The Clean Power Plan:
A Path Forward for New Jersey

NEW JERSEY ANNUAL CLEAN AIR COUNCIL PUBLIC HEARING

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THE CLEAN POWER PLAN

The first ever national limits on carbon pollution from existing power plants announced by President Obama on August 3, 2015

Clean Power Plan

- The final Clean Power Plan (CPP) was announced by President Obama on August 3, 2015 and finalized by EPA under the Clean Air Act, the nation's fundamental air pollution law;
- The CPP sets flexible and achievable standards that give each state the opportunity to design its own most cost-effective pathway toward a cleaner electricity system;
- Carbon pollution limits will kick in starting in 2022 and ramp into full effect by 2030;
- Supreme Court stay of the rule issued Feb 9th, but won't necessarily change compliance timelines, oral arguments before the D.C. Circuit on the merits of the rule in June (more here);
- The Clean Power Plan will cut emissions 32 percent below 2005 levels by 2030, which is equivalent to cutting annual emissions from 70% of the nation's passenger vehicles.

Source: U.S. Environmental Protection Agency. Fact Sheet: Overview of the Clean Power Plan, August 2015.

The Clean Power Plan will provide significant benefits

Benefits Nationally, cont.

- The CPP will significantly cut the pollutants that cause asthma attacks and respiratory illnesses, preventing up to:
  - 3,600 premature deaths;
  - 1,700 heart attacks;
  - 1,700 hospital visits for cardiovascular and respiratory illnesses;
  - 300,000 missed work and school days annually.
- Benefits far exceed the costs:
  - Climate benefits valued at $20 billion in 2030;
  - Health benefits ranging from $14 to $34 billion;
  - Net benefits of $26 to $45 billion.
- Americans will save money on their electricity bills:
  - Average annual bill savings of $85 per household in 2030;
  - Total of $155 billion over the decade leading up to 2030.

Source: U.S. Environmental Protection Agency. Fact Sheet: Overview of the Clean Power Plan, August 2015.

Federal & State Responsibilities

- EPA adopted the Clean Power Plan under section 111(d) of the Clean Air Act, which the Supreme Court ruled in 2011 provides the legal authority to control carbon pollution from America's fleet of fossil-fueled power plants;
- The CPP establishes a federal-state process for controlling power plant pollution, by:
    1. Establishing national "standards of performance" for carbon emissions from existing power plants;
    2. Giving states the opportunity to adopt state plans, including enforceable emission limits, for their fossil power plants.
- If a state chooses not to adopt a satisfactory plan, EPA directly regulates that state's power plants through a federal plan.

Source: U.S. Environmental Protection Agency. Fact Sheet: Components of the Clean Power Plan, August 2015.

Ways to Comply

- EPA identified the "best system of emissions reduction" for existing coal and gas-fired power plants, which includes:
    1. Measures that can be applied at individual coal and gas plants (like burning fuel more efficiently);
    2. Measures that credit plants for shifting the mix of electricity generation towards sources that produce less pollution (like using existing coal plants less and existing gas plants more);
    3. Measures that allow credit for electricity generation with no carbon pollution at all (like replacing fossil generation with power from renewable or other zero-emitting power sources).
- Greater pollution reductions can be accomplished at reasonable cost by using these building blocks than if plants were limited to changes at individual sites.

Source: U.S. Environmental Protection Agency. Fact Sheet: Components of the Clean Power Plan, August 2015.

State Plans

- States have a range of flexible options to design plans:
    1. The two-rate approach:
        - States write plans that enforce the two national emission rate limits on coal and gas plants. Each plant meets the applicable rate limit through reducing its own emissions and investing in emission reducing actions at other locations in the power system.
    2. State-specific emission rate limits:
        - Limits are a blend of the national emission rate limits for coal and gas plants, weighted to reflect the mix of electricity generated from the two types of plants in each state at the starting point in 2012.

Source: U.S. Environmental Protection Agency. Fact Sheet: Clean Power Plan and the Role of States, August 2015.

