

OTC/ MANE-VU Committee Meeting

September 24, 2014

Hall of States  
Washington, D.C.

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Stationary and Area Source Committee  
Update



# Outline

- Update on Committee efforts
- Update on completing Charge
- Moving Forward- Next steps for the SAS Committee



# Charge to the Committee

## LARGEST CONTRIBUTOR ANALYSIS

Using the most recent emission inventory data available to:

- Identify the largest individuals and groupings of NO<sub>x</sub> emitters *within states where that state* contributes at least 1% of the 2008 ozone NAAQS of 75 ppb to OTC states;
- Identify emission sources with the highest short-term emissions of NO<sub>x</sub> and VOC;
- Evaluate real world achievable NO<sub>x</sub> emission rates across load ranges to adjust long and short term expectations for emission reductions.
- Develop individual state EGU NO<sub>x</sub> emission rates achievable, considering reasonable available controls.

## DISTRIBUTED AND EMERGENCY GENERATOR INVENTORY

Obtain information from system operators concerning the location, operation and emissions of all units that participate or plan to participate with the system operator to analyze the air quality impact of these engines and make recommendations for potential control strategies to the Commission.

# Largest Contributor (EGU) Analysis

EGU Workgroup posted the draft Whitepaper of the EGU Emissions Inventory Analysis for the OTC Modeling Domain for stakeholder comments on the OTC website in April, Workgroup is currently reviewing stakeholder comments

The draft EGU Emissions Inventory Analysis Whitepaper includes:

- Analysis of 2011 and 2012 state level ozone season EGU NO<sub>x</sub> emissions (tons) and ozone season state average EGU NO<sub>x</sub> emission rate (lb/mmBtu) data.
- Analysis 1 - NO<sub>x</sub> controls and EGU retirements
- Analysis 2 - Short Term (Hourly) EGU NO<sub>x</sub> Emissions - 2012
- Analysis 3 - EGU NO<sub>x</sub> emissions during the 2011 Ozone Season including emissions, fuel type, and temperature charts.
- Analysis 4 - “Coal SCR Scorecard” Analysis - 2011 & 2012
- Analysis 5 - Recommendation for modeling of Short Term NO<sub>x</sub> emission limits for EGUs

# Largest Contributor Cost Analysis

Largest Contributor Workgroup is looking into both the capital cost and the operating and maintenance cost of pollution control devices.

Preliminary SCR and SNCR control costs were reproduced using the Sargent & Lundy control cost methodology developed for EPA's IPM Model v.5.13

S&L SCR control cost methodology includes 2004 to 2006 industry cost estimates, additional 2010 cost estimates prepared by consultants for UARG and S&L in-house data for recent SCR Projects (2007-2012). Data was converted to 2012 dollars based on Chemical Engineering Plant Index (CEPI) data

S&L SNCR control cost methodology includes S&L in-house data from recent quotes (2009 to 2012) for lump sum contracts

Detailed examples of the SCR and SNCR control cost spreadsheet analyses can be found at:

- [http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5\\_3.pdf](http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5_3.pdf) &
- [http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5\\_4.pdf](http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5_4.pdf)

# Preliminary SCR Cost Calculations(in 2012 dollars)

Type of Boiler	Boiler Size (MW)	Heat Rate (Btu/kWh)	NOx Control Technology	NOx Removal Efficiency (%)	Variable O&M (\$/MWh)	Capital Cost (\$/kW)	Fixed O&M Cost (\$/kW-yr)
Coal-fired Boilers	100	10,000	SCR	75	1.51	380	1.97
	300	10,000	SCR	75	1.51	311	0.87
	500	10,000	SCR	75	1.51	287	0.73
	700	10,000	SCR	75	1.51	274	0.67
	1000	10,000	SCR	75	1.51	261	0.61
Coal-fired Boilers	100	10,000	SCR	90	1.72	392	2.01
	300	10,000	SCR	90	1.72	321	0.89
	500	10,000	SCR	90	1.72	297	0.75
	700	10,000	SCR	90	1.72	283	0.69
	1000	10,000	SCR	90	1.72	270	0.63

Based Sargent & Lundy Cost Development Methodology for IPM Model v.5.13  
(S&L, March 2013)

