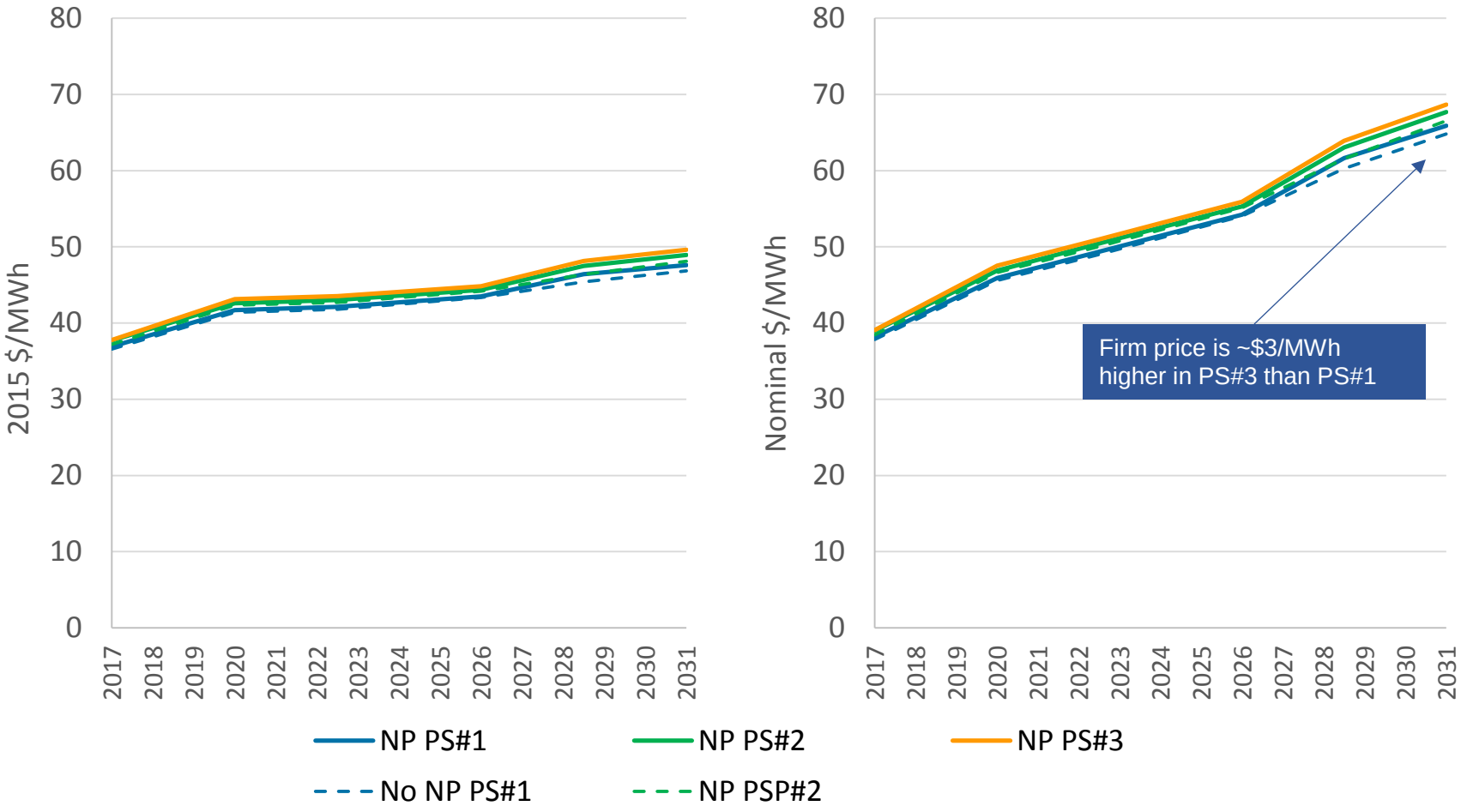
RGGI CO_2 Emissions



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 #10.