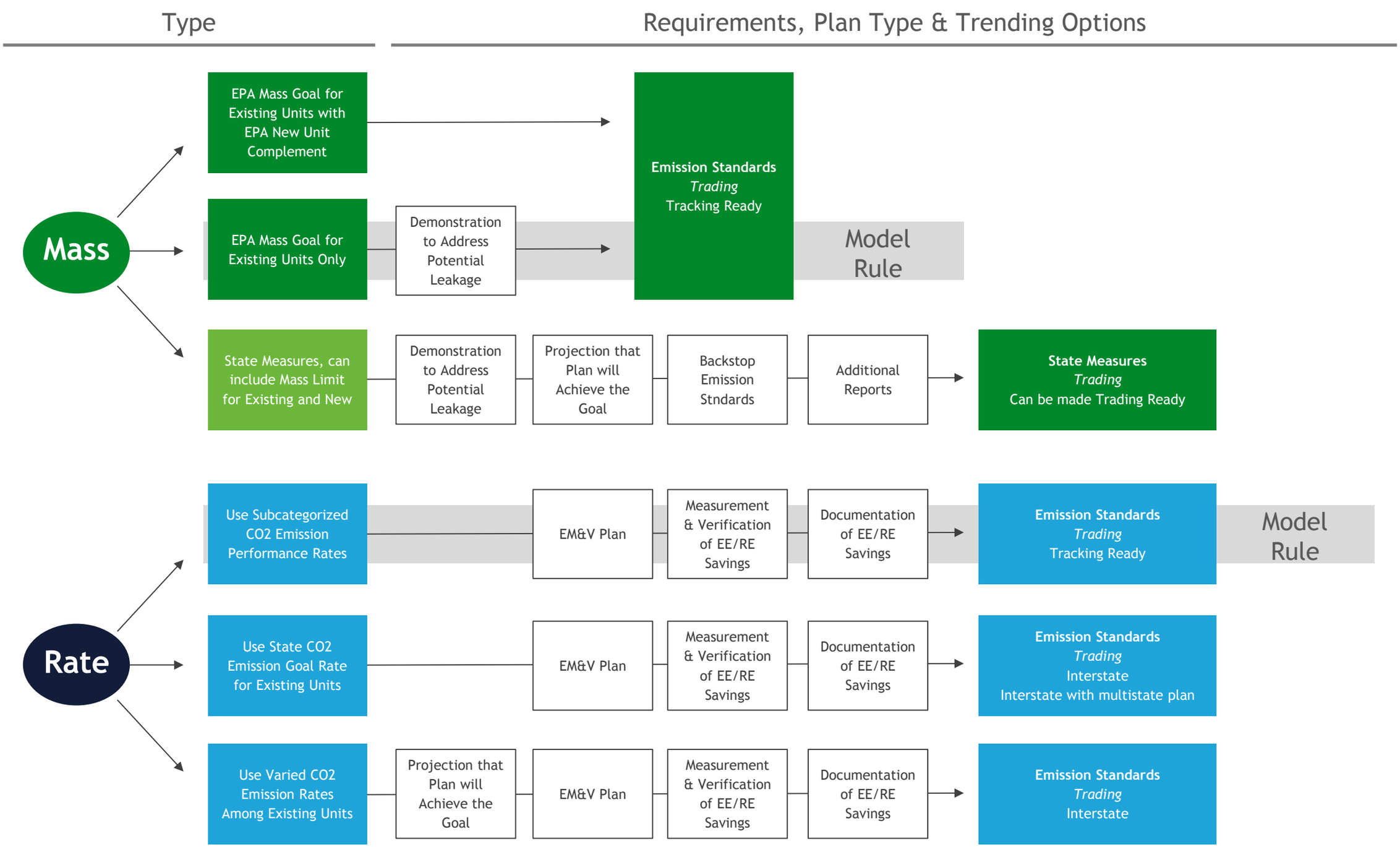
State plans, continued

3. Mass-based limits:
   - Limits on how many tons of pollution a plant may emit each year, rather than the amount of pollution per unit of electricity generated;
   - These limits convert state-specific emission rate limit to an equivalent amount of tons per year;
   - States can either choose to include both existing new and fossil-fueled plants, or only existing plants while accounting for leakage.
4. State measures plans:
   - States can adopt state laws like RPS's to place obligations on entities other than fossil-fueled power plants.

- Other requirements:
  - Plans must demonstrate that they are enforceable, achievable, with adequate monitoring and reporting, consider system reliability, and show that the state has engaged stakeholders and low-income communities.

Source: U.S. Environmental Protection Agency. Fact Sheet: Clean Power Plan and the Role of States, August 2015.

State Plan Options and Requirements



Source: U.S. Environmental Protection Agency.

IPM MODELING RESULTS: NEW JERSEY

MJB&A Preliminary Results – Subject to Change

Modeling of the Clean Power Plan

- The following analysis of EPA's final Clean Power Plan (CPP) is based on Integrated Planning Model (IPM®) runs conducted by ICF International, using assumptions and policy scenarios developed by M.J. Bradley & Associates (MJB&A).

- IPM® is a detailed model of the electric power system that is used routinely by industry and regulators to assess the effects of environmental regulations and policy. It integrates extensive information on power generation, fuel mix, transmission, energy demand, prices of electricity and fuel, environmental policies, and other factors.