[http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5\\_3.pdf](http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5_3.pdf)

Assumes boiler burning bituminous coal with a NOx input rate of 0.5 lb. NOx/MMBtu



# Preliminary SNCR Cost Calculations(in 2012 dollars)

Type of Boiler	Boiler Size (MW)	Heat Rate (Btu/kWh)	NOx Control Technology	NOx Removal Efficiency (%)	Variable O&M (\$/MWh)	Capital Cost (\$/kW)	Fixed O&M Cost (\$/kW-yr)
Coal Boilers Tangential-fired	100	10000	SNCR	25	1.19	56	0.50
	300	10000	SNCR	25	1.19	30	0.27
	500	10000	SNCR	25	1.19	23	0.20
	700	10000	SNCR	25	1.19	19	0.17
	1000	10000	SNCR	25	1.19	16	0.14






Based on Sargent & Lundy Cost Development Methodology for IPM Model v.5.13  
(S&L, March 2013)

[http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5\\_4.pdf](http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v513/attachment5_4.pdf)

Assumes boiler burning bituminous coal with a NOx input rate of 0.5 lb. NOx/MMBtu



# EMF is one-stop-shopping for air emission work

- .Remote access 
- .Organized file storage 
- .Emissions data analysis tools 
  - .Graphical capabilities – Map emissions
- .Future Inventory development 
- .Temporalize inventory (e.g. daily or ozone season inventory can be prepared)
- .Strategy cost analysis tools
- .Prepare modeling files 

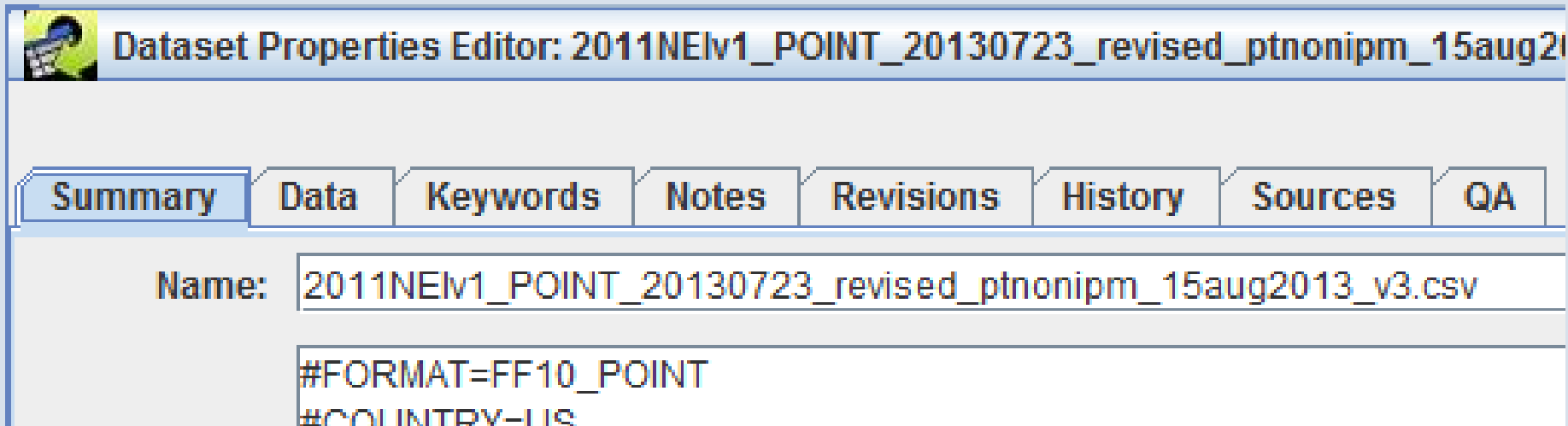


# Remote Access

- EMF Installed on the Cloud
- Remote secure online access
  - MARAMA 2007/2017/2020
  - EPA 2011/2018 v1 Modeling Platform
- State Staff can:
  - Use EMF filters to select and download small parts or larger files- smaller file size allows easier analysis on your own machine
  - Merge files online and download combined files
  - Perform analysis online

