# The EPA Clean Power Plan:
## Update on New Jersey's CPP Evaluation

New Jersey Clean Air Council Meeting

April 13, 2016

*Office of Air and Energy Advisor*
*NJ Department of Environmental Protection*

# Today's briefing topics

1. Litigation Update and Possible Timeline
2. New Jersey Energy Mix and Trends
3. Thoughts on PJM Reference Model Prelim Results
4. New Jersey's Regulated Facilities Under the CPP
5. Renewable Energy and Energy Efficiency: Interaction with the CPP
6. Review of Mass-based Allowance Deficit and Rate-based ERC Surplus in NJ
7. Resources for Additional Information

# Litigation Update and Possible Timeline

Andrea Friedman

NJDEP Office of Air and Energy Advisor

# Litigation Update

- Oral arguments scheduled for June 2nd (and 3rd if necessary) in the U.S. Court of Appeals for the District of Columbia Circuit.

- The D.C. Circuit Court could:
    - uphold or vacate the rule in whole or in part, and/or
    - remand portions of the rule to EPA

- After the decision, either side can petition the D.C. Circuit Court for en banc review of the D.C. Circuit panel decision.

# Litigation Update

- After the D.C. Circuit Court decision, either side can petition the Supreme Court to hear the case.

- The rule remains stayed unless:
    - neither side petitions the Supreme Court
    - the Supreme Court refuses to hear the case
    - the Supreme Court hears the case and issues a decision

# Possible Timeline

| | |
|---|---|
| June 2016 | D.C. Circuit Court hears oral arguments |
| Fall 2016 | D.C. Circuit issues decision |
| Jan 2017 | New Federal Administration |
| 2017/18 | Supreme Court decision grants or denies petition and/or issues a ruling |

# Bottom Line

- States will not submit CPP extension requests or state plans before 2017/18.
- The EPA Proposed Federal Implementation Plan and Model Rule will not be finalized before 2017/18.
- All deadlines and compliance periods in the rule will need to be revisited by EPA.

