# FEDERAL REGULATORY SENSITIVITY

# DRAFT RGGI Sensitivity Case Specifications

## *Federal Regulatory Sensitivity Case*

| Sensitivity Run | Category of Change | Components | Assumptions |
|---|---|---|---|
| **7 FEDERAL REGULATORY POLICY** | **Federal Regulatory Policy** | Hazardous Air Pollutants (HAPs) | • Coal units must have in place scrubber, SCR, ACI and fabric filter by 2015. Oil/gas steam units are required to install a fabric filter, but will continue to meet minimum run requirements. |
| | | Water Intake-316(b) | • Assume that all steam units (coal, nuclear, and oil/gas) that currently rely on once-through cooling must install a cooling tower by 2018.<br>• Cooling tower costs based on NERC 2010 Special Reliability Scenario Assessment ($240 - $300 per gallon per minute)<br>• State modifications to NERC cost data for individual plants |
| | | Coal Combustion Residuals (CCR, ash) | • Plants with surface impoundments must convert to dry ash handling<br>• EOP Group 2009 report cost data (also referred to in the NERC 2010 study)<br>• Compliance date of 2015 |
| | | Ozone NAAQS | • New NAAQS standards are met with the SCR control requirement included in the HAPs compliance assumption. |

# Overview of Federal Regulatory Policy Case Results

- The following slides present the results of the Federal Regulatory Policy sensitivity case (labeled "Fed. Reg." in the charts) alongside the results of the Reference Case.
- This slide and the next summarize the findings of the Federal Regulatory Policy case. ICF summarized the results of the Reference Case and other sensitivity cases at the November 12th RGGI Stakeholder Meeting.
- The costs of compliance with the assumed Federal requirements cause 1.5 GW of coal to retire that did not retire in the Reference Case by 2030 (page 5).
  - No nuclear units retire as a result of the assumed requirements.
- As a result of the coal retirements, generation from coal in the RGGI region declines by 11%, or 9,000 GWh, by 2030 (page 6). Generation from gas-fired combined cycle units increase to compensate for that decline.
- Imports into the RGGI region decline by 15%, or 12,000 GWh, by 2030 (page 6). This change comes almost entirely from non-RGGI PJM, where nearly 6 GW of coal retires in response to the federal regulations, altering the import-export balance with the RGGI states. This decline is also replaced with gas-fired generation in the RGGI region.

