**COMMONWEALTH OF VIRGINIA**
**CLEAN POWER PLAN FOR GREENHOUSE GASES**

**STAKEHOLDER GROUP MEETING MINUTES**

**SECOND FLOOR CONFERENCE ROOM**
**629 EAST MAIN STREET, RICHMOND, VIRGINIA**
**DECEMBER 15, 2015**

**Members Present:**

Malcolm Woolf, Advanced Energy Economy
John Hendricks, AEP
Donald Ratliff, Alpha Natural Resources
Will Poleway, Birchwood
Kris Gaus, Power Plant Management Services
Michael Van Brunt, Covanta
Lenny Dupuis, Dominion
Scott Carver, Doswell/LS Power
Walton Shepherd, NRDC
Laura Rose, ODEC
Greg Kunkel, Tenaska
John Morrill, VACO
Irene Kowalczyk, WestRock/VMA
Dr. Jalonne White-Newsome, We Act

**Department of Environmental Quality:**

David K. Paylor, Director
Ann M. Regn, Office of Public Information
Mary E. Major, Regulatory Affairs
Michael G. Dowd, Air Division
Thomas R. Ballou, Air Division
Karen Sabasteanski, Regulatory Affairs

The meeting began at approximately 9:00 a.m.

**Meeting Purpose**: This stakeholders group has been established to advise and assist the Commonwealth on elements that could be included in the state compliance plan to meet the final U.S. Environmental Protection Agency (EPA) Clean Power Plan (CPP) rule for the control of greenhouse gases. The purpose of this meeting is for DEQ to coordinate and facilitate discussions of this group in an effort to find common ground and elements that could be recommended to the Administration for consideration in the state compliance plan for the Commonwealth.

**Welcome and Introductions:** Mr. Paylor welcomed the group and made a number of introductory remarks. The group needs to understand the impacts of the Clean Power Plan throughout the Commonwealth. He reiterated that alternates should not attend as continuity of discussion is important, and that all materials should be disseminated to the group through DEQ staff.

Ms. Regn welcomed the group. Members introduced themselves individually. Ms. Regn then reviewed the agenda, provided a brief summary of the previous meeting, and reviewed the questions for group discussion, general guidelines for discussions, and the main factors to be considered. She also reviewed the discussion and consensus

process, and provided a brief description of what the final report will contain (see Attachment A).

Mr. Ballou then reviewed baseline data requested by the group at the previous meeting. He described the affected electric generating utilities (EGUs) covered under the 2012 baseline, including changes made to affected sources in Virginia that occurred after 2012. He also provided emission and rate trends for both carbon dioxide ($CO_2$) and for criteria pollutants (nitrogen dioxide and sulfur dioxide) for the 2000 through 2014 period (see Attachment A).

**Work Plan/Group Discussion:** The need to consider how health benefits tie into general environmental benefits, particularly with respect to communities and the potential for "hotspots" was raised. The group discussed initial reactions to Question 1 (see Attachment A): What are the benefits and issues of each type of plan and what is the preferred path? The first factor considered by the group was whether the plan should be an emissions performance standard plan, or a state measures plan, details of which were provided by Mr. Dowd. The group discussed the costs and benefits of either approach, and came to **consensus that the emission standards approach was preferred**.

Given the emissions standard approach as a starting point, the group then began to consider Question 2: whether a mass-based or rate-based program is preferable. The group discussed, in considerable detail, the pros and cons of the mass-based approach, with some overlap with respect to rate; there was also detailed discussion as to whether or not a new source complement should be considered should the program be mass-based. Attachment B is a brief summary of the primary discussion topics.

No formal consensus was reached on any issue, although the group generally agreed that the Clean Energy Incentive Program (CEIP)--given that it is not yet in its final form--was likely a positive program in which Virginia should consider participating.

When the group reconvenes in January, the likely topics of discussion will be:

- Continue discussion of issues with a mass-based program, including whether a new source complement should be included.
- Go into the rate-based program in greater detail.
- Discuss source-specific issues with respect to local impacts.
- Continue to consider available modeling tools. (Mr. Shepherd provided some examples of modeling outputs; see Attachment C.)

In advance of the January meeting:

- Mr. Ballou will provide source-specific data.
- Mr. Shepherd will provide more information on how the mass-based goals were developed.
- Mr. Woolf will review the Advanced Energy Economy State Tool for Electricity Emissions Reduction (STEER) modeling tool in a more Virginia-specific context.

- DEQ staff will review Information Handling Services (IHS) modeling for any applicability to Virginia.
- DEQ staff will report on any additional modeling information from PJM/Nicholas Institute as available.

**Next Steps/Future Meetings:** Ms. Regn wrapped up the meeting. Future meetings are scheduled for January 22, 2016, February 12, 2016, and March 11, 2016.

The meeting adjourned at approximately 2:30 p.m.