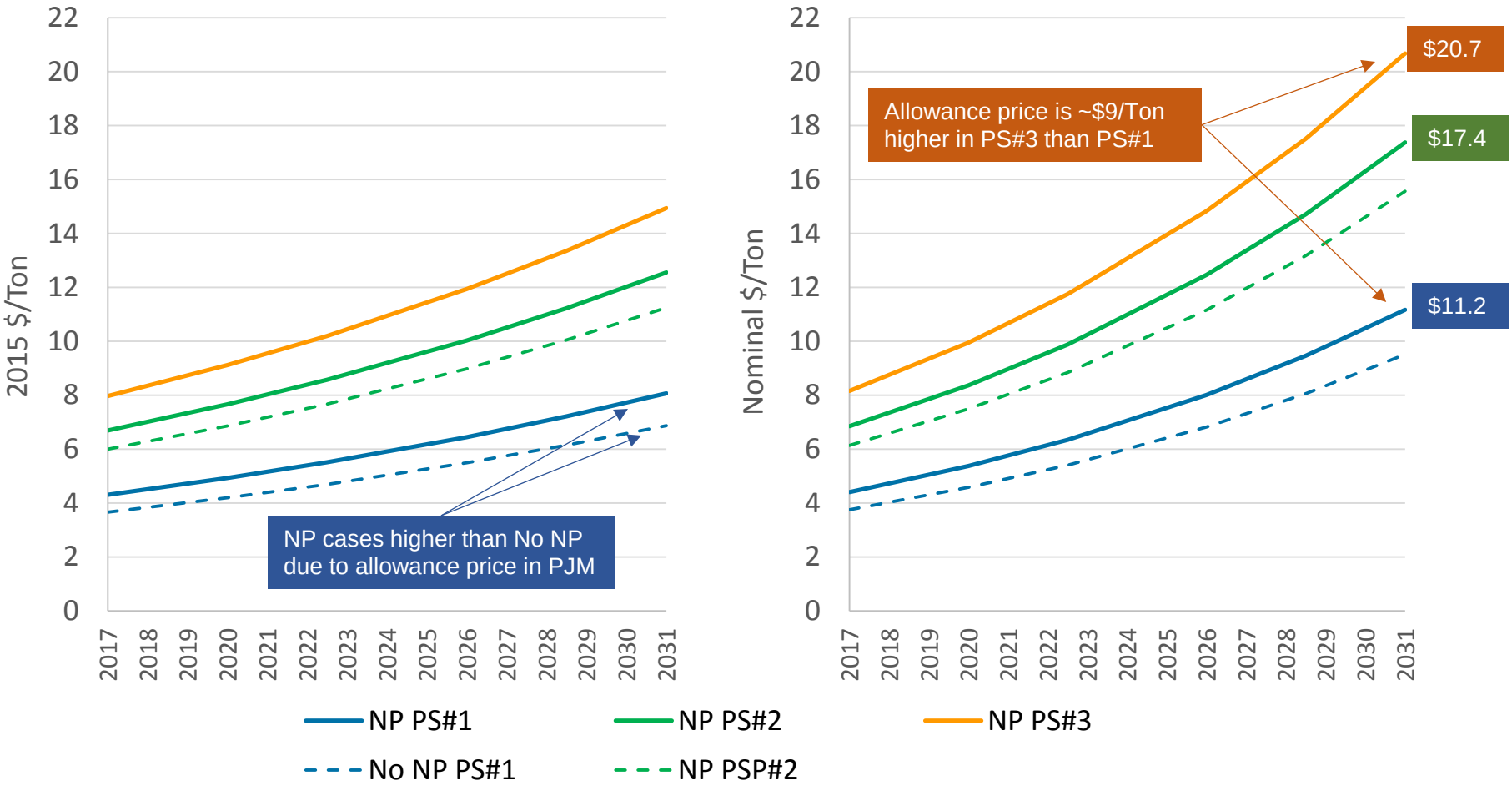
RGGI Firm Power Prices

- 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.



