



Toxics Release Inventory Analysis of Pollution Prevention Information

April 12, 2012





Background

- Pollution Prevention (P2) Information in TRI
 - Pollution Prevention Act requires regulated facilities to submit information on their pollution prevention activities
- Section 8.10 of TRI's Form R collects source reduction activities using "W-Codes"
- Section 8.11 of TRI's Form R is an open response section that allows respondents to provide information on:
 - Source Reduction
 - Recycling
 - Pollution Control Activities



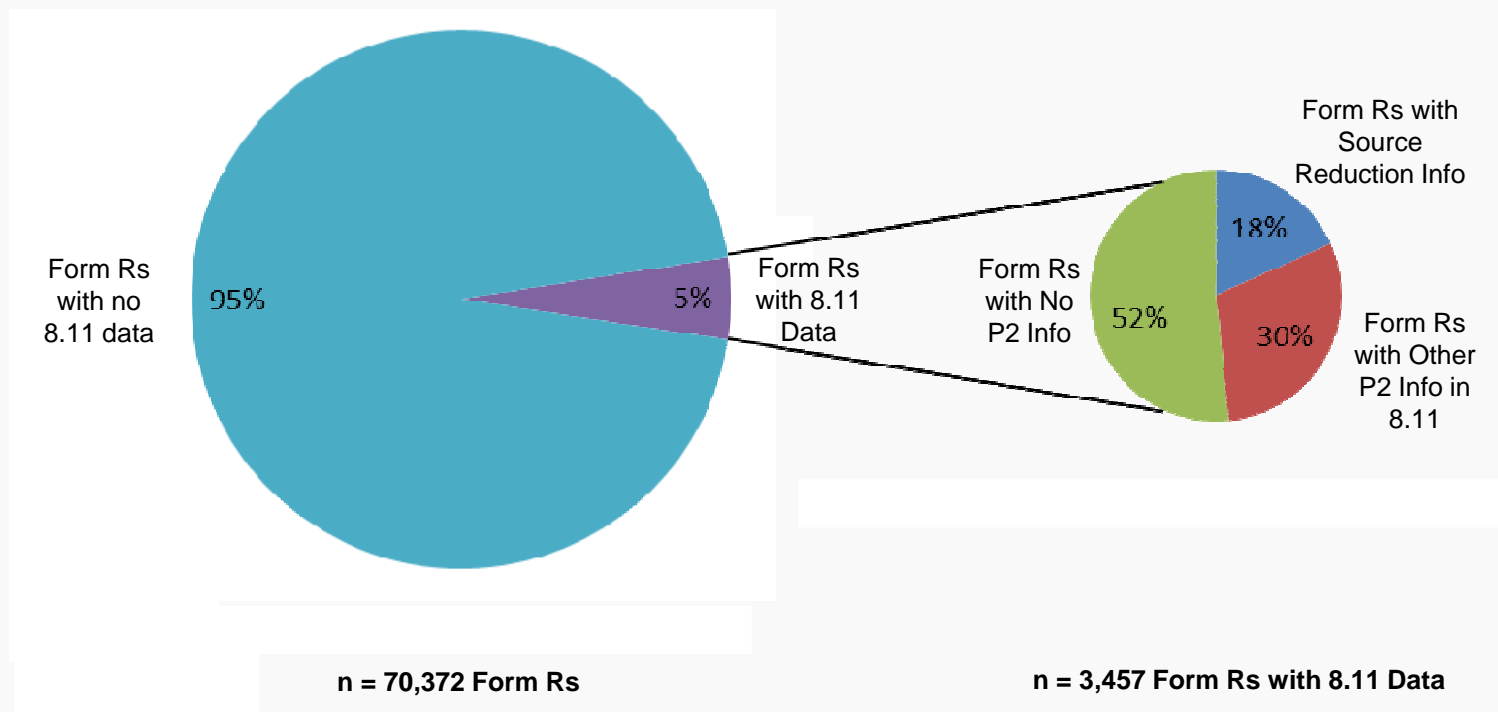
Review of Section 8.11 Data

- Section 8.11 data were reviewed for RY2008 – 2010
- Forms with text in Section 8.11 were categorized as having:
 - **Source reduction information**
 - Good Operating Practices
 - Inventory Control
 - Process Modifications
 - Spill and Leak Prevention
 - Raw Materials Modifications
 - Cleaning and Degreasing
 - Product Modifications
 - Surface Preparation and Finishing
 - **Other P2 information**
 - Recycling
 - Treatment
 - Energy recovery
 - Generic P2 statements
 - **No P2 information**
 - Facility closures
 - Calculation methods
 - Revision explanations
 - Miscellaneous responses.



