

# Candidate Control Measures for Auto Body Refinishing



Regional Air Quality Workshop

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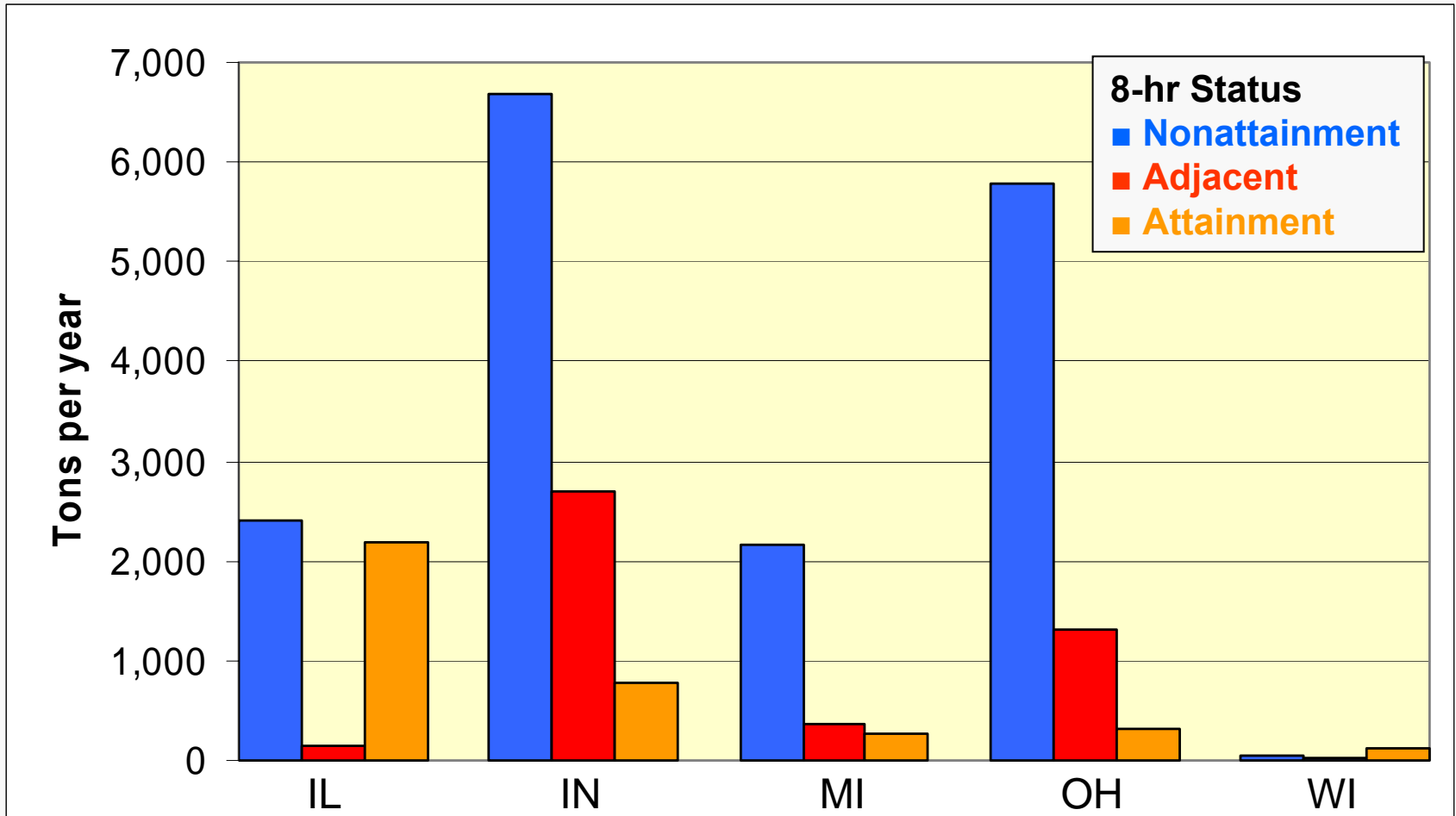
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# Category Description: Auto Refinishing