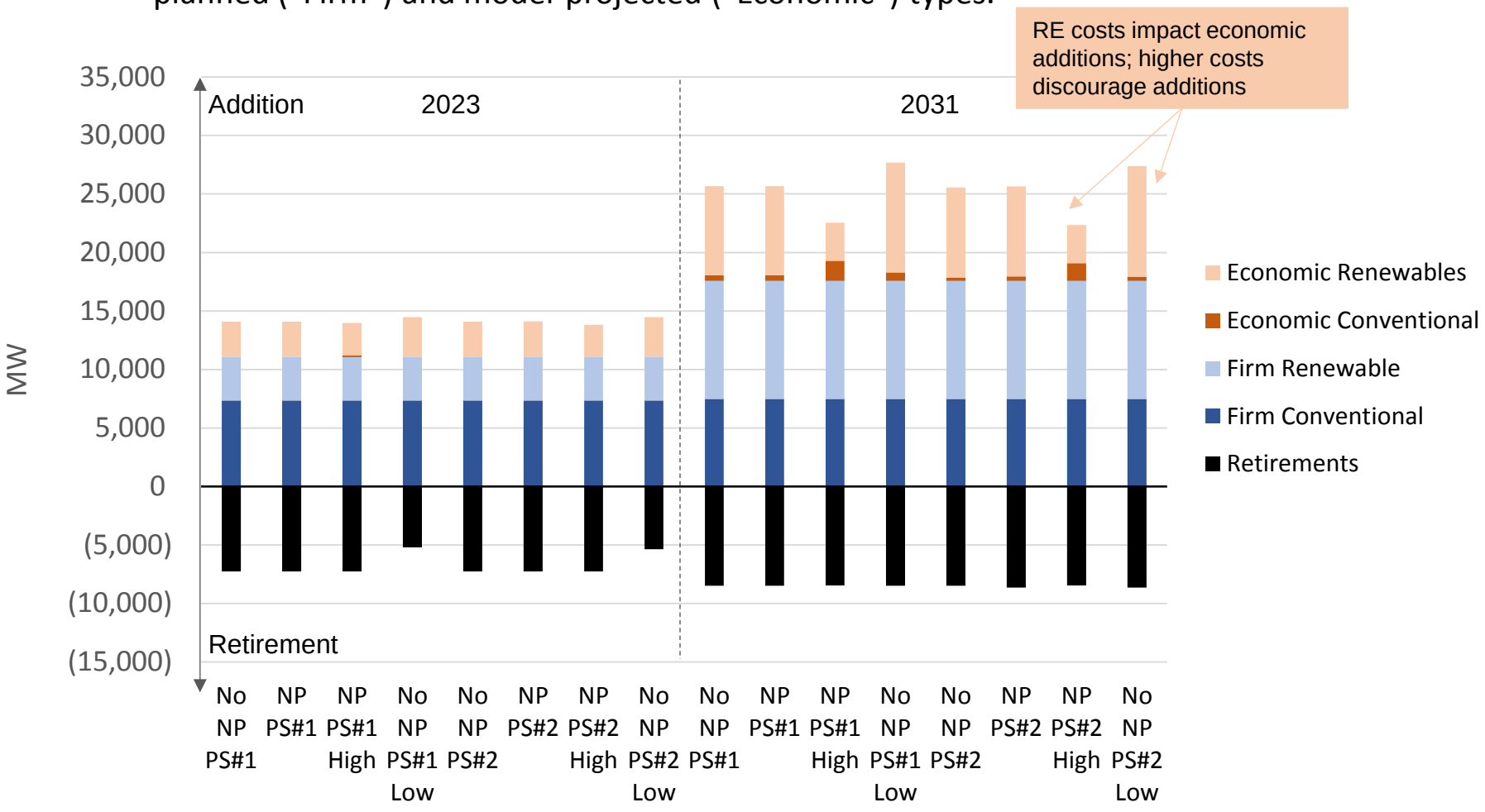
2017 Policy Scenario Sensitivities

DRAFT 2017 RGGI Sensitivity Case Assumptions

Assumption	2017 Reference Case	2017 High Sensitivity Cases	2017 Low Sensitivity Cases
Non-RGGI National CO_2 Program (NP) Targets	NP: States outside of RGGI subject to mass-based goals covering existing and new sources		No NP Only
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, 2022	Remove Reference Case 1,050 MW line from Canada to New England	Add incremental 1,050 MW line from Canada to New England, 2025
Renewable Costs	NREL 2016 Base Case	NREL 2016 High Case	NREL 2016 Low Case
Firm Builds	Reference Case Assumptions		Add 1,600 MW Offshore wind

