



OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Evaluation Briefing Report

Assessment of EPA's Projected Pollutant Reductions Resulting from Enforcement Actions and Settlements

Report No. 2007-B-00002

July 24, 2007



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Abbreviations

CAA	Clean Air Act
CCDS	Case Conclusion Data Sheet
CEMS	Continuous Emission Monitoring System
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
FY	Fiscal Year
ICIS	Integrated Compliance Information System
lbs.	Pounds
OECA	Office of Enforcement and Compliance Assurance
OIG	Office of Inspector General

Cover photos: Images of water pollution (top) and air pollution (bottom)
(photos courtesy Iowa Department of Natural Resources
and U.S. EPA, respectively).



At a Glance

Catalyst for Improving the Environment

Why We Did This Review

We conducted this review at the request of the Office of Management and Budget. We were asked to assess (1) the accuracy and reliability of the U.S. Environmental Protection Agency's (EPA's) Office of Enforcement and Compliance Assurance (OECA) pollution reduction projections for enforcement actions and settlements, and (2) whether the reported projected pollution reductions were achieved.

Background

OECA's enforcement actions can result in facilities agreeing to install pollution controls or take other measures to reduce pollutant emissions or discharges. In accordance with the Government Performance and Results Act, OECA annually reports on the amount of pollutants expected to be reduced, treated, or eliminated as a result of these actions. OECA only reports 1 year's worth of estimated pollutant reductions, though reductions may occur for years into the future. The reductions are reported in the fiscal year that an enforcement case is concluded, not necessarily the year in which the projected reductions will be fully realized.

For further information, contact our Office of Congressional and Public Liaison at (202) 566-2391.

To view the full report, click on the following link:
www.epa.gov/oig/reports/2007/20070724-2007-B-00002.pdf

Assessment of EPA's Projected Pollutant Reductions Resulting from Enforcement Actions and Settlements

What We Learned

The accuracy and reliability of EPA's projected pollutant reductions for Fiscal Years 2003-2006 were dependent on the specific program in which the enforcement action took place. For example, more reliable data were available to project reductions from oil spill and power plant cases than other Clean Water Act (CWA) and Clean Air Act (CAA) cases, respectively. EPA has improved its internal control process for ensuring more accurate pollutant reduction estimates from concluded enforcement cases. The accuracy of estimated reductions from CWA enforcement actions has likely improved as a result of these internal control changes. However, we noted some inconsistencies in the calculation of projected CAA emission reductions. For example, three of the six power plant cases we reviewed did not include estimates for particulate matter reductions, thereby underreporting reductions. Also, different methodologies were used to estimate post-compliance emissions from power plant cases. Further, three of the six regions we surveyed did not independently review the basis for the projected reductions for some CAA cases as called for by OECA's guidance.

EPA's annual projected reductions were heavily influenced by a few large cases. Less than 1 percent of the CWA cases accounted for 52 percent of the projected pollutant reductions from concluded CWA enforcement actions. Similarly, a few large power plant cases resulted in a marked increase in total estimated CAA-related reductions for Fiscal Years 2004-2005. For example, two power plant cases accounted for over 600 million pounds in reductions, about 78 percent of the Fiscal Year 2004 total.

Facilities were on target to meet the projected reductions for the CAA cases we reviewed. However, it will take years to complete all corrective actions in these cases. Consequently, we could not determine whether they had achieved their total projected reductions. Projected reductions have already been achieved for at least one CWA case, and other CWA cases were making progress toward meeting their projected reductions. EPA's 2006 Annual Report used terms such as "achieved," "reduced," and "actual" to describe emission reductions for that year even though the reductions were often only projected amounts, since it can take years for reductions to occur. OECA agreed to use more precise wording in future reports.

We presented the results of our review to OECA on May 23, 2007. We clarified parts of our presentation based on OECA's feedback. OECA generally agreed with our findings and stated that it would address the issues disclosed. We make no recommendations in this report.