# New Jersey's Energy Mix and Trends

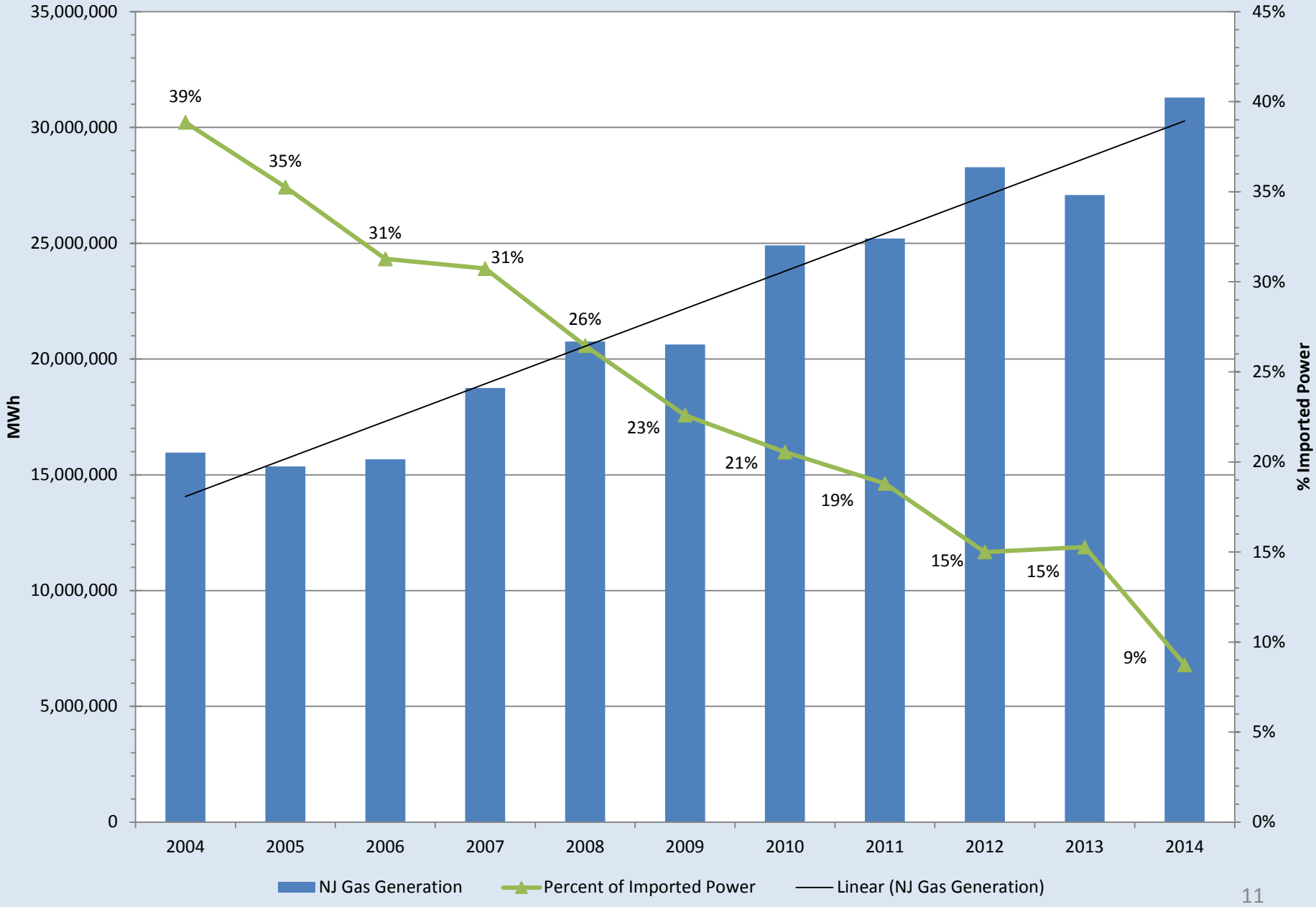
Tom McNevin

NJDEP Office of Air and Energy Advisor

# Total NJ Electric Generation and Retail Sales

# NJ Fossil Generation

# Total NJ Gas-Fired Electric Generation with Imported Power



# Thoughts on PJM Reference Model (not including the CPP) : 4/8/16 Preliminary Results

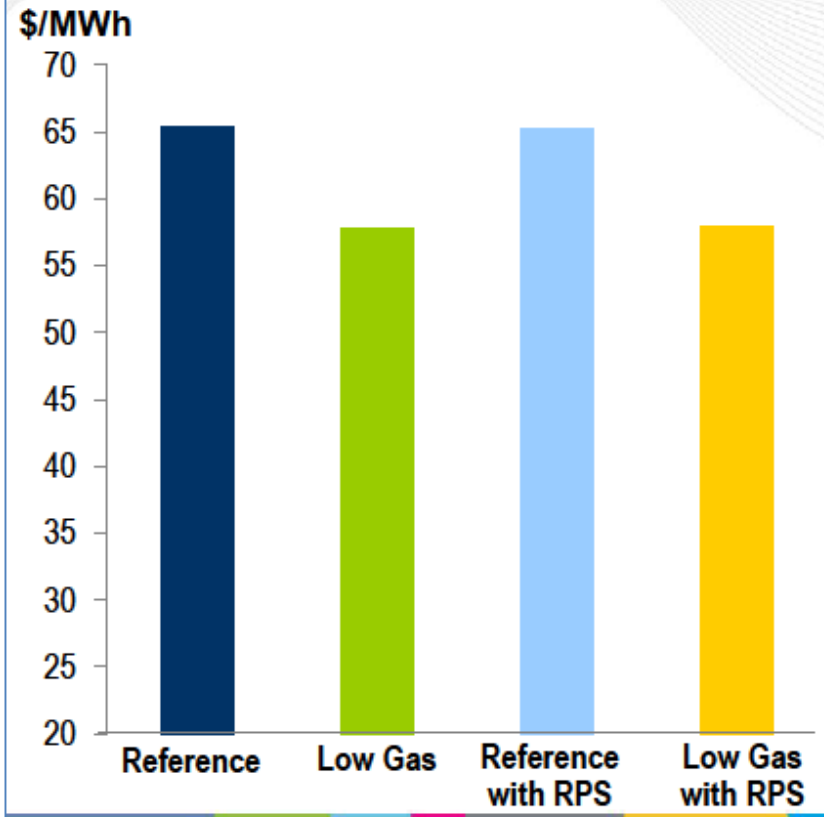
William O'Sullivan

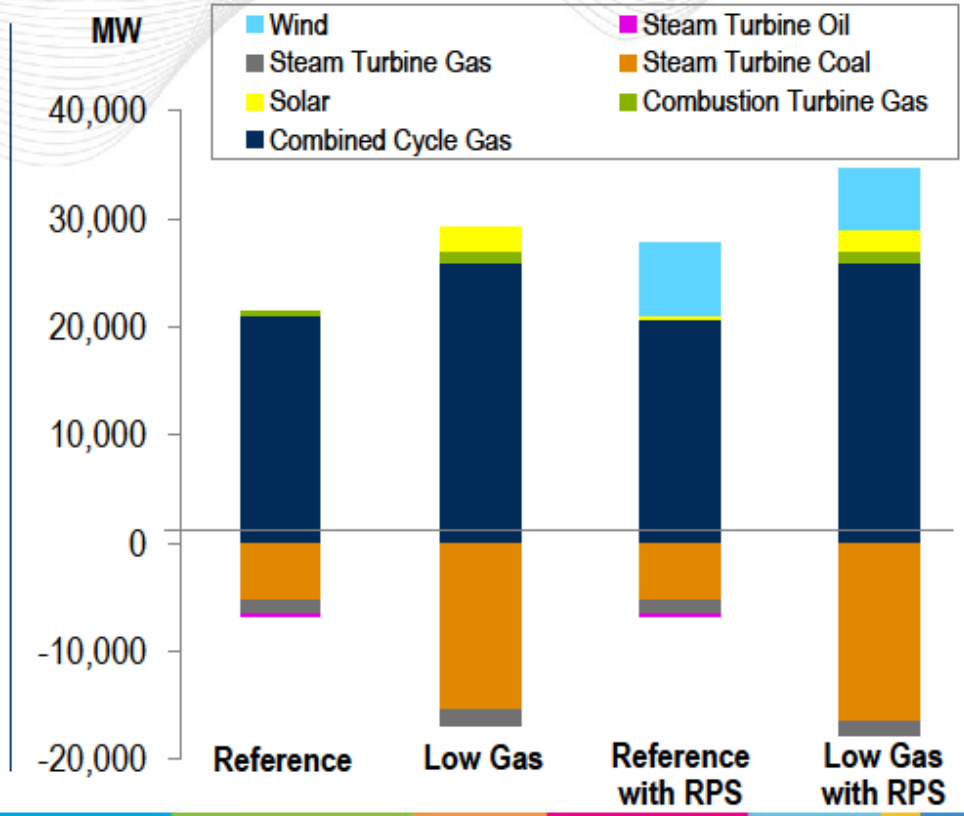
NJDEP Office of Air and Energy Advisor

# Clean Power Plan Webinar with states
# PJM Reference Model and Reference Model Sensitivities Preliminary Results

PJM CPP Modeling Team
April 08, 2016

# Levelized Energy & Capacity Market Prices ($2018) vs. Change in Generating Capacity



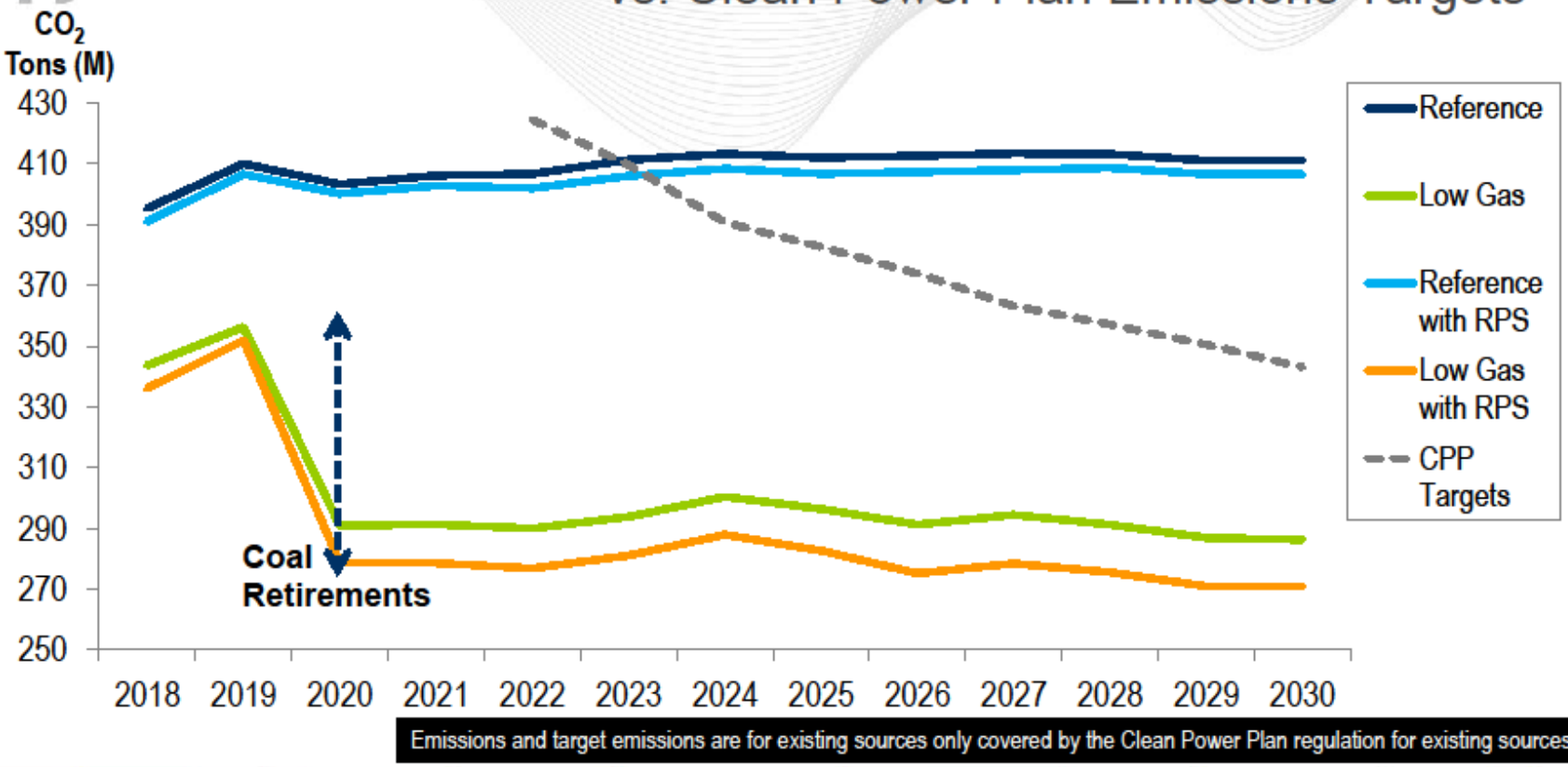
# Thoughts on PJM Reference Case Levelized Electric Costs

