OTC Annual Meeting

June 4, 2015

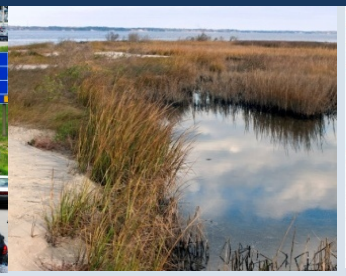
Holiday Inn Hotel

Princeton, New Jersey

Ali Mirzakhalili, P.E.
Stationary and Area Source Committee Update







OZONE TRANSPORT COMMISSION

Outline

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

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Abbreviated Committee Charge

•LARGEST CONTRIBUTOR ANALYSIS

- Identify the largest individuals and groupings of NOx 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 NOx and VOC;
- Evaluate real world achievable NOx emission rates across load ranges to adjust long and short term expectations for emission reductions.
- Develop individual state EGU NOx emission rates achievable, considering reasonable available controls.

• Demand and Emergency Generator Information

- Estimate the emissions from the use of demand response generation units in place of cleaner sources of energy on High Electric Demand Days. Collaborate with other Committees of the OTC to analyze the estimated data to understand the air quality impact of the operation of the distributed and emergency generators and make recommendations for potential control strategies to the Commission

• Reasonably Available Control Technology

- To provide each state with a common base of information, a workgroup will develop a listing of emission rates in each state within the OTR for source categories responsible for significant NOx and VOC emissions and identify a range of emissions rates that the respective state has determined to be RACT.

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Top 25 NOx Emitters- 2014 OS

State	Facilty Name	Facility ID	Unit ID	Average NOx rate	NOx (tons)
OH	W H Zimmer Generating Station	6019	1	0.28	4,639
IN	Rockport	6166	MB2	0.22	4,536
AR	White Bluff	6009	1	0.32	4,481
AR	White Bluff	6009	2	0.31	4,348
MO	New Madrid Power Plant	2167	1	0.54	4,304
PA	Conemaugh	3118	2	0.31	3,893
MO	New Madrid Power Plant	2167	2	0.42	3,810
WV	Harrison Power Station	3944	3	0.38	3,636
WV	Pleasants Power Station	6004	2	0.36	3,576
PA	Bruce Mansfield	6094	3	0.29	3,402
PA	Homer City	3122	3	0.37	3,365
IN	Rockport	6166	MB1	0.22	3,317
PA	Conemaugh	3188	1	0.32	3,249
PA	Keystone	3136	2	0.25	3,151
WV	Harrison Power Station	3944	1	0.36	3,120
WV	Harrison Power Station	3944	2	0.37	2,986
PA	Homer City	3122	1	0.36	2,978
AR	Independence	6641	2	0.23	2,926
AR	Independence	6641	1	0.21	2,632
MI	Monroe	1733	2	0.41	2,618
PA	Montour	3149	2	0.41	2,608
MO	Thomas Hill Energey Center	2168	MB2	0.57	2,463
PA	Keystone	3136	1	0.21	2,291
IN	Cayuga	1001	1	0.33	2,291
MO	Thomas Hill Energey Center	2168	MB3	0.2	2,238

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*Pink highlight indicates units with SCR installed

* Conemaugh has planned controls to be installed in 2015

Largest Contributor (EGU) Analysis

The draft EGU Emissions Inventory Analysis Whitepaper includes*:

- Analysis of 2011 and 2012 state level ozone season EGU NOx emissions (tons) and ozone season state average EGU NOx emission rate (lb/mmBtu) data.
- Analysis 1 - NOx controls and EGU retirements
- Analysis 2 - Short Term (Hourly) EGU NOx Emissions - 2012
- Analysis 3 - EGU NOx 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 NOx emission limits for EGUs

- The OTC SAS Committee is working with the OTC Modeling Committee and the University of Maryland to model Analysis 1 of the EGU Emission Inventory Analysis Whitepaper- Preliminary results to follow

- Additional modeling runs based on the Emissions Inventory Analysis Whitepaper will be conducted in the future

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*** available on the OTC website at www.otcair.org**

Scenario 3A

Reduce NOx at all coal-fired SCR and SNCR units (in the 176A petition states, plus MD and PA) to the lowest ozone season average emission rates as seen in CAMD data (2005-2012).