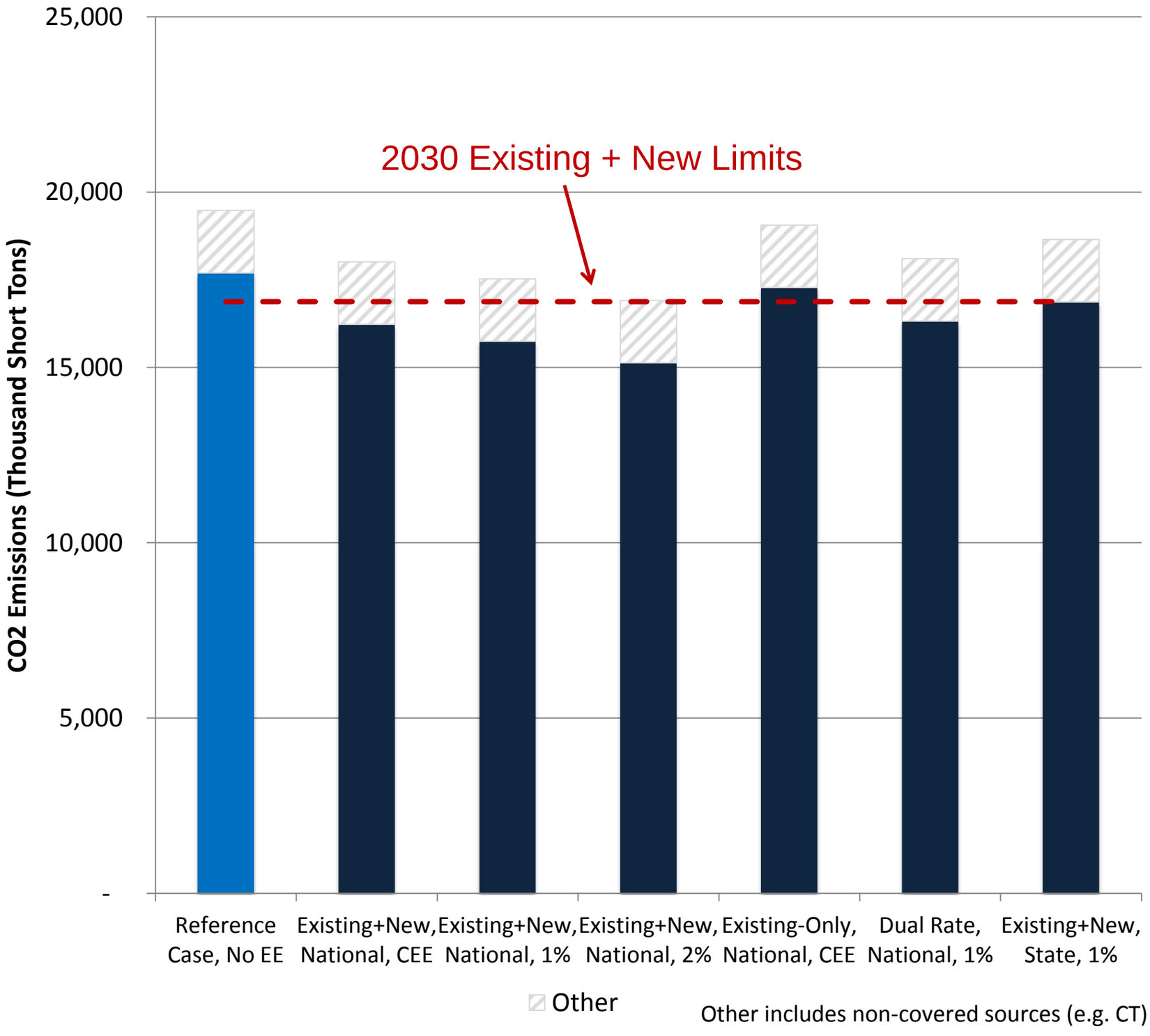
- MJB&A has been coordinating analysis of the CPP with a variety of stakeholders, including utility companies and other organizations, such as NRDC.

- This latest round of analysis incorporates the extension of the renewable energy tax credits for wind and solar (the ITC and PTC), alternative gas price forecasts, and other scenario changes. The 30 percent ITC will be extended for three years, then ramped down incrementally through 2021, remaining permanently at 10 percent for utility-scale projects beginning in 2022. The full value of the 2.3 cent/kWh PTC will be extended through 2016, then dropping 20 percent each year through 2019.