# Overview of Federal Regulatory Policy Case Results

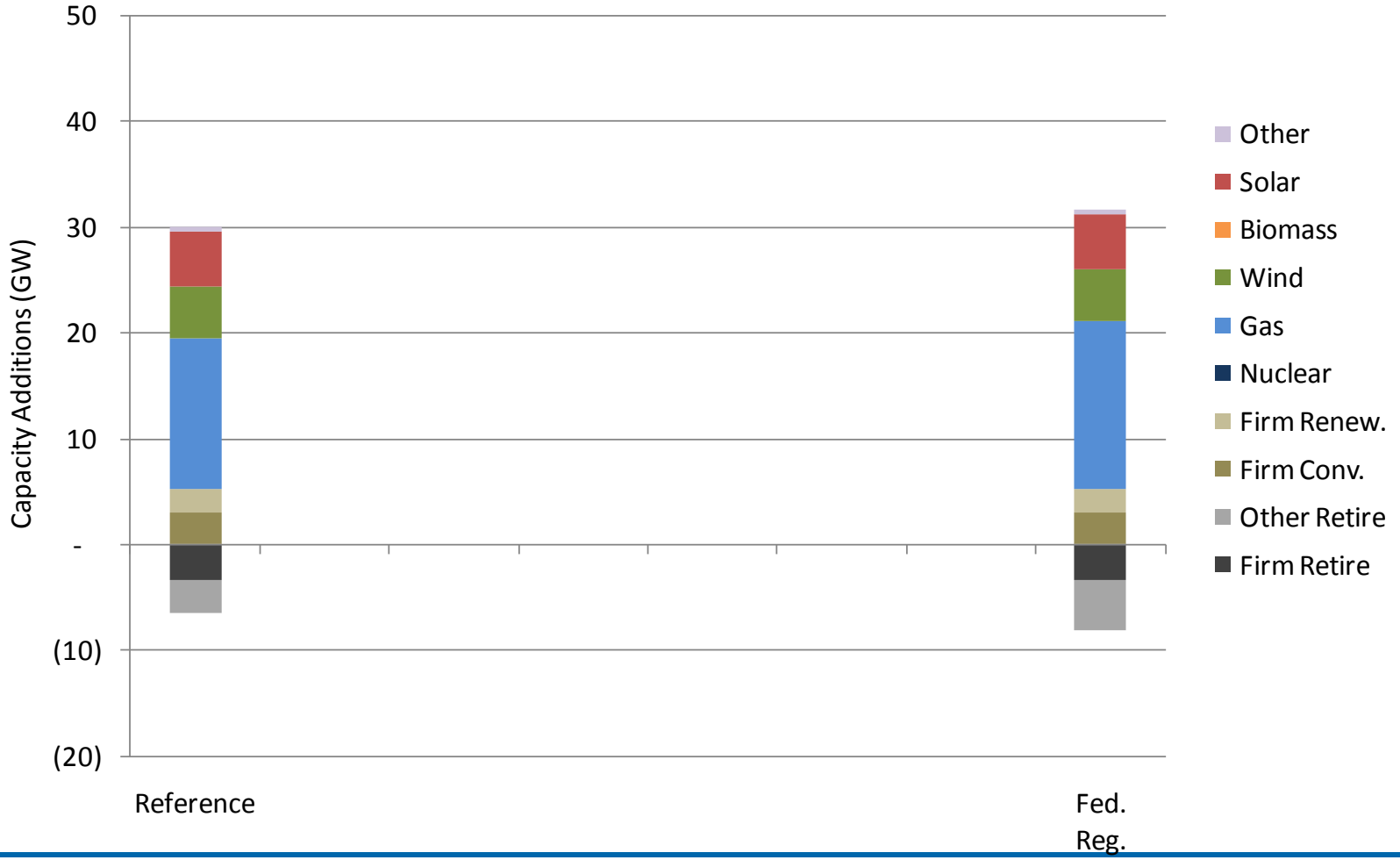
## *continued*

- Generation from gas in the RGGI region increases by 14%, or 21,000 GWh, by 2030 to compensate for the combined reductions in coal-fired generation and net imports (page 6).
- The decline in emissions from coal generation in the RGGI region is offset by the increase in emissions from gas generation such that the federal regulations have little net impact on $CO_2$ emissions in the RGGI states (page 7). Cumulative emissions between 2010 and 2030 differ by less than 1% from the Reference Case.
