Summary of Allocation Comparisons Exhibit

February 7, 2011

Filed with the Comments of the National Mining Association on EPA's Third Notice of Data Availability for Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone, 76 Fed. Reg. 1,109 (Jan. 7, 2011)

The following exhibit provides summary data and analysis on the allowance allocations under EPA's three proposed unit-level allocation methods – the PTR Method (emissions based), Option 1 Method (heat-input based) and Option 2 Method (heat-input based with an emissions constraint). The purpose of our analysis was to compare the impact each allocation method had on electric generating units categorized based on fuel type. EPA did not provide sufficient data to efficiently and comprehensively perform that analysis. However, as an appropriate surrogate, we were able to compare the allocations base on technology class/plant type (e.g., coal-fired boilers, combined cycle units).[1] As demonstrated below, our analysis shows that the two NODA-3 heat-input based allocation methods provide a substantial windfall profit to natural gas generation – at coal-fired generation's expense – and lead to absurd over-allocations to certain technology classes/plant types, chiefly combined cycle natural gas.

I. Summary of Analysis.

A. Problems with Data EPA Has Provided.

EPA has not provided sufficient information that would allow the public to efficiently and comprehensively compare and analyze the unit-level allocations that result from these three vastly different allocation methods. EPA made numerous changes between the proposed Transport Rule and NODA-3 to the available unit-level databases that prevent us from completing a complete line-by-line, unit-by-unit comparison for all units. For example, the universe of units changed between the proposed rule and NODA-3 because EPA proposes different cut-off dates for determining when a unit will be treated as a new unit. Additionally, EPA treats and lists steam turbines at combined cycle facilities differently under NODA-3 than it did under the proposed rule. Further, EPA did not provide any single field (i.e., column) that is unique to each unit in all databases.[2] Finally, there are numerous other changes and anomalies in the data that we were not able to resolve in the short time permitted for public review.

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[1] EPA did not provide data in a manner that would allow the public to fully evaluate and comment on the allocation methods because. It was only after a significant investment of time that we were able to perform this surrogate analysis.

[2] *See* list of databases in Section I.B.1 below.

B. Data Analysis Method Explanations.

1. Data Analysis Method for Allocation Comparisons under the Three Allocation Methods Based on Technology Class/Plant Type.

Our analysis in Part II below (comparing allocations under the three allocation methods based on technology class/plant type) relies chiefly on the following three databases provided by EPA in this rule making:

- The National Electric Energy Data System (or "NEEDS") database Version 4.10 provided with the first NODA (September 1, 2010) ("**NEEDS Database**");
- The Budgets and Allocations – Detailed Unit-Level Data (Excel) data file provided with the proposed Transport Rule ("**PTR Database**"); and
- The Alternative Allocation Tables and Underlying Data (Excel File) data file provided with NODA-3 ("**NODA-3 Database**").

In the NODA-3 Database, EPA does not provide information about the fuel used by each unit. To perform our analysis we used EPA's unique "technology class capacity factors" as identified in the NODA-3 Database. Those factors were for the following five Technology Classes: **Coal-Fired Boiler** (0.87); **Combined Cycle** (0.70); **Combustion Turbine** (0.14); **Oil or Gas Fired Boiler** (0.46); and **Other** (0.71).[3] This allowed us to group the units based on technology class.

Unfortunately, EPA did not provide fuel type or technology class information in the PTR Database. To determine that information, we used the unique unit identifiers in the NEEDS Database and PTR Database (i.e., "UniqueID_Final" and "NEEDS ID," respectively) to pull "plant type" and "modeled fuels" data values for each unit from NEEDS Database into the PTR Database.[4] This then allowed us to group the PTR Database data according to "plant type."[5] Once that was completed, we were able to group the units based on "plant type." The plant type and technology class

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[3] *See* 76 Fed. Reg. at 1,115/Table I (titled "Summary of Capacity Factors at 95th Percentile").

[4] When we pulled over the "plant type" and "modeled fuel" values from NEEDS there were several units that registered no value. Where feasible in the time allowed, we researched specific facilities to determine their plant type (i.e., technology class) and manually recorded those values. We were unable to determine technology class for a number of units – less than one hundred. It appears, based solely on SO2 allocations under the PTR Method that many of these (certainly the ones representing the most emissions) were coal-fired boilers. Nonetheless, because we were unable to verify technology class we left these units out of the totals for

[5] Because EPA did not provide fuel type information in its NODA-3 Database, we were not able to use the "modeled fuels" field as a basis for comparison. We did, however, use the "modeled fuels" field to confirm that "plant type" was an appropriate surrogate for fuel type – particularly with respect to natural gas and coal. Only eight of the 1,018 individual units in the PTR Database that are designated as "Combined Cycle" in NEEDS were not modeled to use Natural Gas (Six units at Cape Fear (ORIS 2708) in North Carolina and two at Phillips (ORIS 748) in Florida). Had EPA used a consistent list of units – or consistently referenced the units – this analysis could have been more precise and infinitely more efficient.

designations correlate,[6] and we were therefore able to perform analysis/comparisons of data (e.g., allocations) under the PTR Method and the two NODA-3 Methods – Option 1 Method and Option 2 Method.

2. Data Analysis Method for Comparing NODA-3 Allocations to Maximum Emissions and for Individual Sample Unit Analysis.

Our analysis in Part III (comparing NODA-3 allocations to maximum emissions) and Part IV (providing sample unit data) relied solely on the information contained in the NODA-3 Database.

II. Comparison of Allocations Based on Technology Class/Plant Type.

Based on the process described above, we calculated the change in allocations to all units grouped by technology class/plant type that occurred when switching from the PTR Method allocations to the two NODA-3 Method allocations. The allocation changes from the PTR Method to Option 1 are shown in Part II.A below and the allocation changes from the PTR Method to Option 2 are shown in Part II.B below.

A. Comparisons of PTR Allocations to NODA-3 Option 1 Allocations.

The following charts show the change in total allocation to all units grouped by technology class/plant type that results from switching from the PTR Method to the Option 1 Method.

