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Understanding Pollution from Small and Medium Enterprises: Where to Start?

**11th Canadian Pollution Prevention Roundtable
Winnipeg, MB - June 2007**

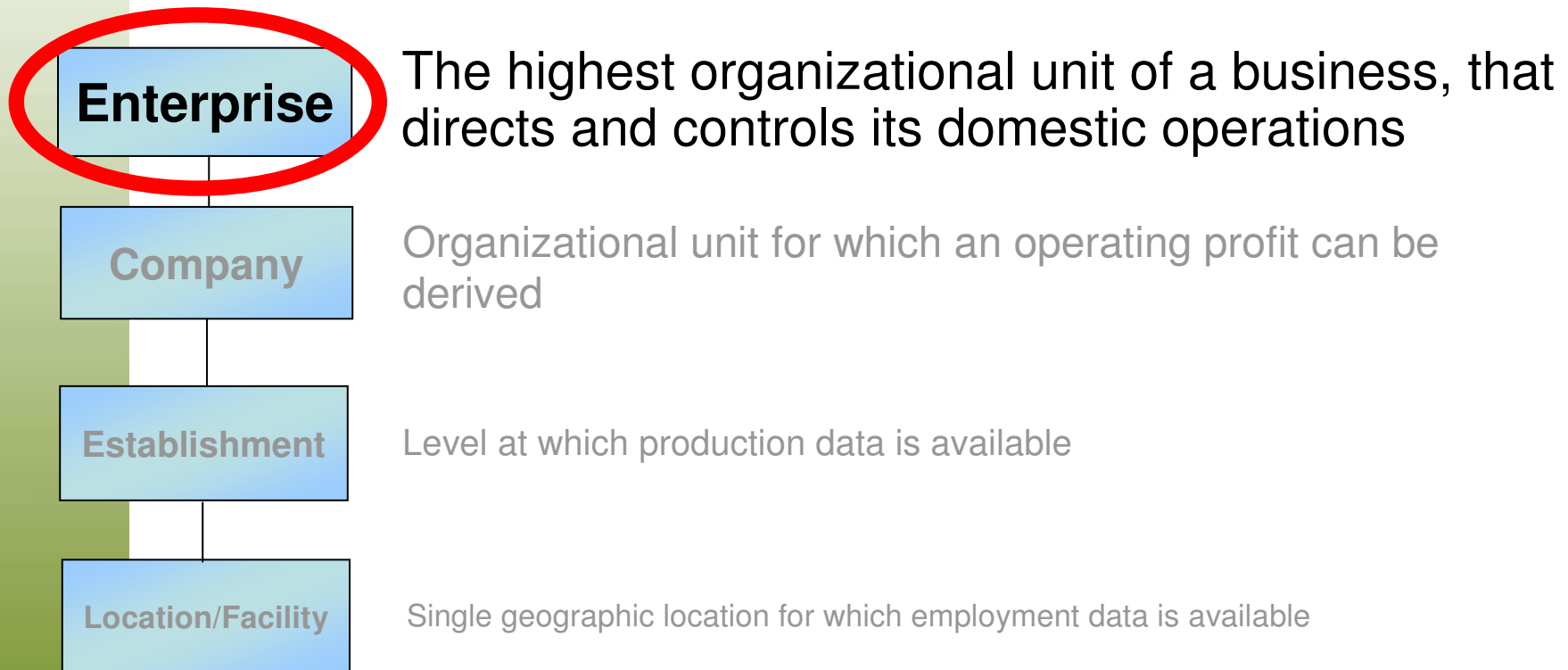
David Backstrom-
Environment Canada,
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Division

&

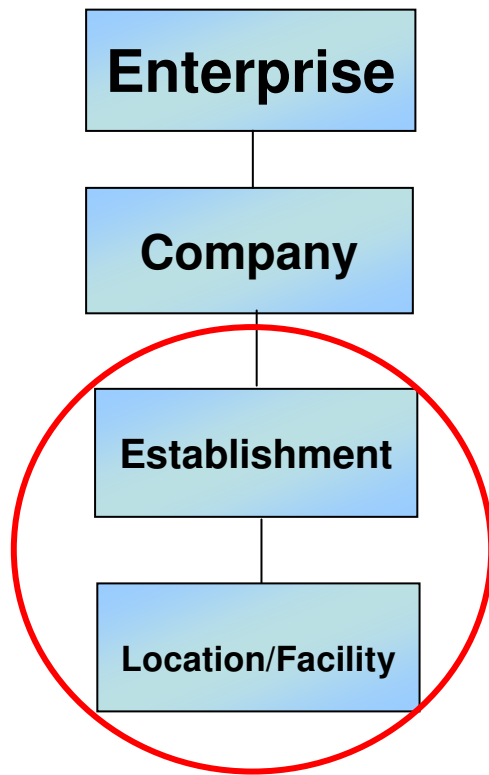
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According to Statistics Canada, SMEs are Enterprises (firms) with fewer than 500 employees...



Concern is growing about potential environmental impacts of SMEs, but limited information causes challenges for priority setting and policy development...



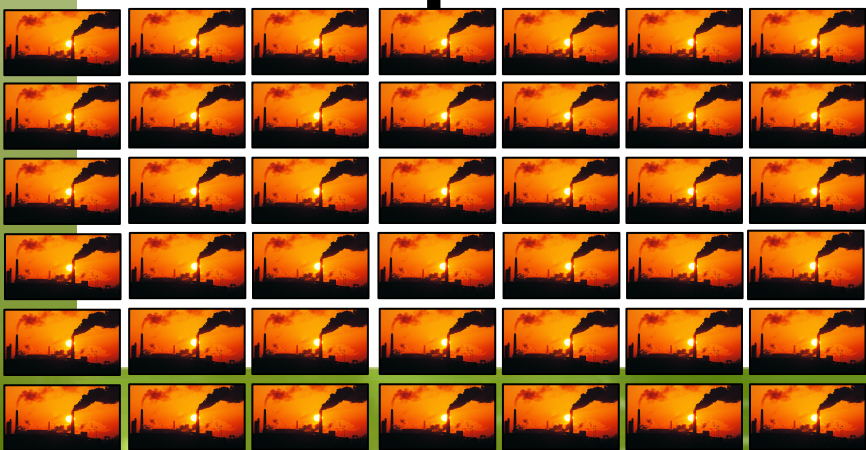
- Canada's National Pollutant Release Inventory (NPRI) and similar pollutant release & transfer registers in other countries, collect and publish data at the establishment/facility level, making enterprise-level analysis difficult.
- *Canadian and European studies, using facility-level data as a proxy for enterprises, have estimated that SMEs contribute as much as 70% of industrial pollution.*



“Facility Proxy” studies have not accounted for the fact that much of the pollution released to the environment by large enterprises (500+ employees) is actually from branch establishments with < 500 employees...