- The lowest ozone season average emission rate was selected for all units with SCR and SNCR.
- If the unit installed a SCR or SNCR after 2005, the data collection period was narrowed to one year after the installation to 2012. Note that if the control was installed in 2012, the 2012 rate was used.
- If a unit was identified in ERTAC or IPM as installing a control in a future year, the emission rate identified as indicative of that control running in 2018 was selected. Note that if a unit was identified as either running or adding a control in 2018, but has performed at a lower rate than the 2018 rate, then the lower rate was used.
- A reduction percentage was calculated by dividing the 2018 ozone season emission rate in IPM 5.13 by the identified best ozone season average emission rate.
- Applying that reduction percentage to the 2018 ozone season emission rate will reduce the 2018 ozone season emission rate to the units lowest demonstrated average ozone season emission rate. This scenario, named 3A, represents the best rates and mass achievable in ozone season based on demonstrated performance from units with SCR and SNCR installed.

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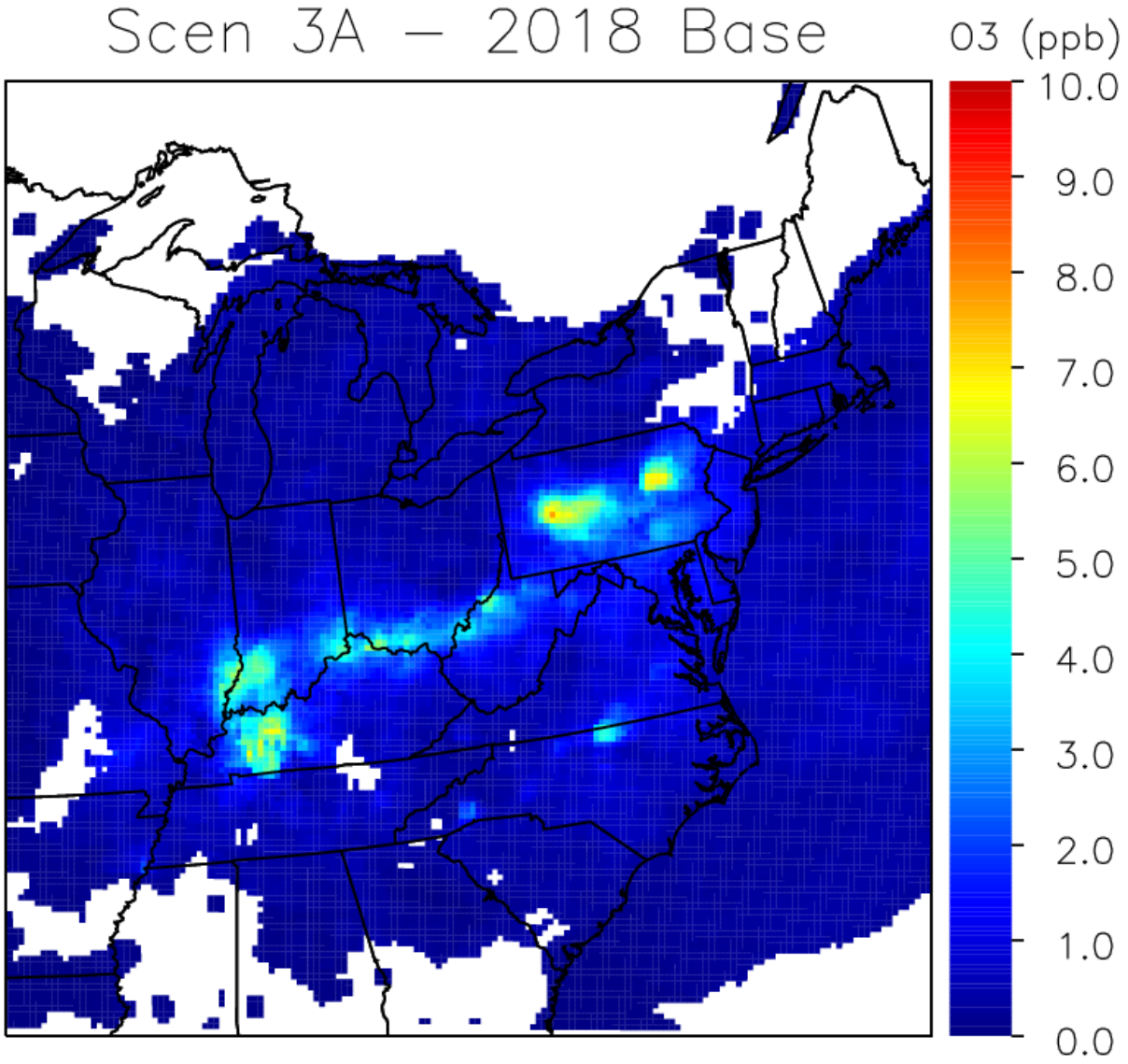
Scenario 3A 2018 Ozone Season Benefit