In the first year allocation alone (2012), combined cycle units and combustion turbines will receive a total of almost 600,000 more allowances under the Option 1 Method (as compared to the PTR Method). Coal-fired boilers would receive 571,877 fewer allowances under the Option 1 Method. These extra allocations to combined cycle units and combustion turbines would be realized each year of the program. That is, these combined cycle units and combustion turbines would collectively received an additional roughly 600,000 extra allowances in the second year (2013), and so on.[7] Thus, by the beginning of the third year (2014), the Option 1 Method will allocate an extra 1.2 million allowances to combine cycle and combustion turbines collectively. Over this same period of time, coal-fired boilers collectively will receive over 1.1 million fewer allowances under the Option 1 Method.

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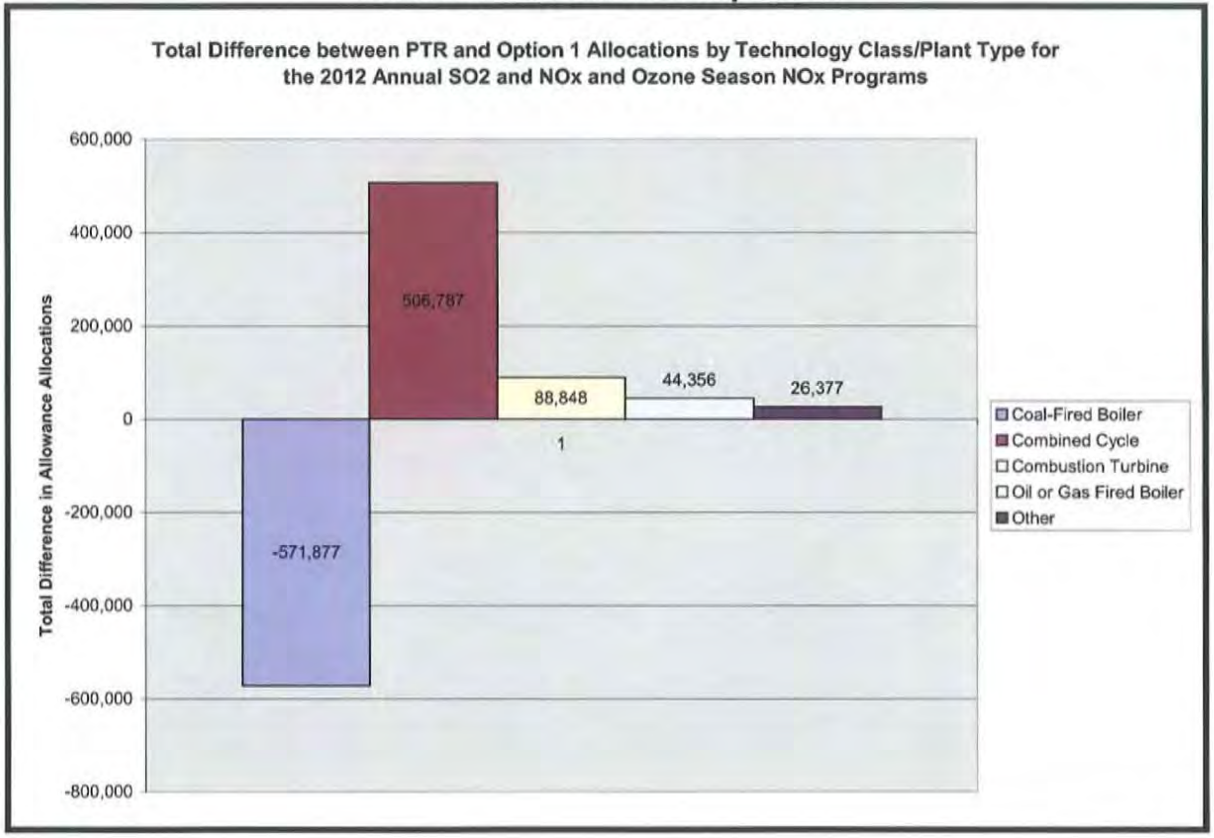
6 The following "plant type" values correspond to the "other" technology class: biomass, fossil waste, and IGCC. The other plant type to technology class correlations were as follows: coal steam = coal-fired boiler class; combined cycle = combined cycle class; combustion turbine = combustion turbine class; and O/G steam = oil or gas fired boiler.

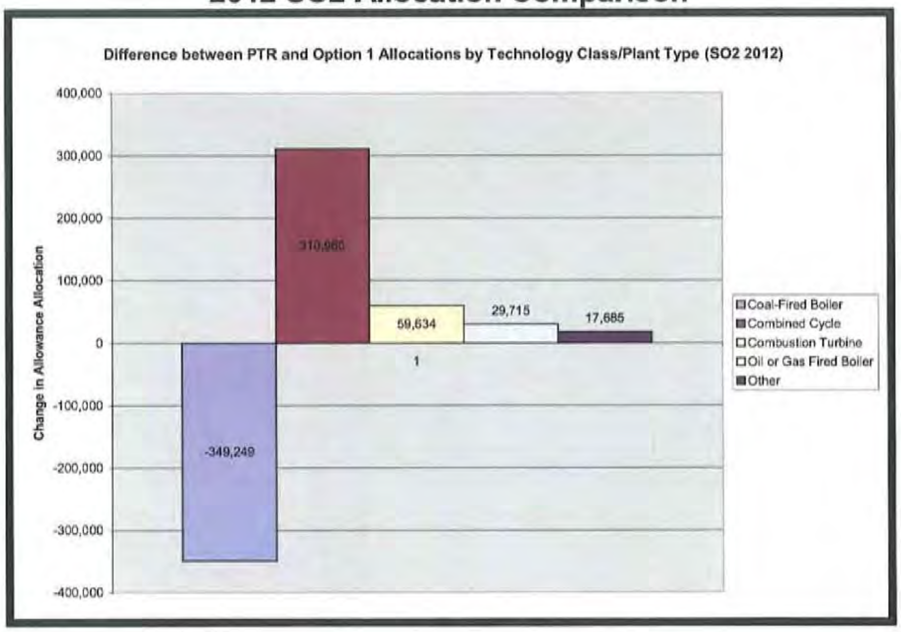
7 When the second phase of the SO2 program kicks in for the Group 1 states, the per-year extra allocation to combined cycle and combustion turbine units will drop from almost 600,000 to just over 500,000 allowances (501,621).