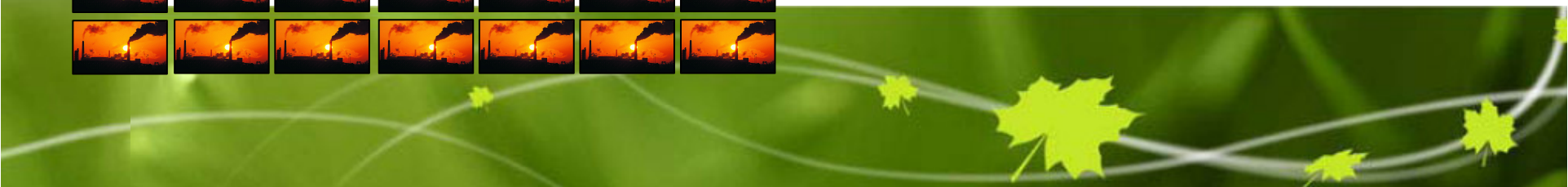
“Large Enterprise A”

Canadian Employees: 8,500+
Annual Revenue: \$3 Billion+
Establishments/Facilities: 50+
Pollutant Releases: 45,000 Tonnes



“SME B”

Canadian Employees: 237
Annual Revenue: \$13 Million
Establishments/Facilities: 3
Pollutant Releases: <100 Tonnes



Policy/program responses to SME pollution require accurate understanding of impacts

- Wide variation and uncertain methodologies of previous pollution estimates have hampered policy & program development
- Information on comparative performance between Canadian SMEs and large firms has not been available



Environment Canada staff have been working to reduce this information gap and support Canadian policy & program development by focusing on several key questions...

1. What is the contribution of SMEs to pollution in Canada?
 - a. Contribution of SMEs to pollutant releases reported through Canada's National Pollutant Release Inventory
 - b. Comparison of toxicity/hazard of releases versus total pollutant releases alone
 - c. Contribution of SMEs to "overall pollution" in Canada (including non-industrial pollution sources)
2. Compared with large firms, how are SMEs performing in terms of reducing or preventing pollution?
3. What insight does pollution prevention information reported to the NPRI provide about SME performance in Canada?



Methodology: Moving from Facility-Level to Enterprise-Level Analysis

- “Roll-up” from facilities to enterprises using business numbers and other company identifiers reported to NPRI
- Confirmation of enterprise-level employment totals using Dun & Bradstreet database and other data sources
- Result was database of NPRI facilities identified according to ownership by either a Small, Medium, or Large Enterprise.
- This dataset was then used for:
 - Trend analysis
 - Toxicity/Hazard analysis
 - Estimating industrial pollution not reported to the NPRI using federal and provincial comprehensive air emission inventories and Statistics Canada employment survey data
 - Analysis of P2 data reported to the NPRI



Data Sources...

Canadian National Pollutant Release Inventory (NPRI) / US Toxics Release Inventory (TRI)



- Annual reporting to EC by over 8,000 industrial & commercial facilities on releases and transfers of 300+ toxic, smog forming and other pollutants.
- Information on releases to air, water and land, and transfers to recycling & disposal.

Environment Canada & Ontario MOE Comprehensive Air Emission Inventories



+



- NPRI data for most industrial sources of key air pollutants, **plus** air emission estimates—based on economic, statistical and other data—for non-reported sources (e.g. residential, transportation, forest fires, agriculture)

Canadian business patterns / employment data from Statistics Canada and Dun & Bradstreet