Scenarios Evaluated: Integrated Planning Model (IPM®)

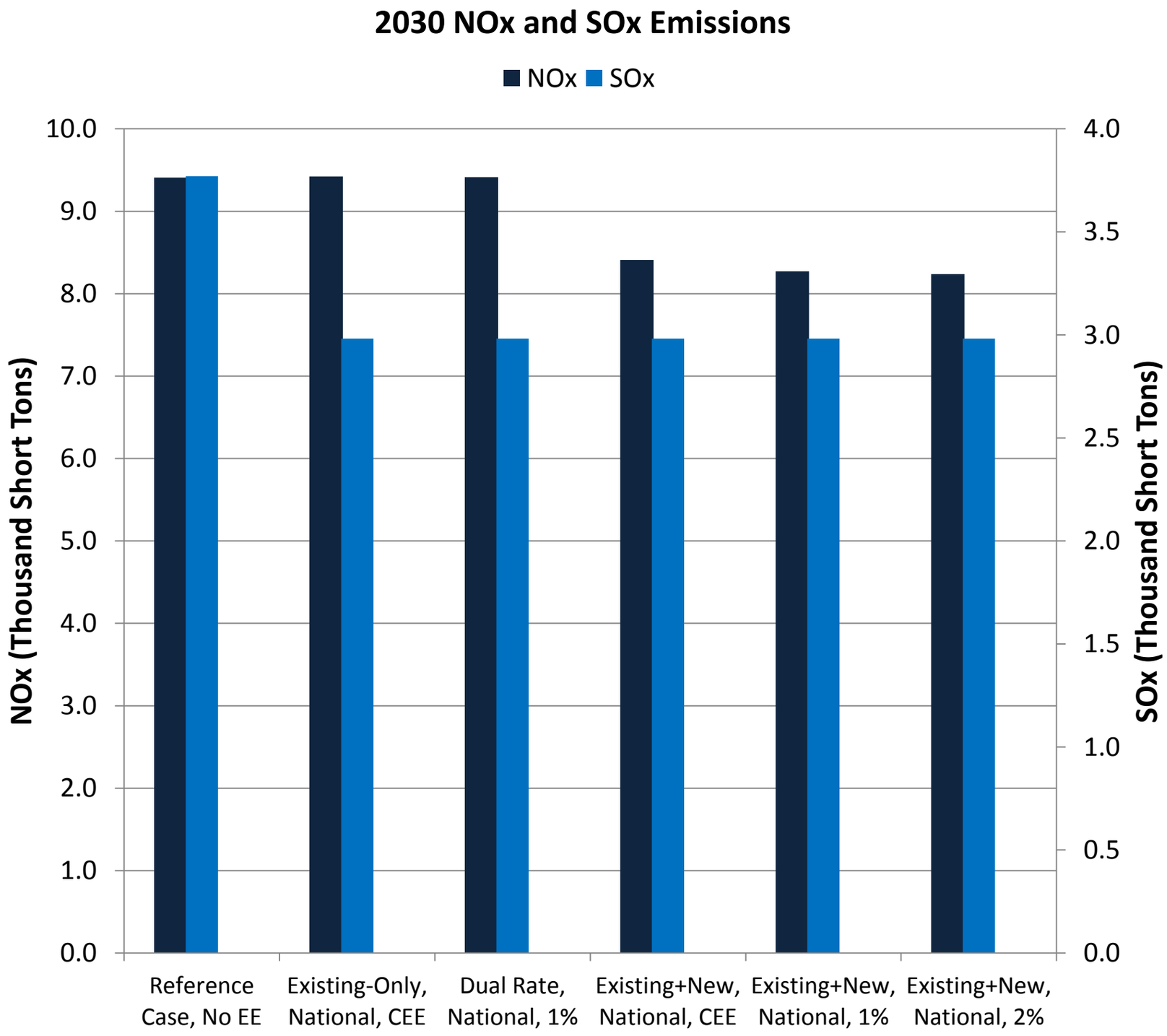
- The modeling included two Reference Case scenarios (no CPP) and six Policy Case scenarios:
  - Two Reference Case scenarios: (1) "RC, No EE" assumes no additional energy efficiency savings beyond what is reflected in EIA's AEO 2015 demand forecast; and (2) "RC, CEE" assumes "business-as-usual" level of energy efficiency savings described below (what we call the "current EE" savings levels)
  - Five mass-based scenarios (both "Existing Only" and "Existing plus New")
  - One dual rate scenario (fossil steam and NGCC)
- The modeling varied the extent of allowance/Emissions Reduction Credit (ERC) trading across the Policy Cases to reflect the choices that states have in implementing the rule. Modeling includes both national trading and state-only (intrastate) trading options.
- The modeling varied the amount of energy efficiency available in our "supply curve" across the cases:
  - **Current EE (CEE):** States can achieve savings up to their current (2013) annual savings rates between 2018 and 2030. This results in the lowest total energy efficiency savings among the three approaches. For **New Jersey, CEE is equivalent to 0.7% savings**.
  - **Modest EE (EE1):** States achieve up to a 1% annual savings rate or 2013 annual savings, whichever is higher.
  - **Significant EE (EE2):** States achieve up to a 2% annual savings rate
- The modeling includes the ITC/PTC extension, as well a gas price forecast derived from the average of the AEO 2015 Reference Case and the AEO 2015 High Gas Resource Case.