1. The lower gas price ($3.43) has a significant effect on electric costs (about 14% less), as compared to the higher gas price ($5.14).
2. Implementation of existing Renewable Portfolio Standards (RPS) does not significantly impact the average cost of electricity production in PJM.
3. Results will be different on a state by state basis.
4. The 2 gas prices studied are neither the lowest or highest possible.

# Thoughts on Changes in Capacity for Different Generating Types

1. NGCC new builds increase significantly, more so if gas is lower price.
2. Coal decreased significantly, much more so if gas is lower price.
3. Solar new builds are significantly higher with low gas price.
4. Wind is significantly higher with RPS implementation.

# PJM Region $CO_2$ Emissions for Existing Sources vs. Clean Power Plan Emissions Targets




Emissions and target emissions are for existing sources only covered by the Clean Power Plan regulation for existing sources.

# Thoughts on PJM Reference Case $CO_2$ Emission Projections

1. Natural gas prices have a major effect on $CO_2$ emissions in PJM.
2. $3.43 gas reduces $CO_2$ emissions by over 30%, as compared to $5.14 gas.
3. RPS is more effective with lower gas price.
4. $3.43 gas achieves $CO_2$ levels well under the 2030 CPP goal for PJM (over 20% lower).

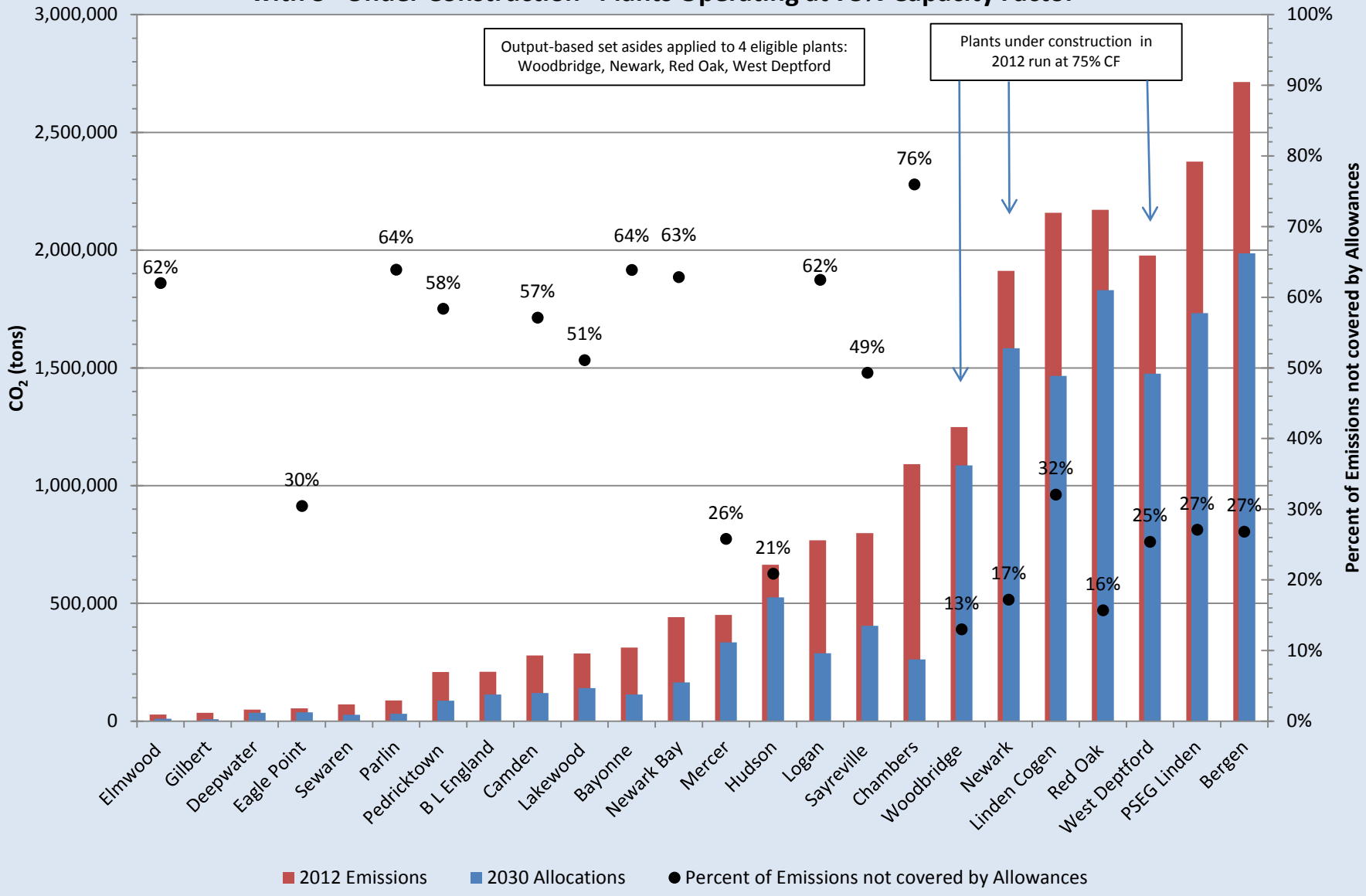
# New Jersey's Regulated Facilities Under the CPP