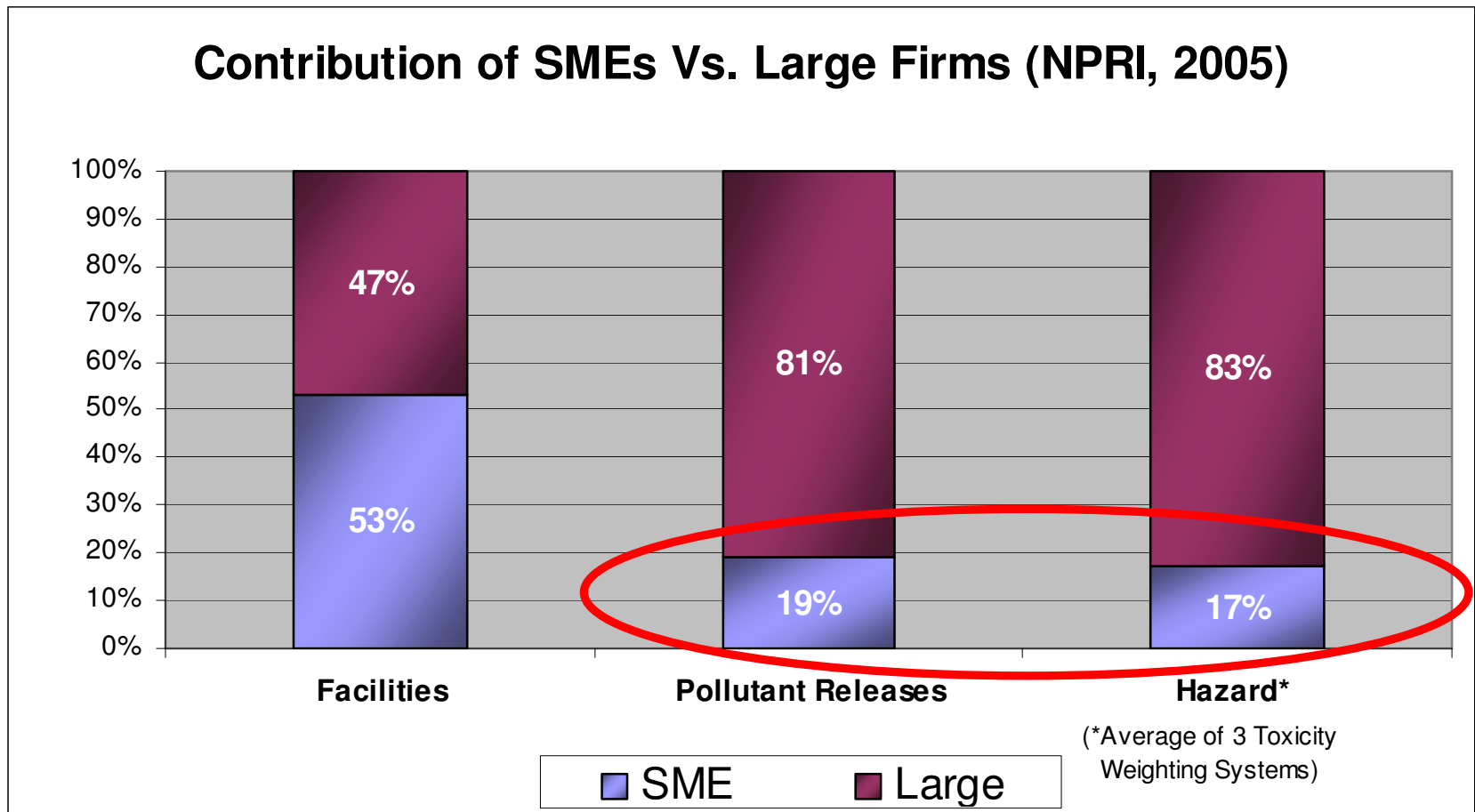




Results

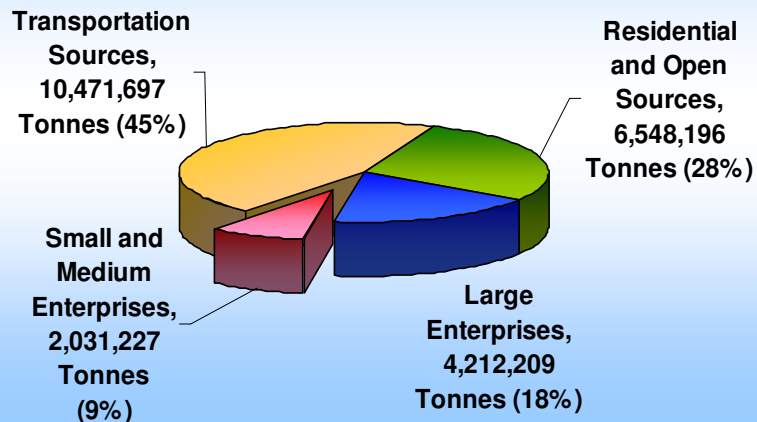


I. SMEs account for less than 20% of total pollutant releases reported to the NPRI...

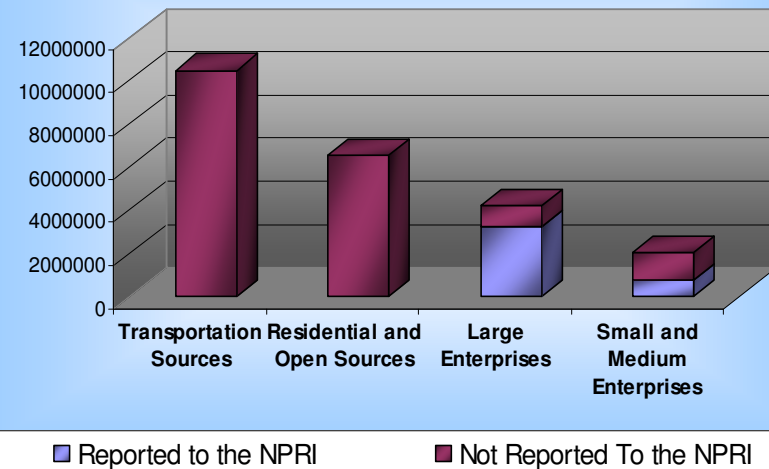


II. SMEs account for ~9% of total Canadian emissions of criteria air contaminants (main pollutants contributing to Smog and poor air quality) and ~33% of industrial emissions...

2002 CAC Emissions (NOX, SOX, VOC, CO and PM 2.5) by Source

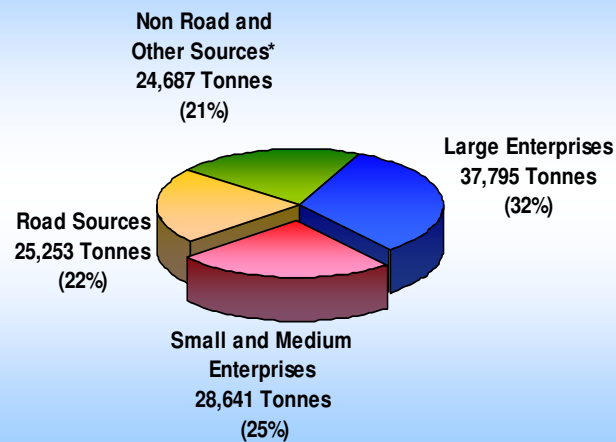


2002 CAC Emissions (NOX, SOX, VOCS, CO and PM2.5) by Source, in Tonnes



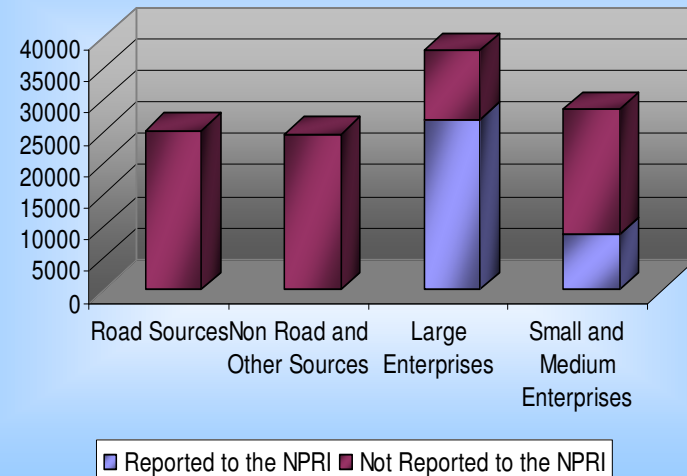
III. SMEs account for ~25% of total releases of other hazardous air pollutants, and ~40% of industrial releases...