-Reference Case 2018 Ozone Season NOx Mass: 175,684 Tons

-Scenario 3A 2018 Ozone Season NOx Mass: 112,364.17 Tons

-Ozone Season Benefit: 63,320 Tons. This is equivalent to 413 tons per day

*Note that the color scale is different from the 2011/2018 reference case

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 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_4.pdf

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Sargent and Lundy vs. Modified Sargent and Lundy

Sargent and Lundy	Modified Sargent and Lundy
Sargent and Lundy	Modified Sargent and Lundy
Reagent use and Unit costs (VOMR)	Reagent use and Unit costs (VOMR)
Catalyst replacement and disposal costs (VOMW)	Catalyst replacement and disposal costs (VOMW)
Additional power required and unit power cost (VOMP)	Additional power required and unit power cost (VOMP)
Steam required and unit steam cost (VOMM)	Steam required and unit steam cost (VOMM)
"Base" Year = 2011	"Base" Year = 2011
Uncontrolled NOx Emission Rate	Uncontrolled NOx Emission Rate
NOx Removal Efficiency	NOx Removal Efficiency
Electric Generator Heat Input Capacity (Name Plate Rating x Heat Rate)	Steam Generator Heat Input Capacity

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CSAPR Allowances vs. Cost of Running Controls

Unit	S&L Variable O&M ($/ton)	S&L Modified Variable O&M	CSAPR Allowance (per short ton)*
Unit 1 (151MW)	$748-$1,985	$439- $1598	Annual: $125 Seasonal: $125
Unit 2 (403MW)	$744- $2,118	$440- $1,785	Annual: $125 Seasonal: $125
Unit 3 (958MW)	$529- $1,755	$439- $1,680	Annual: $125 Seasonal: $125