  - $CO_2$ emissions in the Eastern Interconnect outside the RGGI region decline by 91 million tons by 2030 in response to the assumed regulations and resulting coal capacity retirements.
- As in the other sensitivity cases, RGGI allowance prices remain at the floor price throughout the period.
- Energy prices in RGGI follow a very similar trajectory as those in the Reference Case and demand sensitivities, all of which assume the same gas price trajectory.

# RGGI Cumulative Capacity Changes by 2030

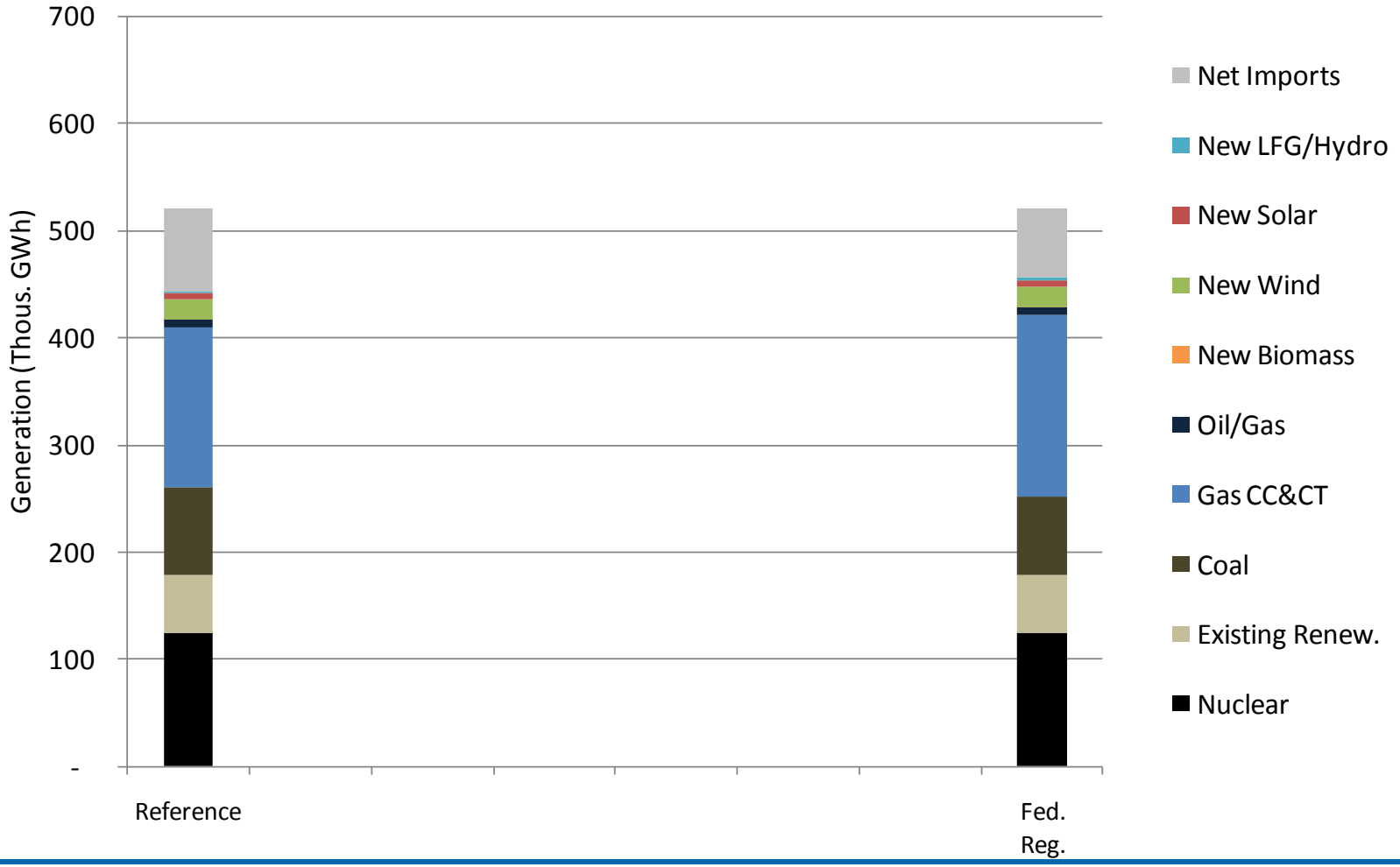
## *Reference Case and Federal Regulatory Case*