2002 Non-CAC Emissions in Ontario, by Source in Tonnes

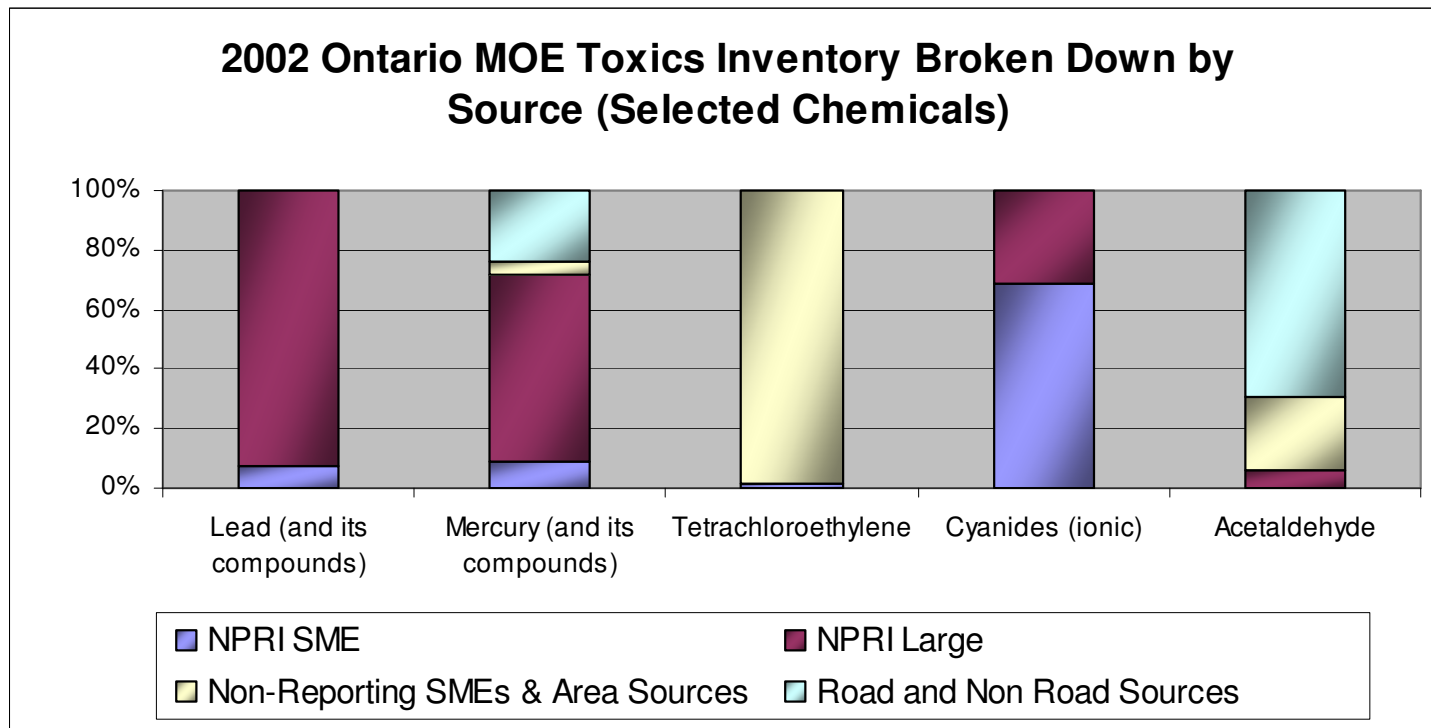


*Non-Industrial, commercial or institutional sources

2002 Non-CAC Emissions in Ontario, by Source in Tonnes

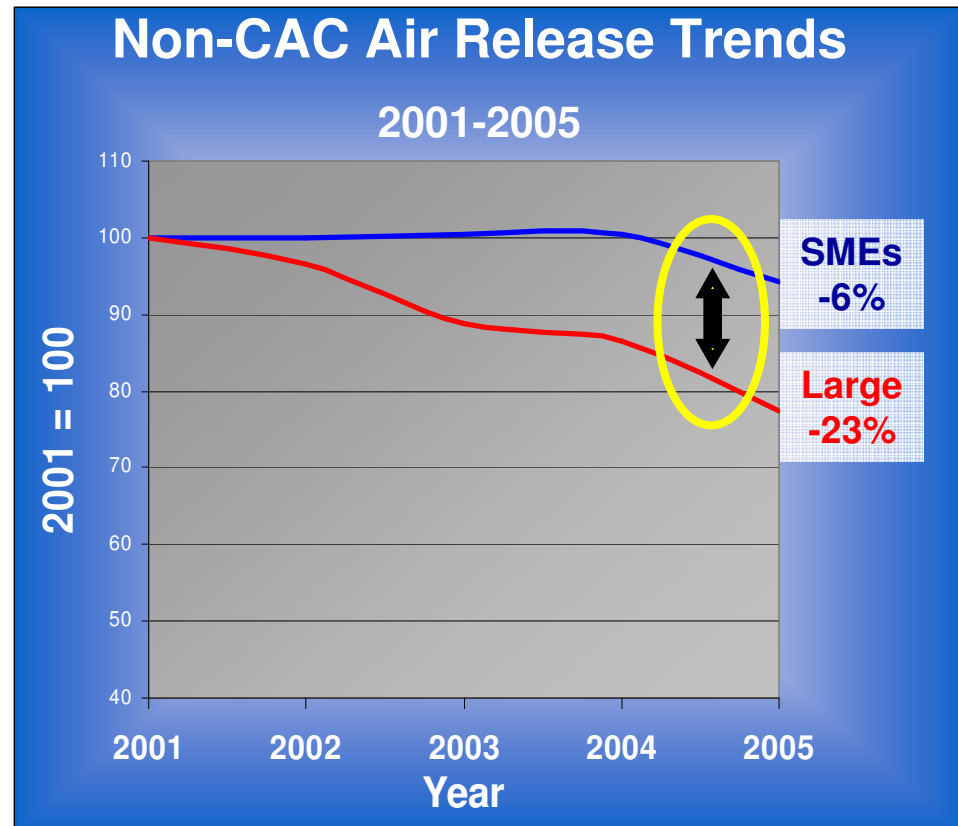


(Breakdown of pollutant releases by individual substances, however, shows a wide variation in the contribution of SMEs...)