- Application of coatings subsequent to original equipment manufacture (OEM)
  - (i.e., coating of new cars is not included in this category).
- Majority of these operations occur at small body shops that repair and refinish automobiles
- Auto refinishing applications include:
  - Washes
  - Primers
  - Primer sealers
  - Topcoats
  - Cleanup solvents
- VOC emissions result from the evaporation of solvents during application, curing, and cleanup
- Account for about 1.0% of the total anthropogenic VOC emissions in the MRPO region in 2002

# VOC Emissions By State – Auto Refinishing



# Regulatory History: Auto Refinishing Federal Efforts

- EPA published an Alternative Control Technique (ACT) document for automobile refinishing in May 1994
  - Improve transfer efficiency
- EPA published the Auto Refinish Coatings rule on Sept. 11, 1998 (40 CFR Part 59 Subpart B)
  - Limits VOC content in coatings
  - Reduce VOC by 37% nationwide
- EPA Urban Air Toxics Strategy
  - Identified auto refinishing as an area source category
  - Scheduled to propose rule in 2007 and finalize it by Aug. 2008
- EPA Design for the Environment Program
  - Promoting pollution prevention and best practices/technology

# Regulatory History: Auto Refinishing

## Non-MRPO State Rules

- SCAQMD and BAAQMD adopted Rules in late 1980s
  - VOC content limits more stringent than the national Part 59 limits
  - Require the use of electrostatic or high-volume low-pressure (HVLP) spray application techniques
  - Require storing solvent laden materials in closed containers
  - Require using a coating applicator cleaning device that recirculates solvent, recovers spent solvent, and minimizes evaporation
  - SCAQMD Rule 1151 is the most stringent CA district rule
- Ozone Transport Commission (OTC) Model Rule
  - Use of high transfer-efficiency painting methods (e.g., HVLP)
  - Controls on emissions from equipment (e.g., spray gun) cleaning,
  - Housekeeping activities (e.g., sealed containers for clean-up rags)
  - Operator training
  - Same VOC content limits as Federal rule
    - except for slightly more stringent limits for primer/surfacer coatings and three- or four-stage topcoats
  - Incremental control effectiveness of 38% beyond national rule
  - Implemented in virtually all OTC states

# Regulatory History: Auto Refinishing MRPO State Rules

- Illinois, Indiana, and Wisconsin have adopted rules
  - Limited to the 1-hour ozone nonattainment counties
  - Include VOC limits that mirror the Subpart B
  - Include requirements similar to the OTC model rule for use of high transfer-efficiency painting methods and controls on emissions from equipment cleaning, housekeeping activities, and operator training.
  - Wisconsin rule is estimated to reduce emissions by 55% from uncontrolled levels
- No requirements beyond the Federal Part 59 were identified in Michigan and Ohio
- Michigan DEQ has initiated a voluntary auto body refinishing compliance assistance program
  - Have not been able to quantify VOC reductions from voluntary program

# Available Control Measures: Auto Refinishing

- Using lower-VOC coatings
- Improving transfer efficiency of spray guns
- Using lower-VOC cleaning solvents
- Using enclosed cleaning devices to minimize solvent evaporation during equipment cleaning