- The chart shows total firmly planned ("Firm") and economic capacity additions by type and total retirements projected by IPM.



# RGGI Generation Mix in 2030

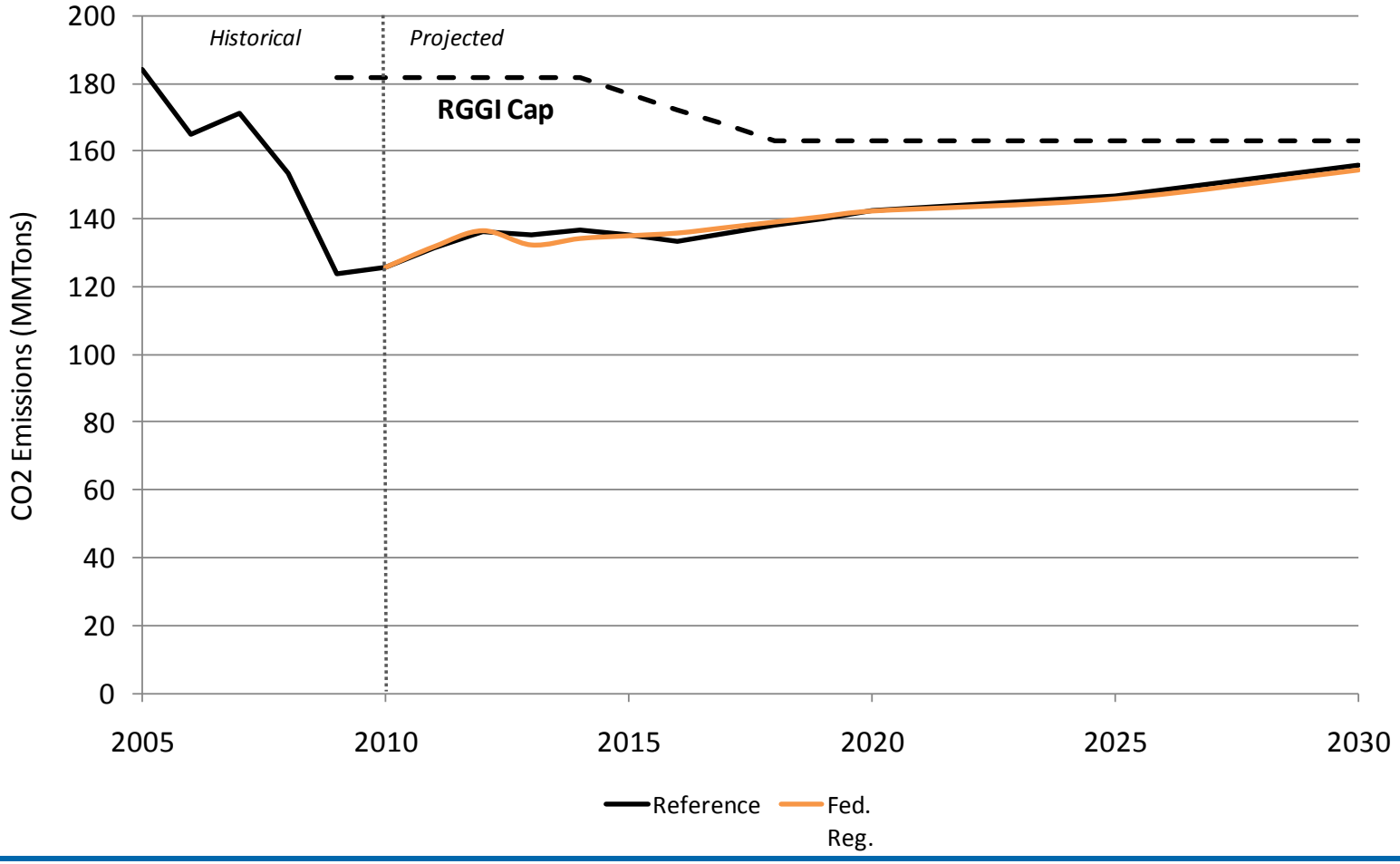
## *Reference Case and Federal Regulatory Case*



# RGGI $CO_2$ Emissions

## *Reference Case and Federal Regulatory Case*

- The chart shows historical and projected $CO_2$ emissions for the RGGI states.