Total 2012 Allocation Comparison[8]

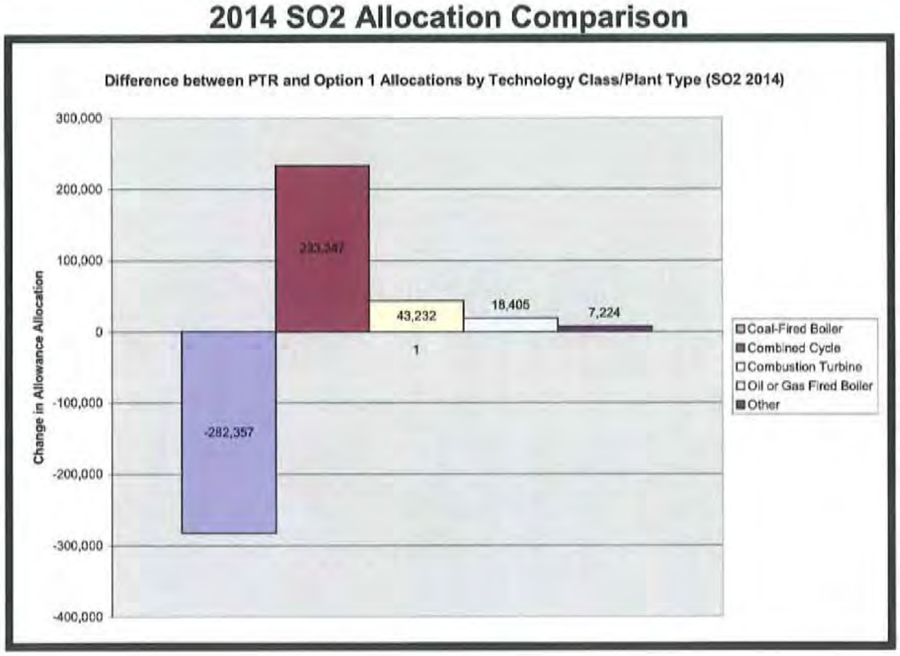


8 This includes the total change in allocation for both the annual SO2 and the annual NOx programs for 2012, as well as for the ozone season NOx program.