Attachments

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ATTACHMENT A

# COMMONWEALTH OF VIRGINIA CLEAN POWER PLAN STAKEHOLDER GROUP DECEMBER 15, 2015

# AGENDA

| | |
|---|---|
| 9:00 – 9:10 a.m. | WELCOME<br>David Paylor |
| 9:10 – 9:30 a.m. | MEETING 1 RECAP & DISCUSSION GUIDELINES AND PROCESS<br>Ann Regn |
| 9:30 – 9:50 a.m. | AFFECTED EGU 2012 BASELINE<br>Tom Ballou |
| 10:00 – 11:30 a.m. | FACILITATED GROUP DISCUSSION: QUESTION #1<br>Ann Regn |
| 11:30 a.m. – 12:30 p.m. | LUNCH BREAK (on your own) |
| 12:30 – 2:15 p.m. | FACILITATED GROUP DISCUSSION: QUESTION #2<br>Ann Regn |
| 2:15 – 2:30 p.m. | WRAP-UP<br>Ann Regn |
| 2:30 p.m. | ADJOURN |

# RECAP OF STAKEHOLDER MEETING 1

- Purpose of the group
- Process and guidelines group will use for discussion
- Identified of key elements and decisions to be made
- Developed a schedule for work

# QUESTIONS FOR GROUP DISCUSSION

- Two general approaches are provided in the rule for compliance:
  - Source performance standards plan or State measures plan
- Question 1 - What are the benefits and issues of each approach and what is the preferred path? (Meeting 2)
- Question 2 – What general mechanism should be used to implement the preferred compliance plan? (Meetings 2-3)
- Question 3 – What specific mechanisms should be included in the compliance plan? (Meeting 4)
- Question 4 – What other issues should be addressed and how? (Meeting 5)

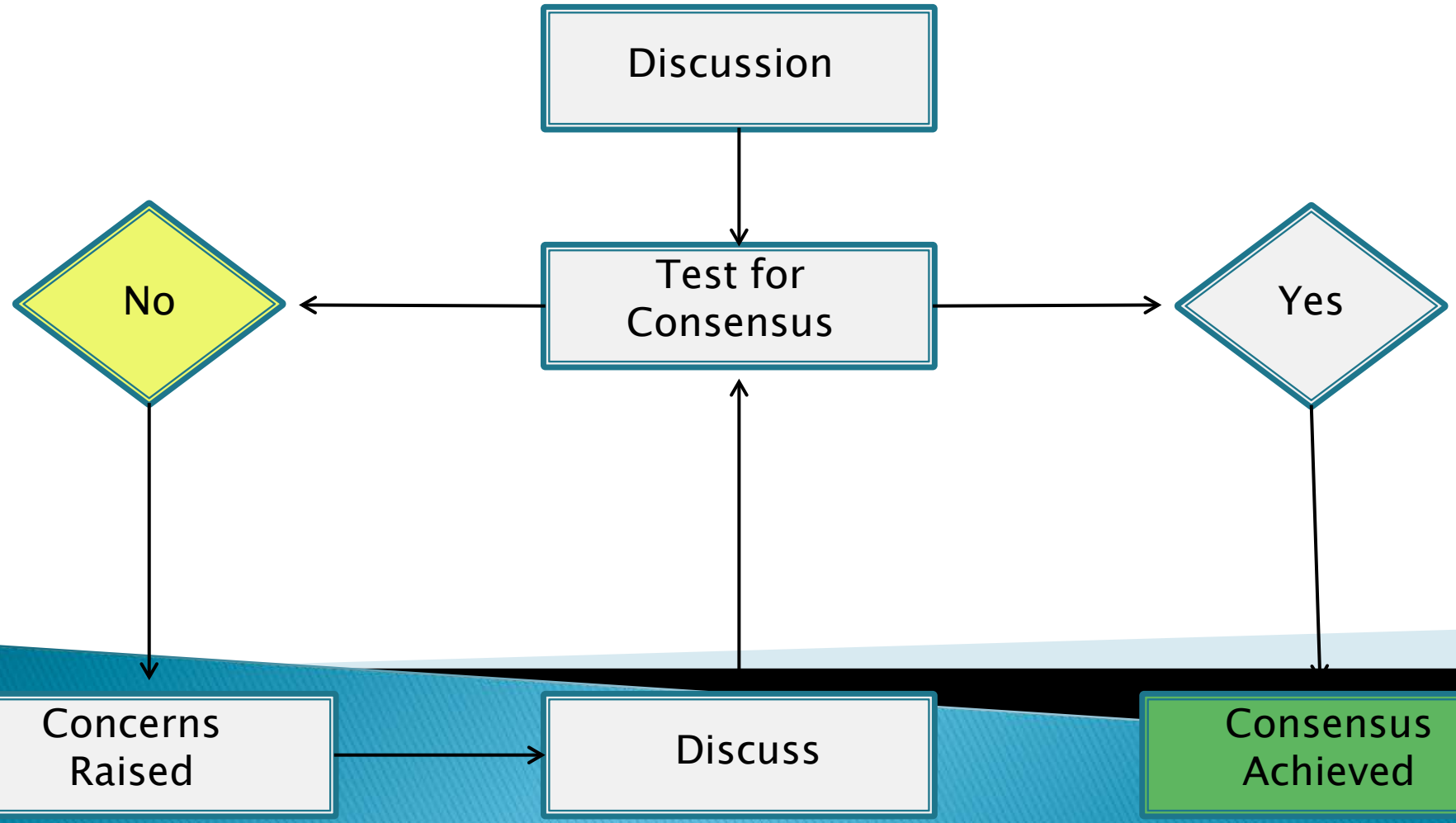
# GUIDELINES FOR DISCUSSIONS

1. Listen actively with an open mind.
2. Speak from your own experience instead of generalizing.
3. Be respectful and focus on the issue or the idea, not the speaker.
4. Be concise and speak only once on a particular issue. Weigh in with new or different information to share after everyone else has had an opportunity to speak.
5. Simply note your agreement with what someone else has said; it is not necessary to repeat it.
6. Present options for solutions at the same time you present the problems you see.
7. Be courteous and speak one at a time; interruptions and side conversations are distracting and disrespectful to the speaker.
8. Come prepared.
9. Turn off all devices.
10. Stay positive; a negative attitude hinders the group's ability to reach agreement.