P2 Information in Section 8.11 of RY 2010 Form R Submissions

(% of Form Rs)





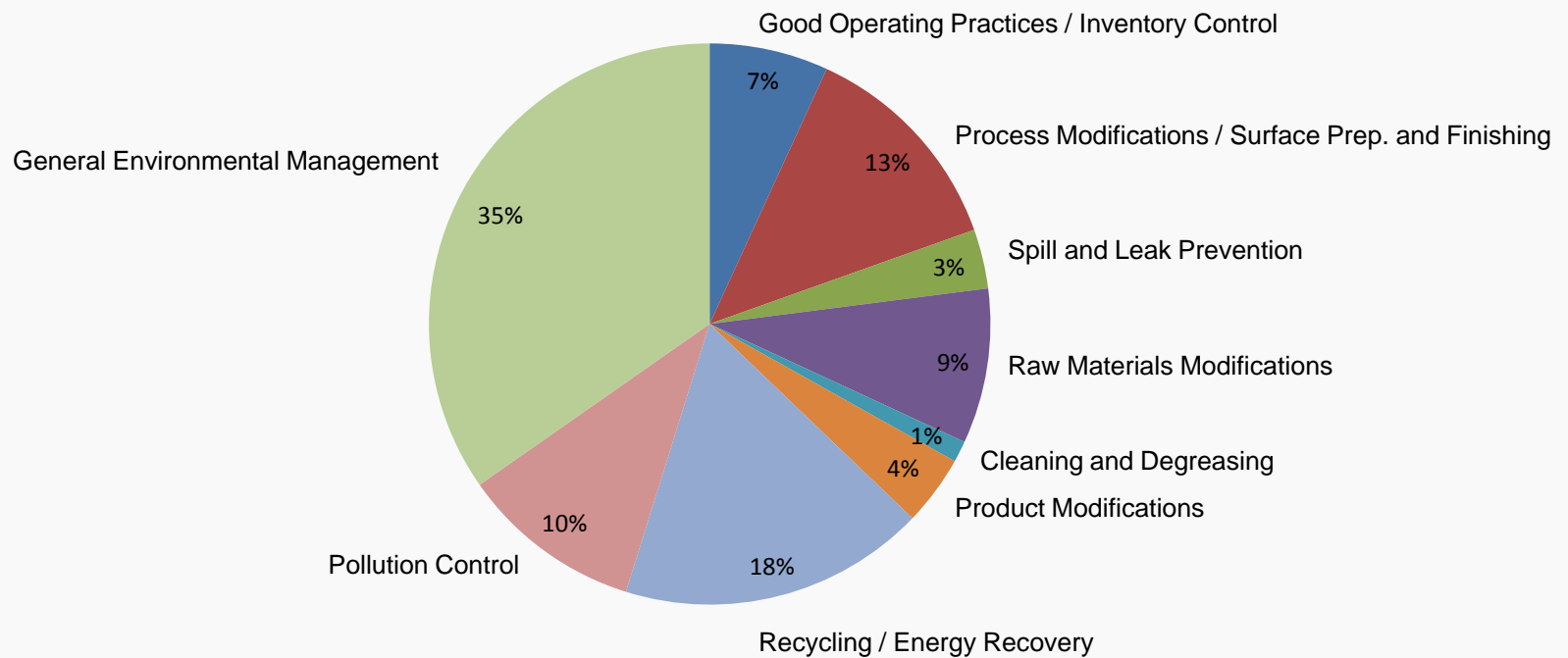
Section 8.11 P2 Information Submittal Rates: RY2008-2010

- Although the purpose of 8.11 is to enter source reduction, recycling, and treatment information, many filers use it to enter unrelated information