* Air Daily: Issue 22-88, May 8, 2015

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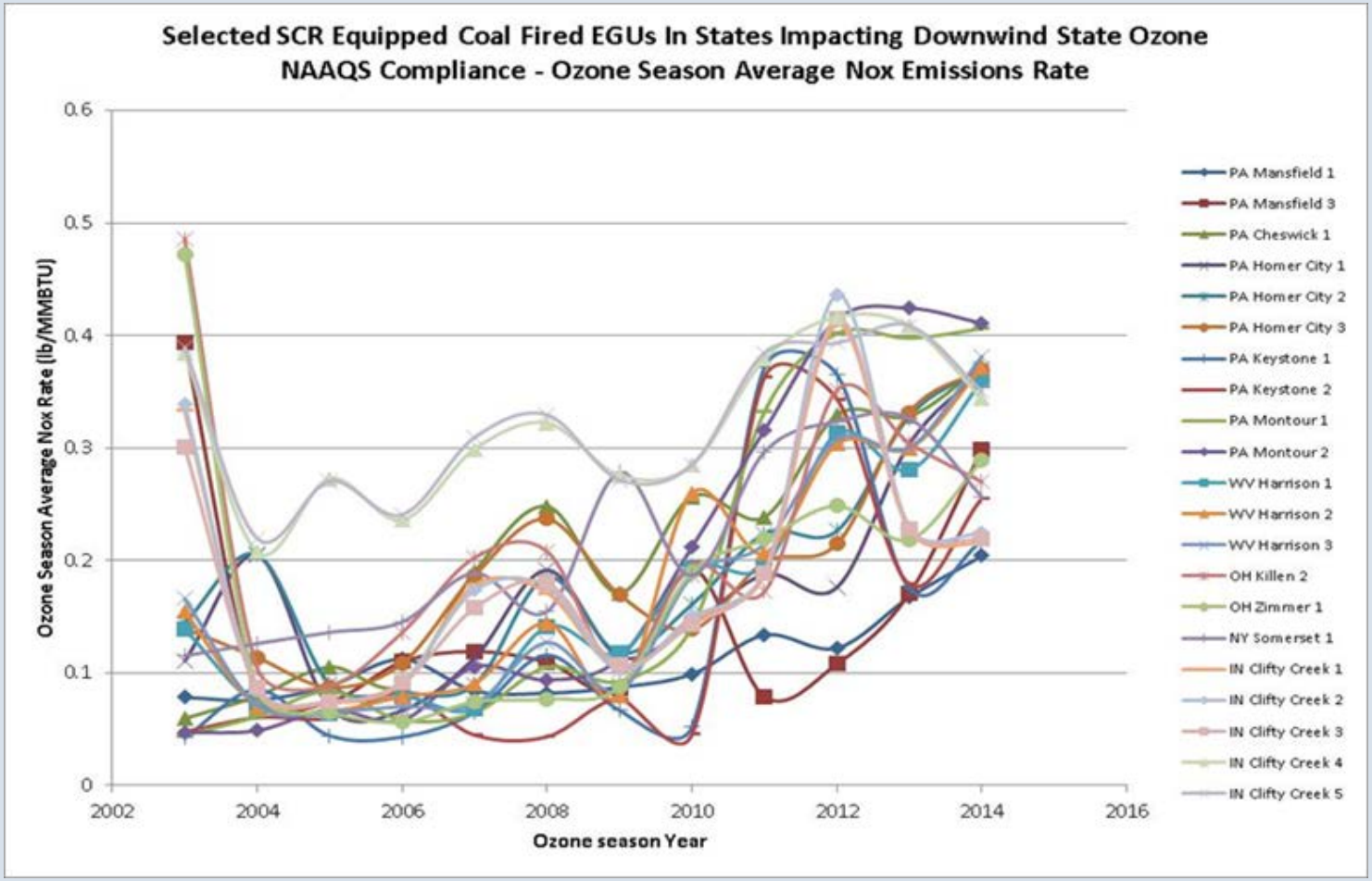
Running Controls and Cost of Allowances



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CSAPR Allowances vs. Cost of Running Controls

Cost Whitepaper posted on OTC Website. Please provide comment by July 6, 2015.

http://www.otcair.org/

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CSAPR Budgets v. Actual Emissions 2012 Annual

State	2012 NOx	CSAPR Phase I	CSAPR Phase II	2012 v. CSAPR Phase I	2012 v. CSAPR Phase II
AL	45,745	72,691	71,962	26,946	26,217
GA	34,864	62,010	53,738	27,146	18,874
IA	34,435	38,335	37,498	3,900	3,063
IL	52,841	47,872	47,872	-4,969	-4,969
IN	103,829	109,726	108,424	5,897	4,595
KS	33,264	31,354	31,354	-1,910	-1,910
KY	80,162	85,086	77,238	4,924	-2,924
MD	14,890	16,633	16,574	1,743	1,684
MI	61,155	65,421	63,040	4,266	1,885
MN	24,353	29,572	29,572	5,219	5,219
MO	69,562	52,400	48,743	-17,162	-20,819
NC	44,015	50,587	41,553	6,572	-2,462
NE	26,906	30,093	30,093	3,187	3,187
NJ	3,130	8,218	7,945	5,088	4,815
NY	14,283	21,722	21,722	7,439	7,439
OH	81,205	95,468	90,258	14,263	9,053
PA	122,359	119,986	119,194	-2,373	-3,165
SC	17,351	32,498	32,498	15,147	15,147
TN	22,427	35,703	19,337	13,276	-3,090
TX	127,172	137,701	137,701	10,529	10,529
VA	18,986	33,242	33,242	14,256	14,256
WI	24,494	34,101	32,871	9,607	8,377
WV	48,067	59,472	54,582	11,405	6,515
Total	1,105,495	1,269,891	1,207,011		

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CSAPR Budgets v. Actual 2013 Annual Emissions