Tom McNevin

NJDEP Office of Air and Energy Advisor

# Mass-Based

## NJ 24 CPP Plants: 2012 Emissions with 2030 Allocations based on EPA Proposed FIP, with 3 "Under Construction" Plants Operating at 75% Capacity Factor



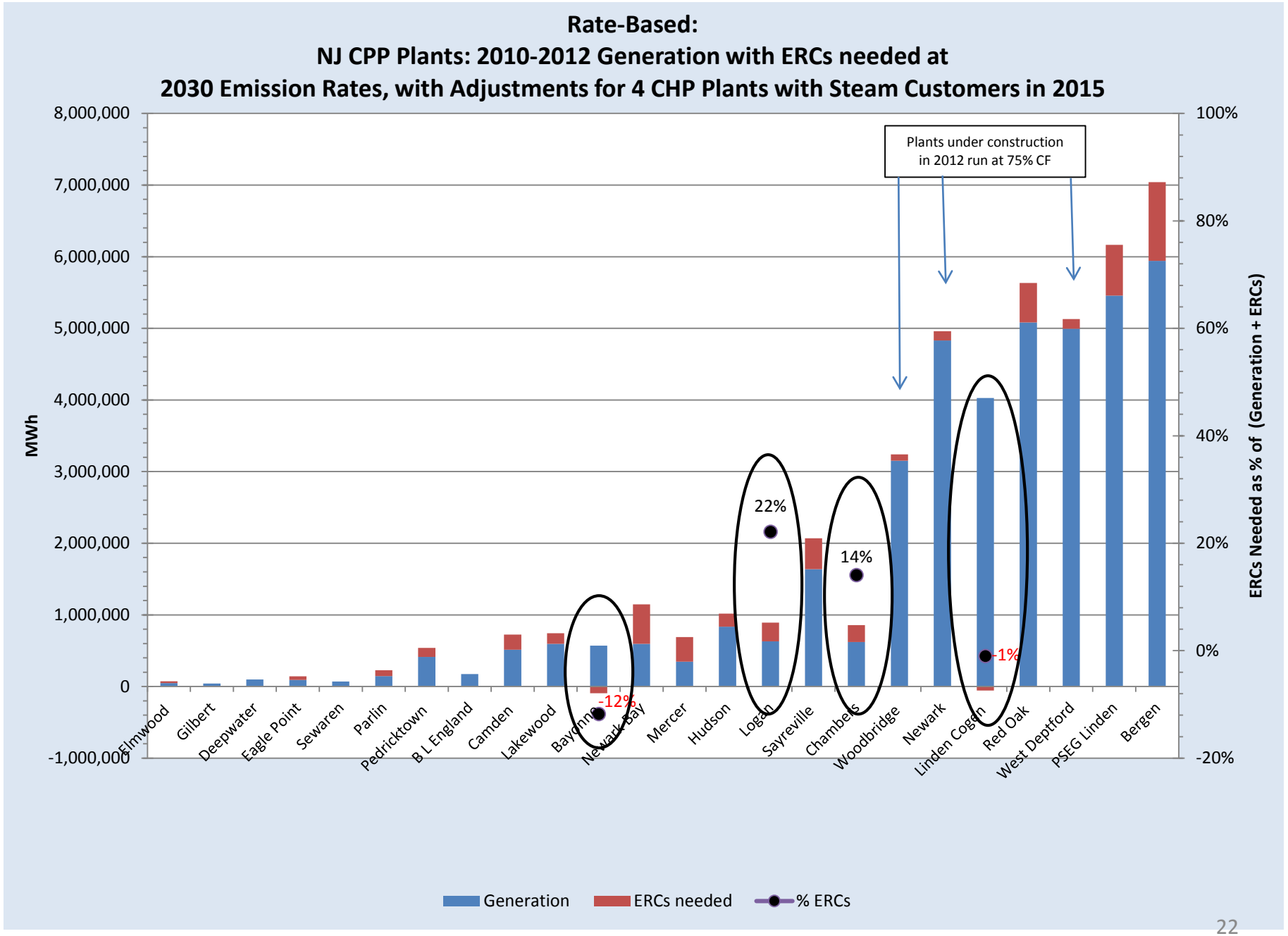
# Rate-Based Approach: What is an ERC?

An ERC is an administratively created, tradable instrument with a unique serial number that "represent[s] one MWh of actual energy generated or saved with zero associated $CO_2$ emissions". When held and retired by an EGU, an ERC allows that EGU to adjust its emission rate as follows:

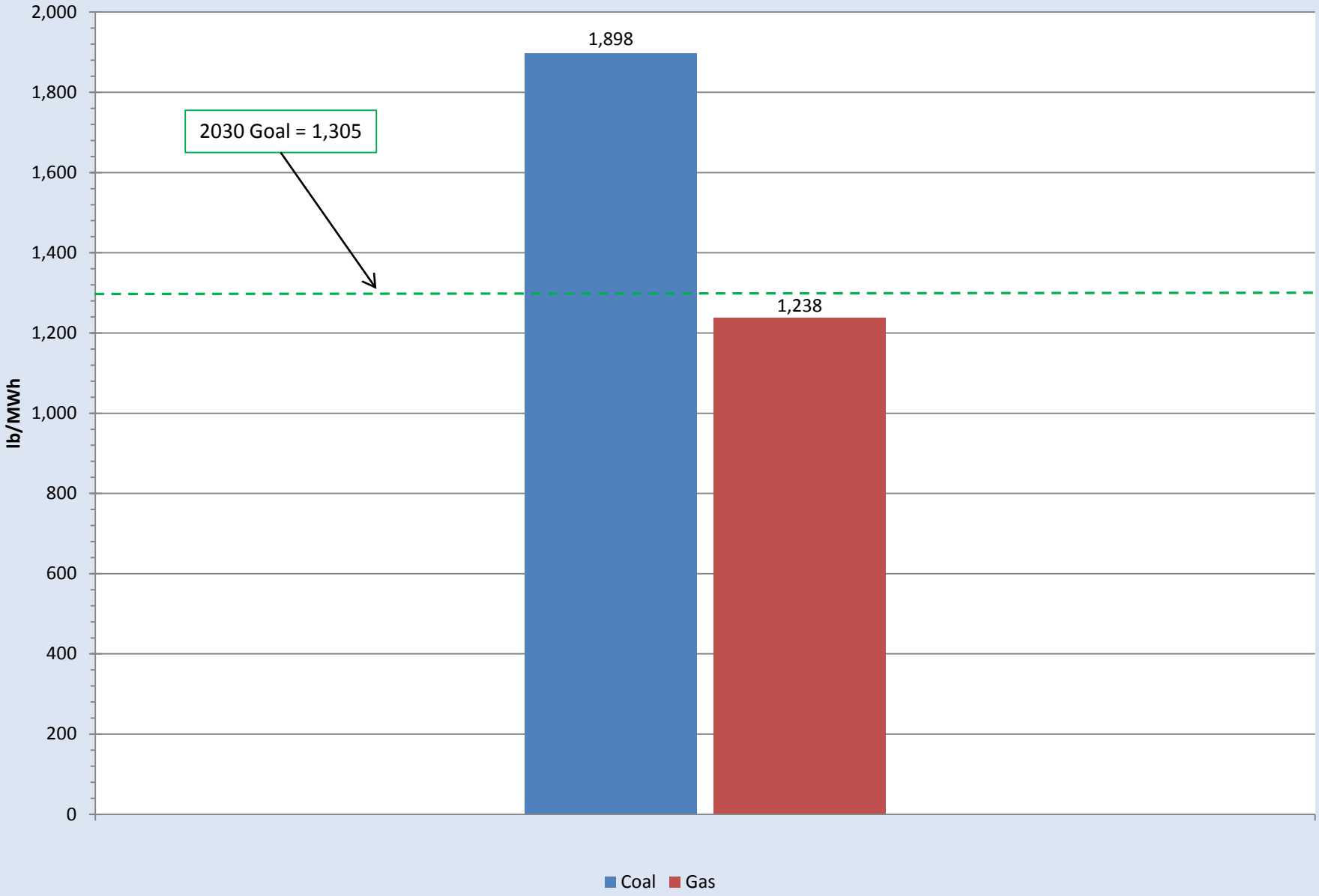
$$\textbf{Adjusted emission rate} = \frac{\textbf{EGU } CO_2 \textbf{ Emissions (lb)}}{EGU\ Generation\ (MWh) + ERCs\ (MWh)}$$

2030 Adjusted emission rate goals:

NGCC = 771 lb/MWh, Boilers = 1,305 lb/MWh


Rate-Based:
NJ CPP Plants: 2010-2012 Generation with ERCs needed at
2030 Emission Rates, with Adjustments for 4 CHP Plants with Steam Customers in 2015
MWh
ERCs Needed as % of (Generation + ERCs)
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
-1,000,000
100%
80%
60%
40%
20%
0%
-20%
Plants under construction in 2012 run at 75% CF
22%
14%
-12%
-1%
Elmwood
Gilbert
Deepwater
Eagle Point
Sewaren
Parlin
Pedricktown
B L England
Camden
Lakewood
Bayonne
Newark Bay
Mercer
Hudson
Logan
Sayreville
Chambers
Woodbridge
Newark
Linden Cogen
Red Oak
West Deptford
PSEG Linden
Bergen
Generation
ERCs needed
% ERCs

# Hudson-2 Average 2012 - 2015 $CO_2$ Rates, Coal vs Gas-fired Generation



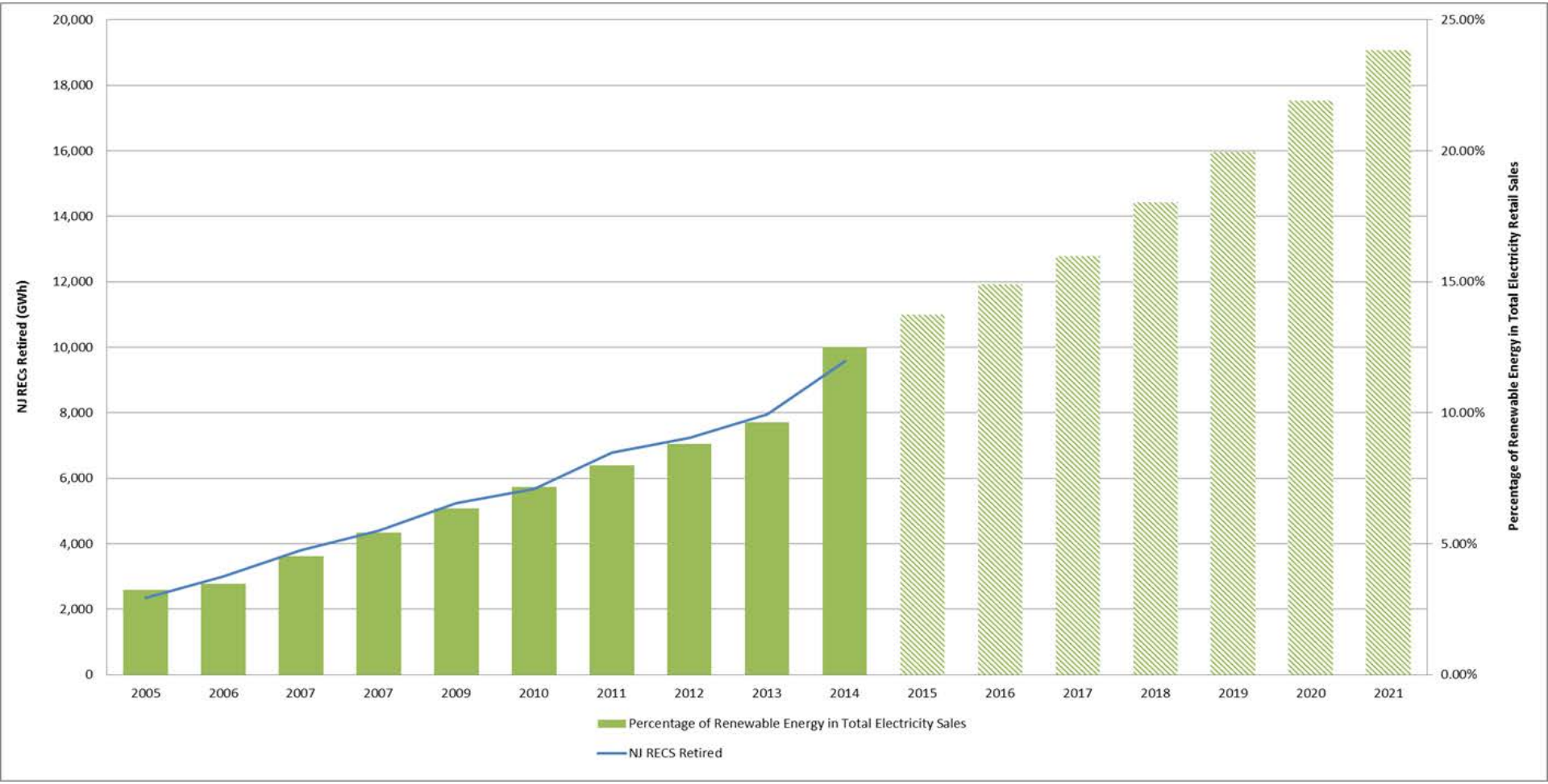
# Renewable Energy and Energy Efficiency: Interaction with the CPP