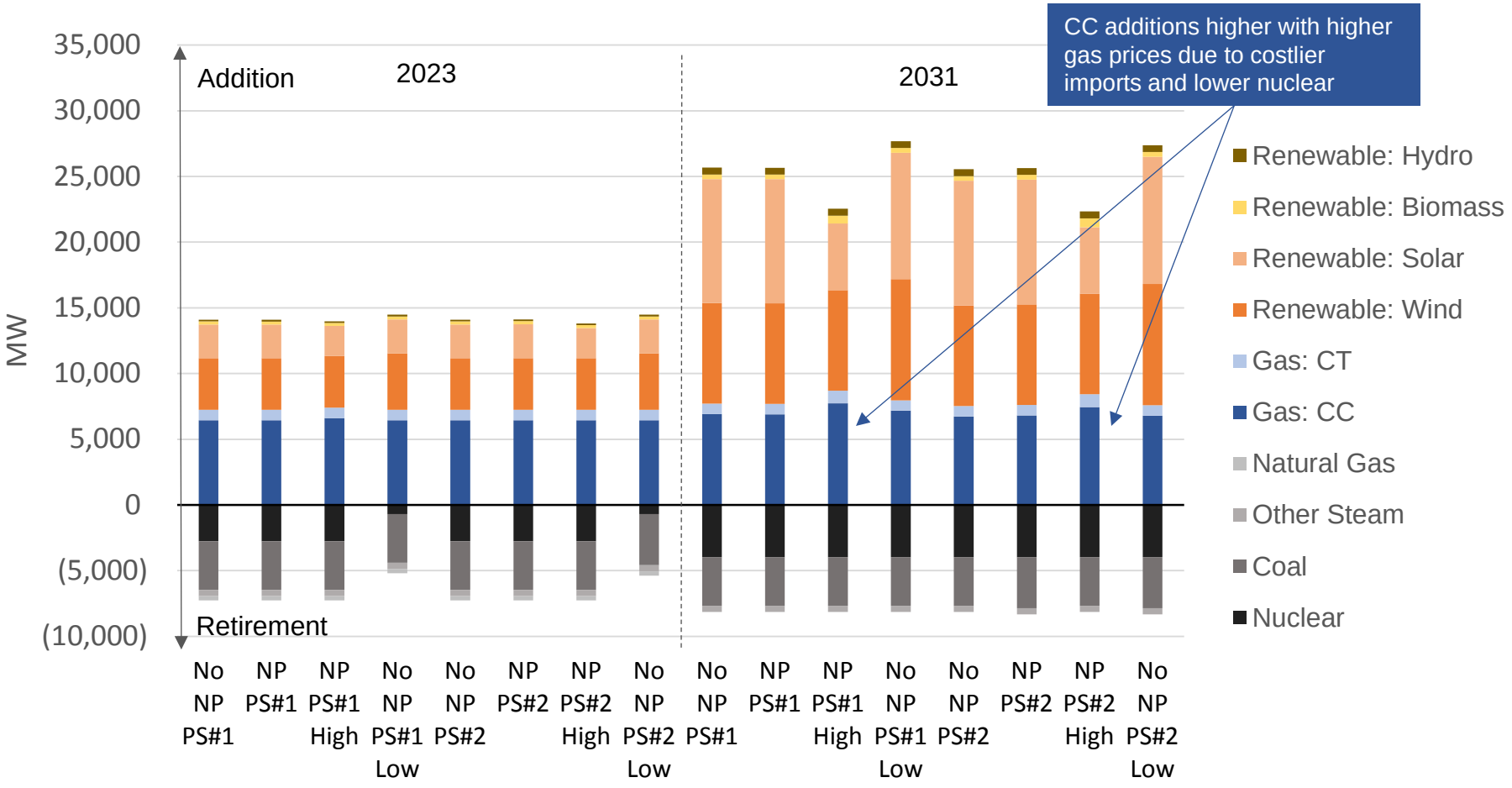
RGGI Cumulative Capacity Additions

- The chart shows the distribution of capacity additions and retirements across firmly planned ("Firm") and model-projected ("Economic") types.