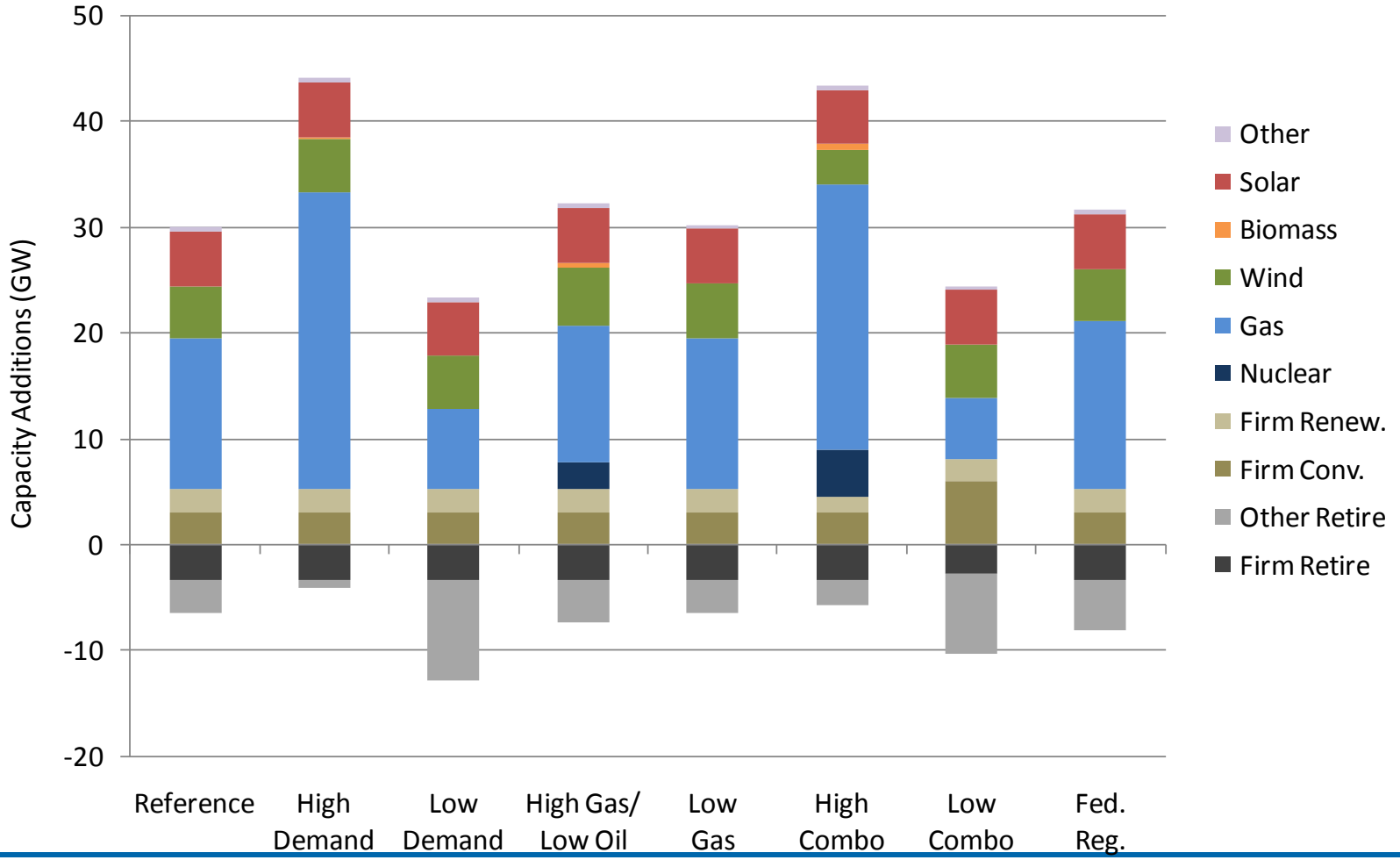


# ALL SENSITIVITY CASES- Updated to include Federal Regulatory Sensitivity

# RGGI Cumulative Capacity Changes by 2030

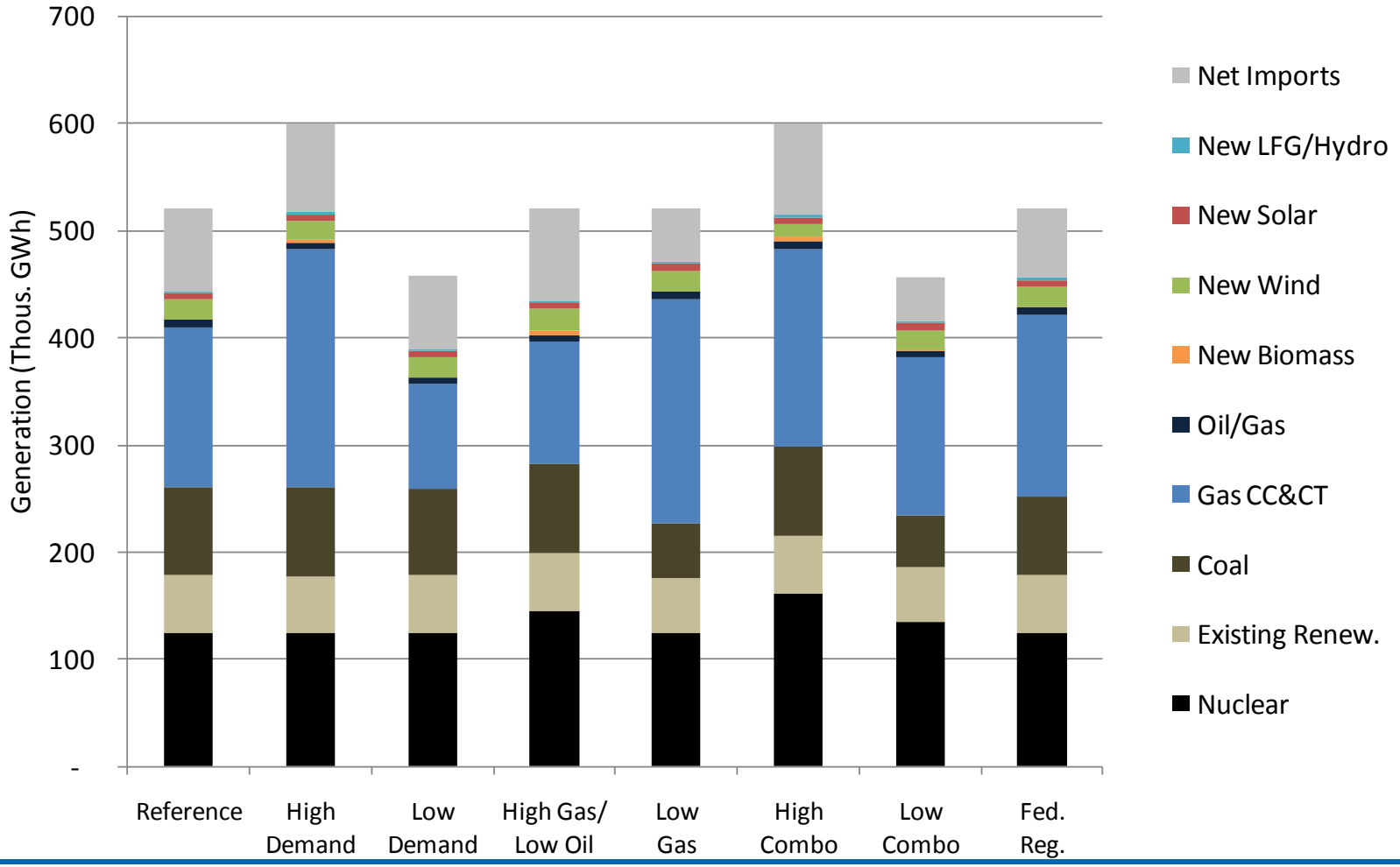
## *Reference Case and All Sensitivity Cases*

- The chart shows total firmly planned ("Firm") and economic capacity additions by type and total retirements projected by IPM.