# FACTORS TO CONSIDER DURING GROUP DISCUSSIONS:

- Compliance deadlines
- Compliance flexibility
- Compliance with federal requirements
- Cost effectiveness
- Electric rate impacts
- Environmental benefits/impacts
- Low income and vulnerable communities impacts
- Plan implementation and administration
- Reliability and asset impacts
- State and regional interactions

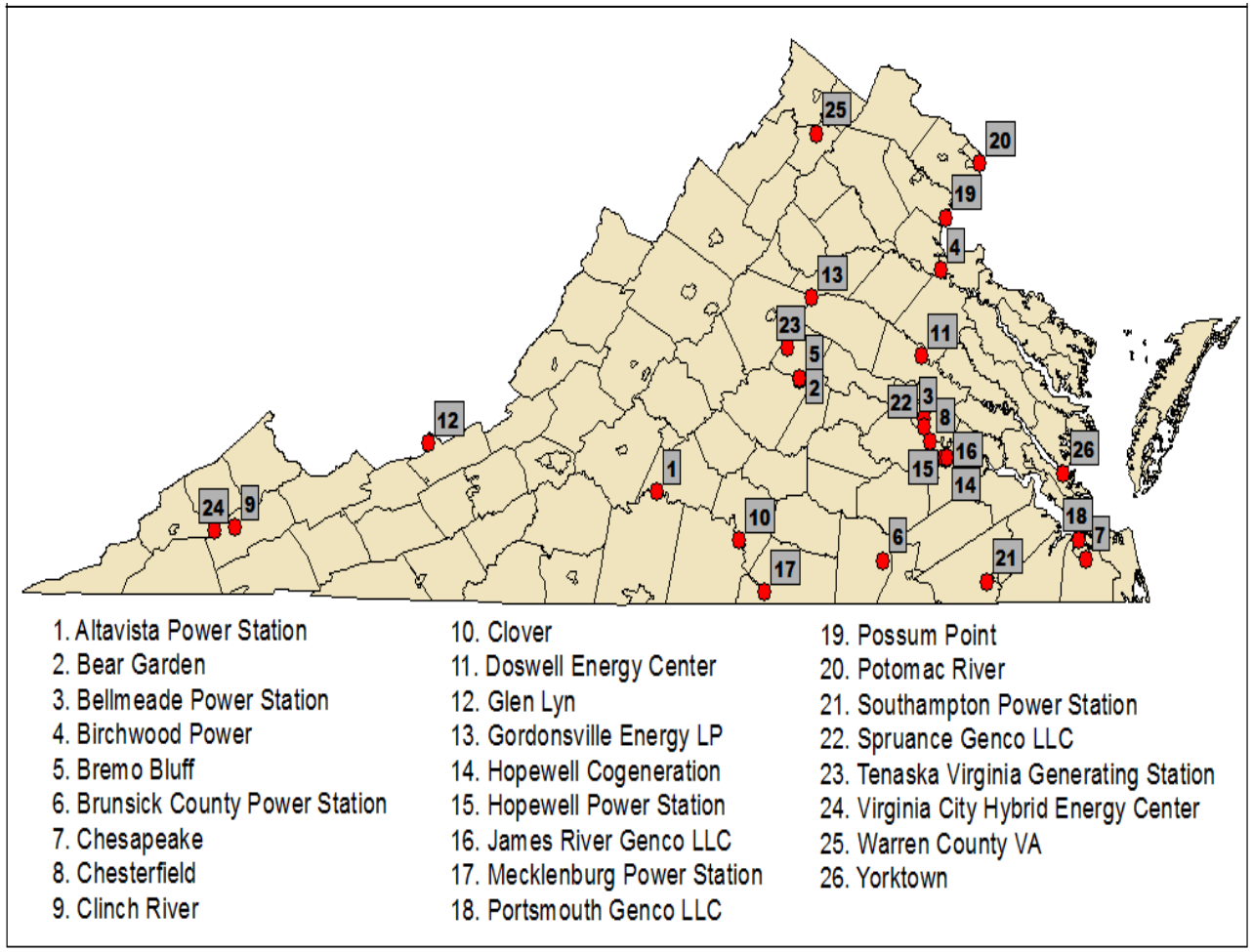
# DISCUSSION AND CONSENSUS PROCESS



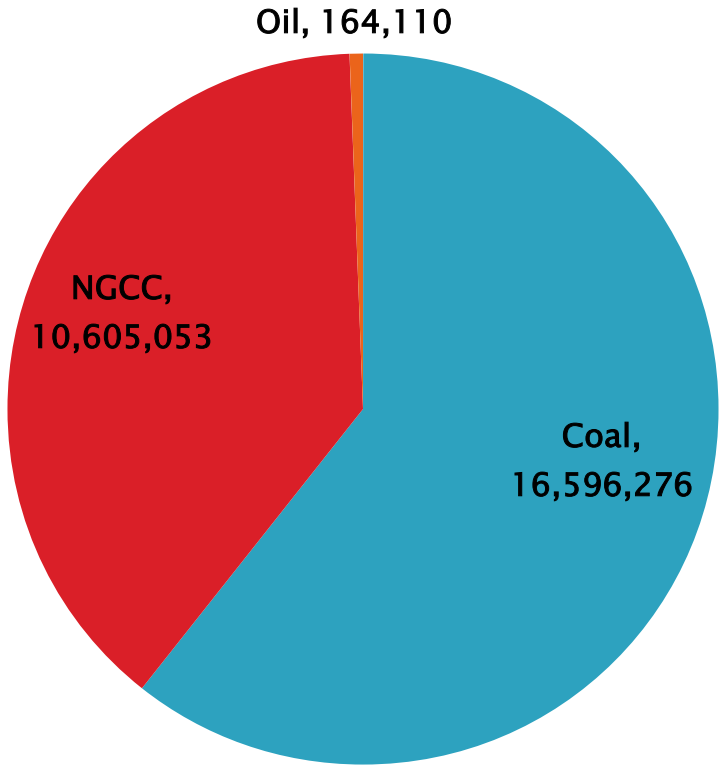
# FINAL REPORT - STAKEHOLDER GROUP CONCERNING CLEAN POWER PLAN FOR GREENHOUSE GASES

- Final Report will be compiled by DEQ, and include the following information:
  - Introduction (e.g., purpose and meeting dates)
  - List of stakeholder members
  - Procedures (e.g., FOIA and process)
  - Recommendations and unresolved issues
  - Attachments (e.g., list of stakeholder group members)