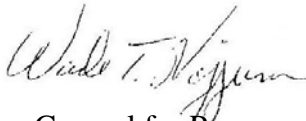
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
INSPECTOR GENERAL

July 24, 2007

MEMORANDUM

SUBJECT: Assessment of EPA's Projected Pollutant Reductions
Resulting from Enforcement Actions and Settlements
Report No. 2007-B-00002

FROM: Wade T. Najjum 
Assistant Inspector General for Program Evaluation

TO: Granta Y. Nakayama
Assistant Administrator for Enforcement and Compliance Assurance

This is our briefing report on the accuracy of pollution reduction projections resulting from Office of Enforcement and Compliance Assurance enforcement actions and settlements, conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). This briefing represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this briefing will be made by EPA managers in accordance with established resolution procedures.

The estimated cost of this project – calculated by multiplying the project's staff days by the applicable daily full cost billing rates in effect at the time – is \$397,274.

Action Required

Since this briefing report contains no recommendations, you are not required to respond to it. We have no objections to the further release of this briefing report to the public. This report will be available at <http://www.epa.gov/oig>.

If you or your staff have any questions regarding this briefing report, please contact Rick Beusse, Director for Program Evaluation, Air Issues, at (919) 541-5747 or beusse.rick@epa.gov; or Dan Engelberg, Director for Program Evaluation, Water Issues, at (202) 566-0830 or engelberg.dan@epa.gov.

cc: Office of the Administrator
Assistant Administrator for Air and Radiation
Assistant Administrator for Water
Agency Followup Official (CFO)
Agency Followup Coordinator
Office of General Counsel
Associate Administrator for Congressional and Intergovernmental Relations
Associate Administrator for Public Affairs
Audit Liaison, Office of Enforcement and Compliance Assurance
Acting Inspector General

OIG Assessment of EPA's Projected Pollutant Reductions

Briefing for OECA
Originally Presented on
May 23, 2007

Objectives

- How accurate and reliable are OECA's pollutant reduction projections for enforcement actions and settlements?
- Were the projected pollutant reductions reported for selected enforcement actions and settlements actually achieved?

What We Learned

The reliability of estimated pollutant reductions is dependent on the specific program in which the enforcement action takes place.

- Projected pollutant reductions from Oil Pollution Act cases tend to be more reliable than those associated with other types of CWA enforcement actions.
- Projected pollutant reductions for power plant cases are based on more reliable methods [i.e., Continuous Emission Monitoring System (CEMS)] than projections for other CAA cases.

What We Learned

There have been improvements in the internal control process EPA uses to generate pollutant reduction estimates.

- OECA issued new guidance in August 2004.
- Standard calculation methodologies have been expanded to cover more types of enforcement actions.

What We Learned

Projected pollutant reductions have been or are being achieved in most of the cases reviewed. However, because of the length of time needed for required corrective actions, it is not possible to make a determination in all cases.

What We Learned

The settlement of a few large power plant cases resulted in a marked increase in total estimated reductions for Fiscal Years (FYs) 2004 – 2005. For example:

- 2 power plant cases in FY 2004 account for over 600 million lbs. in reductions – approximately 60% of the FY 2004 total.
- 2 other power plant cases in FY 2005 account for over 535 million lbs. in reductions – almost 50% of the FY 2005 total.

What We Learned

- EPA's FY 2006 Performance and Accountability Report uses terms such as "achieved," "reduced," and "actual" in describing pollutant reductions (pp. 9, 118).
- These descriptions should be revised to reflect that results are based on estimated projections of future pollutant reductions and are not actual reductions.