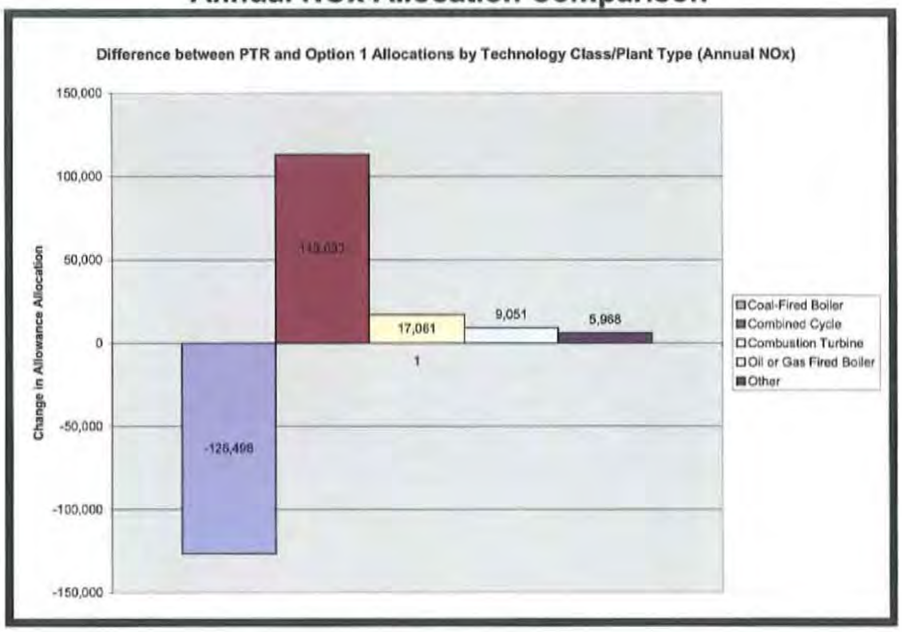
2012 SO2 Allocation Comparison



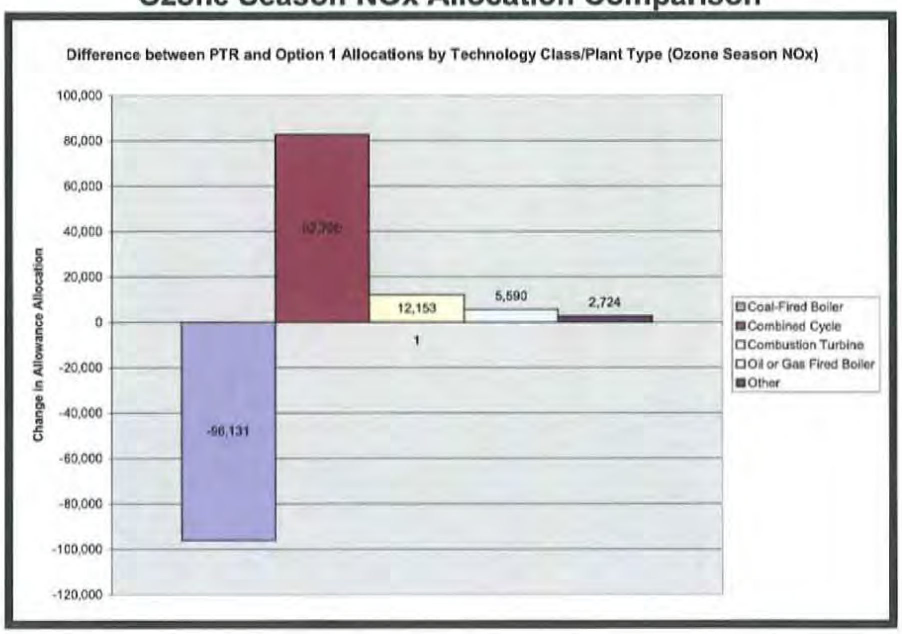
2014 SO2 Allocation Comparison



Annual NOx Allocation Comparison



Ozone Season NOx Allocation Comparison

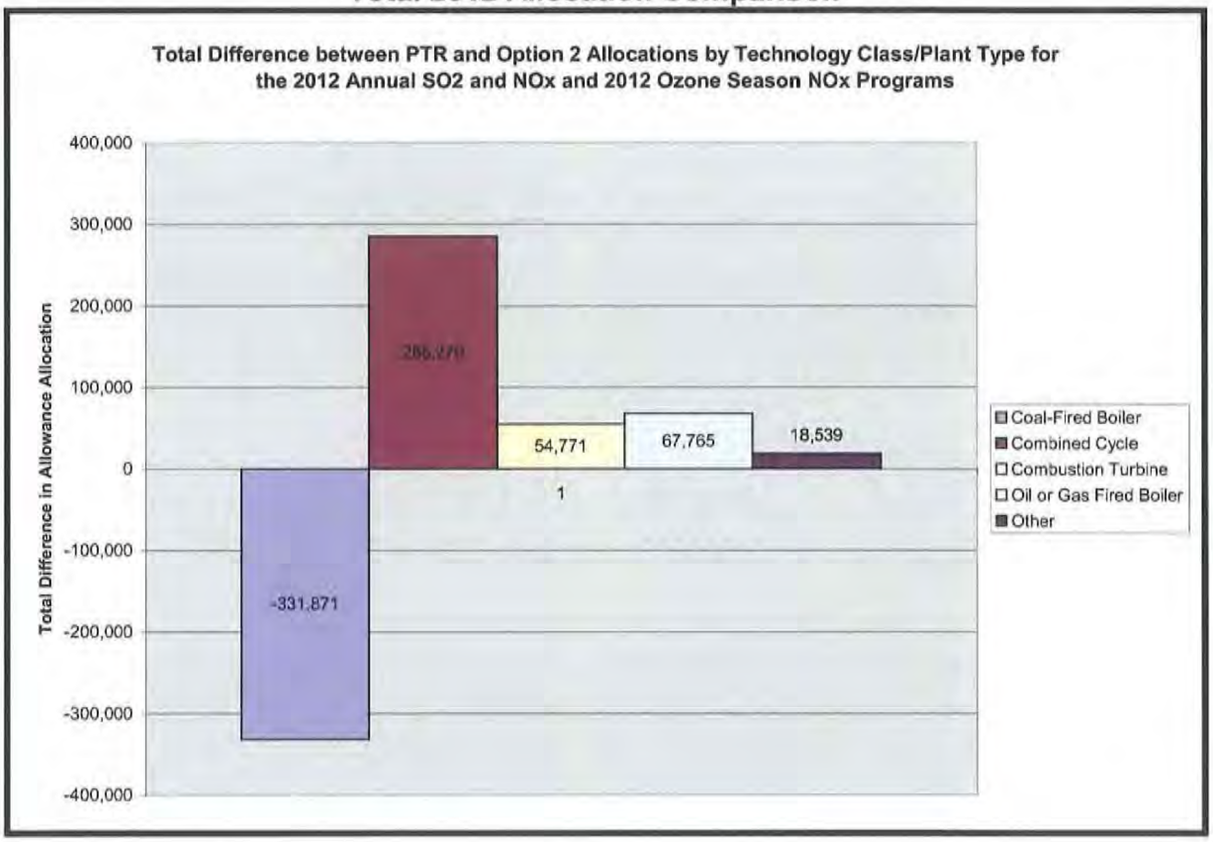


B. Comparisons of PTR Allocations to NODA-3 <u>Option 2</u> Allocations

The following charts show the change in total allocation to all units grouped by technology class/plant type that results from switching from the PTR Method to the Option 2 Method.

The Option 2 Method still results in a significant shift of allowances from coal-fired boilers to other technology classes. In the first year allocation alone (2012), combined cycle units and combustion turbines will receive a total of 340,041 more allowances under the Option 2 Method (as compared to the PTR Method). Coal-fired boilers would receive 331,871 fewer allowances under the Option 2 Method. These extra allocations to combined cycle units and combustion turbines would be realized each year of the program. That is, these combined cycle and combustion turbines would collectively received an additional 340,041 extra allowances in the second year (2013), and so on. Thus, by the beginning of the third year (2014), the Option 2 Method will allocate an extra 680,082 allowances to combine cycle and combustion turbines collectively. Over this same period of time, coal-fired boilers collectively will receive over 660,000 fewer allowances under the Option 2 Method.

Total 2012 Allocation Comparison[9]