# Organized File Storage

- File types recognized by EMF and searchable
- User changes tracked and document
- Metadata containing documentation is associated with each file



The screenshot shows a software window titled "Dataset Properties Editor: 2011NElv1\_POINT\_20130723\_revised\_ptnonipm\_15aug2013\_v3.csv". The window has a tabbed interface with tabs for "Summary", "Data", "Keywords", "Notes", "Revisions", "History", "Sources", and "QA". The "Summary" tab is selected. Below the tabs, the "Name" field contains the text "2011NElv1\_POINT\_20130723\_revised\_ptnonipm\_15aug2013\_v3.csv". Below the name field, there are two lines of metadata: "#FORMAT=FF10\_POINT" and "#COUNTRY=US".

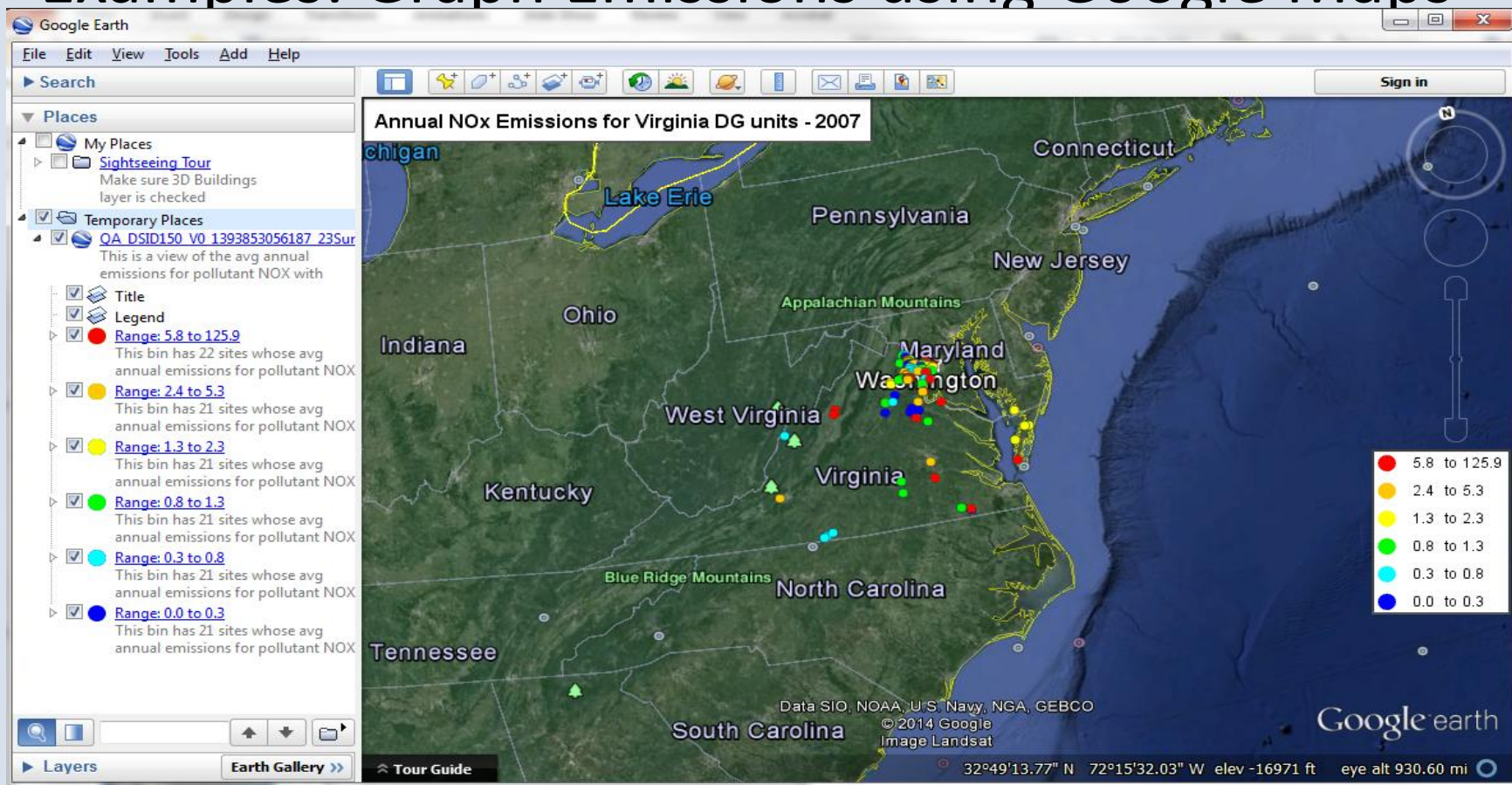
# Emission Data Analysis Tools

## Examples: Summarize and Compare

	poll	ann_emis_2007	ann_emis_2011	ann_emis_diff	a
	CO	1,951.75	2,237.79	286.04	
	NH3	2,075.56	2,392.45	316.88	
	NOX	366.41	419.55	53.14	
	SO2	158.87	116.39	-42.48	
	VOC	2,047.20	1,665.87	-381.33	