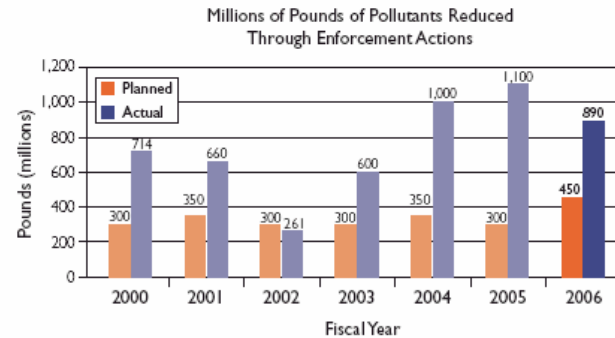
What We Learned

*Excerpt from
EPA's FY 2006
Performance and
Accountability
Report*

PERFORMANCE RESULTS—GOAL 5, C

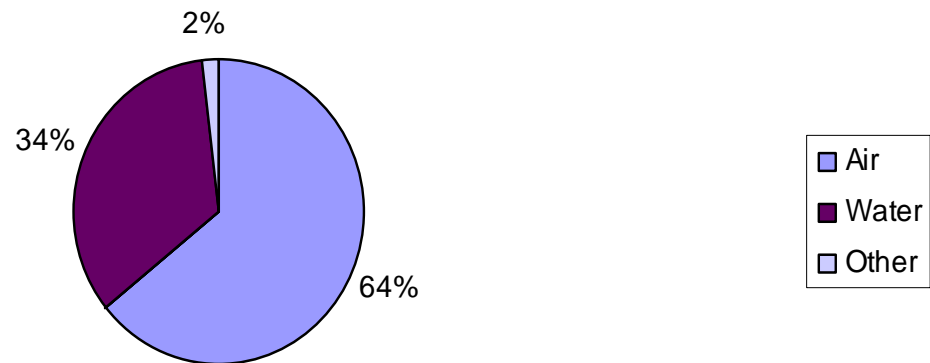
egregious violations and return violators to compliance as quickly as possible, greatly reducing impacts on sensitive populations. To increase compliance and improve EMPs, EPA encourages facilities to identify, disclose, and correct violations through incentives such as reduced or eliminated penalties.

through a few key performance accomplishments. EPA has reduced, treated, or eliminated 890 million pounds of pollution through enforcement actions in FY 2006. That represents an increase of 97.78 percent over the performance target of 450 million pounds. EPA significantly exceeded the FY 2006 performance target of

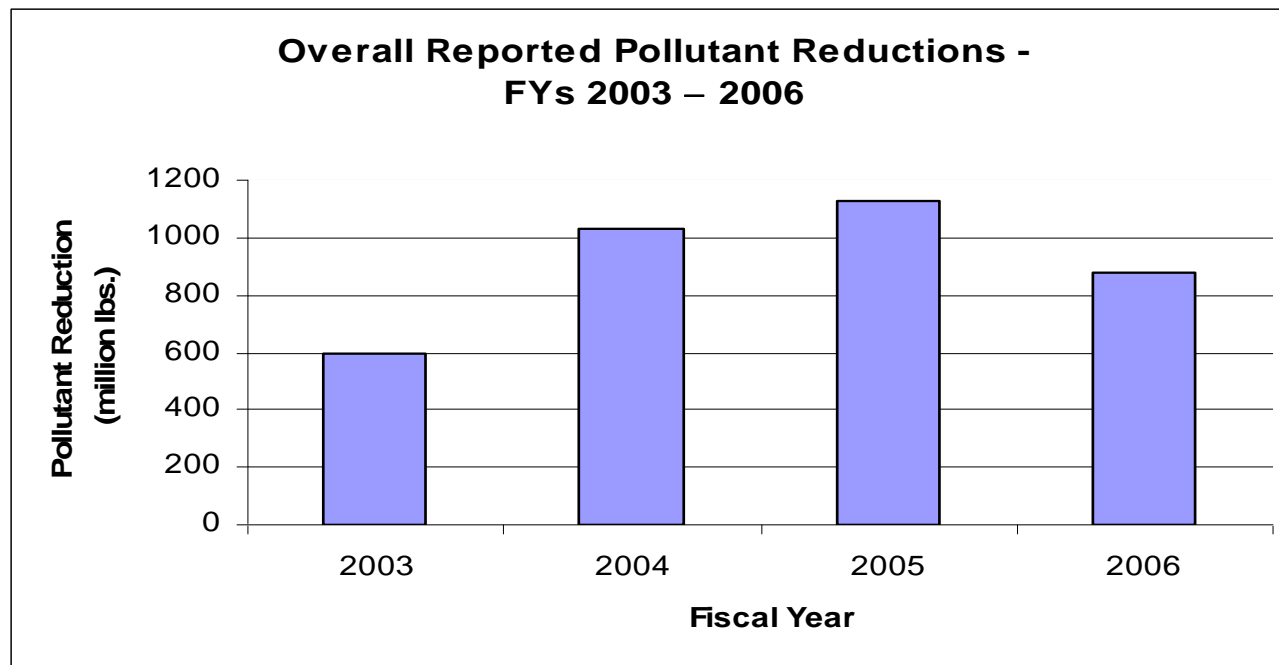


Background

Estimated Pollutant Reductions by Environmental Media
FYs 2003 – 2006



Background



Background

- Regions record enforcement case information - including estimated pollutant reductions - on the Case Conclusion Data Sheet (CCDS).
- CCDS information is entered into the Integrated Compliance Information System (ICIS).