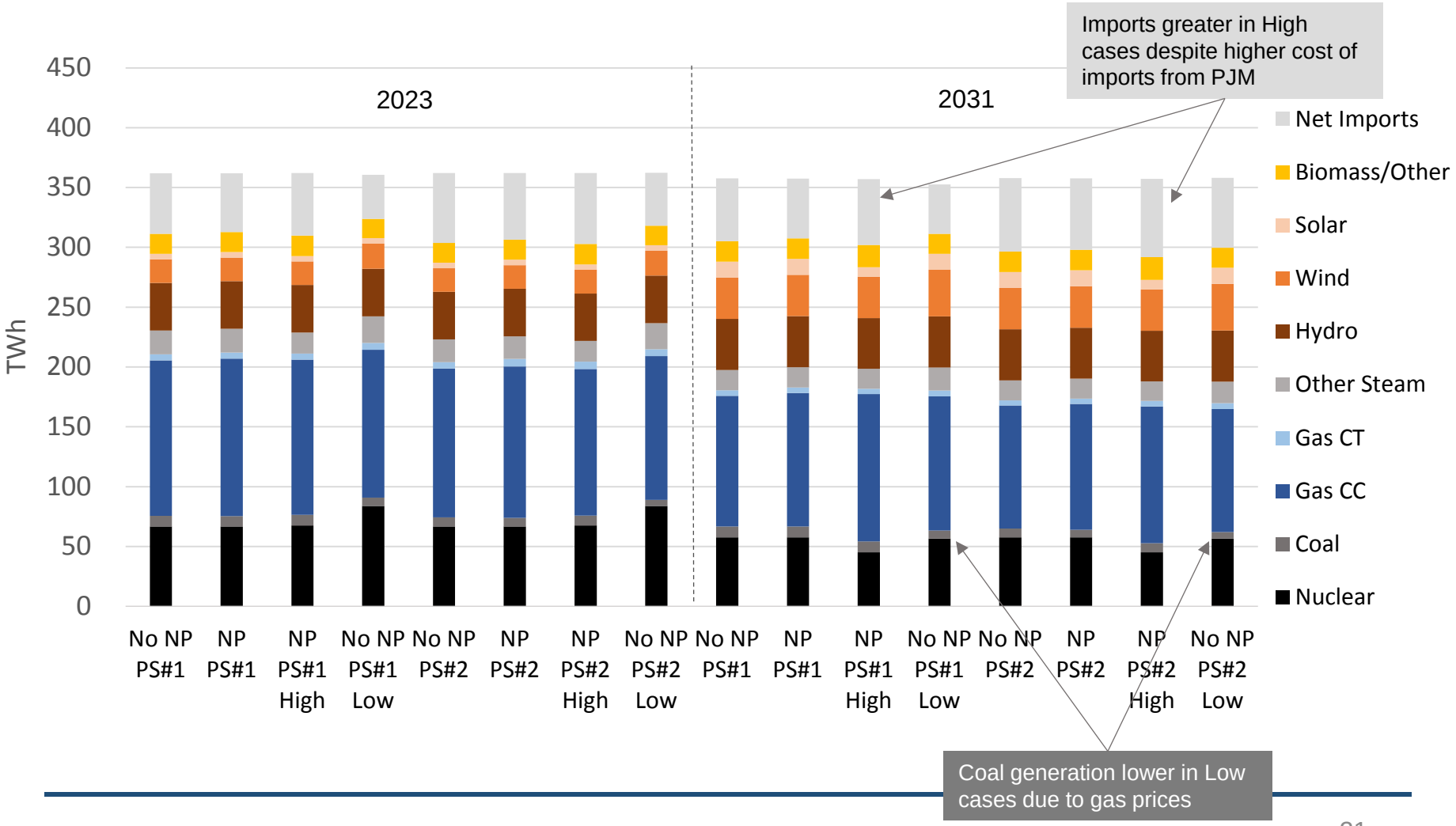
RGGI Cumulative Capacity Additions (2)