New Jersey's Power Sector Can Go Beyond Its 2030 Target



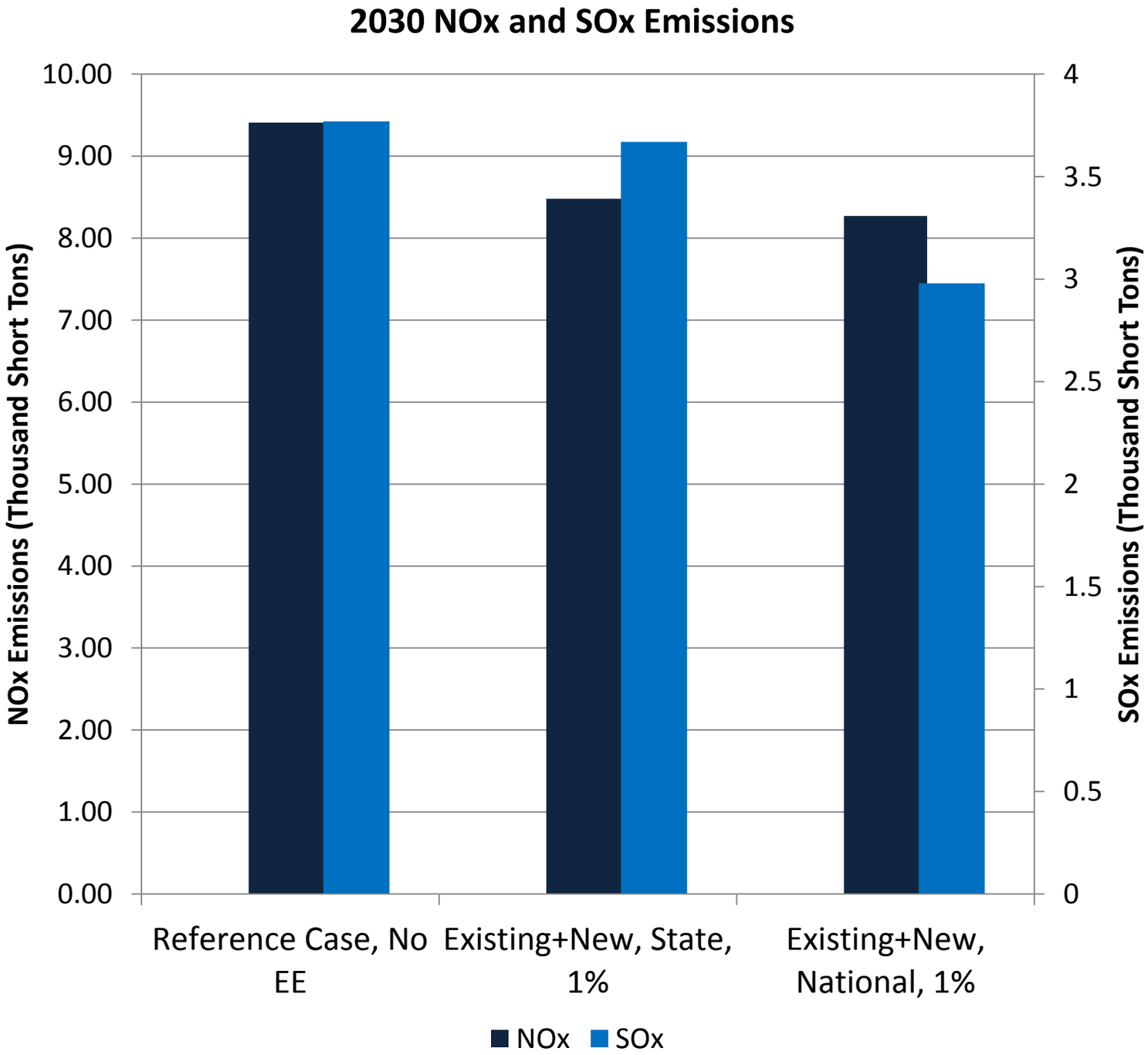
- In almost all cases, New Jersey's power plants emit below their 2030 limit.
- In these cases, New Jersey would see additional revenue by entering into a broader trading market
- Under an existing-only approach, total emissions are higher than other scenarios and exceed the existing + new cap due to new NGCC emissions not being covered under the state's plan
  - This could indicate emissions "leakage", which EPA requires that states address in mass-based plans that only cover existing sources.

Covering All Sources Results in Largest Decrease of SOx and NOx



- Under all CPP cases, SOx emissions are reduced by over 20% compared to BAU
- An approach that covers both existing + new sources produces greater NOx reductions. Under a mass-based approach that includes new sources, NOx emissions are reduced by 10.5% - 12.5% compared to BAU.
- In contrast, there is no decline in NOx under a rate or existing-only approach compared to BAU.