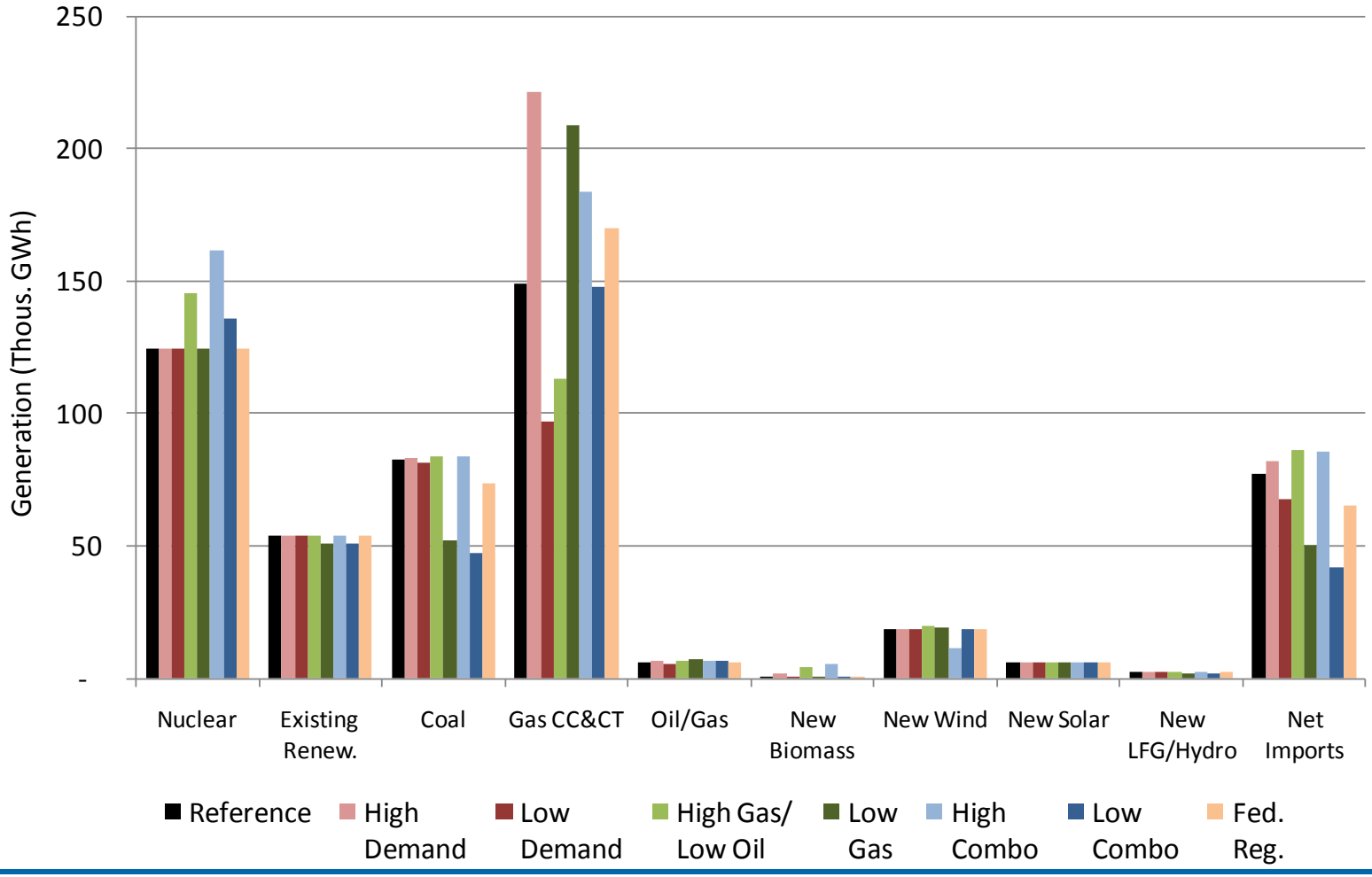
# RGGI Generation Mix in 2030

## *Reference Case and All Sensitivity Cases*



# RGGI Generation Mix by Type in 2030

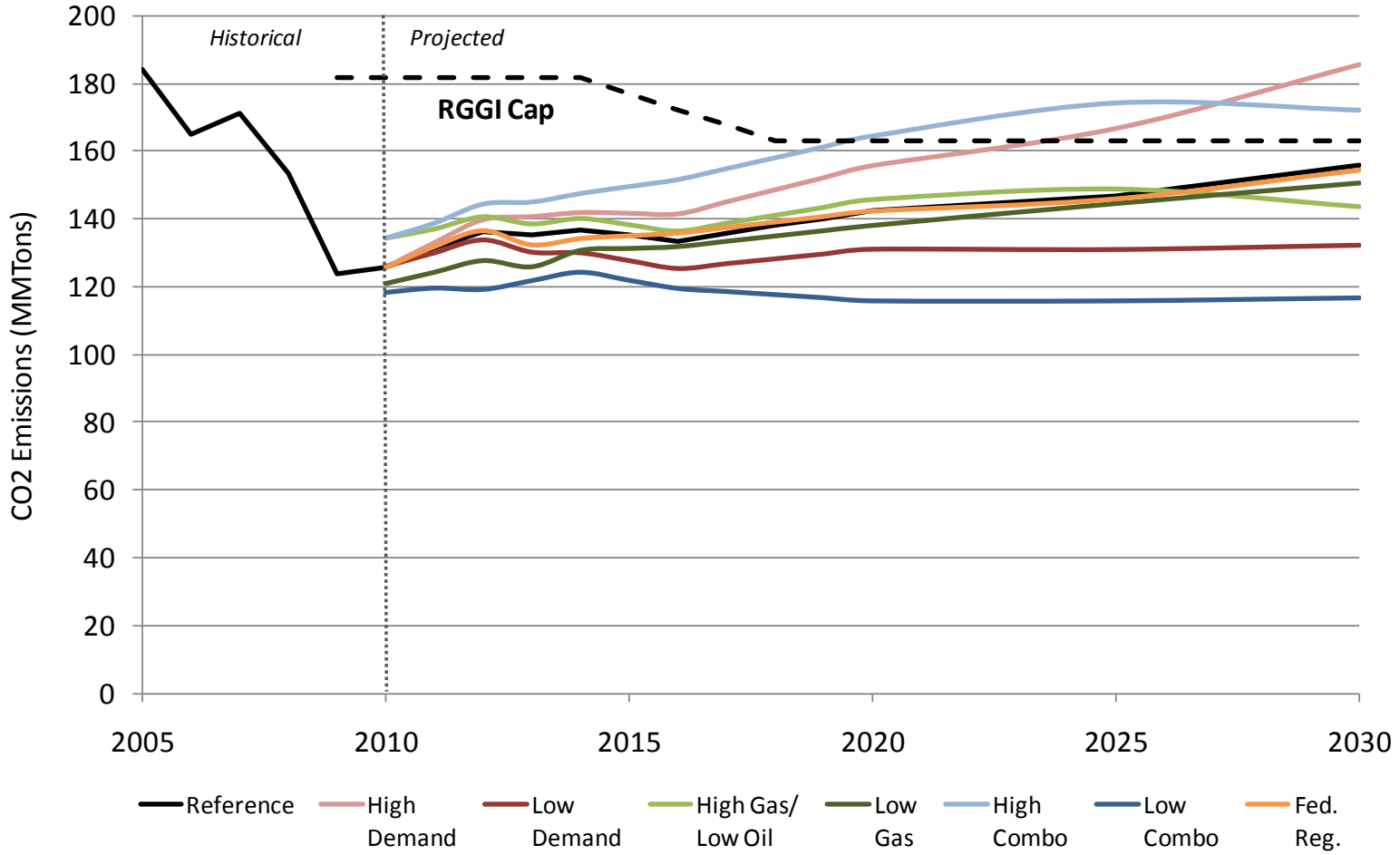
## *Reference Case and All Sensitivity Cases*