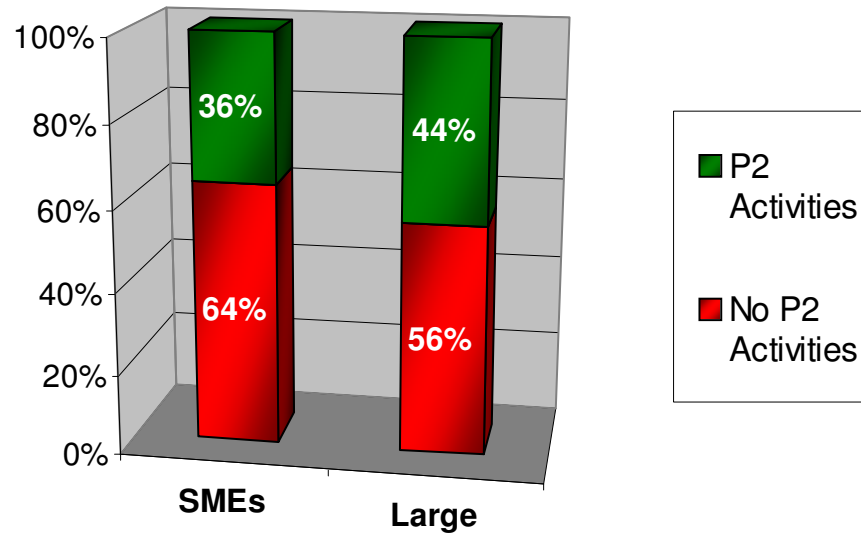
IV. SMEs are underperforming in terms of reducing releases of hazardous air pollutants...

- Comparative CAC, hazardous air pollutant, and water release trends were analysed
- Air releases reported by large-enterprise owned facilities decreased 17% more than for SME-owned facilities
- CAC and water release trends, however, indicate similar performance



V. SME-owned facilities report lower rates of engagement in pollution prevention activities...

% of Large Enterprise & SME-Owned Facilities Reporting Pollution Prevention Activities (NPRI, 2005)



Analysis Summary

- Previous estimates that small & medium *enterprises* account for 60-70% of total pollution are unsupported in the Canadian case.
- SME-owned facilities are:
 - A small source of CAC emissions in Canada (~9%) compared with transportation (45%) or large firms (18%), but do account for ~1/3 of industrial emissions;
 - A more significant contributor to non-CAC air releases (25%)—accounting for the majority of Canadian releases for some substances such as tetrachloroethylene (widely used in dry cleaning operations)



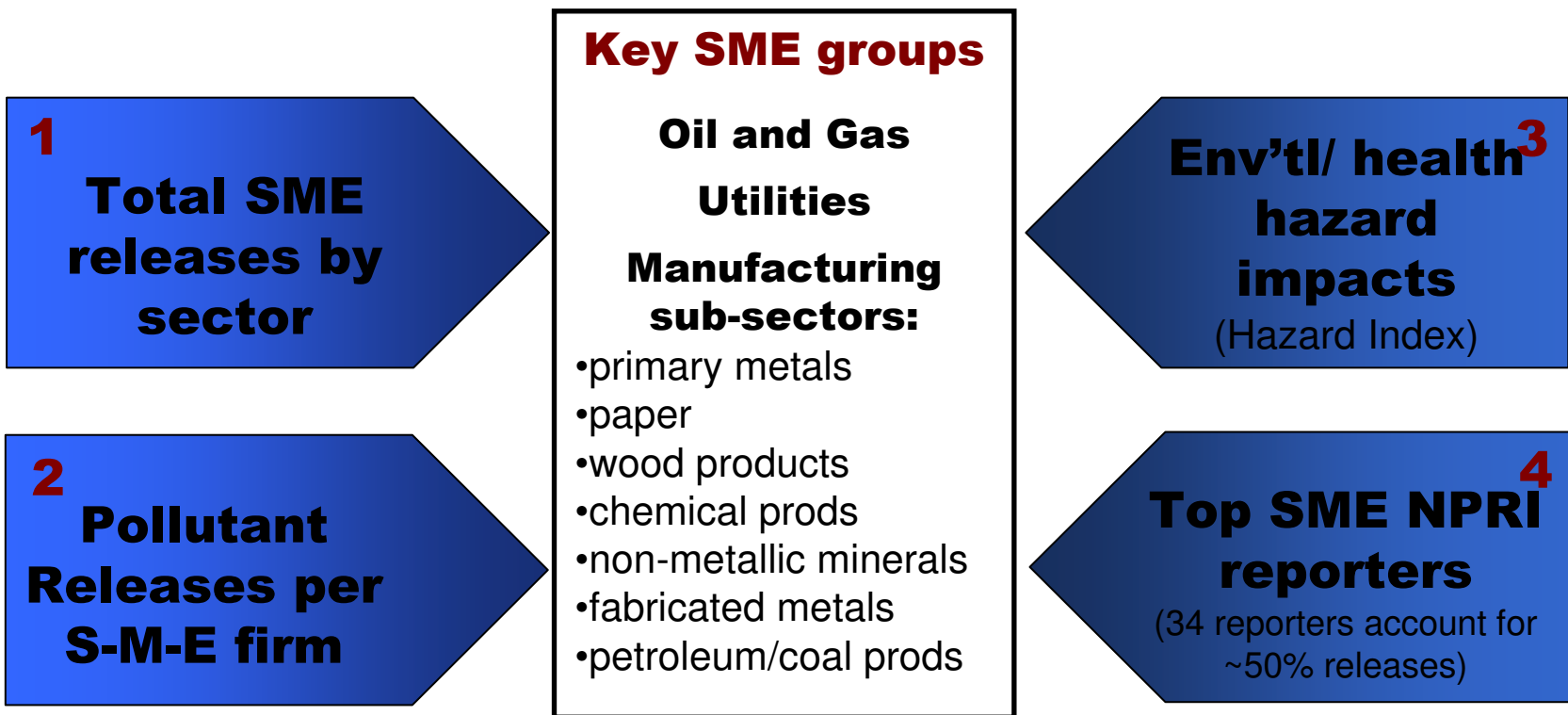
Analysis Summary (cont.)