Broader Trading Further Reduces NOx, SOx Emissions



- Participating in a broader trading market consistently reduces NOx and SOx emissions in New Jersey, holding energy efficiency constant
- A broader trading market results in further emission reductions in-state because there are more low-cost reduction opportunities available, and excess allowances can be sold to out-of-state power plants.

Mass-Based Approaches Produce Greatest Health Benefits

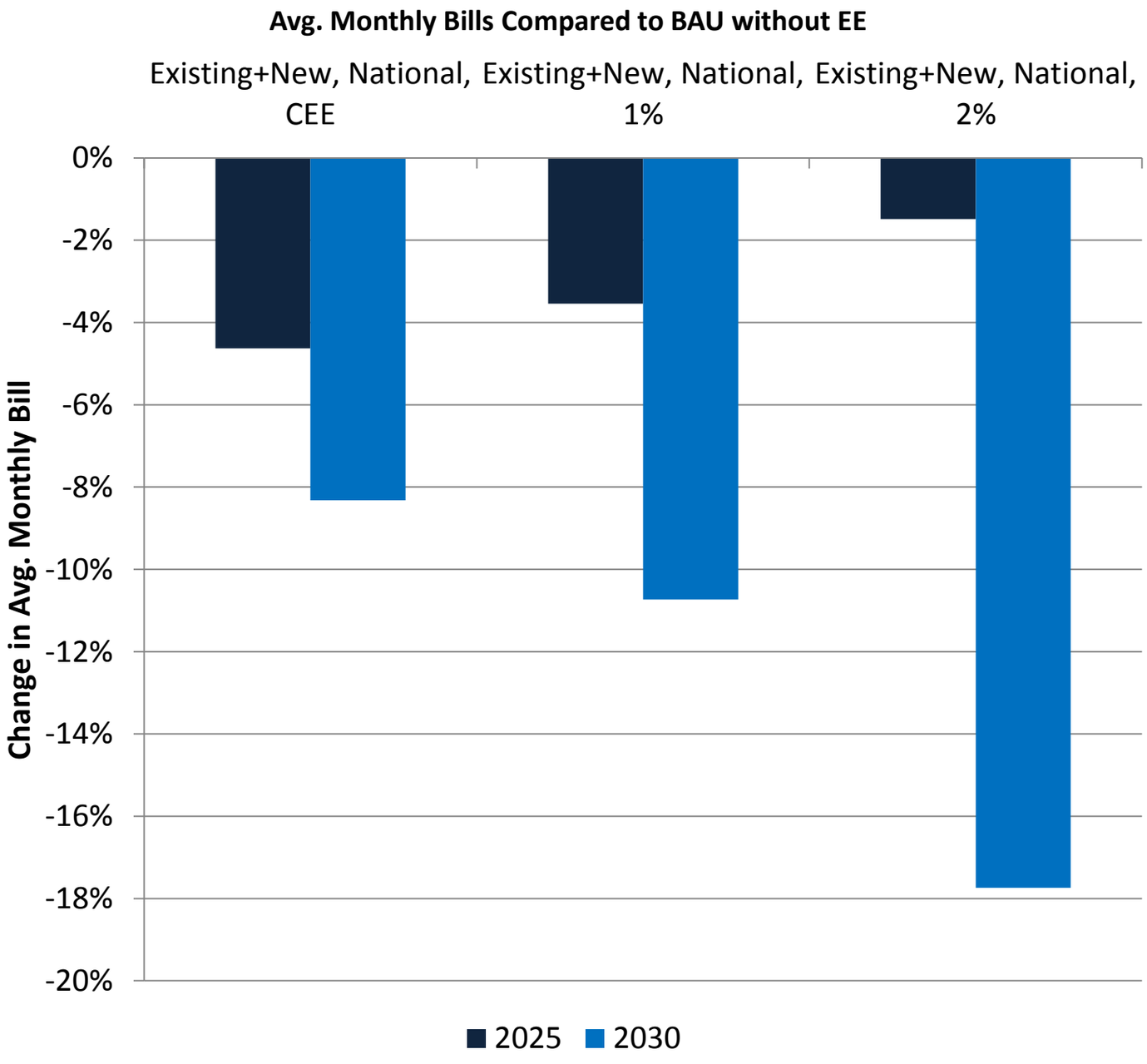
Value of Public Health Savings for New Jersey Under the CPP(in 2030)*

Policy Case**	Annual Health Benefit (in Millions) - *Low Estimate*	Annual Health Benefit (in Millions) - *High Estimate*
Existing + New, CEE^	$42.60	$111.31
Existing + New, 1%	$44.14	$117.05
Existing + New, 2%	**$44.47**	**$118.28**
Existing-Only, CEE	$31.49	$69.90
Dual Rate, 1%	$31.49	$69.90

** All policy cases shown include national trading of allowances.
^ CEE stands for "Current Energy Efficiency" and reflects annual savings equal to 2013 incremental savings. For New Jersey this is equal to annual savings of 0.7%

* Monetary value is calculated using EPA's "Benefit-Per-Ton" 2030 Estimates for the Eastern Region. See EPA's RIA for more details on the methodology. These values reflect savings from reduced NOx and SOx emissions. Health benefits of other co-pollutants and climate benefits are not reflected in the above values.