# VIRGINIA'S CPP AFFECTED EGUs - 2012 BASELINE




Total 2012 CO2 Emissions: 27,365,439 Tons

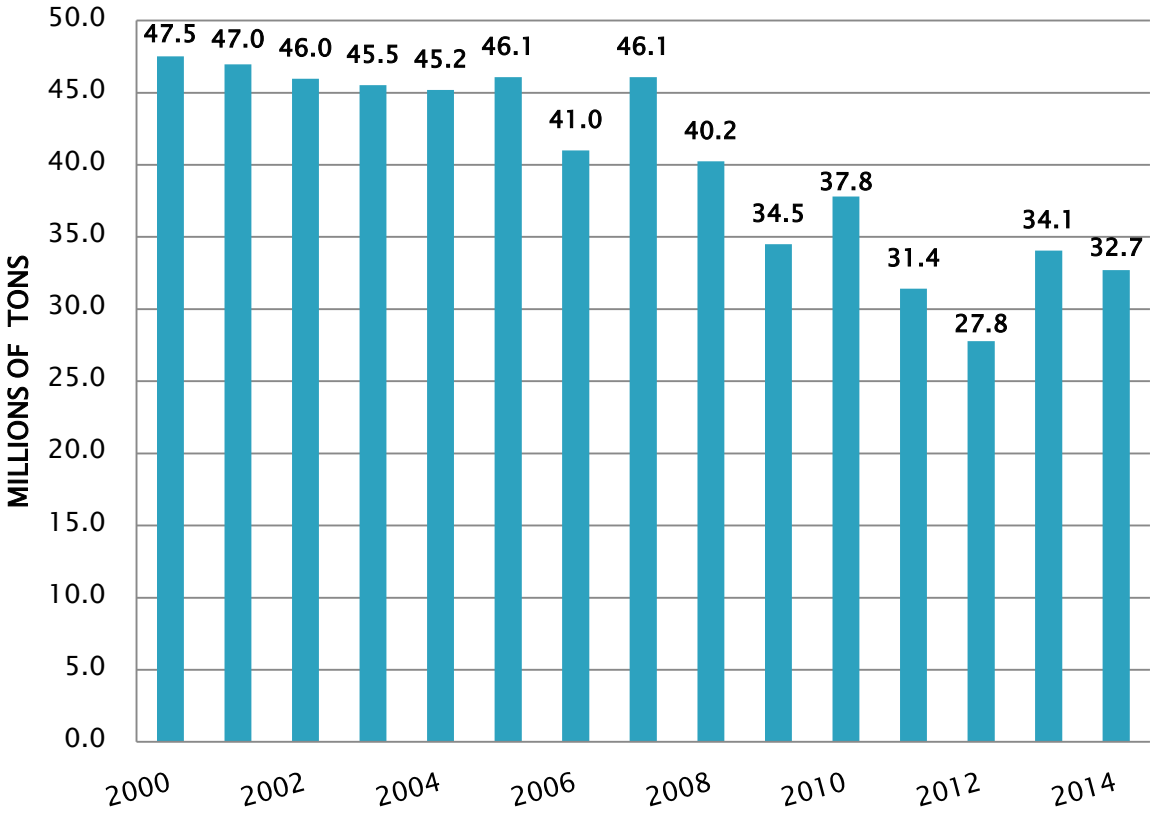


# CHANGES TO AFFECTED SOURCES IN VIRGINIA (POST-2012)

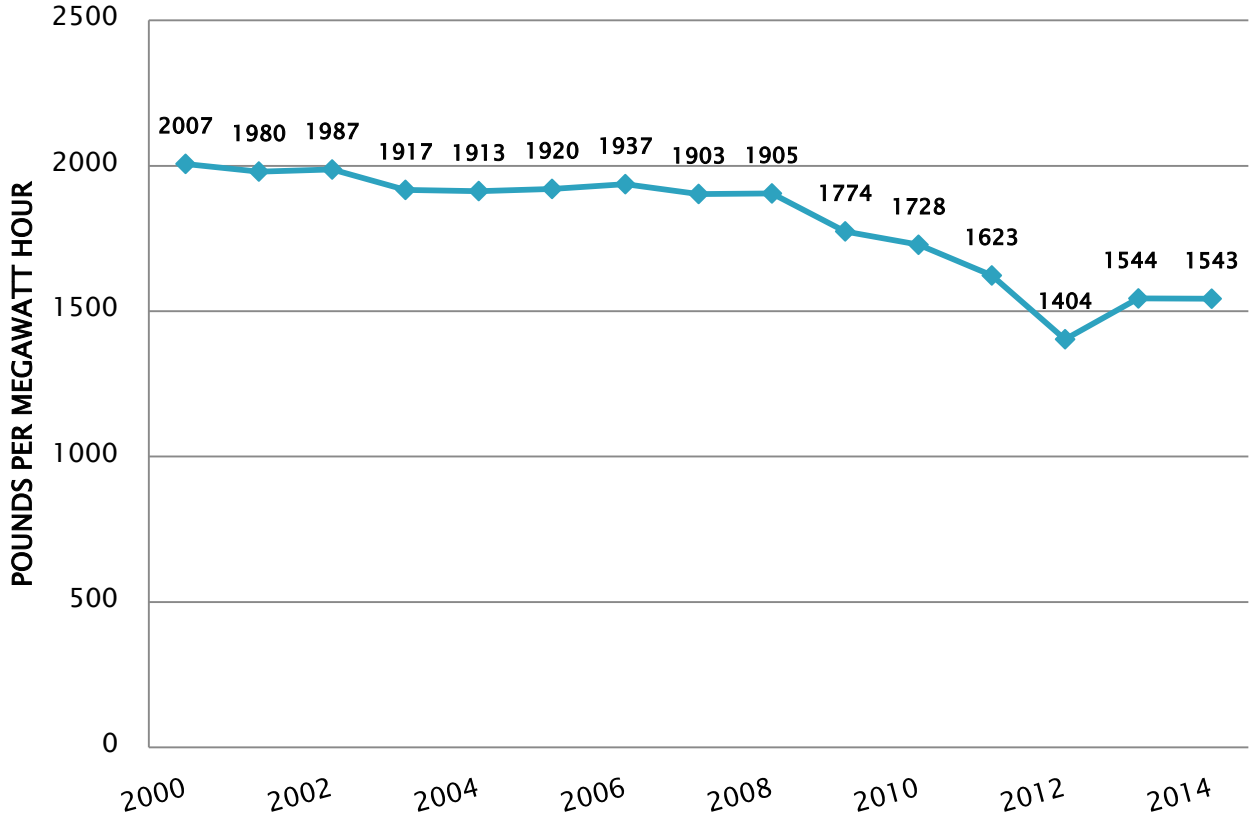
| Plant Name | Change In Operation/Fuel | Year |
|---|---|---|
| Altavista Power Station (Coal) | Converted to biomass (wood) | 2012 |
| Bremo Bluff (Coal) | Converted to natural gas | 2014 |
| Chesapeake (Coal) | Coal units permanently shut down | 2015 |
| Clinch River (Coal) | 1 coal unit shut down/2 converting to gas | 2015 |
| Glen Lyn (Coal) | Facility permanently closed | 2015 |
| Hopewell Power Station (Coal) | Converted to biomass (wood) | 2013 |
| Portsmouth Genco LLC (Coal) | Facility permanently closed | 2015 |
| Potomac River (Coal) | Facility permanently closed | 2012 |
| Southampton Power Station (Coal) | Converted to biomass (wood) | 2013 |
| Warren County VA (NGCC) | Constructed and began operation | 2014 |
| Brunswick Power Station (NGCC) | Currently under construction | 2016 |