# RGGI $CO_2$ Emissions

## *Reference Case and All Sensitivity Cases*

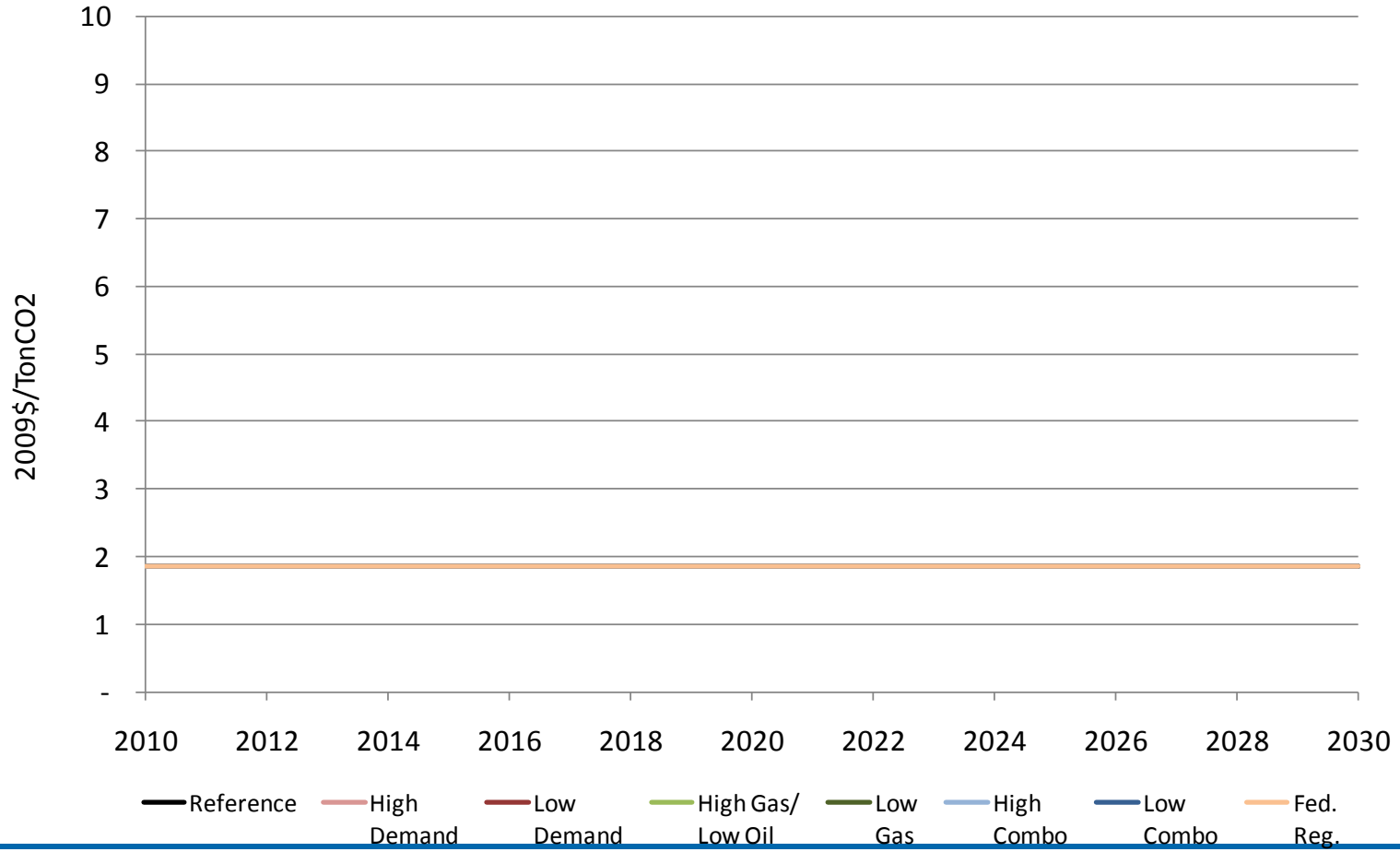
- The chart shows historical and projected $CO_2$ emissions for the RGGI states.