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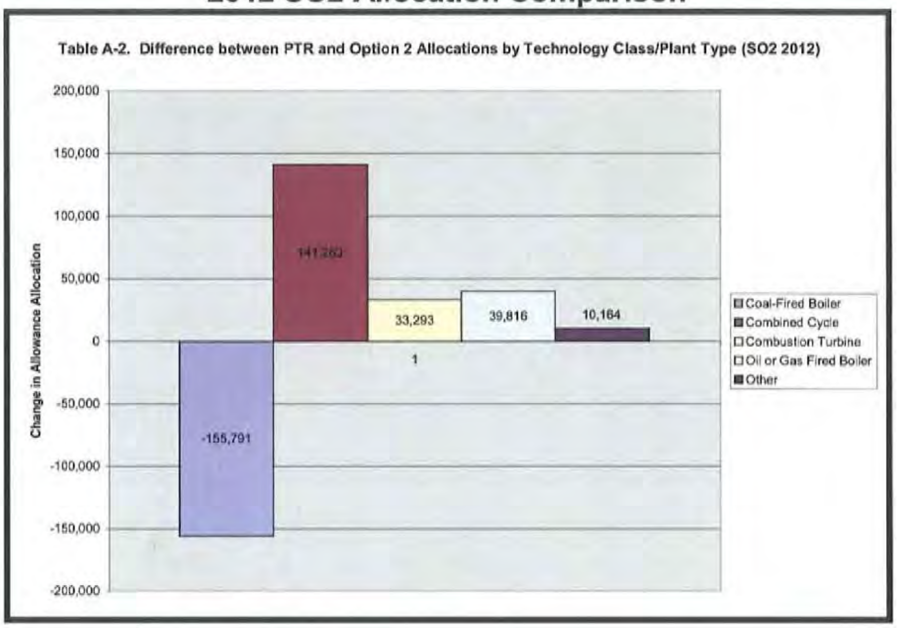
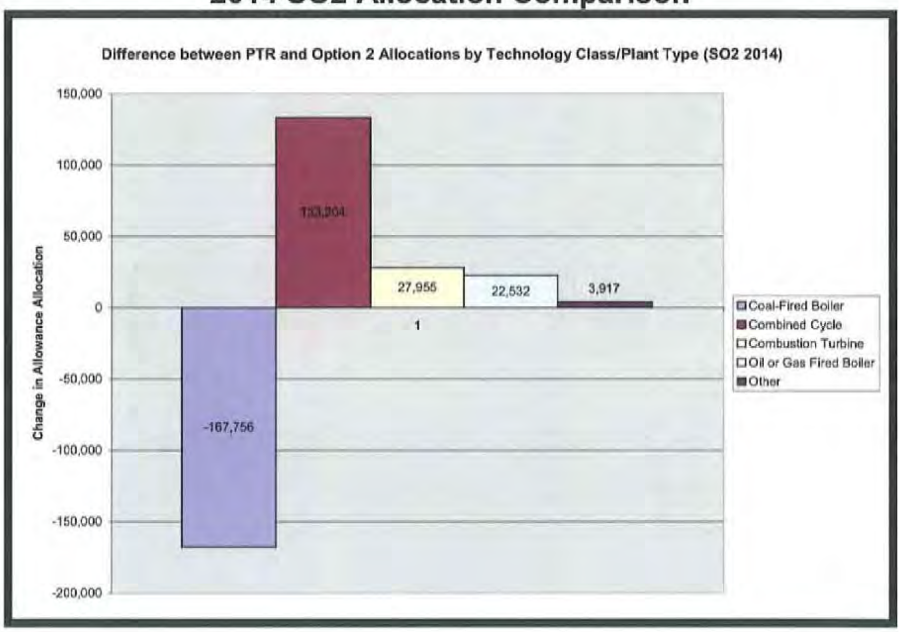
9 This includes the total change in allocation for both the annual SO2 and the annual NOx programs for 2012, as well as the ozone season NOx program.

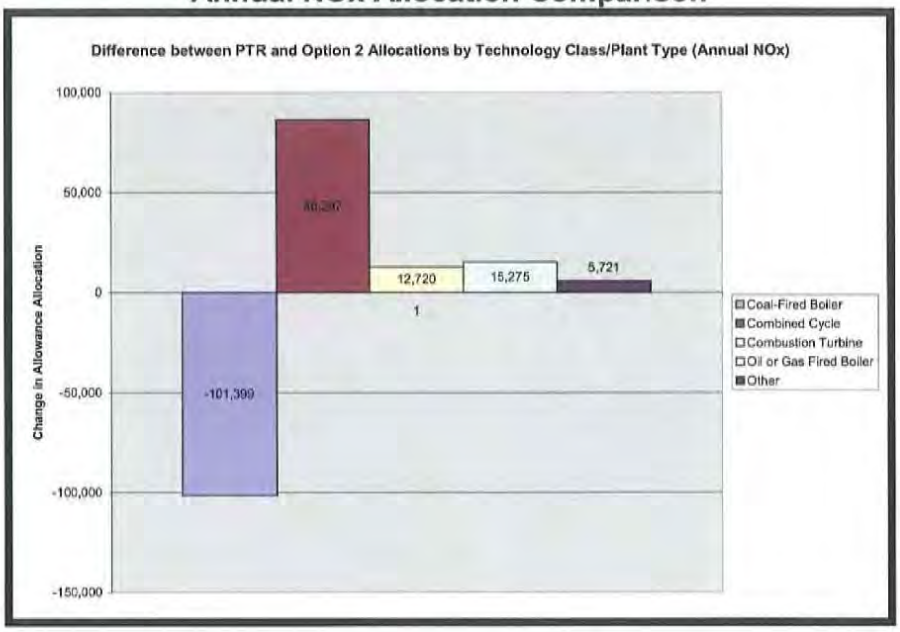
2012 SO2 Allocation Comparison



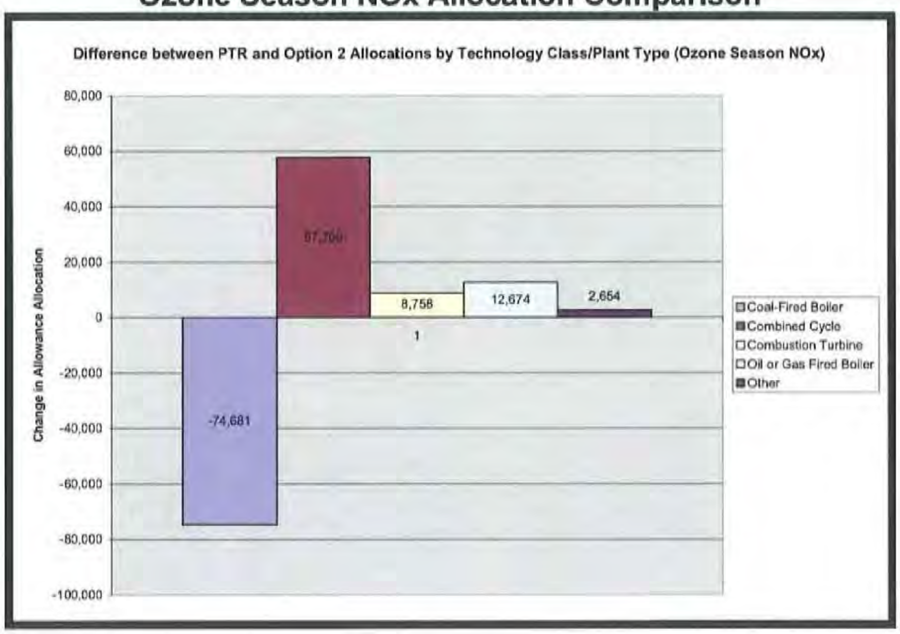
2014 SO2 Allocation Comparison



Annual NOx Allocation Comparison



Ozone Season NOx Allocation Comparison



III. Comparison of Combined Cycle/Combustion Turbine Allocations with Combined Cycle/Combustion Turbine Record High Emissions.