	RY2008	RY2009	RY2010
Form Rs filed in RY	76,025	70,813	70,327
Percent of Form Rs filed in RY that had information in 8.11	6%	6%	5%
Percent of Form Rs filed in RY with 8.11 information that had P2 activities in 8.11	41%	41%	48%



P2 Activities in Section 8.11 by Activity Category, RY2010



n = 1,672 Form Rs with P2 Information in 8.11



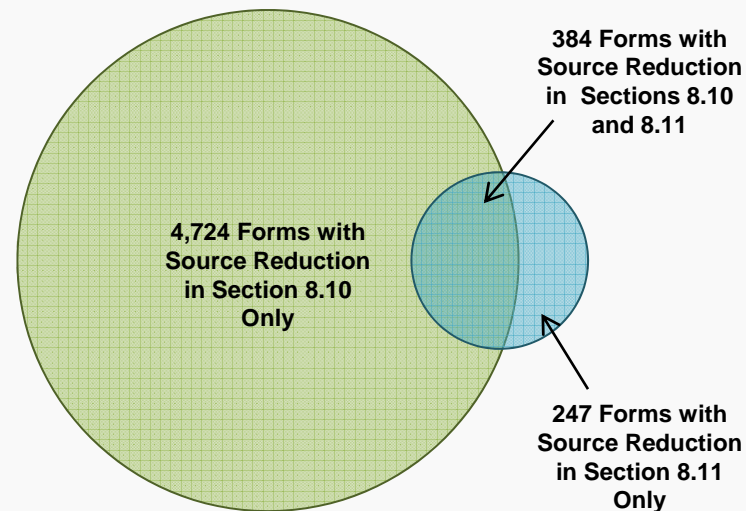
Comparison of Source Reduction Data Reported Under 8.10 to 8.11

- Forms with Source Reduction were placed into one of three categories:
 - Source Reduction in Section 8.11 and Section 8.10
 - Source Reduction in Section 8.10 Only
 - Source Reduction in Section 8.11 Only



Source Reduction Data is Primarily Reported in Section 8.10 Only

Source Reduction in Sections 8.10 or 8.11; RY2010





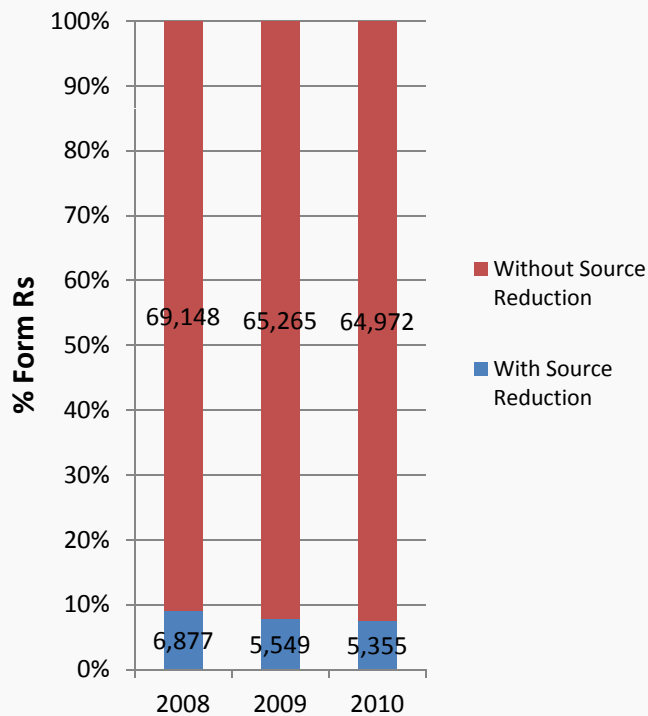
Combination of 8.10 and 8.11 Data

- Data from Section 8.10 and 8.11 were combined in further analyses because many forms had source reduction in only one Form R Section.
- A form was characterized as having source reduction if:
 - it had a source reduction activity in Section 8.10 or
 - text corresponding to a source reduction activity in Section 8.11.
- Source reduction activity W-codes were assigned to each form based on Section 8.10 and Section 8.11.