# Candidate Control Measures: Auto Refinishing

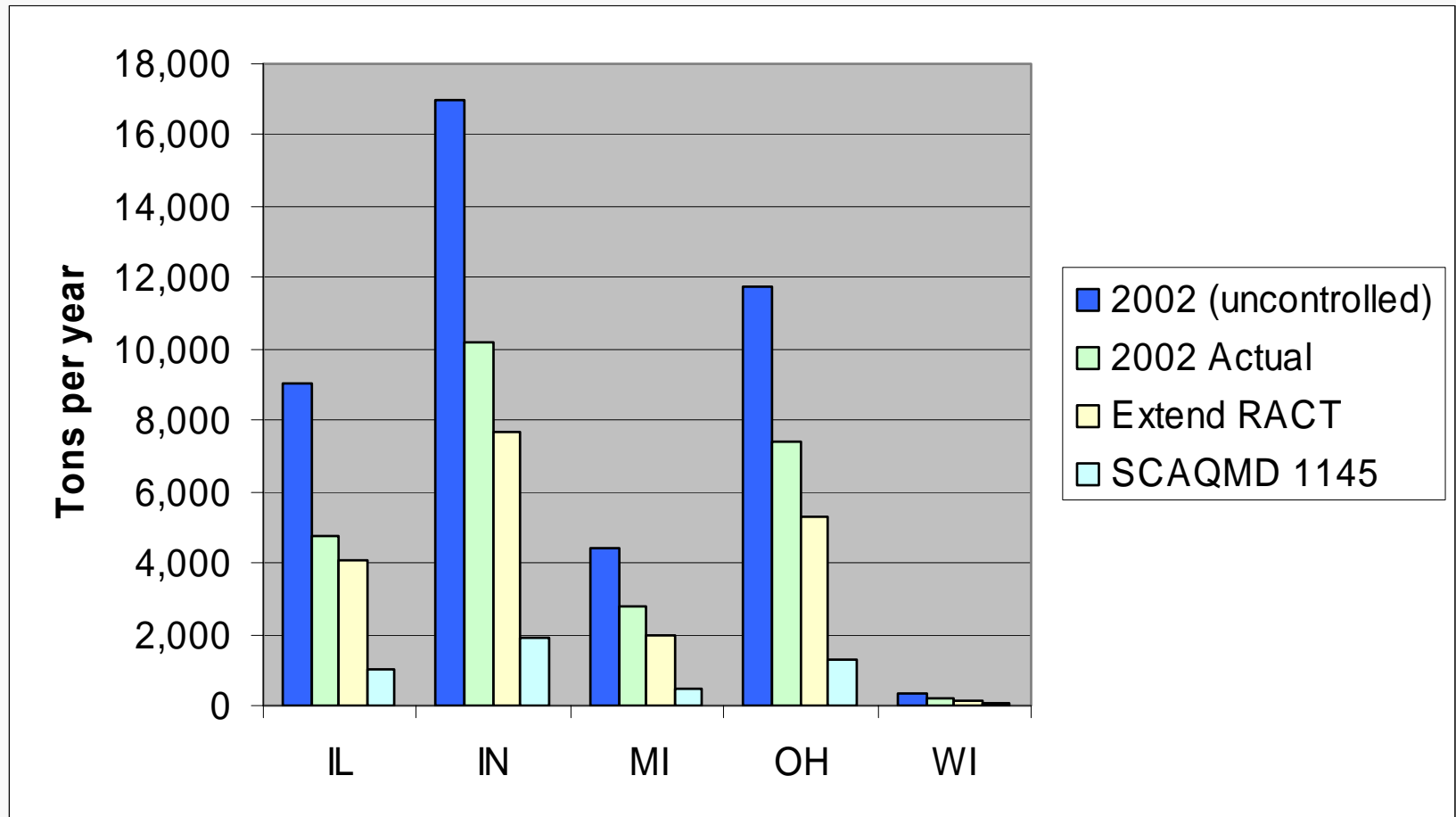
- *Measure SOLV4A – Extend the existing IL/IN/WI RACT regulations beyond 1-hr nonattainment counties*
  - Extend existing RACT rules for the 1-hr nonattainment counties to additional areas. Three options are considered:
    - All 8-hr nonattainment counties
    - All counties in or adjacent to an 8-hr nonattainment area
    - All counties in the MRPO region.
  - 29% percent additional reduction will be applied beyond the 37% percent reduction obtained from the Federal Part 59 rule (i.e., a 55% reduction from uncontrolled VOC emissions).
  - No incremental reduction in the 1-hr nonattainment counties where the existing RACT rules are currently in place.