Background

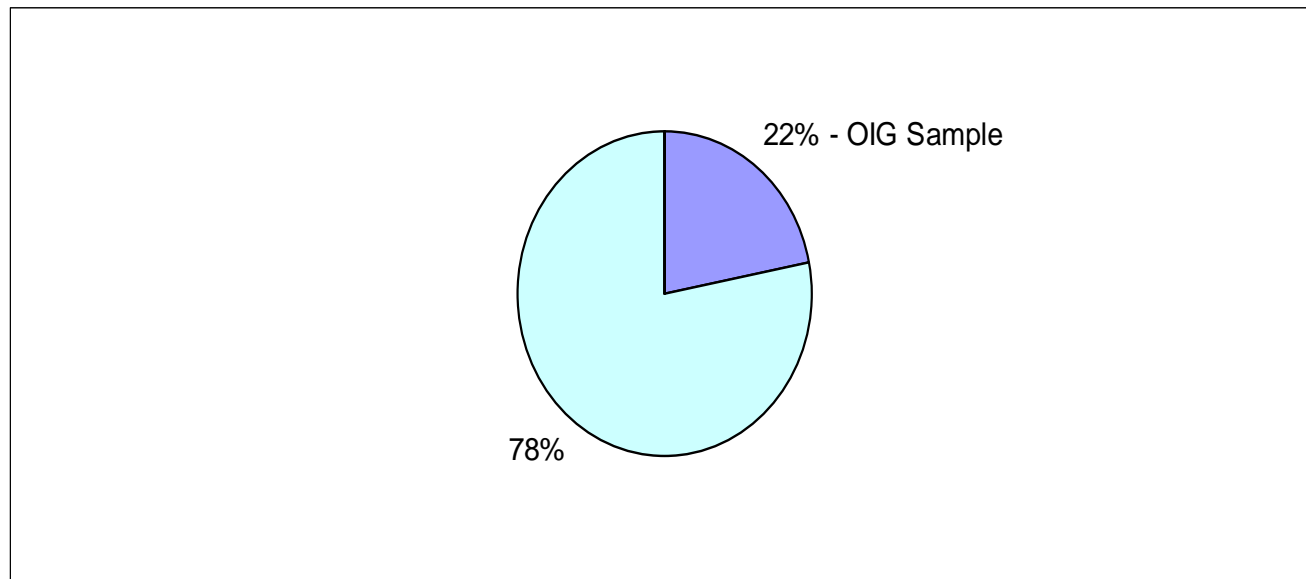
- OECA contractor to develop a methodology for verifying projected pollutant reductions.
- OECA contractor to pilot test methodology on petroleum refinery cases.
- Completion date is September 30, 2007.