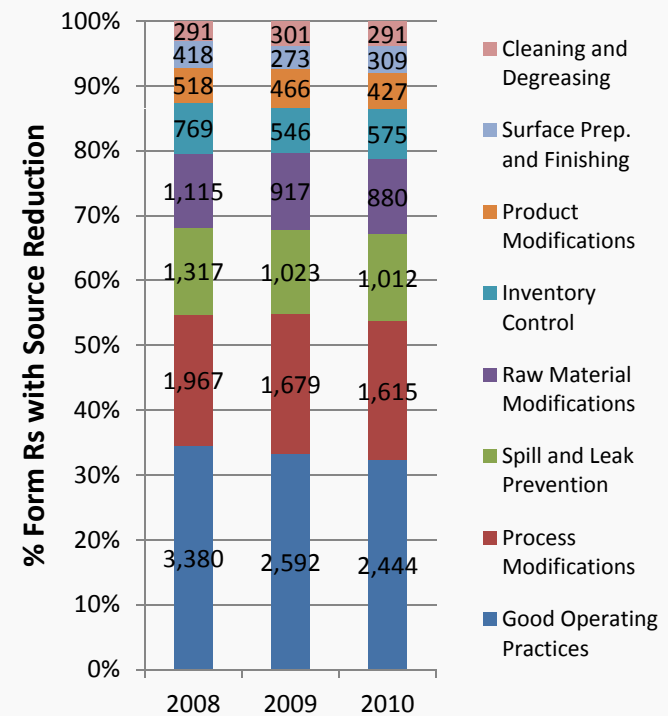


Source Reduction Reporting Consistent across RY2008-2010

Source Reduction Reporting in Sections 8.10 and 8.11



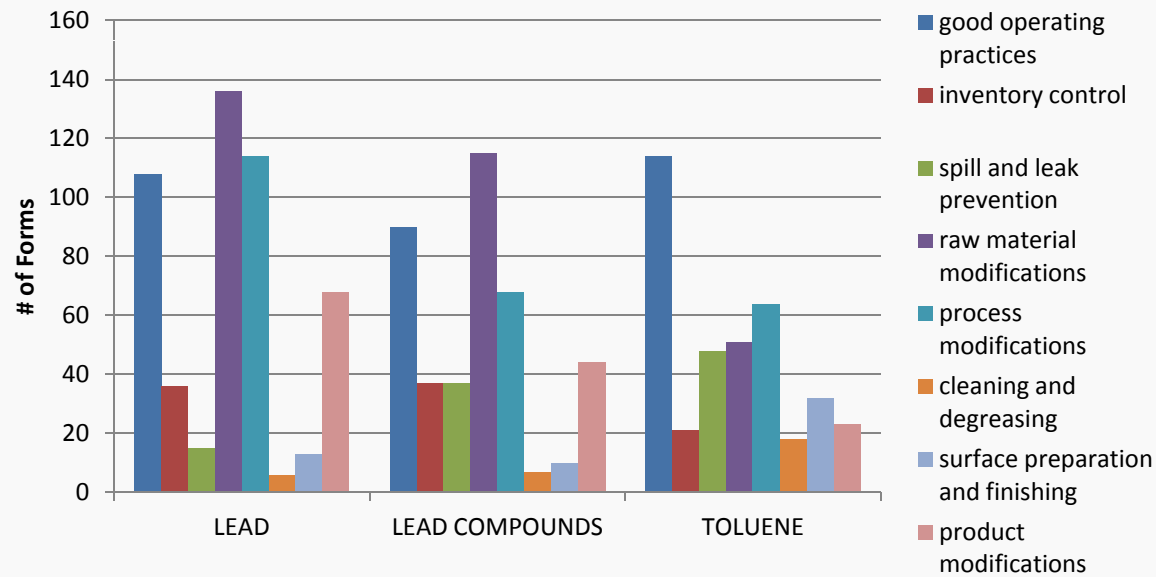
Source Reduction Activities in Sections 8.10 and 8.11