# VIRGINIA EGU CO2 EMISSION & RATE TRENDS

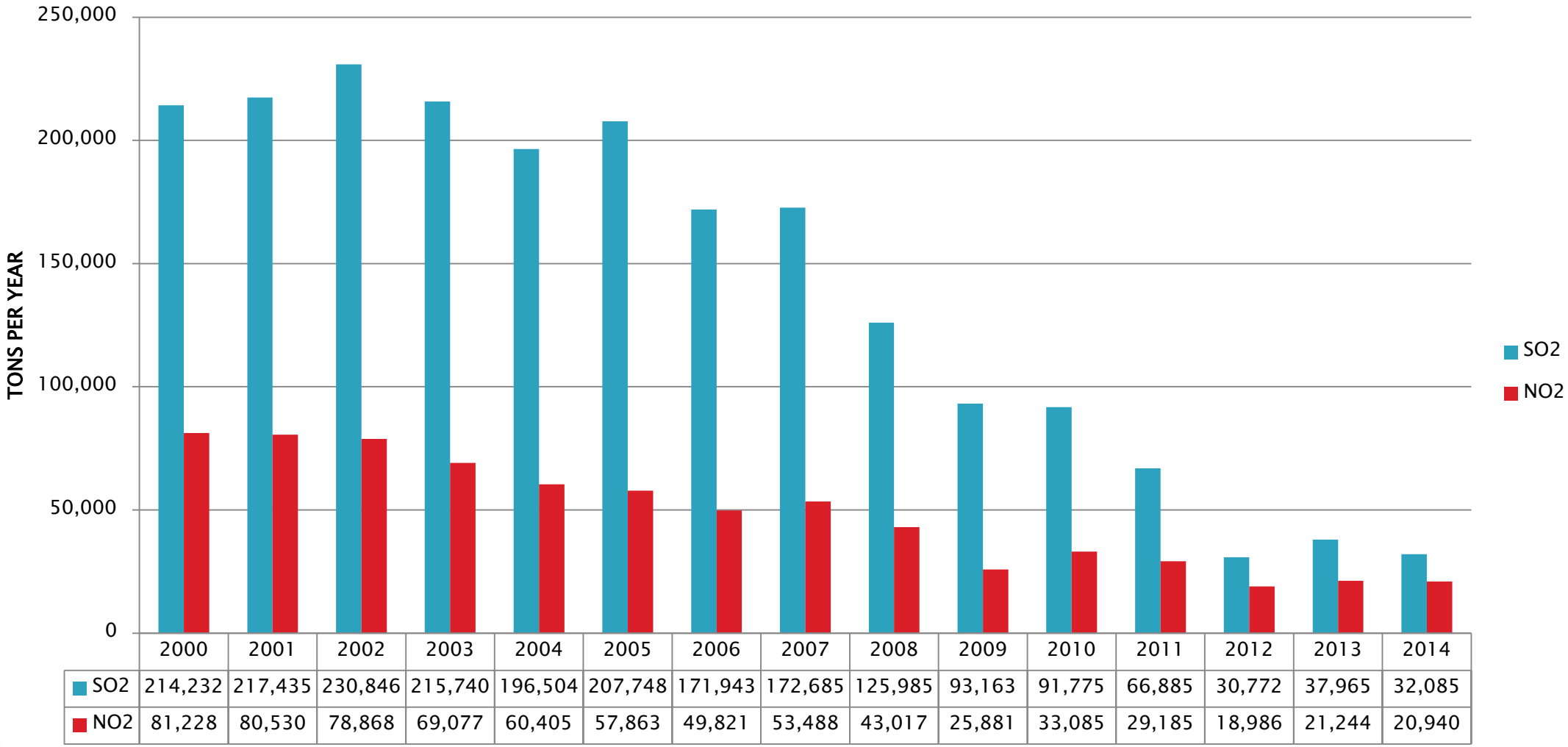
## VIRGINIA EGU CO2 EMISSIONS




## VIRGINIA EGU CO2 EMISSIONS RATES



# VIRGINIA EGU CRITERIA EMISSION TRENDS




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | 214,232 | 217,435 | 230,846 | 215,740 | 196,504 | 207,748 | 171,943 | 172,685 | 125,985 | 93,163 | 91,775 | 66,885 | 30,772 | 37,965 | 32,085 |
| NO2 | 81,228 | 80,530 | 78,868 | 69,077 | 60,405 | 57,863 | 49,821 | 53,488 | 43,017 | 25,881 | 33,085 | 29,185 | 18,986 | 21,244 | 20,940 |

# FACTORS TO CONSIDER: QUESTION #1

Emissions Performance Standards Plan or State Measures Plan

- Compliance: deadlines, flexibility , federal requirements
- Costs: effectiveness, electric rate impacts, community impacts, implementation
- Environmental benefits: CO2 emission reductions

# STATE COMPLIANCE PLAN APPROACHES: EMISSION STANDARD

- Use established overall rate or mass goals or specific rate/mass goals for specific sources
- Can participate in intra or interstate trading facilitated by EPA
- Can adopt EPA's final model trading rules
- Compliance is determined at the "stack" through monitoring
- Can participant in EPA's Clean Energy Initiative Plan (CEIP)
- Rate based program would require generation and tracking of emission reduction credits (ERCs) from renewable energy (RE) and demand-side energy efficiency (EE) projects
- Mass-based program would require provisions for how CO2 allowances would be distributed

# STATE COMPLIANCE PLAN APPROACHES: STATE MEASURES

- Allows states to implement a suite of state measures that are adopted, implemented, and enforceable only under state law, and rely upon such measures
- Measures implemented under a state measures plan type could include a market-based emission budget trading program, as well as renewable energy (RE) and demand-side energy efficiency (EE) requirements and programs, such as renewable energy portfolio standards (RPS) energy efficiency resource standard (EERS), utility and state administered incentive program for deployment of RE and demand side EE technologies and practices
- Could be measures involving entities other than affected EGUs, or a combination of measures such measures, so long the state demonstrates that such measures will result in achievement of a state's mass-based CO2 goal (or mass CO2 goal plus new source complement)
- States choosing this option must also adopt a federally enforceable "backstop"