Clean Water Act Enforcement

Summary Information



Projected CWA Pollutant Reductions FYs 2003 – 2006



**Total CWA Projected Pollutant Reductions – 1.2 billion lbs.
Total OIG Sample – 271 million lbs.**

CWA Review Methodology

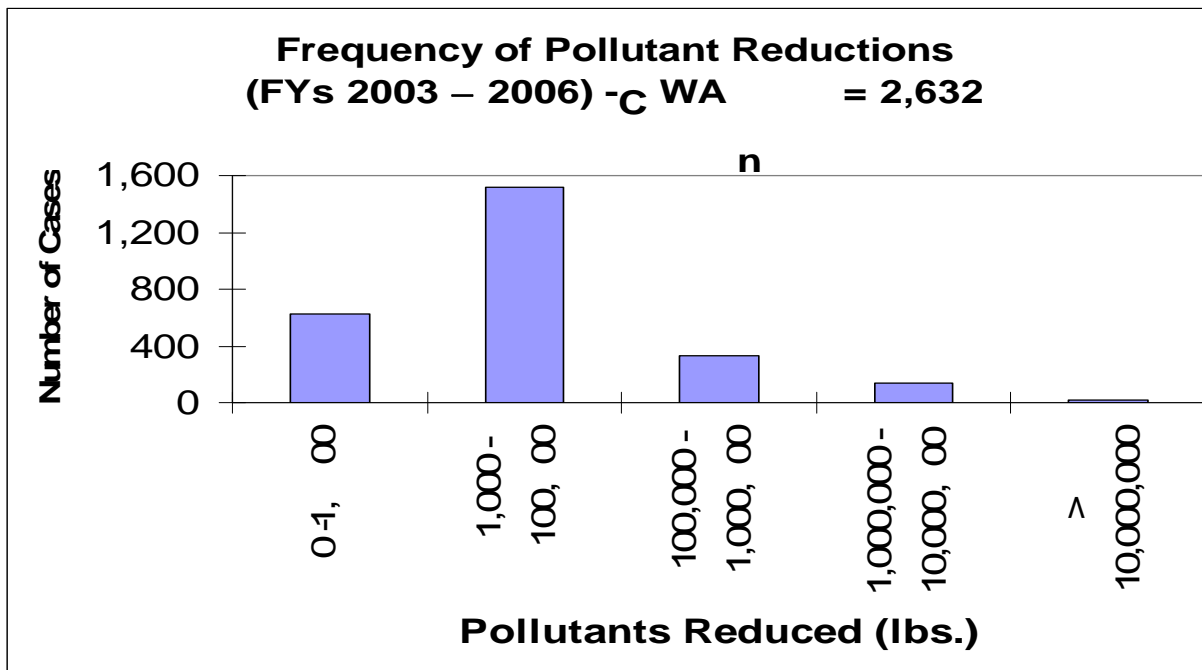
- Selected eight cases for review.
- Evaluated processes used to calculate pollutant reductions against existing Agency guidance.
- Determined how Agency tracks compliance with the enforcement order.
- Determined, if possible, whether projected reductions were occurring.

CWA Cases Reviewed

Case	EPA Region	Date Final Order Entered	CWA Section
Cooper Land Development, Inc.	7	2/17/2006	301/402
Midwest Feeding Company	7	11/7/2003	301/402
Joe Ivie Hog Farm	6	3/25/2003	301/402
Explorer Pipeline	6	10/8/2004	311 (b)
Galveston, City of	6	12/10/1996	301
H & W Petroleum Company, Inc.	6	6/2/2006	311 (j)
South Star Oil & Gas	6	5/20/2005	301
Wal-Mart	HQ	9/22/2005	301/402

Total Projected Reductions = 270,874,329 lbs.

Most Projected Pollutant Reductions from CWA Enforcement Actions are Modest (1,000 – 100,000 pounds)



Projected Pollutant Reductions are Concentrated in a Small Number of CWA Enforcement Actions

Just 23 of 2,632 cases accounted for 52 percent of the projected pollutant reductions from concluded CWA enforcement actions.

Conclusions – CWA

The accuracy and reliability of pollutant reduction estimates vary based on the information available to enforcement staff.

- Estimates for oil spill removals, for example, are more accurate because better monitoring data are available.
- Enforcement actions requiring volumetric estimates (e.g., holding ponds) may be less accurate.

Conclusions – CWA

The accuracy and reliability of pollutant reduction estimates have likely improved as a result of changes to EPA's quality assurance process.

- Updated OECA guidance (2004) encouraged greater standardization of pollutant reduction calculations.
- Reported pollutant reduction estimates are receiving increasing levels of scrutiny.

Conclusions - CWA

- Where corrective action has been completed, field inspections have been used to verify that pollutant reductions have been achieved.
- Where corrective action has not yet been completed, site inspections and progress reports are used to gauge interim progress.

Clean Air Act Enforcement

Summary Information



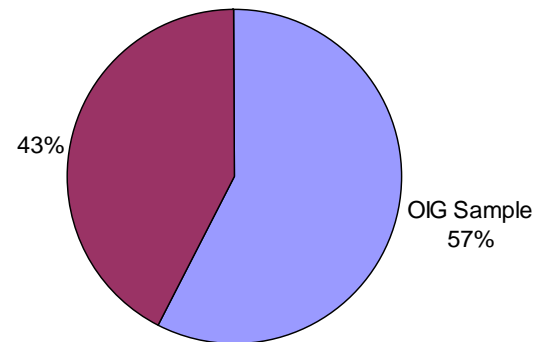
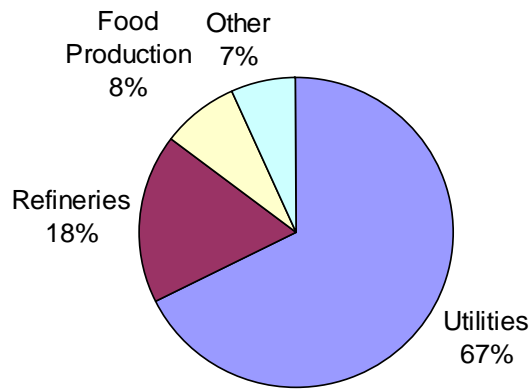
Background