State	2013 NOx	CSAPR Phase I	CSAPR Phase II	2013 v. CSAPR Phase I	2013 v. CSAPR Phase II
AL	45,538	72,691	71,962	27,153	26,424
GA	35,550	62,010	53,738	26,460	18,188
IA	33,387	38,335	37,498	4,948	4,111
IL	50,079	47,872	47,872	-2,207	-2,207
IN	101,235	109,726	108,424	8,491	7,189
KS	28,542	31,354	31,354	2,812	2,812
KY	84,877	85,086	77,238	209	-7,639
MD	11,263	16,633	16,574	5,370	5,311
MI	61,647	65,421	63,040	3,774	1,393
MN	24,855	29,572	29,572	4,717	4,717
MO	75,831	52,400	48,743	-23,431	-27,088
NC	41,796	50,587	41,553	8,791	-243
NE	27,557	30,093	30,093	2,536	2,536
NJ	2,750	8,218	7,945	5,468	5,195
NY	14,865	21,722	21,722	6,857	6,857
OH	83,596	95,468	90,258	11,872	6,662
PA	130,401	119,986	119,194	-10,415	-11,207
SC	12,746	32,498	32,498	19,752	19,752
TN	18,018	35,703	19,337	17,685	1,319
TX	134,089	137,701	137,701	3,612	3,612
VA	21,244	33,242	33,242	11,998	11,998
WI	25,409	34,101	32,871	8,692	7,462
WV	55,368	59,472	54,582	4,104	-786
Total	1,120,643	1,269,891	1,207,011		

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ICI Boiler Workgroup

- Using EMF evaluate how ICI Boiler Emissions changed from 2007 and 2011, and estimate how emissions will change in 2018;
- Do ICI boiler warrant additional analysis based on their impact on total emissions
- White Paper detailing preliminary results will be released in late summer/early fall

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ICI Boiler Workgroup

- Preliminary conclusions:
  - NOx and SO_2 for the Northeast states plus VA region decreased by 22% and 40% respectively between 2007 and 2011
  - Modest NOx decreases are expected between 2011 and 2018; ranging from 5% for the Northeast states to 11% for the Southeast states.
  - For 2011 total annual ICI boiler emissions:
    - NOx ranged from 6 to 7% of the total from all sectors for the NE, MW, & SE regions
    - NOx for the CONUS was 5% of the total from all sectors
  - For 2018 total annual ICI boiler emissions:
    - NOx ranges from 9 to 10% of the total from all sectors for the NE, MW, & SE regions
    - NOx for the CONUS is 7% of the total from all sectors

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100 Hour Emergency Demand Response Allowance

- May 1, 2015 - U.S. Court of Appeals for the D.C. Circuit vacated 100hr emergency demand response allowance from RICE NESHAP and NSPS.
- The court found EPA's action to be arbitrary and capricious on multiple grounds:
  - EPA failed to properly respond to comments that the rule would threaten the efficiency and reliability of the energy market;
  - EPA failed to adequately respond to comments suggesting that the evidence upon which the 100hr limit was based was faulty;
  - EPA did not consider the alternative of limiting the exemption to portions of the country not served by organized capacity markets; and
  - EPA did not obtain the views of FERC or NERC on the reliability considerations upon which EPA based the exemption.
- EPA may file a motion to delay issuance of the mandate to request either that the current standards remain in place or that EPA be allowed reasonable time to develop interim standards. (Unknown at this time.)
- Vacatur unknown effects, such as what happens to reporting requirements (in 2016 for CY2015)? (Do they go away or stay in effect for partial year?)

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Distributed and Emergency Generator Inventory

- Workgroup formed and in the process of developing bounding emissions for sensitivity run. Questions to be answered are:
    1. What quantity of emissions should be added to the model run to represent HEDD units?
    2. Where in the modeling domain should these emissions be added?
    3. During what time periods should these emissions be added?

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Other SAS Committee Updates

CSAPR Workgroup

- Reviewing EPA memo (January 22, 2015) on Good Neighbor provision of the Clean Air Act
- Tracking CSAPR first year implementation, budgets, and implementation issues

RACT Workgroup

- Compiling and evaluating each states NOx and VOC limits for source categories, as well as reviewing CTG's

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

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Other SAS Committee Updates

AIM

- OTC AIM Model Rule updated with Stakeholder comments.