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

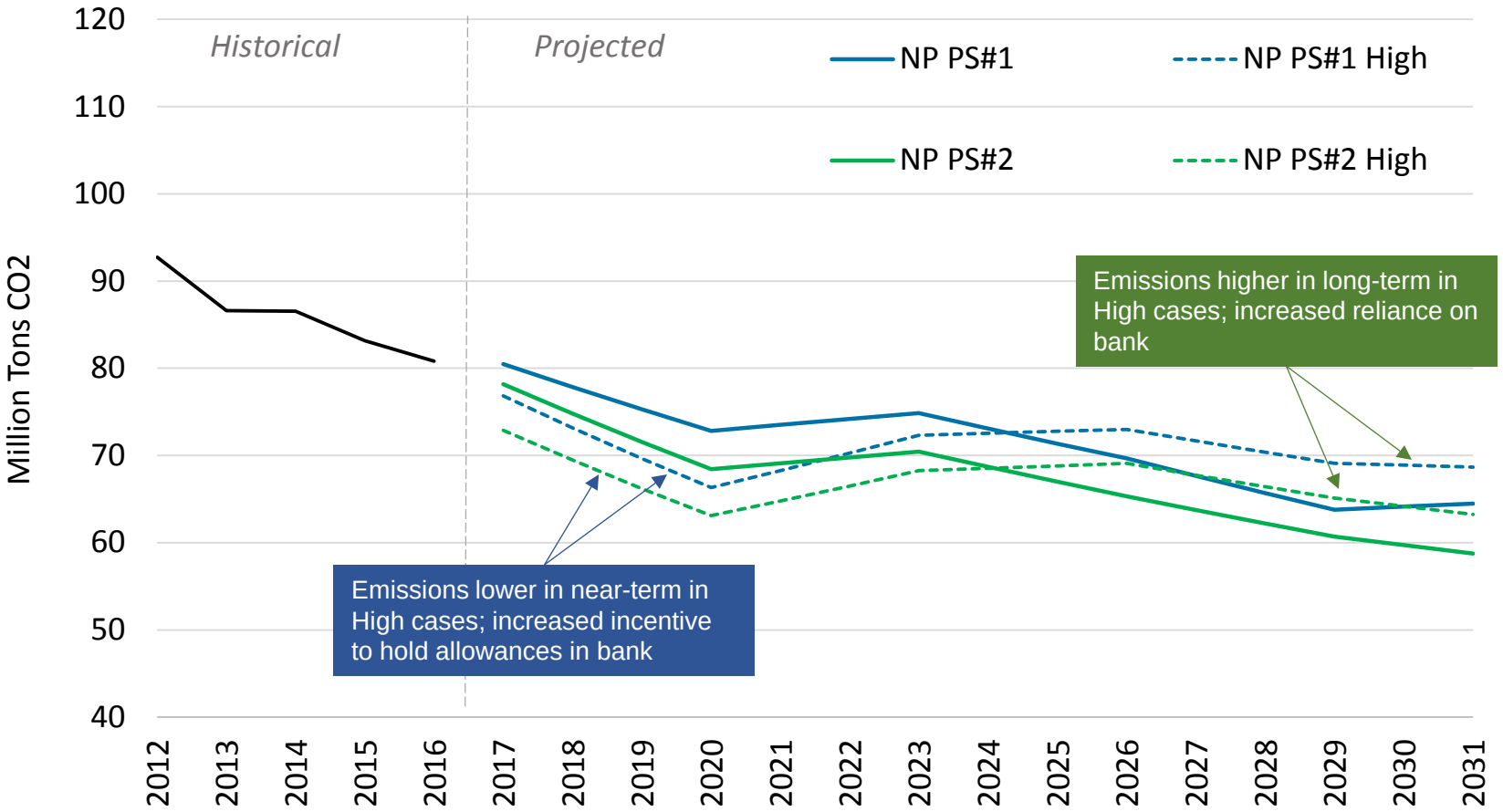


RGGI Generation Mix

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