# QUESTION #1 - WHAT ARE THE BENEFITS AND ISSUES OF EACH PLAN AND WHAT IS THE PREFERRED PATH?

| | Emission Standards Approach | State Measures Approach |
|---|---|---|
| Compliance | +determined at the stack<br>+trading of allowances or credits | +trading of allowances<br>-must include a performance "backstop" |
| Costs | | -not enough programs currently in VA for a plan<br>-might require legislation<br>-may isolate Virginia |
| Benefits | +reductions in C02 will occur<br>+does not preclude renewables or demand-side energy efficiency programs | +similar to CA plan-could include entities other than EGU |

# 15 MINUTE BREAK

# QUESTION #2 - WHAT GENERAL MECHANISM SHOULD BE USED? MASS- OR RATE-BASED?

- *Mass-based emission standard compliance approach:*
  - Apply standard for affected EGUs, for affected EGUs and new fossil fuel sources, or require individual affected EGUs meet a specific mass emission standard
  - State or multiple state plan approach
  - Provision for addressing leakage required if new source complement is not included (i.e. allowance set asides)
  - Market-based Emission Budget Trading:

    - Allowance allocation, including set asides (if applicable)

    - Single-state "ready-for- interstate- trading" or through a multi-state plan

    - Adopt EPA's final mass-based "ready-for- interstate- trading" model rule
  - Early Action

    - CEIP participation

# WHAT GENERAL MECHANISM (CONT')

- *Rate-based emission standard compliance approach:*
  - Apply CO2 subcategorized, blended emission standard for affected EGUs, or differentiated rates for specific EGUs
  - Encourage or require EGUs to undertake actions to reduce $CO_2$
  - State or multiple state plan approach
  - Market-based Emission Trading Program:

    - Single-state "ready for interstate trading" approach or through a multi-state plan

    - Emission reduction credit (ERC) issuance and tracking system

    - Adopt EPA's final rate-based "ready-for-interstate-trading" model rule
  - Early Action

    -CEIP participation

# FACILIATED DISCUSSION

| | Mass-based Emission Standards Approach | Rate-based Emission Standards Approach |
|---|---|---|
| Compliance | | |
| Costs | | |
| Benefits | | |

| | MASS Goal for Existing EGUs Only | MASS Goal for Existing EGUs + New Source Complement |
|---|---|---|
| Compliance | | |
| Costs | | |
| Benefits | | |

# MEETING WRAP-UP

- Next Steps/Future Meetings
  - January 22, 2016
  - February 12, 2016
  - March 11, 2016

- Homework – to be determined

# CO2 PROJECTIONS – LOOKING INTO THE FUTURE

Just a few projections on future emissions and rates:

- EPA's CPP Projections for Virginia (Business As Usual)
  - 2020 – 26.4 million tons CO2/959 lbs per megawatt hour
- ERTAC State Cooperative Projections for Virginia (BAU)
  - 2019 – 33.2 million tons CO2/1,234 lbs per megawatt hour
- MJ Bradley CPP Compliance Tool Projections for Virginia
  - 2022 – 30.4 million tons of CO2/1,218 lbs per megawatt hours

ATTACHMENT B

MASS discussion

- Would allow for market competition for coal-markets (M/R)
- For coal/independent sources, Can buy, but may be difficult to generate ERCs; can do intra-company; must meet EM/V (M/R)
- ERC may not translate to equivalent 1:1 allowance (R)
- Different types of ERCs both a deterrent and opportunity (R)
- Fungibility available- or exchangability (M/-R)
- Uncertainty for ERC markets (R)
- More difficult for sources with limited energy portfolios (M)
- ERCs are more difficult for sources with limited energy portfolios (R)
- Sources have more experience with mass-based approach (M)
- One price for carbon (a ton = a ton = a ton) (M)
- Larger market if more sources go with mass-based (M):
  - # of states
  - ERCs allow intra company trading of ERCs
- Difficult to develop costs w/o doing a unit-by-unit assessment (M)
- Mass may be more difficult for demand side efficiency; other states may do better (M)

ATTACHMENT C

**MJ Bradley Compliance Tool, Utilizing Business-as-usual Changes to Achieve Rate-based Compliance and Mass-based Compliance including the New Source Complement**

DEQ Stakeholder Meeting, 12/15/15

## 1). Rate-Based compliance, through Planned Retirements, PJM Gas Build Queue, and Planned RE & EE:

Compliance scenario includes:

- Utility announced EE and already-planned RE (500 MW solar by 2020; Dominion and Apex wind builds)
- All 6,498 MW of NGCC in the PJM queue/Dominion IRP (4,919 MW online between 2013-2022 and 1,570 MW online in 2023)
- Dominion IRP coal retirements, in addition to already announced post-2012 coal retirements, and
- Decrease in coal generation of 44.5% below 2012 levels.