The following charts compare total allocations to combined cycle units under the Option 1 Method and the Option 2 Method with record historical emissions from these same combined cycle units. It also shows these same comparisons for the combustion turbine technology class units.

In determining a given unit's "reasonable foreseeable maximum emissions level" EPA calculates, among other things, a "maximum historical baseline emissions" value for each covered unit under the rule. The maximum historical baseline emissions value is simply the single highest annual (or ozone season, depending on the program) reported emissions for a seven-year period from 2003 to 2009 for each unit. Put simply, the maximum historical baseline emissions value represents each unit's seven-year record high emissions. EPA recorded these record-high emissions values for each unit in its NODA-3 Database.[10]

We totaled these record values for all combined cycle units and then compared this record reported historical emissions value (for all combined cycle units) to the Option 1 and Option 2 allocations (for all combined cycle units). It is important to note that our record high total for the combined cycle technology class has never been achieved in a single year. In order for our record high total to be achieved, every single combined cycle unit subject to the rule would have to have record emissions in the same year.

We then repeated this process for the combustion turbine technology class.

This analysis demonstrates that under the NODA-3 heat-input based allocation methods, combined cycle units, and to a lesser extent combustion turbines, receive an extraordinary over-allocation. Even using this implausibly-high, record emissions value as a comparison, these technology classes are allocated allowances orders of magnitude greater than emissions. This is true under both Option 1 and Option 2 allocation methods.

Under Option 1, in the first year alone, combined cycle units will receive over 300,000 allowances that they could never need. Even under Option 2, combined cycle units will receive nearly 140,000 allowances that they do not need – even in a year where every combined cycle unit has emissions equal to their seven-year record high. These over-allocations are realized every year of the program.

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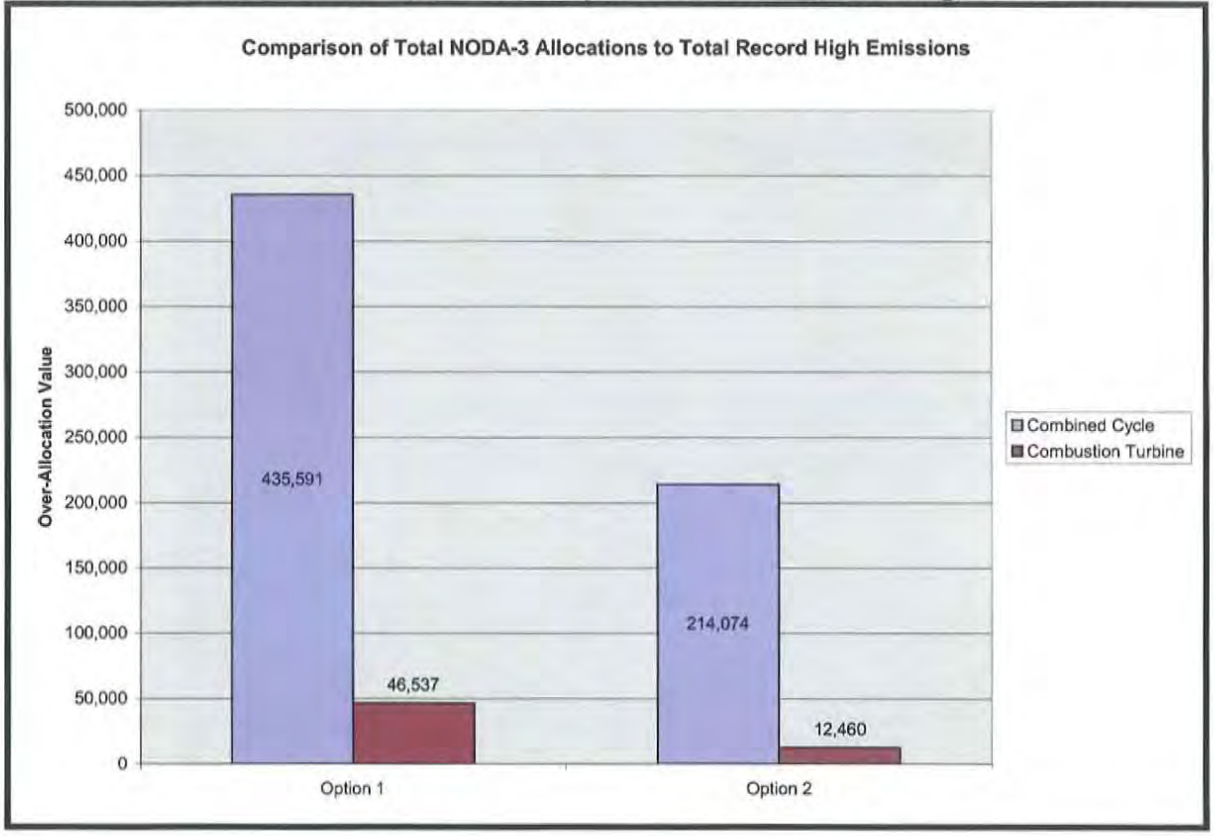
10 In the NODA-3 Database these values are recorded as the "Annual SO2 Historical Cap (tons)" (Column AA), the "Annual NOx Historical Cap (tons)" (Column AI), and the "Ozone Season NOx Historical Cap (tons)" (Column BN).

Total Allocations under NODA-3 Compared to Total Record High Emissions[11]