- Projected emission reductions are reported in the fiscal year in which the case is concluded (e.g., date an administrative order is issued), not necessarily in the year(s) the benefit is expected to occur.
- Projected pollutant reductions are the difference between annual emissions prior to a settlement agreement and annual emissions once corrective actions are taken.

Background

- Between FYs 2004 – 2006, emission reductions from power plants decreased from 93% to 30%.
 - During same period, emission reductions from petroleum refineries increased from 4% to 50%.
- Methods for estimating projected emission reductions less reliable for non-utility industry sectors (CEMS data generally not available).
 - For example, projected reductions for one case were based on several emission estimation methods of varying reliability.

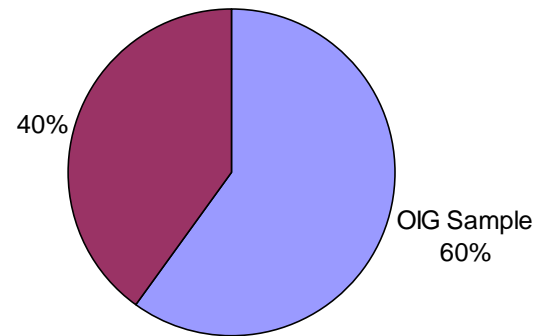
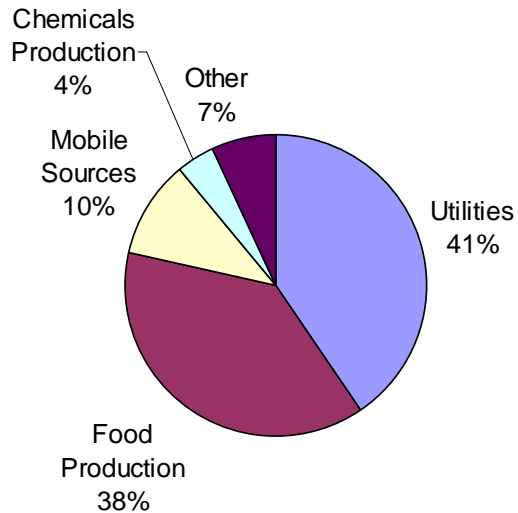
Projected CAA Emission Reductions FYs 2003 – 2006



Total CAA Reductions = 2.3 billion lbs.

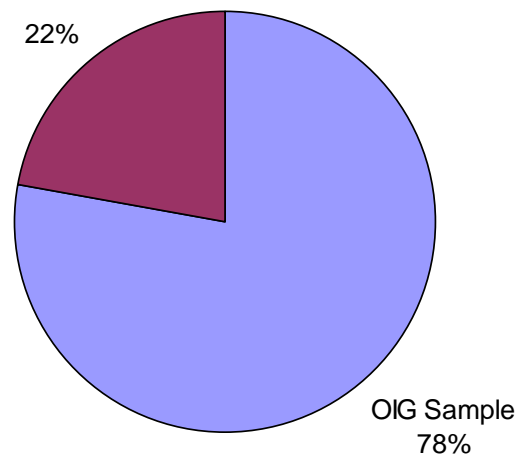
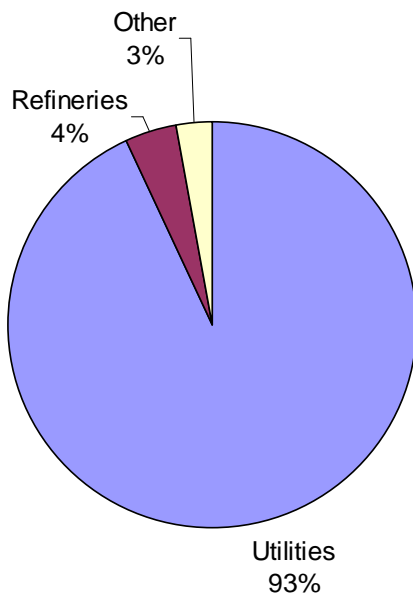
Total OIG Sample = 1.3 billion lbs.