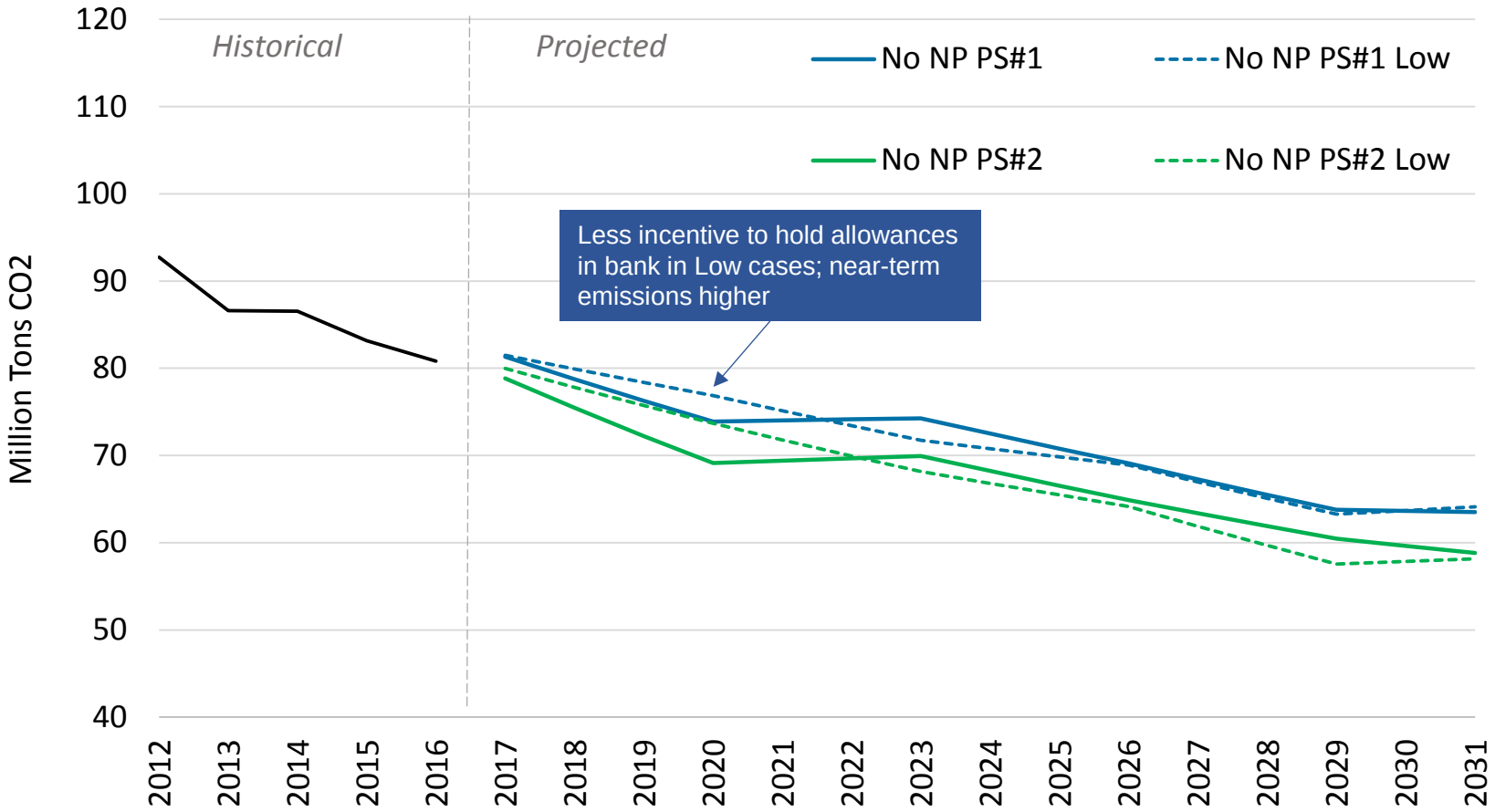


RGGI CO_2 Emissions



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 #10.

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 #10.