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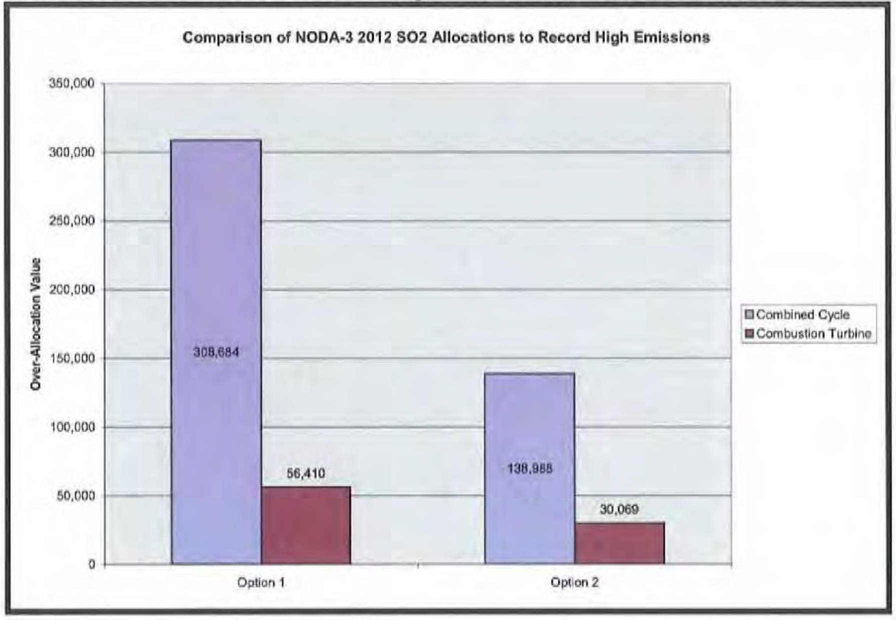
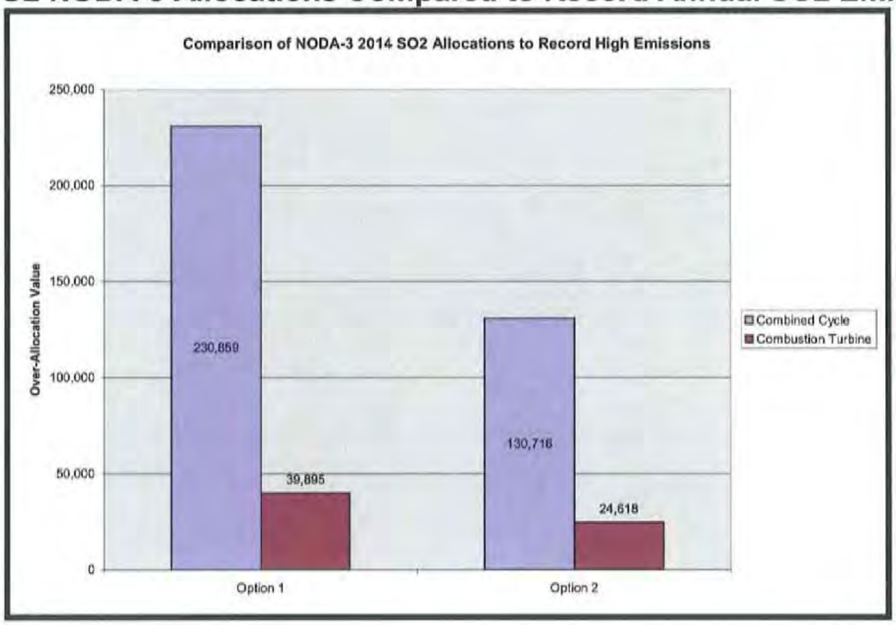
11 This compares the total allocation for both the annual SO2 and the annual NOx programs for 2012, as well as the ozone season NOx program, and compares that allocation with total annual SO2 and NOx emissions, plus total ozone season NOx emissions (thus, counting double NOx emissions during ozone season).

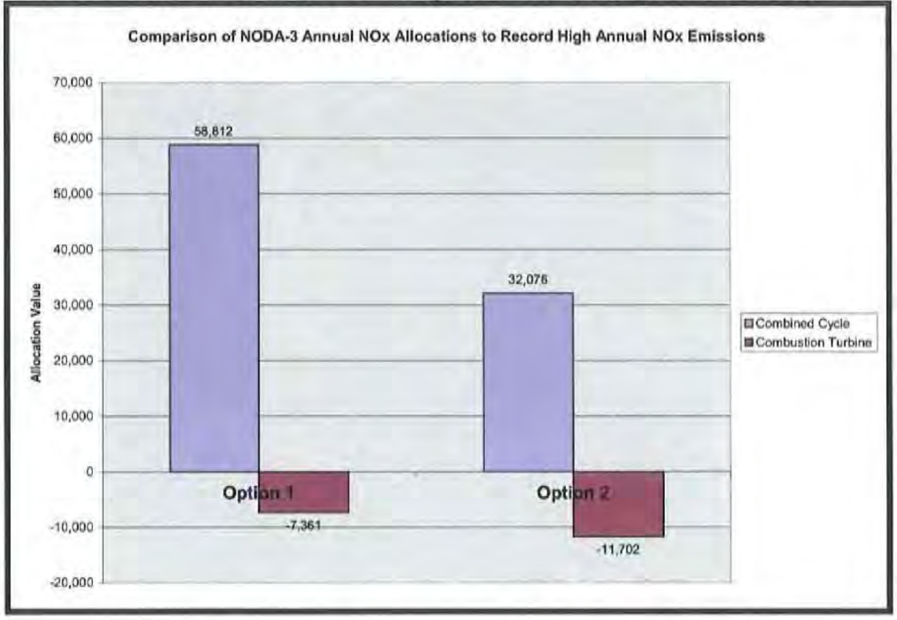
2012 SO2 NODA-3 Allocations Compared to Record Annual SO2 Emissions



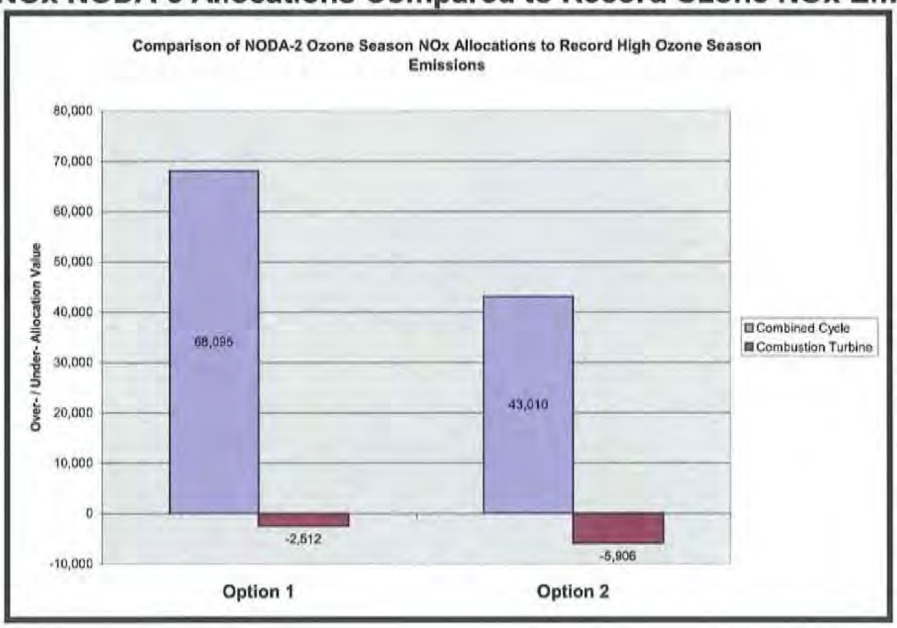
2012 SO2 NODA-3 Allocations Compared to Record Annual SO2 Emissions