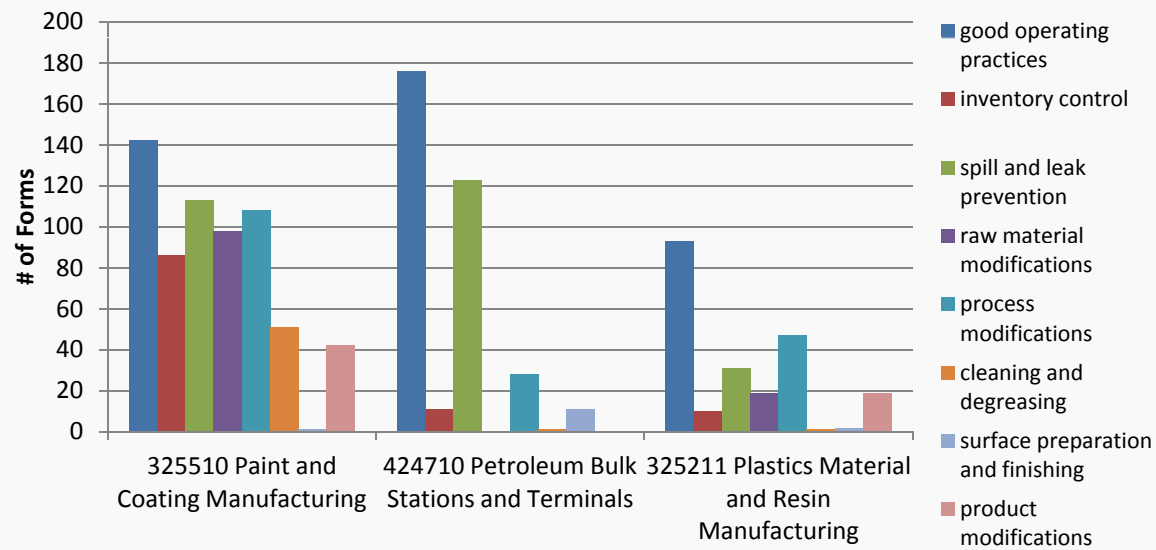
Top 3 Chemicals

Source Reduction Activity Reported in RY 2010





Top 3 Sectors Source Reduction Activity Reported in RY 2010





Top Sectors Reporting Source Reduction

Sector	Examples of Reported Source Reduction Activities
Paint and Coating Manufacturing	<ul style="list-style-type: none"> • Replaced xylene with recycled toluene for some cleaning operations. • Reduced waste generated for several TRI-reportable chemicals by putting the samples collected for quality control checks back into the process.
Petroleum Bulk Stations and Terminals	<ul style="list-style-type: none"> • Installed emission reduction sleeves on slotted guidepoles for bulk storage tanks which reduced releases for numerous volatile chemicals. • Added secondary seals to external floating roof tanks to reduce releases of numerous volatile chemicals.
Plastics Material and Resin Manufacturing	<ul style="list-style-type: none"> • Employees suggested grouping small batch runs of similar colors to minimize toner impacts, thereby reducing Di(2-ethylhexyl) phthalate use and waste. • Identified an outside user for the solvent generated as-is through the solvent recovery process.
All Other Basic Organic Chemical Manufacturing	<ul style="list-style-type: none"> • A cross-functional team formed to review waste reduction activities. The benzoyl peroxide packaging equipment was changed to an improved design conveyor belt that reduced the waste generated. • Reduced the use of certain glycol ethers by increasing catalyst yield.
Fossil Fuel Electric Power Generation	<ul style="list-style-type: none"> • Reduced emissions by converting the facility's fuel oil system from #6 fuel oil to #2 fuel oil. • Reduced ammonia emissions by optimizing ammonia use and turbine performance by conducting preventative maintenance, automating ammonia injection, performing continuous dynamic tuning monitoring, and providing training to plant personnel on ammonia systems.