Customers Will Save on Their Monthly Electricity Bills



- Bills are reduced in all policy cases by 8-17% in 2030 (compared to BAU with no EE).
- Compared to a reference case with current EE, bills remain flat or are slightly reduced (~8% decline in 2% EE case)
- Bill savings result from reduced household consumption, as well as wholesale price suppression due to increase energy efficiency and renewable energy.

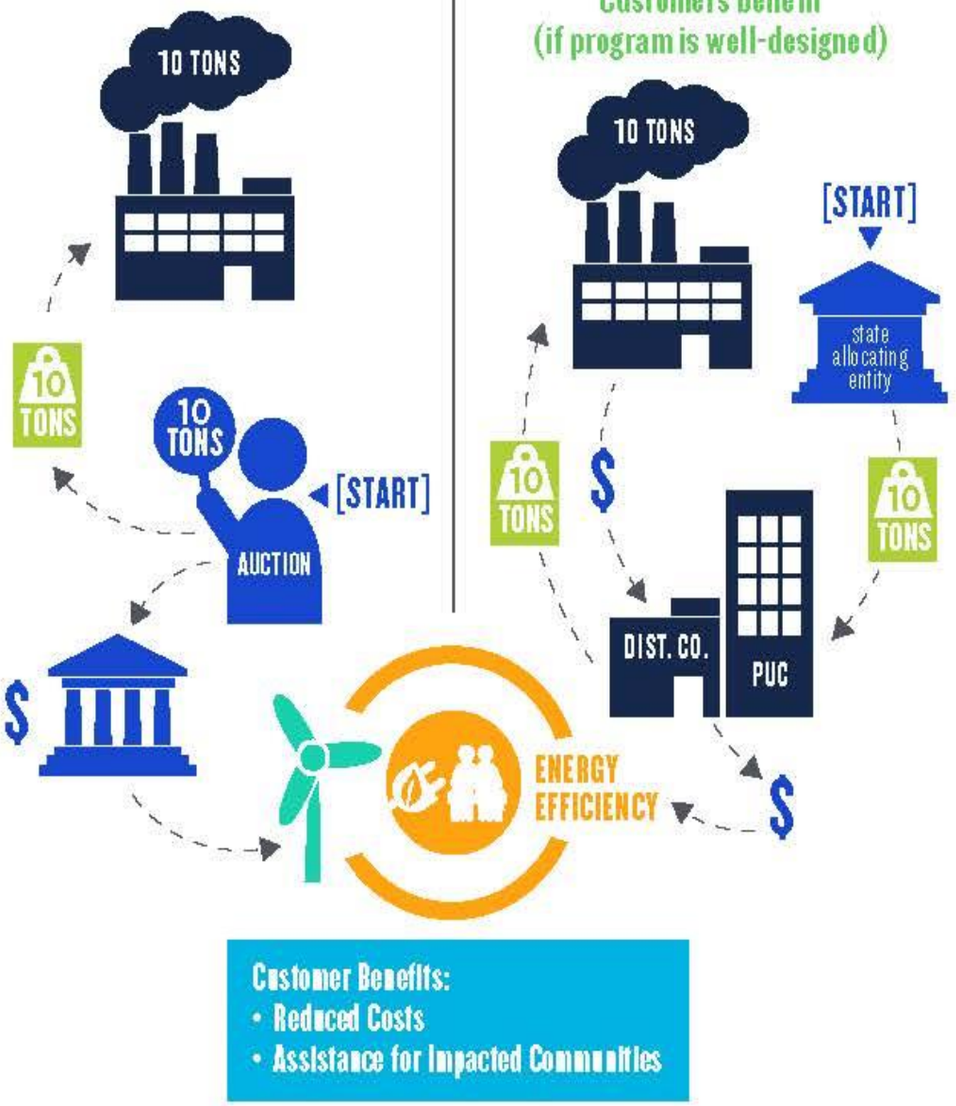
Recommendation for New Jersey

- Mass-based, cover new and existing sources (no leakage)
- Auction allowances and allow trading
- Reinvest revenue for consumer benefit (EE, RE, low-income programs, targeted investments in EJ communities, etc.)
- Should coordinate with other states in the PJM footprint to maximize consistency in compliance approaches
- RGGI model a proven winner for NJ through 2011 before dropping out of the program:
  - $151 million in value added to the state economy ($2.9 billion through 2014 in RGGI overall)
  - 1,772 job-years (30,290 job-years through 2014 in RGGI overall)
  - $118 million in allowance revenue, of which NJ spent:
    - 63% on general fund/state government funding
    - 23% on RE investment
    - 9% on direct bill assistance, and
    - 5% on GHG programs and program administration