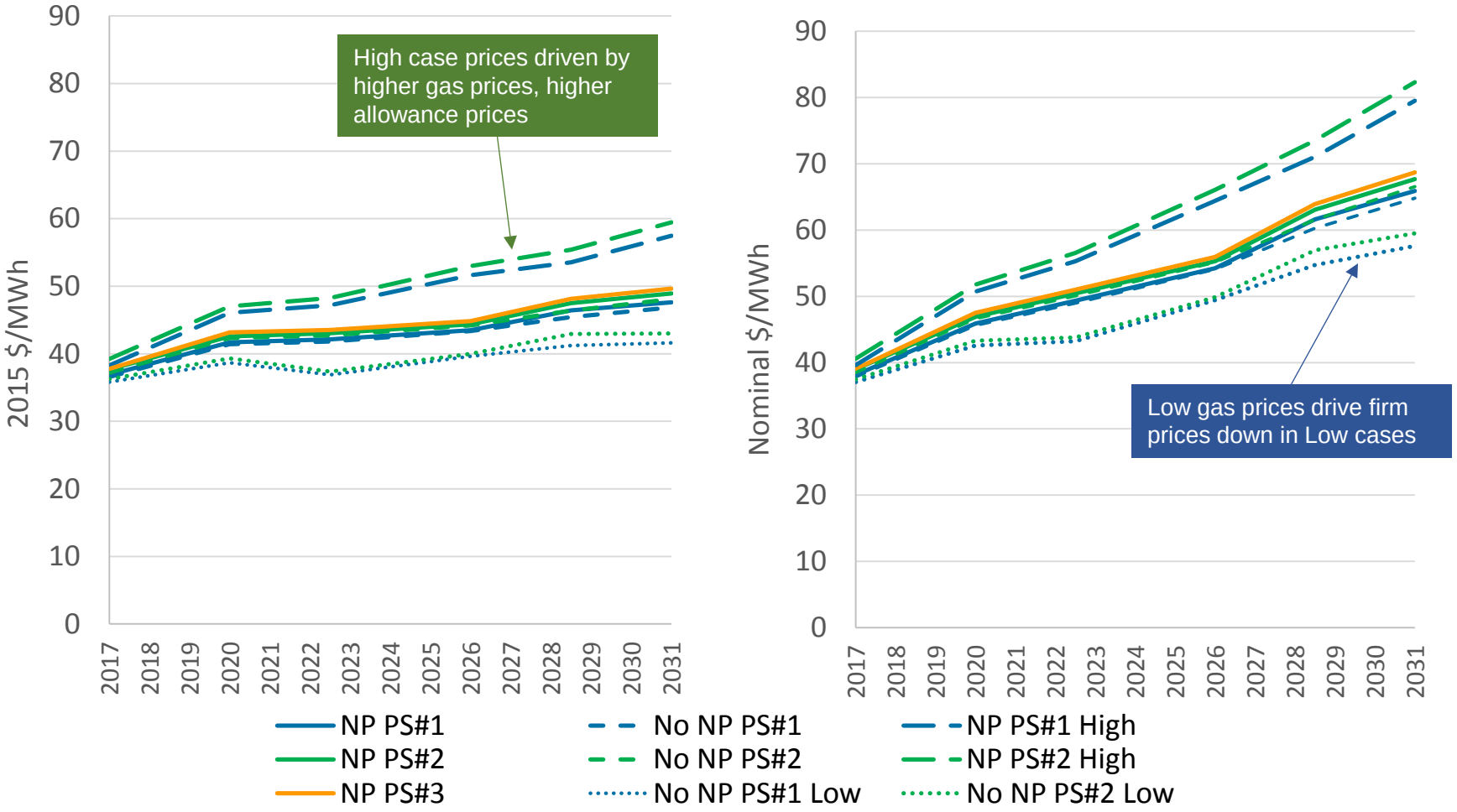
RGGI Emissions (Million of Tons)

Case	Cumulative Emissions				Average Emissions, 2017-2031	2031 Projected Emissions	2032 Cap*
	2017-2021	2022-2031	2022-2029	2030-2031			
NP PS#1	380	689	560	129	71	64	55
No NP PS#1	384	684	557	127	71	64	55
NP PS#2	362	646	528	118	67	59	45
No NP PS#2	365	643	525	118	67	59	45
NP PS#3	352	616	503	113	65	56	46
NP PS#1 High	354	710	572	138	71	69	55
No NP PS#1 Low	392	678	550	128	71	64	55
NP PS#2 High	336	668	540	127	67	63	45
No NP PS#2 Low	379	630	514	116	67	58	45
NP Goals (Aggregate for RGGI States)		*850*	*690*	*160*			

* The time horizon of this analysis is 2017 through 2031. As discussed in slide 4, 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.