Joseph Carpenter

NJDEP Office of Air and Energy Advisor

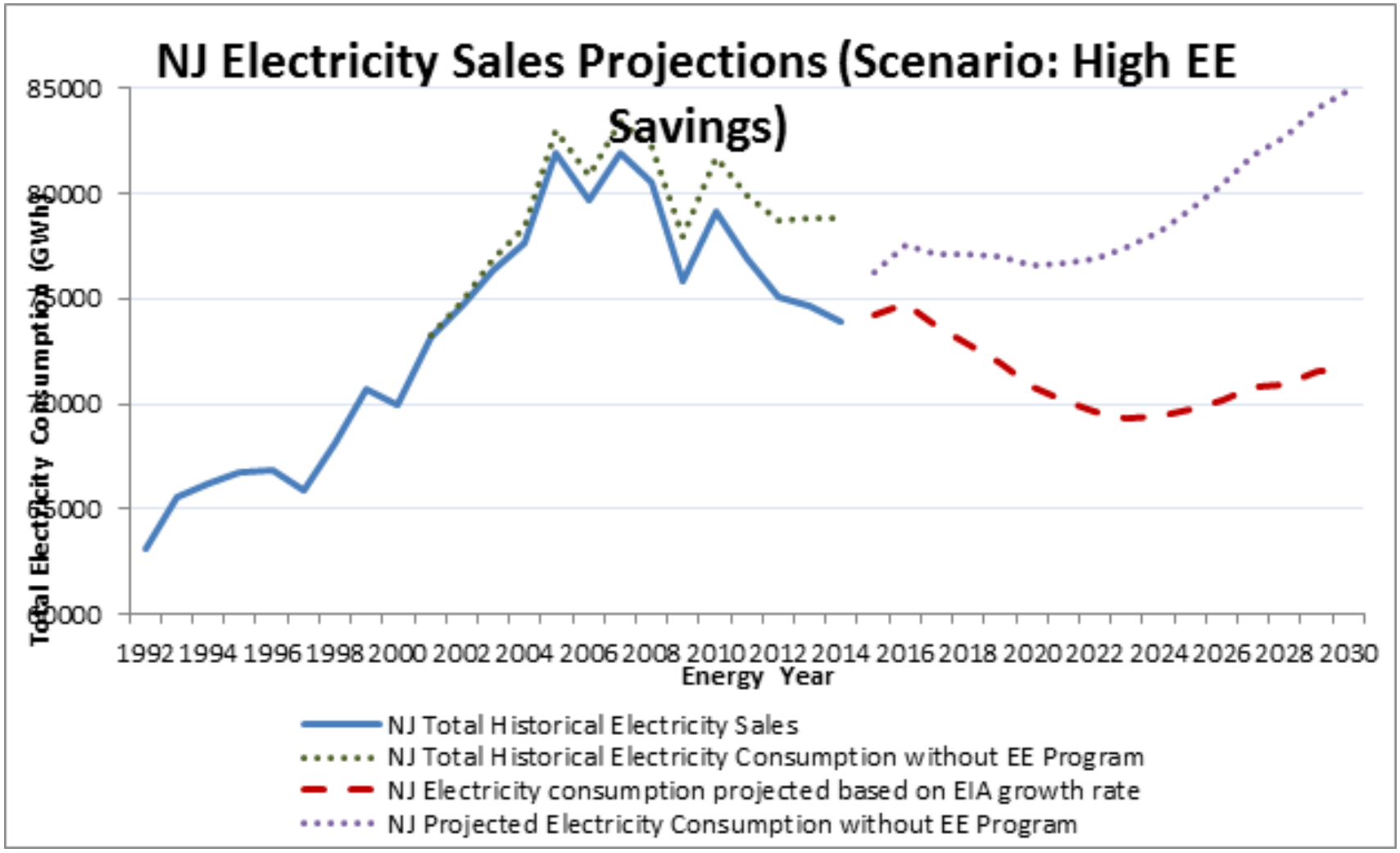
# NJ RPS Trajectory

(Note: Pre-2013 activities are not credited under CPP)



# NJ EE Savings – Projected to 2030

(Assumes 1% EE savings annually)



# RE Treatment in a Mass Based Program

- MWh of RE reduces demand, which helps keep state under the emission cap
- RE can receive allowance allocation from set-aside (state discretion) for sale to regulated generators
- 5% RE set-aside in FIP for new source leakage
- Utility scale wind, solar, geothermal, hydropower can be set-asides to address leakage

# RE Treatment in a Rate Based Program

- RE MWhr generates tradeable ERCs for compliance purposes
- Post-2012 wind, solar, geothermal power, hydropower

  (EPA solicits comment on inclusion of qualifying biomass feedstocks)
- Rate based requires RE or EE for compliance

# EE Treatment in a Mass Based Program

- MWh savings from EE help keep state under the emission cap
- Do not result in a tradeable compliance mechanism – therefore no direct financial incentive, aside from optional allowance allocation under a state plan

# EE Treatment in a Rate Based Program

- Post-2012 EE actions create tradeable ERCs for compliance
- All measurable EE qualifies, provided verified using EPA-accepted EM&V protocols
- State and utility EE programs, project based demand-side EE, state building codes, state appliance standards, conservation voltage reduction, CHP