  --*2011 Analysis Group report* *(2012-2014 benefits in remaining 9 RGGI States here)*

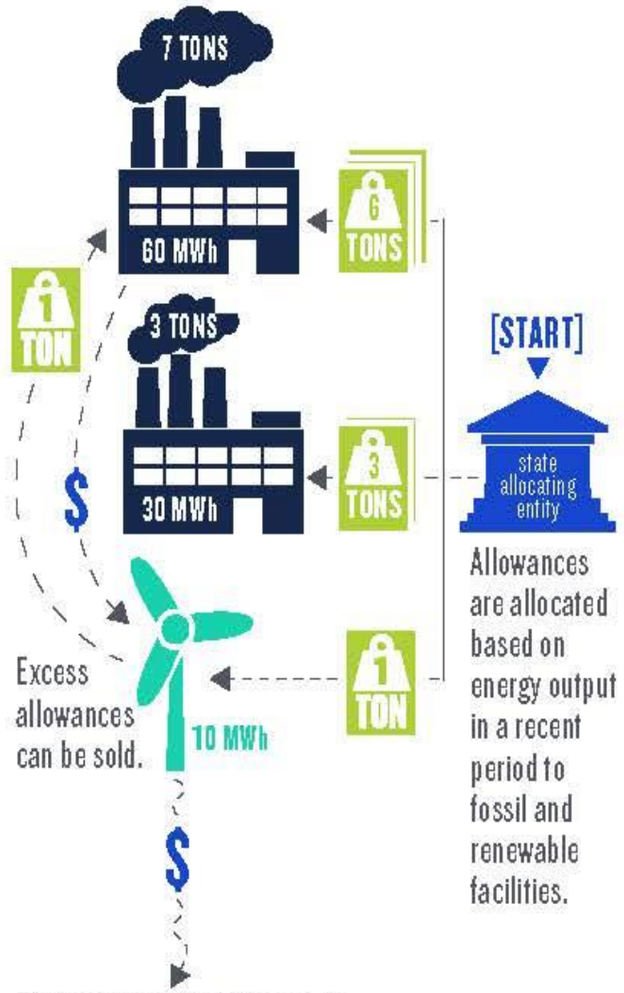
ALLOCATING ALLOWANCES: WHO BENEFITS?

AUCTION
Customers benefit



AUCTION TO CUSTOMERS VIA DISTRIBUTION COMPANIES
Customers benefit (if program is well-designed)

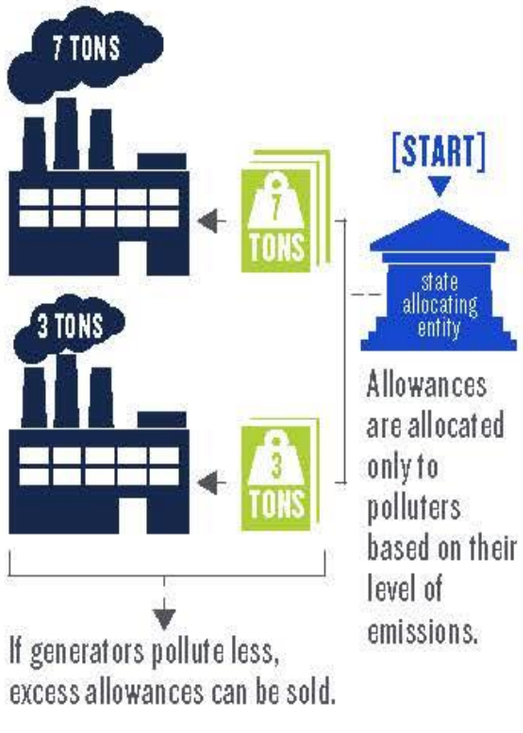
OUTPUT-BASED ALLOCATION
Clean generation benefits

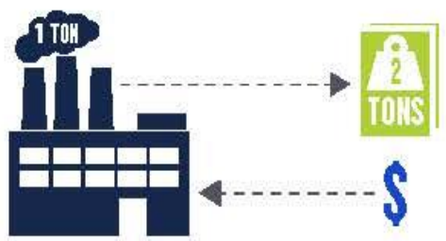


Allowances are allocated based on energy output in a recent period to fossil and renewable facilities.

There is no oversight to ensure that revenue is invested to reduce customer costs.

ALLOCATION TO EMITTERS
Dirty generation benefits





Dirty generators profit from selling excess allowances, denying customers most of the cost reduction savings.