# Candidate Control Measures: Auto Refinishing

- *Measure SOLV4B – Adopt More Stringent RACT regulations based on SCAQMD 1145*
  - VOC content limits in the SCAQMD rule are more stringent than the federal rule, the OTC model rule, and the existing IL/IN/WI RACT rules for several types of auto refinish coatings.
  - Adoption of a rule similar to SCAQMD Rule 1151 would result in an emissions reduction of 89% from uncontrolled levels.
  - Three geographic options considered:
    - All 8-hr nonattainment counties
    - All counties in or adjacent to an 8-hr nonattainment area
    - All counties in the MRPO region

# VOC Emissions For Auto Refinishing Candidate Control Measures



# Cost Effectiveness: Auto Refinishing

- OTC Model Rule - \$1,345 per ton VOC
  - Existing IL/IN/WI RACT rules should have similar costs
- SCAQMD Rule 1151 - \$7,200 per ton VOC
  - BAAQMD also notes that high-solids low-VOC clear coats are now available at lower cost than the conventional materials, and the reducer or thinner used is also less expensive

# Other Issues: Auto Refinishing

- Timing for reductions
  - Ozone SIPs in 2007, RACT compliance achieved by 2009
- Geographic applicability – options:
  - All 8-hr nonattainment counties
  - All counties in or adjacent to an 8-hr nonattainment area
  - All counties in the MRPO region
- Rule Effectiveness and Rule Penetration
  - Rule effectiveness (RE) is an adjustment to account for failures and uncertainties that affect the actual performance of the control measure
    - Because emissions will be controlled via reformulations, the EIIIP guidance recommends that the rule effectiveness (RE) can be assumed to be 100 percent for all coating types affected by the rule
  - Rule penetration (RP) is the percentage of the area source category that is expected to be complying with the regulation
    - Assume all products will be expected to comply by 2009, so the rule penetration (RP) is estimated to be 100 percent

# Ohio Perspective on Auto Refinishing



# Proposed Ohio Regs

- Current agreement ends program in Cincinnati on December 31, 2005
- Ozone season from May 1 to September 30
- E-check ending means increase in VOC and NOx emissions during the season
- The 8-hour ozone anti-backsliding provision requires replacement of the VOC and NOx E-check reductions via new control strategies

# Control Strategies

- VOC and NOx
- TPD reduction needed for each with loss of E-check – 5.2 TPD VOC and 4.4 TPD NOx
- NOx/VOC ratio of 2.1 : 1
- Federal criteria for emission reductions to compensate for the control measure being removed: equivalent or greater, contemporaneous, permanent, enforceable, quantifiable and surplus

# VOC Control Strategies

- Final selection of controls measures and reductions:
  - Low Reid vapor pressure gasoline – 4.6 TPD VOC
  - Vapor pressure solvent limit for cold cleaners - 2.3 TPD VOC
  - Mobile equipment refinishing emission reduction via high transfer efficiency spray guns (HVLPs) – 0.40 TPD VOC



# Control Strategies

- Mobile equipment refinishing emission reduction via high transfer efficiency spray guns (HVLPs)
- Auto body refinishing includes the application of coatings subsequent to original equipment manufacture (OEM).
- The primary reduction in VOC emissions from these operations will occur when higher transfer efficiency equipment such as high volume low pressure (HVLP) spray guns or equivalents (65% eff.) are used for the painting operations along with improved storage and work practices.
- This control strategy has also been used in other parts of the country and more specifically in Northern Kentucky as a substitute for the vehicle emissions inspections which have also been eliminated there.

# Control Strategies

- Mobile equipment refinishing emission reduction via high transfer efficiency spray guns (HVLPs)
- It has been determined that this control strategy will reduce VOC emissions in the Cincinnati non-attainment area by .40 tons/day (TPD) during the ozone season (May-October)
- The estimated cost per ton of VOC reduced based on the use of HVLP spray guns and a gun cleaning system is \$1354.

# Ohio Draft Rule

- OAC rule 3745-21-18, Commercial Motor Vehicle and Mobile Equipment Refinishing Operations
- Currently going into IP review
- Modeled after N. Kentucky rules and OTC Model rule
- Commercial operation vs less than 20 gallons/yr (Ill.)

# Questions? Auto Refinishing