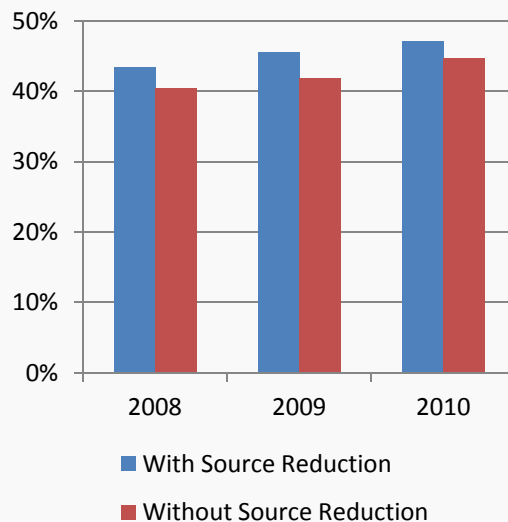
Comparison of Changes in Releases between Forms with Source Reduction and Forms without Source Reduction

- Forms were placed into two categories:
 - With Source Reduction in Section 8.10 or 8.11
 - Without Source Reduction
- Releases in the prior year:
 - Section 8.1
- Releases in the current year adjusted for changes in production:
 - Section 8.1 divided by the production ratio
- Remove production ratio outliers:
 - Limit universe to forms with production ratios between 0.5 and 2.



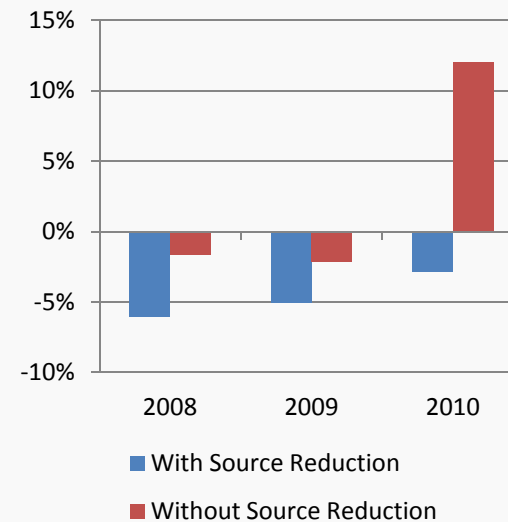
Changes in Reporting Between Forms With and Without Source Reduction

Forms with a Year-to-Year Decrease in Releases*



* Adjusted for production based on the reported production ratio

Year-to-Year % Change in Releases*



* Adjusted for production based on the reported production ratio



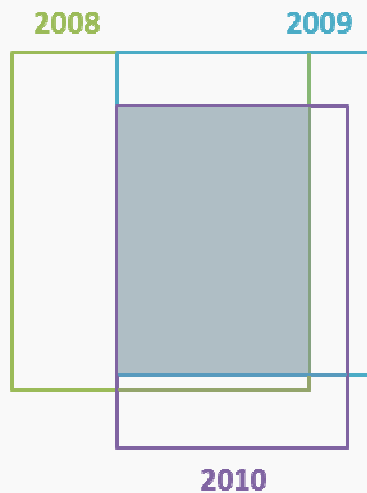
Change in Universe Reporting Source Reduction Across Reporting Years

- All forms with source reduction in RY2008-2010 were identified
- These forms were placed into seven categories:
 - Source Reduction in:
 1. RY2008 Only
 2. RY2009 Only
 3. RY2010 Only
 4. RY2008 and RY2009
 5. RY2008 and RY2010
 6. RY2009 and RY2010
 7. RY2008, RY2009, and RY2010

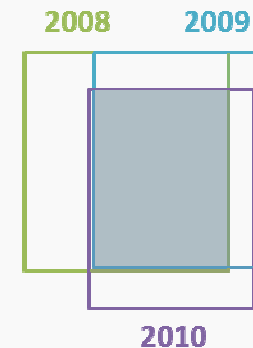


Change in Universe Reporting Source Reduction

Of the **9,097 facility-chemicals** with source reduction on a Form R in 2008, 2009, or 2010, **more than one third** (3,506; 39%) had source reduction in all three years.



Of the **4,019 facilities** with source reduction on a Form R in 2008, 2009, or 2010, **more than one third** (1,631; 41%) had source reduction in all three years.





Next Steps

- Form R Improvements
- Technology Transfer/Outreach
 - Make P2 information in TRI more easily accessible
 - Searchable by sector, by chemical, by geographic location, or by P2 category
 - For use by industry and communities
 - Incorporate into other tools (e.g., myRTK, ECHO, Envirofacts)



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