- SME-owned facilities:
 - Are underperforming large firms in reducing emissions of (non-CAC) hazardous air pollutants, however; and
 - Report lower rates of engagement in P2 activities compared with large enterprise-owned facilities
- *Analysis indicates that efforts to engage SMEs are required, but initiatives should be strategically focused, and balanced with initiatives to target large enterprises and other non-industrial pollution sources*



Priority setting for SME Engagement

- Assessed SMEs across industrial sectors according to:



Sectors with high SME impacts and improvement opportunities

SME Releases Sectors	Total Releases	CACs	Non-CACs
Oil and Gas	30%	+32.5%	7%
Utilities	24%	20%	17%
Manufacturing 7 subsectors	35%	32.5%	50%
Cumulative	89%	+85%	74%

- Primary metals, chemicals, wood products, metal products account for +70% of SME hazard impacts
- 73% of impacts from wood products, paper, and non-metallic mineral manufacturing are not recycled or managed



Fostering SME Engagement: Green Business Network

- The GBN is a collaborative partnership through which government, industry, and NGOs are cooperating to help SMEs improve environmental performance and productivity:
 - Providing SME-tailored resources / tools to help SMEs derive business value from environmental performance
 - Enhancing coherence of existing/new SME programming
 - Increasing SME engagement through partners credible to SMEs (industry associations, supply chains)
 - Leveraging existing infrastructure/resources on projects of mutual interest
- The GBN is driven by partners' converging priorities





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Thank you!

Interested partners are invited to contact the
Green Business Network at:

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Strategic Priorities Directorate, Environment Canada

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For more information on SME pollution analysis,
contact:

David Backstrom

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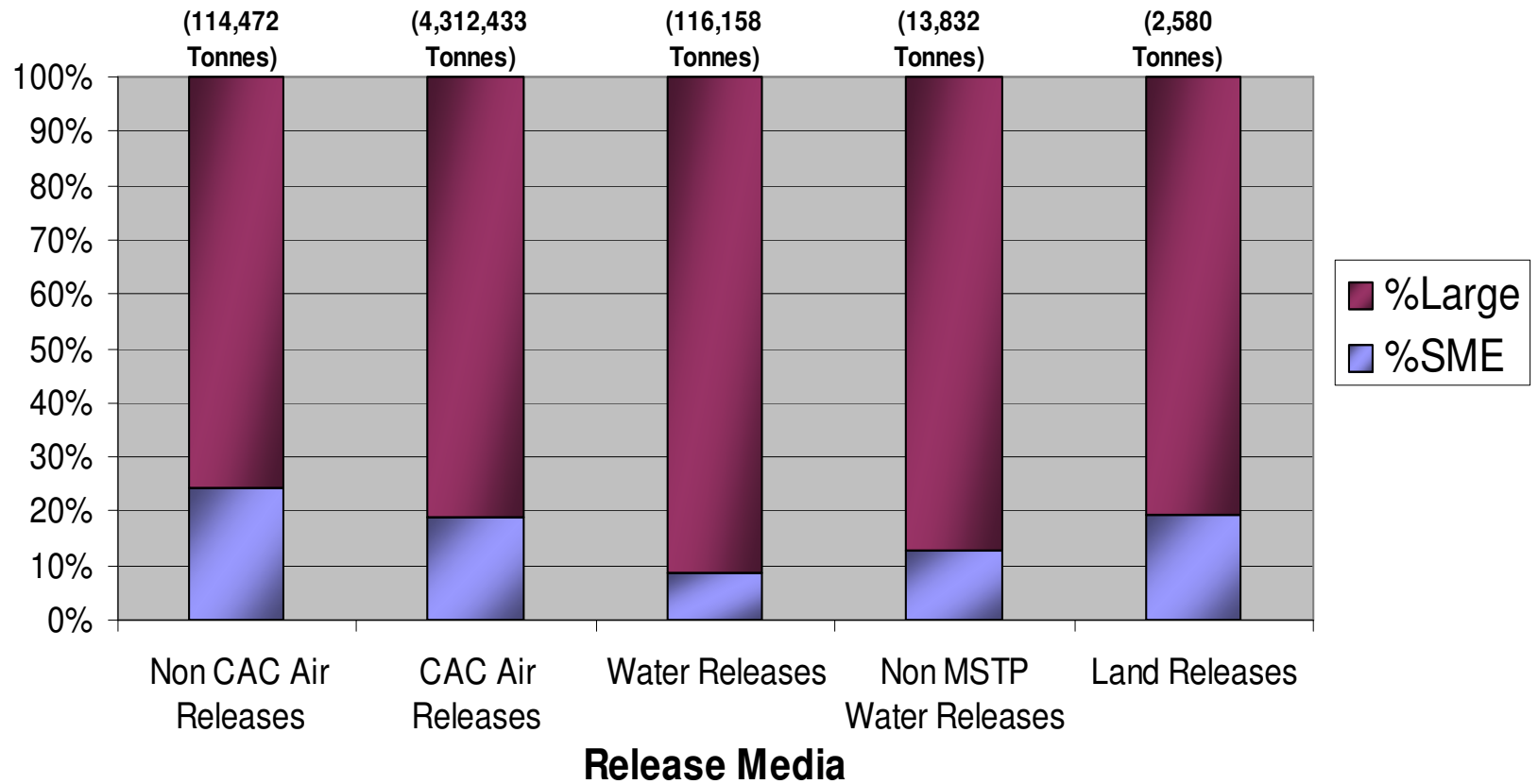
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Annex