	CO	3,906.82	4,374.92	468.10	
	NH3	653.01	623.64	-29.37	
	NOX	1,292.85	1,424.68	131.82	
	SO2	629.98	457.06	-172.92	
	VOC	4,958.88	4,766.52	-192.35	
	CO	2,407.14	2,239.25	-167.88	
	NH3	9,653.19	10,154.67	501.48	
	NOX	577.49	648.88	71.40	
	SO2	354.89	211.03	-143.86	
	VOC	2,476.32	2,285.67	-190.65	

# Emissions Data Analysis Tools

## Examples: Graph Emissions using Google Maps



# Future Inventory Development

- Apply growth factors to create future year inventories
- Currently can grow to any year out to 2030
- Apply facility changes including new sources, plant closures, and new allowable emission rates
- Apply control measures
- Scenario development

# Temporalize Inventories

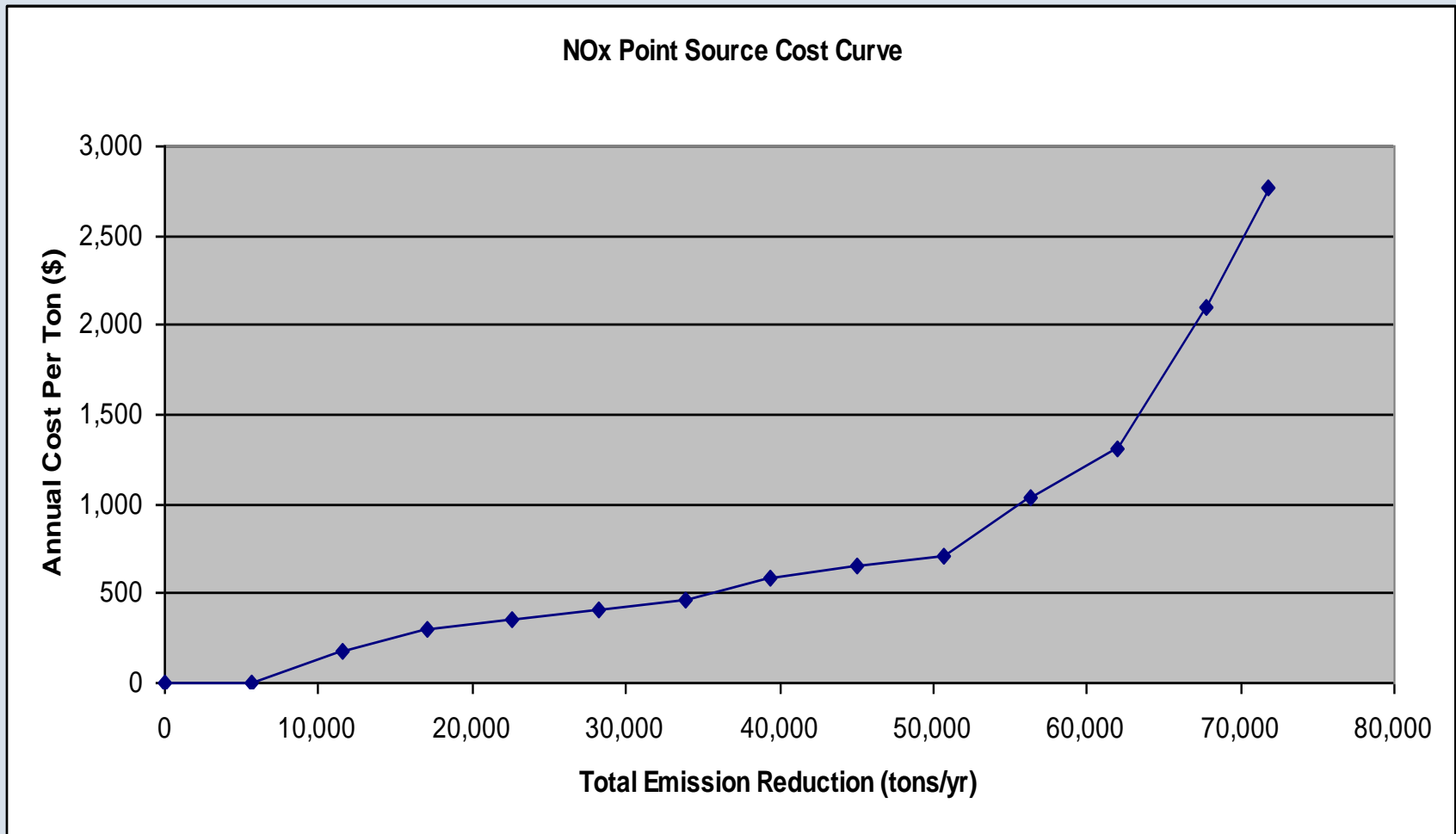
- Emission files are prepared on different time steps:
  - Non-EGU Point and Area Sources- Annual
  - EGU-Hourly
  - Nonroad- Monthly
- Temporal tool will allow inventories to be normalized to a selected time step
- Allows for HEDD or ozone season analysis
- Tool still in development by UNC