Annual NOx NODA-3 Allocations Compared to Record Annual NOx Emissions



Ozone NOx NODA-3 Allocations Compared to Record Ozone NOx Emissions



IV. Comparison of Sample Individual Units Allocations under the Three Allocation Methods.

The following tables show unit-level data for sample natural gas combined cycle and coal-fired boilers. The first two tables show the allocations to six natural gas combined cycle units under each of the three allocation methods. They also show the historical maximum emissions (i.e., the seven-year record high emissions) for each unit and a comparison of those historical maximum emissions to the NODA-3 allocations. The last two tables show these same data and comparisons for six coal-fired units.

These tables demonstrate the severe over-allocation to many natural gas combined cycle units and the severe under-allocation to many coal-fired units.

[Tables on Next Two Pages]

Sample Large Combined Cycle Unit Level Allocations for Annual SO2

Unit Information			Allocations							Over Allocations			
			2012 SO2			2014 SO2				2012 SO2		2014 SO2	
Plant Name	ORIS	Boiler	PTR	Option 1	Option 2	PTR	Option 1	Option 2	Historical Max	Option 1	Option 2	Option 1	Option 2
East River	2493	2	3	1099	582	0	694	582	8	1091	574	686	574
East River	2493	1	3	1088	582	0	688	582	4	1085	578	684	578
Whiting Clean Energy, Inc.	55259	CT2	3	2712	551	0	1364	551	3	2709	547	1361	547
Whiting Clean Energy, Inc.	55259	CT1	2	2061	551	0	1037	551	2	2059	549	1035	549
AES Ironwood	55337	0002	0	2318	533	0	845	533	4	2315	2896	842	530
AES Ironwood	55337	0001	0	2267	533	0	827	533	3	2264	2897	823	530

Sample Large Combined Cycle Unit Level Allocations for NOx

Unit Information			Allocations						Historical Max		Over Allocations			
			Annual NOx			Ozone NOx			Annual	Ozone	Annual NOx		Ozone NOx	
Plant Name	ORIS	Boiler	PTR	Option 1	Option 2	PTR	Option 1	Option 2			Option 1	Option 2	Option 1	Option 2
East River	2493	2	22	385	386	10	162	164	45	22	340	341	140	142
East River	2493	1	22	382	390	9	149	150	47	20	335	343	129	130
Whiting Clean Energy, Inc.	55259	CT2	4	596	**551**	3	261	**241**	33	16	563	518	245	225
Whiting Clean Energy, Inc.	55259	CT1	9	784	**551**	6	285	**241**	48	16	736	503	269	225
AES Ironwood	55337	0002	21	664	553	6	372	233	79	41	585	474	331	192
AES Ironwood	55337	0001	42	680	553	12	356	233	88	41	592	465	315	192

Sample Coal-Fired Unit Level Allocations for Annual SO2

Unit Information			Allocations							Over Allocations			
			2012 SO2			2014 SO2				2012 SO2		2014 SO2	
Plant Name	ORIS	Boiler	PTR	Option 1	Option 2	PTR	Option 1	Option 2	Historical Max	Option 1	Option 2	Option 1	Option 2
Big Cajun 2	6055	2B1	12,159	5,325	**10,063**	12,159	5,325	**10,063**	17,881	-12,556	-7,818	-12,556	-7,818
Big Cajun 2	6055	2B2	11,541	5,363	**10,135**	11,541	5,363	**10,135**	19,105	-13,742	-8,970	-13,742	-8,970
Eastlake 5	2837	5	31,669	12,658	14,096	8,647	4,854	4,859	49,293	-36,635	-35,197	-44,439	-44,434
Homer City Station	3122	1	47,491	10,945	**16,066**	4,519	3,991	**4,375**	78,225	-67,280	-62,159	-74,234	-73,850
Homer City Station	3122	2	45,815	10,744	**15,771**	4,360	3,918	**4,295**	75,747	-65,003	-59,976	-71,829	-71,452
Homer City Station	3122	3	2,486	11,470	**5,149**	2,365	4,182	**4,585**	5,149	6,321	0	-967	-564

Sample Coal-Fired Unit Level Allocations for NOx

Unit Information			Allocations						Historical Max		Over Allocations			
			Annual NOx			Ozone NOx			Annual	Ozone	Annual NOx		Ozone NOx	
Plant Name	ORIS	Boiler	PTR	Option 1	Option 2	PTR	Option 1	Option 2			Option 1	Option 2	Option 1	Option 2
Big Cajun 2	6055	2B1	4,371	2,586	**3,180**	1,912	1,139	**1,394**	8,050	3,775	-5,464	-4,870	-2,636	-2,381
Big Cajun 2	6055	2B2	4,340	2,605	**3,203**	1,899	1,141	**1,396**	8,472	3,375	-5,867	-5,269	-2,234	-1,979
Eastlake 5	2837	5	4,567	2,649	**2,649**	1,847	1,154	**1,226**	15,519	6,056	-12,870	-12,870	-4,902	-4,830
Homer City Station	3122	1	1,268	3,208	**3,385**	555	1,443	**1,776**	6,874	1,809	-3,666	-3,489	-366	-33
Homer City Station	3122	2	1,223	3,149	**3,323**	536	1,386	**1,705**	7,775	1,732	-4,626	-4,452	-346	-27
Homer City Station	3122	3	1,327	3,362	**3,547**	581	1,336	**1,644**	7,911	1,991	-4,549	-4,364	-655	-347