# Review of Mass-based Allowance Deficit and Rate-based ERC Surplus in NJ

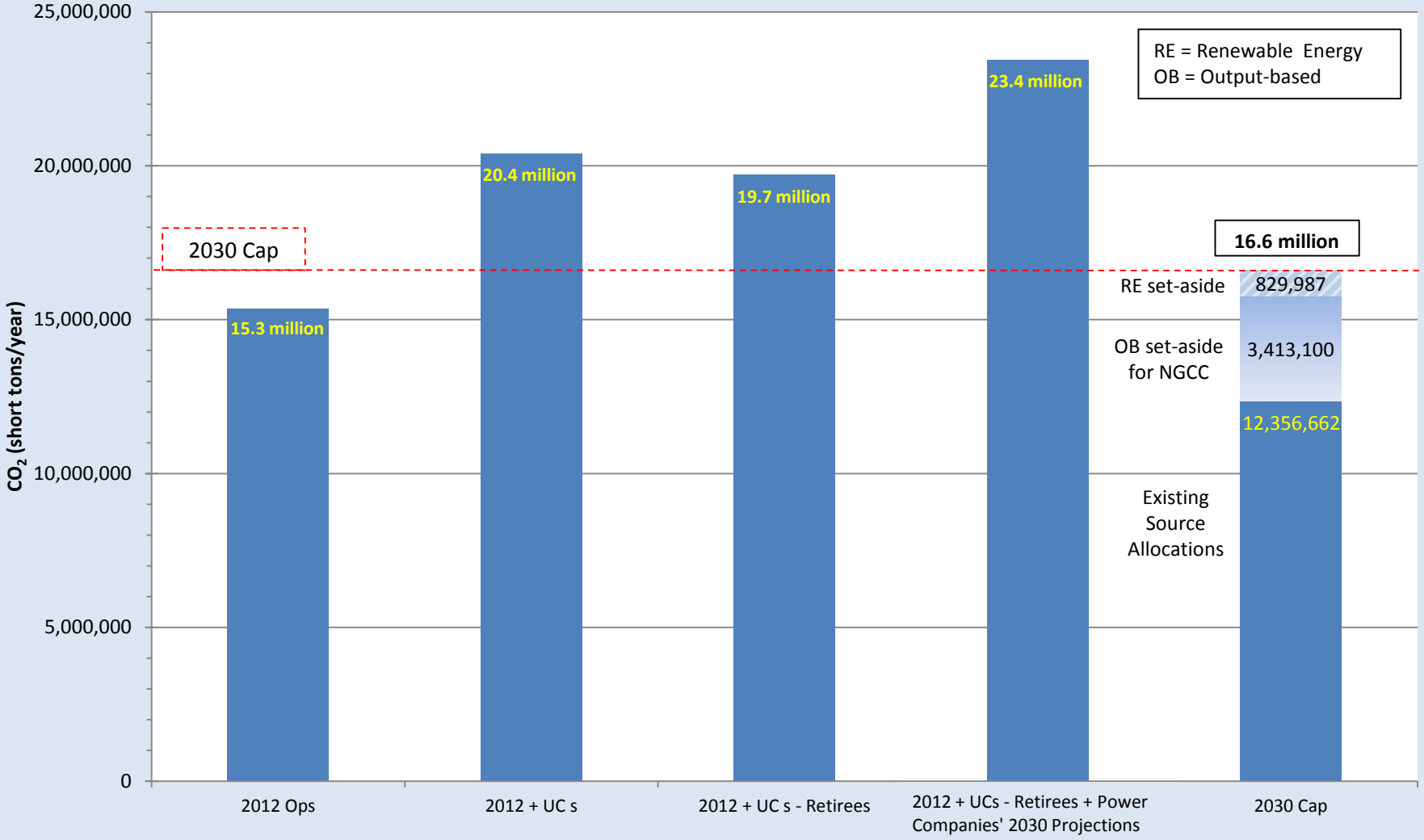
William O'Sullivan

NJDEP Office of Air and Energy Advisor

# Mass-Based Approach

- **New Jersey 2030 Cap = 16.6 million tons**
  - Existing Sources (directly allocated) = 12.4 million tons (75%)
  - Renewable Energy Set-Aside (indirectly available) = 0.8 million tons (5%)
  - Output-Based Set-Aside = 3.4 million tons (20%) (directly allocated to certain efficient NGCCs)

# NJ Estimated Actual $CO_2$ Emissions Compared with 2030 Emissions Cap




"2012 Ops" = Annual 2012 emissions from 21 plants
"2012 + UCs" = Actual 2012 emissions plus emissions from 3 plants then Under Construction operating at a 75% capacity factor
"2012 = UCs - Retirees" = "2012 + UCs" - 5 plants scheduled to retire

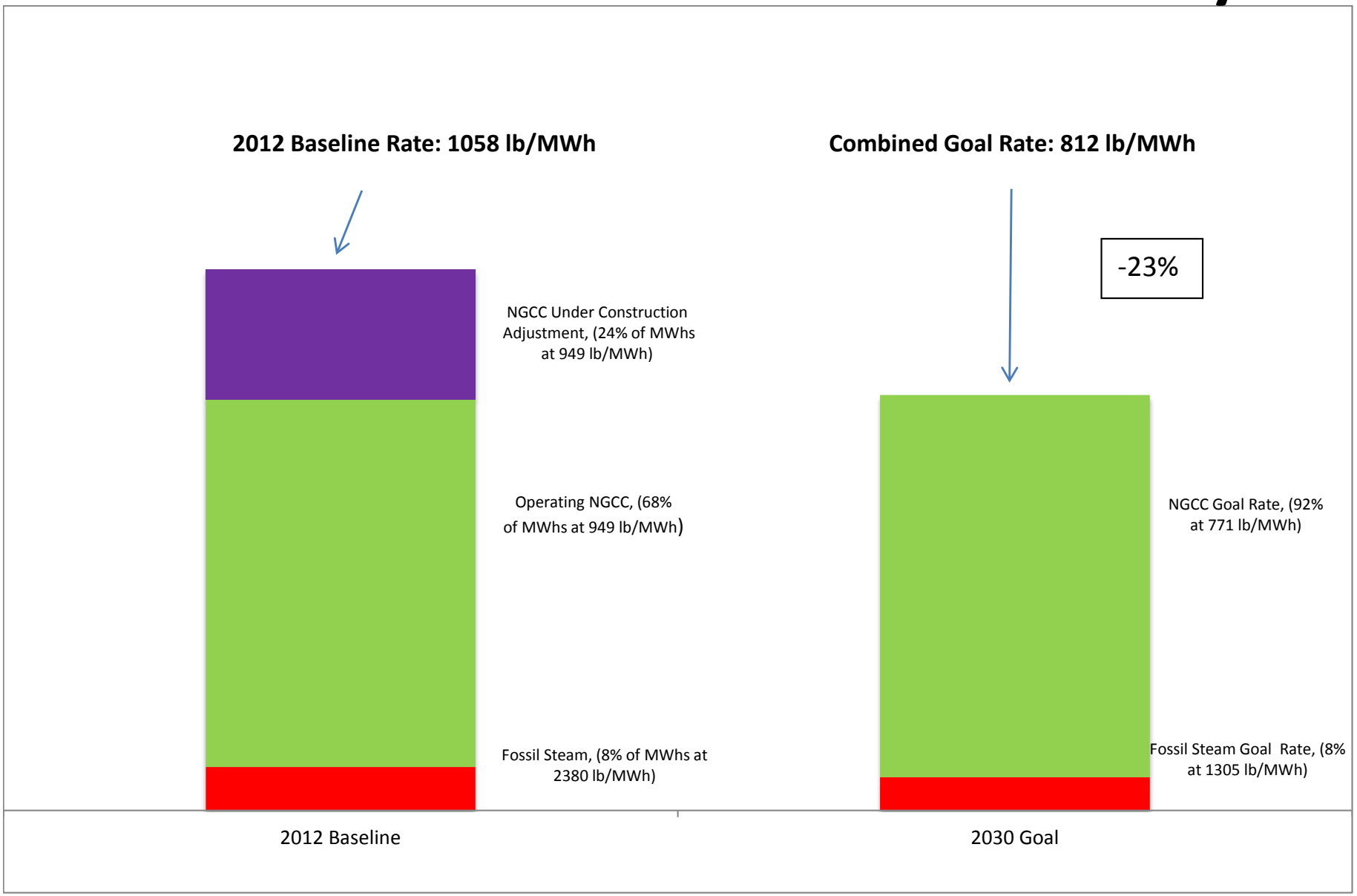
# 2030 Mass Based Allowance Shortfall Per Year