# CoST Analysis Tool

- USEPA uses the Cost tool to prepare RIA's
  - CoST tool is fully functional in the MARAMA EMF
- \*MARAMA recommends that users evaluate the cost factors contained in the tool to confirm their validity prior to use of the tool by states

# Cost Analysis: Per Ton Cost Curve



\*Data generated by CoST, but plotted with Excel





# Preparation of Modeling Files

- The EMF creates future year, SMOKE ready inventories.
  - Advantages
    - Cost saving
    - Time saving
    - Ability to easily make last minute changes

# EMF Training

- Six webinars comprising 10 hours of training held from January through March 2014
- EMF Users Guides updated and provided electronically
- SQL was a barrier to user implementation
- Three ongoing user groups established
- More training needed- refresher series, including SQL will be offered this fall

# EMF Conclusion

- As we shift to a 2011 base year, we are using EMF rather than a contractor to project future emissions and capacity building
- EMF allows remote access to regional data sets for analysis
- Training and practice work groups are essential

# Distributed and Emergency Generator Inventory

- OTC pursuing strategy of using state authority to gather information on DR engines
- OTC looking into how to account for Demand Response emissions in modeling scenarios



# Other SAS Committee Updates

## Consumer Products Rule

- OTC Sent EPA a request to adopt the OTC Consumer Products Model Rule as a National Rule
  - Available at <http://www.otcair.org>

## AIM

- Beginning process to develop a package to present to EPA asking for the adoption of the OTC AIM Model Rule as a National Rule.

## Vapor Recovery

- Delaware has proposed regulation for the Stage II program
- Continue to look at ways to improve Stage I
- Looking at Low Permeation Hoses, Dripless Nozzles, and Pressure Monitoring and Management

# Next Steps for the Committee

- Continue to evaluate EGU NO<sub>x</sub> real world emission data including daily EGU NO<sub>x</sub> emissions during ozone season episodes and HEDD days
- Use Largest Contributor analyses in ERTAC EGU modeling
- Look at ICI Boiler Emissions
- Recommend using individual state authorities to collect data from demand response units
- Continue developing the AIM model rule to send to EPA.
- Continue to evaluate Vapor Recovery strategy options.
- Continue to provide an economic impact assessment of each new or significantly revised strategy that is presented to the Commission for action or consideration

# Questions?