***Compliance achieved at a rate of 932 lbs/MWh, with total emissions of 43,417,959 tons in 2030 (112,355,647 tons above the mass budget). Compliance cost can be assessed utilizing STEER model.***

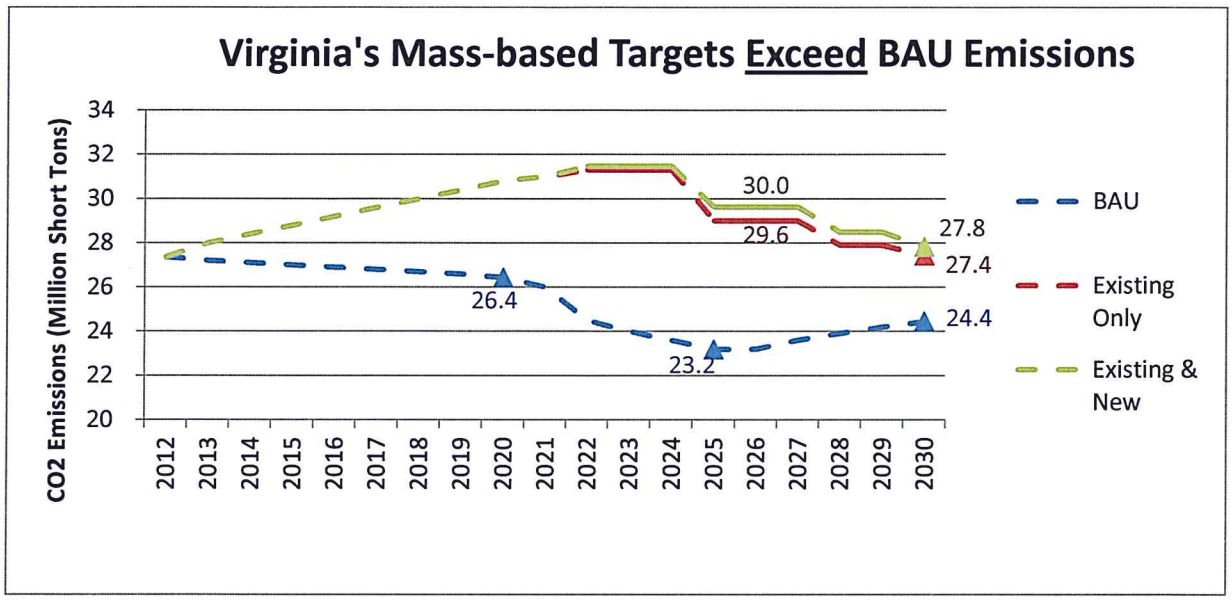
## 2). Mass-based compliance, through Planned Retirements, Planned Utility NGCC, and Planned RE & EE:

Compliance scenario includes:

- Utility announced EE and already-planned RE (500 MW solar by 2020; Dominion and Apex wind builds)
- Dominion IRP coal retirements (721,033 tons) , in addition to already announced post-2012 coal retirements, and
- NGCC fleet at average 60% capacity factor, including the forthcoming Greensville plant.

***Compliance achieved with the mass-based standard including new source complement, at 27,830,173 tons. Compliance cost can be assessed utilizing STEER model.***

*Note: If EE penetration is increased to EPA's assumed level and already-planned RE is doubled by 2030, mass-based compliance can be achieved while also: preserving historic coal capacity factors at remaining generators; substantially increasing NGCC capacity factors; and completing Doswell's NGCC expansion.*




Source: EPA, "Base Case State Emissions File", IPM Base Case Run, available at: http://www2.epa.gov/airmarkets/analysis-clean-power-plan

| | CO2 Emissions Targets Compared to BAU (Short Tons) | | | |
|---|---|---|---|---|
| | 2012 | 2020 | 2025 | 2030 |
| BAU | 27,365,439 | 26,433,868 | 23,182,323 | 24,446,232 |
| Existing Only | 27,365,439 | | 29,580,072 | 27,433,111 |
| Existing&New | 27,365,439 | | 30,030,110 | 27,830,174 |

Due to how generous they are, Virginia's mass-based emissions are very achievable: EPA developed Virginia's mass targets to be "equivalent" to the emissions that are allowed to occur under the state's rate-based target.

To achieve such "equivalence" between rate and mass targets, **EPA allowed for both demand growth and significant growth in carbon emissions from existing sources when calculating the mass budget.**

Specifically, EPA accounted for the emissions that would be permissible from existing sources if under a full, 100% build-out of "building block 3." This equates to an additional 166,255,493 MWh of renewable energy in 2030 above what EPA assumed would come online under a source-specific rate system for the entire country. EPA assigned 3,202,516 MWh of this "excess" BB3 to Virginia's mass-based standard.[1]

To calculate the additional emissions associated with this buildout, EPA doubled that amount of RE-generated MWh and attributed those doubled MWh to Virginia's fossil-based baseline generation as allowable emissions under a very generous and high mass-based standard.[2]

[1] See Appendix 5 of the "CO2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule". Technical Support Document (TSD) for the CAA Section 111(d) Emission Guidelines for Existing Power Plants. Docket ID No. EPA-HQ-OAR-2013-0602.
[2] The equation be found on Pg. 24 of the CO2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule. Mass Adjustment = State Emission Rate Goal × BB3 Generation Not Captured in Source Category-Specific Performance Rates × 2.