Projected CAA Emission Reductions FY 2003



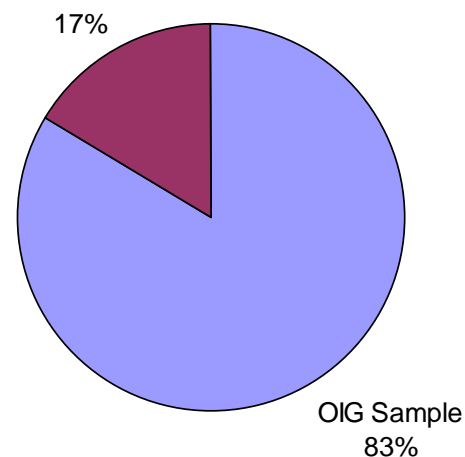
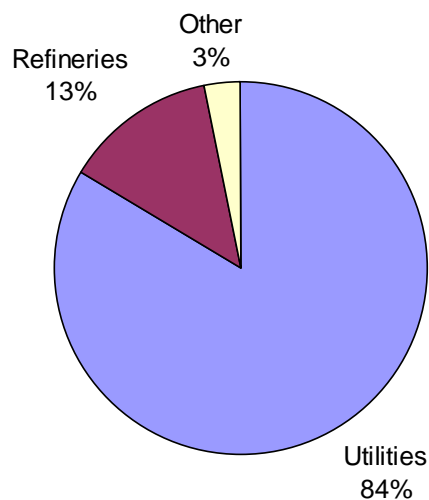
Total CAA Reductions = 320.4 million lbs.
Total OIG Sample = 193.6 million lbs.

Projected CAA Emission Reductions FY 2004



Total CAA Reductions = 781.9 million lbs.
Total OIG Sample = 607.9 million lbs.

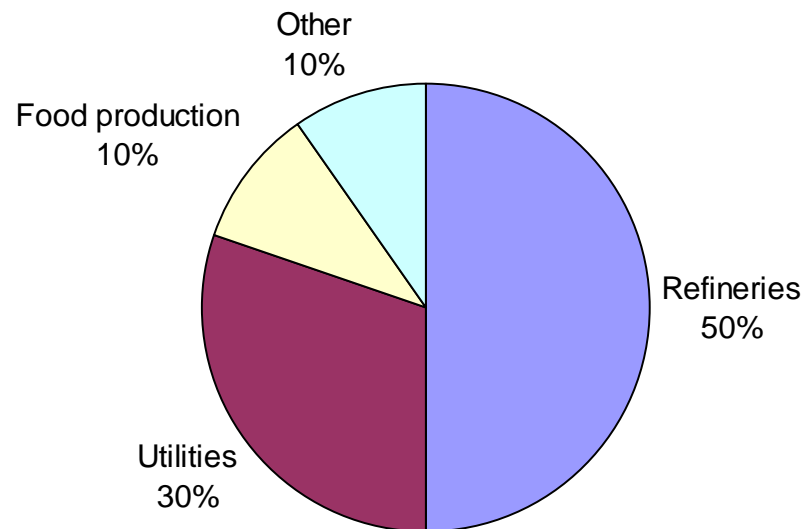
Projected CAA Emission Reductions FY 2005



Total CAA Reductions = 642.2 million lbs.

Total OIG Sample = 536.2 million lbs.

Projected CAA Emission Reductions FY 2006



Total CAA Reductions = 583.2 million lbs.
Total OIG Sample = NA

CAA Review Methodology

- Selected two largest CAA cases from each of FYs 2003, 2004, and 2005.
- Also selected one large case from FY 2002. Case identified through OIG query of OECA database.

CAA Review Methodology

- For each sample case:
 - Determined how the estimated reduction was calculated.
 - Compared process followed to CCDS guidance.
 - Determined how compliance with the enforcement agreement is tracked.
 - Determined whether projected reductions were occurring.