Vapor Recovery

- Delaware and Maryland have proposed regulation for the Stage II program
- Continue to look at ways to improve Stage I
- Preparing letter to send to CARB requesting certification of EVO Nozzles

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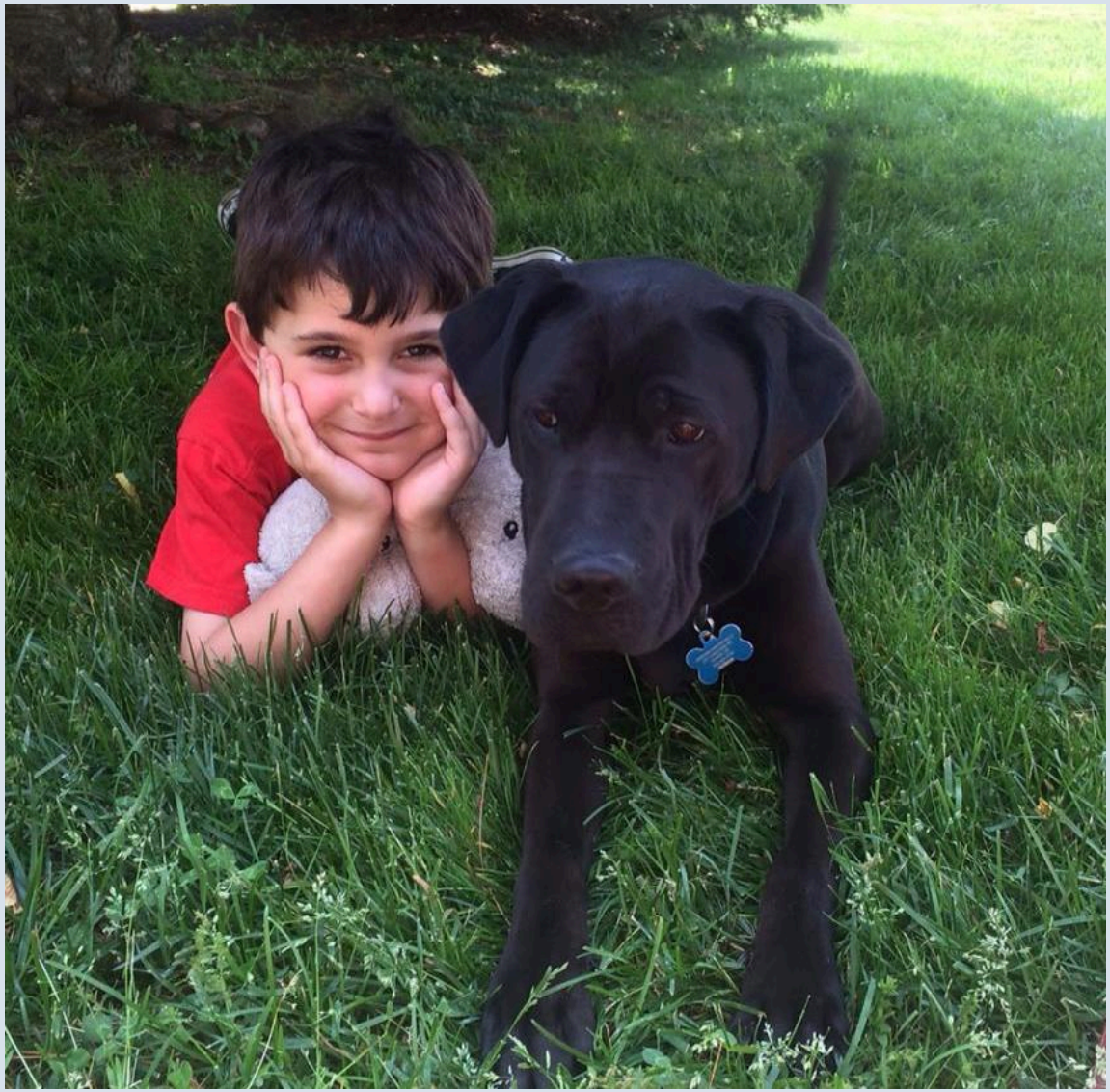
Questions?



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