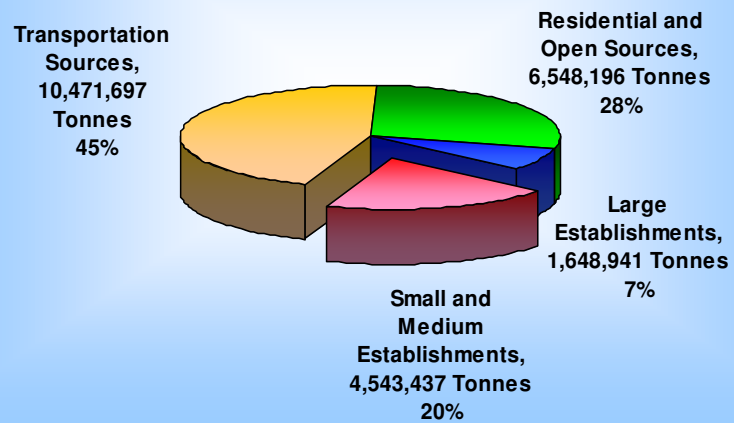


2005 NPRI Reported Releases by Media: SMEs and Large Enterprises

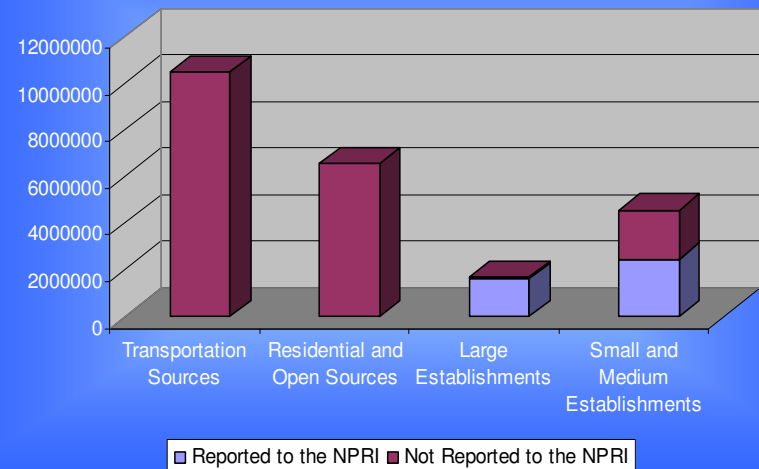


Establishment-Level Analysis:

2002 CAC Air Emissions, by Source (CO, VOC, Nox, Sox, PM 2.5)

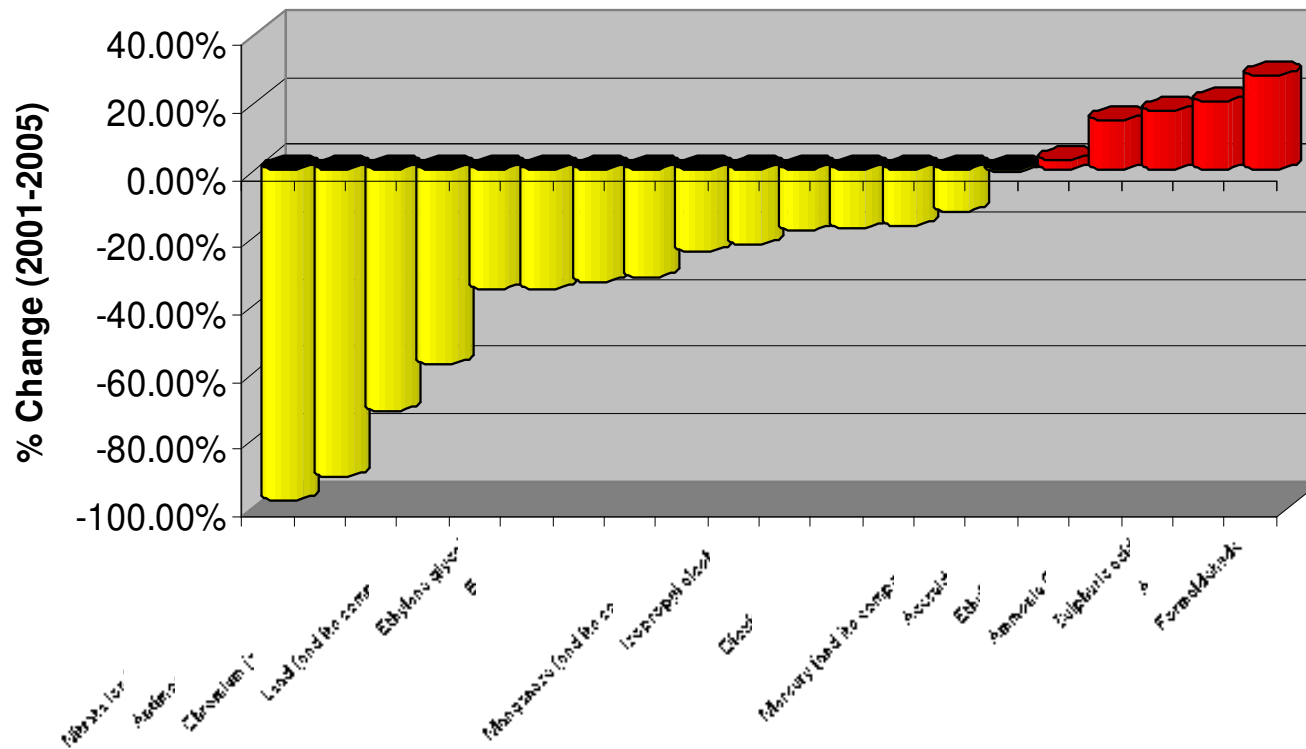


2002 CAC Air Emissions, by Source (CO, NOx, SOx, VOC, PM 2.5)



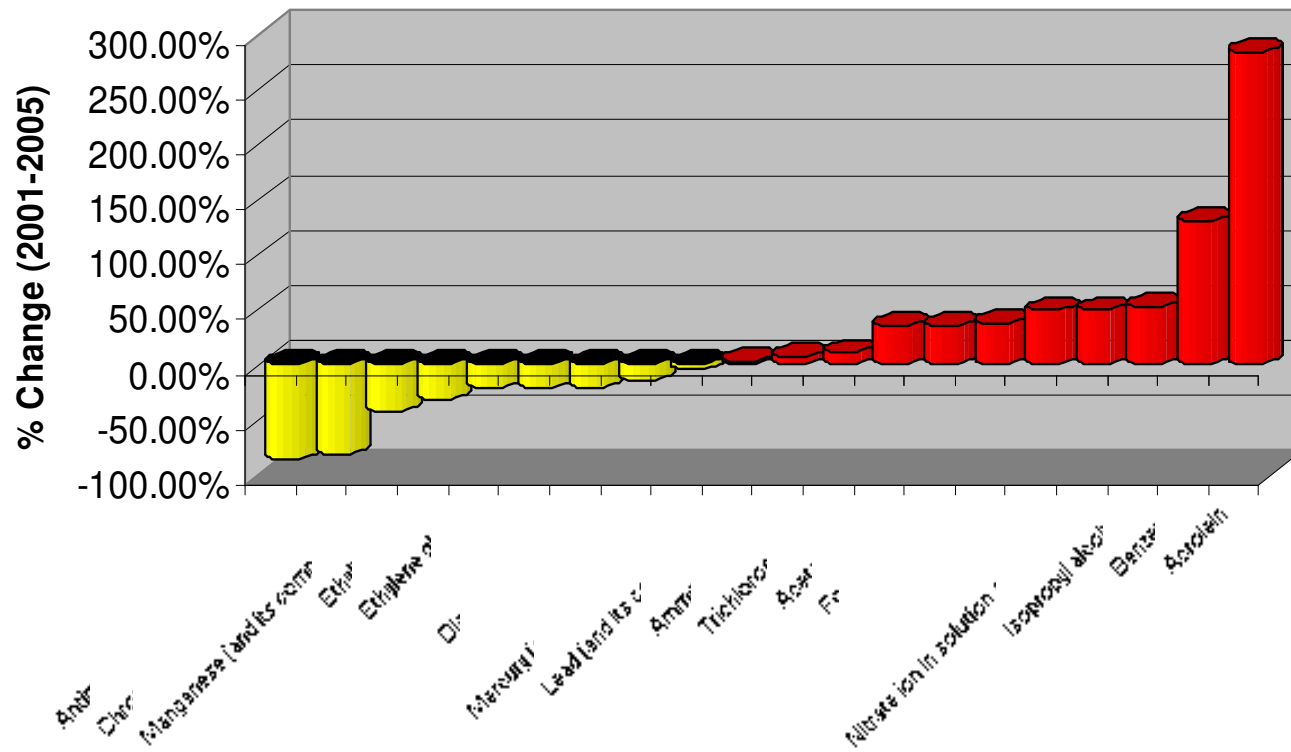
Individual Substance Trends- Large Enterprises

Individual Substance Trends for Pollutant Releases Reported to the NPRI by Large Enterprise-Owned Facilities (2001-2005)



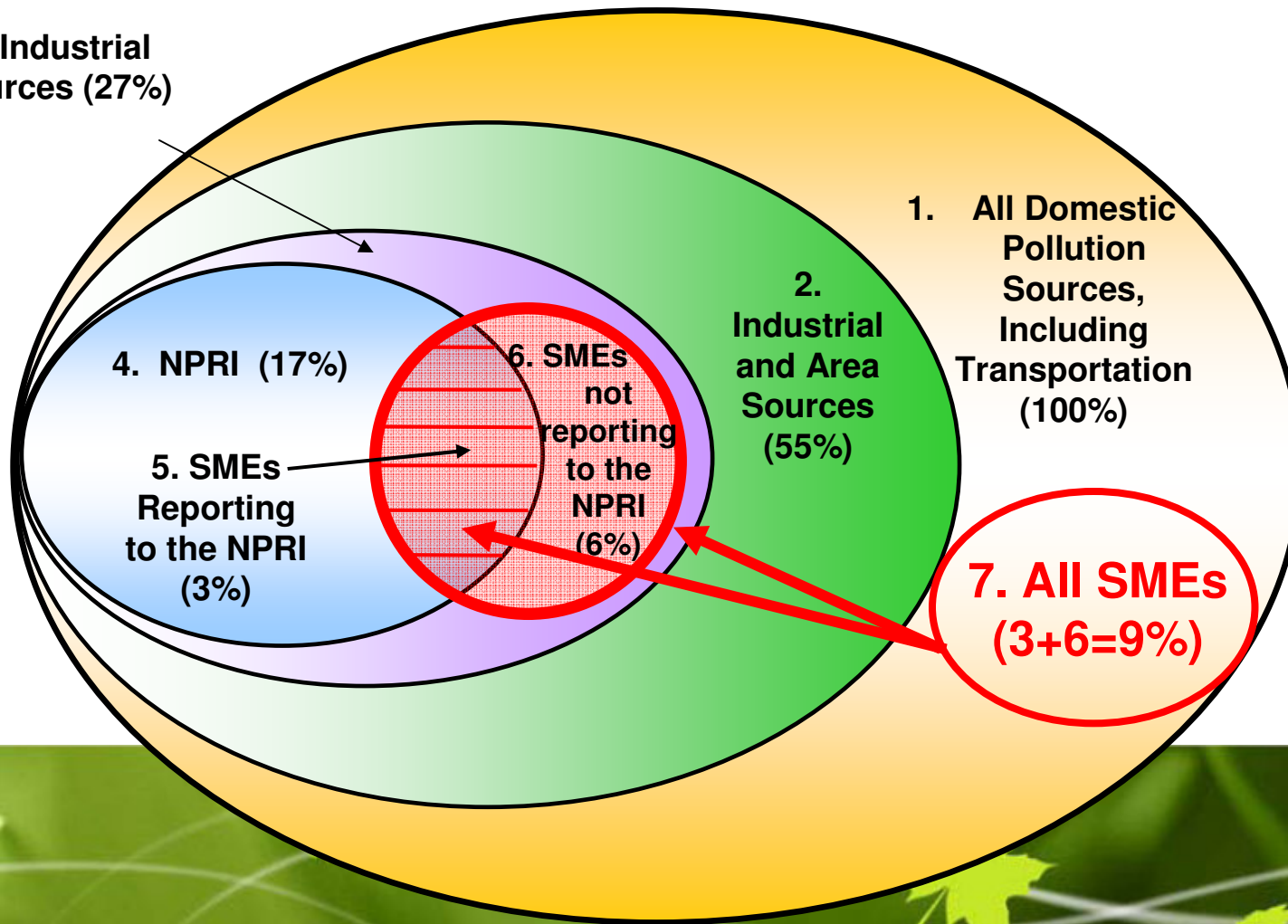
Individual Substance Trends- SMEs

Individual Substance Trends for Pollutant Releases Reported to the NPRI by SME-Owned Facilities (2001-2005)



[Alternative Perspective for CAC Emissions...]

3. Industrial Sources (27%)



4. NPRI (17%)

5. SMEs Reporting to the NPRI (3%)

6. SMEs not reporting to the NPRI (6%)

1. All Domestic Pollution Sources, Including Transportation (100%)

2. Industrial and Area Sources (55%)

7. All SMEs (3+6=9%)

[Alternative Perspective for Non-CAC Air Releases...]

[Based on comparative analysis of the NPRI and 84 matching substances of the 2002 Ontario MOE Toxic Air Emissions Inventory...]