CAA Cases Reviewed

Case	Date Final Order Entered	Compliance Date	Reduction (lbs.)
PSEG Fossil Inc.	7/26/02	2010	108,000,000
Alcoa Inc.	7/28/03	2011	130,000,000
Archer Daniels Midland Co.	8/21/03	2012	63,600,000
Virginia Electric and Power Co.	10/3/03	2013	472,596,000
South Carolina Public Service Authority	6/24/04	2012	135,300,000
Illinois Power Co.	5/27/05	2013	110,850,000
Ohio Edison Co.	7/11/05	2012	425,314,000
Total Projected Reductions			1,445,660,000

Quality Assurance/Quality Control for the CCDS Process

Basic steps in CCDS Quality Assurance/Quality Control process:

- Complete the CCDS form.
- Conduct independent review of data on the form.
- Reconcile inconsistencies and incomplete entries as needed.
- Enter CCDS data into ICIS.
- Certify that the data is complete and accurate at mid-year and end-of-year.

Compliance with CCDS Quality Assurance/Quality Control Steps

Case	Complete CCDS	Independent Data Review	Reconcile	Enter into ICIS	Certify
PSEG	Yes	No	Yes	Yes	Yes
Alcoa	No	No	No	Yes	Yes
ADM	Yes	Yes	Yes	Yes	Yes
VEPCO	Yes	Yes	Yes	Yes	Yes
SCPSA	Yes	Yes	Yes	Yes	Yes
IL Power	Yes	No	Yes	Yes	Yes
OH Edison	Yes	No	Yes	Yes	Yes

Emission Estimation Methods – Power Plants Cases

Case	Sulfur Dioxide (SO ₂)		Nitrogen Oxides (NO _x)		Particulate Matter (PM)	
	Pre-Compliance Baseline	Post-Compliance Reported Emissions	Pre-Compliance Baseline	Post-Compliance Reported Emissions	Pre-Compliance Baseline	Post-Compliance Reported Emissions
PSEG	CEMS	Removal Efficiency	CEMS	Emission Rate	Not Projected	Not Projected
Alcoa	EPA Inventory	Removal Efficiency	EPA Inventory	Removal Efficiency	EPA Inventory	Removal Efficiency
VEPCO	CEMS	Removal Efficiency	CEMS	Annual Cap	Not Projected	Not Projected
SCPSA	CEMS	Removal Efficiency	CEMS	Emission Rate	Stack Test	Manufacturer Design Data
IL Power	CEMS	Emission Rate	CEMS	Emission Rate	Not Documented	Not documented
OH Edison	CEMS	Annual Cap	CEMS	Annual Cap	Not Projected	Not Projected

Emission Estimation Methods – Archer Daniels Midland Food Production Case

Reductions Projected for:
Sulfur Dioxide (SO₂), Nitrogen Oxides (NO_x), Particulate Matter (PM), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO)

Pre-Compliance Baseline

Post-Compliance Reported Emissions

Various methods including:

- Stack tests
- CEMS
- Material balance
- Emission factors
- Screening data

Removal efficiencies

Methods Used to Track Compliance with Interim Emission Requirements

Case	Interim Reduction Met?	CEMS	Stack Test	On-site Inspection	Company Reports
PSEG	Yes	Yes	Yes	Yes	Yes
Alcoa	Yes	N/A	Yes	Yes	Yes
ADM	Yes	Yes	Yes	Yes	Yes
VEPCO	Yes	Yes	Yes	Yes	Yes
SCPSA	Yes	Yes	Yes	Yes	Yes
IL Power	Yes	Yes	Yes	Yes	Yes
OH Edison	Yes	Yes	Yes	Yes	Yes

Conclusions – CAA

- For time period reviewed the majority of projected reductions came from power plant cases.
- FYs 2004 – 2005 spike in projected reductions came from a few large power plant cases.
- Projected reductions for power plants are based on more reliable data – CEMS.
- Cases reviewed are on schedule to meet projected emissions reductions.

Conclusions – CAA

- Inconsistencies in how projected reductions were calculated:
 - Not all regions included estimates for particulate matter reductions from power plant cases.
 - Final compliance emissions based on different methods.
 - Post-compliance annual cap.
 - Post-compliance emission rate used to estimate annual emissions (assumes no change in production).