| | |
|---|---|
| 2030 Allowance Need* | 23.5 million |
| 2030 Allowance Allocation | 16.6 million |
| 2030 Allowance Deficit | **- 6.9 million (30%)** |

*Based on company expectations for 2030 electric generation.

- Under construction units at 75% capacity
- 5 facilities are shut down or replaced with new units

# CPP Rate-based Goal for New Jersey




Note: This graph is based on EPA CPP data.

# See attachment (2 pages)

*Rough Accounting for Hypothetical NJ Rate Based Program (in 2030 Based on 2012 Electric Generation)*

# Conclusions

1. NJ has an allowance deficit if it selects mass based
   - 30% short for existing CPP regulated facilities
   - 50% short if include new facilities

   (based on permitted or planned facilities)

2. NJ would need to depend on excess allowances in other states to comply with a mass based program.

3. Including new sources (as is done in RGGI) would add to the difficulty of compliance with the EPA's mass-based program.

# Conclusions (cont'd)

4. NJ may have an ERC surplus if it selects rate based

5. ERC credit depends on EPA final rules

6. EPA's proposed rules cannot be met by NJ under existing energy law. EPA regulation at the wholesale market is primary problem.

# Resources for Additional Information

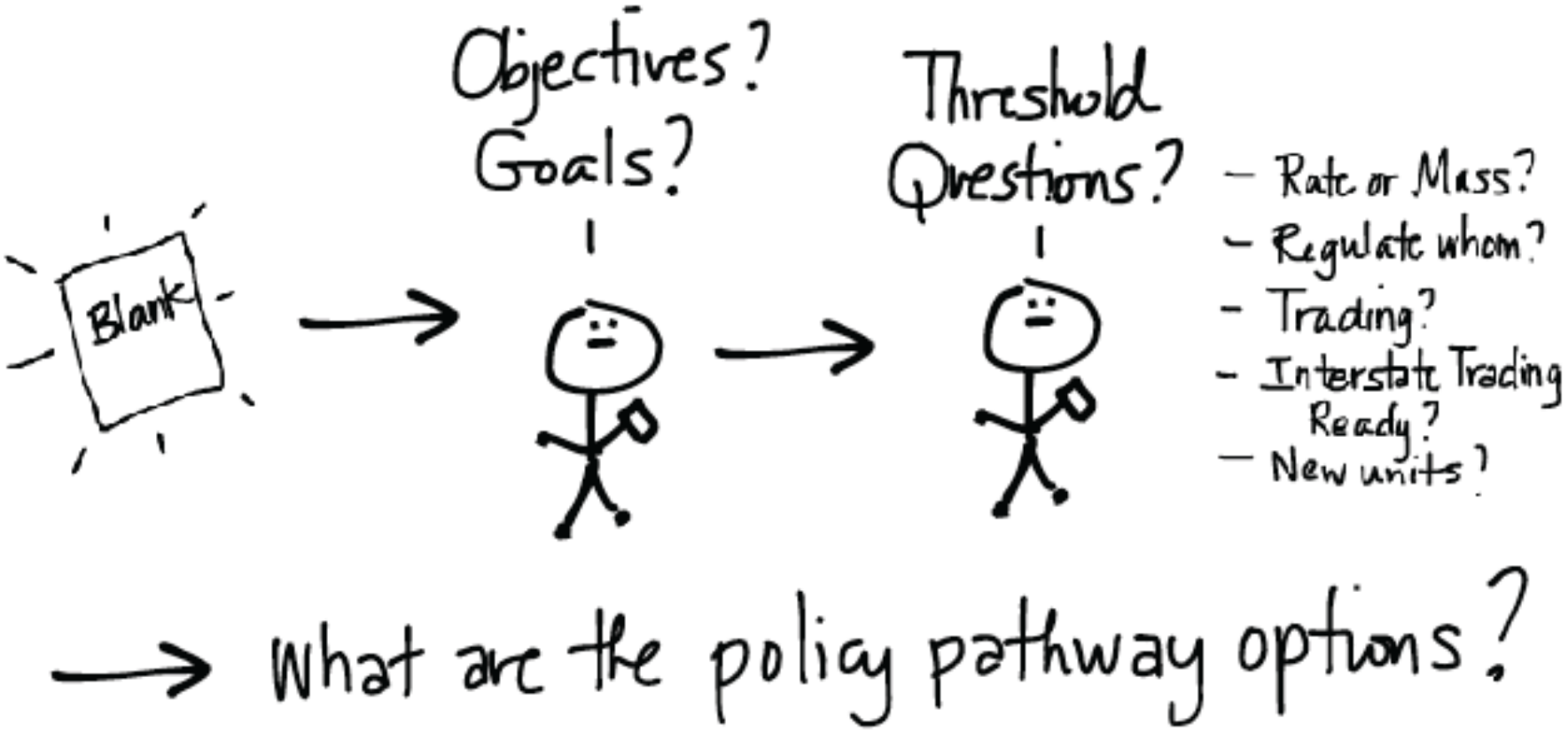
***Background Material on the Clean Power Plan*** on the CAC website at http://www.state.nj.us/dep/cleanair/hearings/pdf/cpp.pdf

Includes:

- Text of the CPP and the Proposed Federal Plan and Model Rules
- Resources from the U.S. Environmental Protection Agency
- Resources from Universities
- Resources from Other Sources
- The State of New Jersey's Response to the CPP
- New Jersey Energy Master Plan
- Litigation Materials

***Background Material on the Clean Power Plan*** was updated on 3/31/16. If you see an older version on the CAC website, refresh your web browser. (The date is on the bottom of the last page.)

# There is much to consider…




Adapted from *Understanding EPA's Clean Power Plan: A Webinar for State Energy & Environmental Regulators,* Great Plains Institute and Duke Nicholas Institute for Environmental Policy Solutions