# RGGI Allowance Price

## *Reference Case and All Sensitivity Cases*

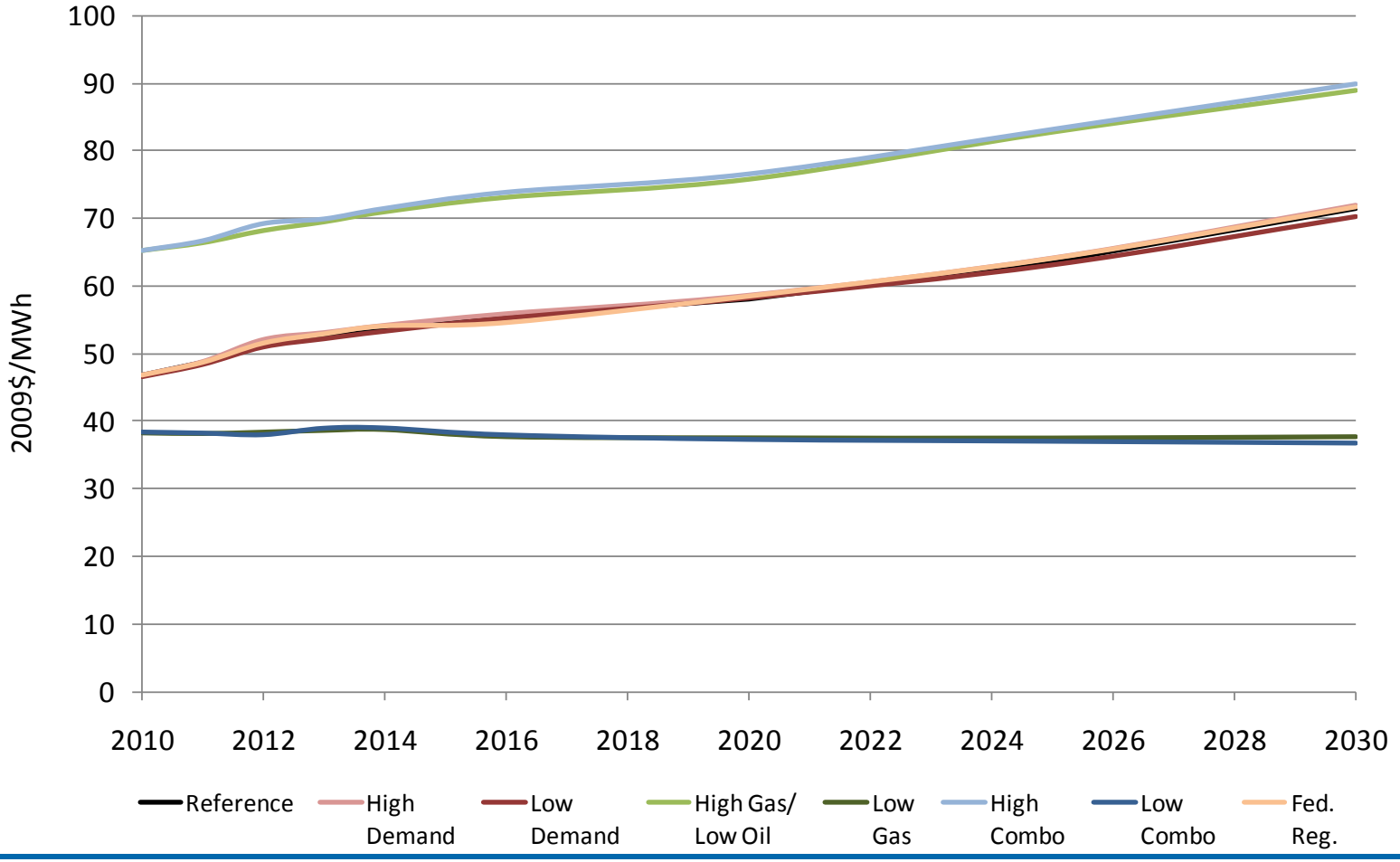
- RGGI emissions are projected to remain below the cap in most cases over the time horizon of the analysis, so projected prices in those cases are set by the auction price floor. Cases with emissions that exceed the cap in some years carry a sizable enough bank into those years to keep the price at the auction floor.



# Wholesale Electricity Prices

## *Reference Case and All Sensitivity Cases*

- The chart shows projected weighted-average wholesale electricity prices* for the RGGI states as a whole. These prices are not indicative of a particular hub in the RGGI region but are instead an average of all the RGGI states.




* IPM also projects capacity prices by region, which are not included here.