Projection of Future Year Emissions from a Base-Year Toxics Emission Inventory

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Why Project Toxics?

• Show progress of programs – the big picture
• Help set priorities for future programs, along with other analyses
• Determine impacts of potential emission reduction strategies – “what if” scenarios
Current Projection Methodology For Toxics

Stationary Source Emissions (point, non-point):

Mobile Source Emissions

EMS-HAP

Less automated Methodology based on Mobile toxics models and VOC and PM inventories (details in http://www.epa.gov/otaq/toxics.htm#regswww.epa.gov/otaq/)
Overview of EMS-HAP Functions

- Emissions Inventory
  - QA Locations
    - Convert Locations to Air Dispersion Model Coordinate Units
      - QA and/or Default Point Source Stack Parameters
        - Retain Desired Pollutants
          - Spatially Allocate non-point source emissions
            - Temporally Allocate Emissions
              - Project Emissions
                - Assign Source Groupings
                  - Format & Output Air Dispersion Model-Ready Emission-Related Inputs

Re-Project Emissions?

YES

NO
EMS-HAP’s Projection
Algorithm

Temporally Allocated Emissions

MACT Growth

SIC Growth

SIC-linked Growth

General MACT Reductions

Specific MACT Reductions

User Defined Reductions

Projected Inventory
Two Ancillary Growth Factor Files

- Temporally Allocated Emissions
  - MACT Growth
    - Growth factors by MACT code for a specific base and projection year
  - SIC Growth
    - Growth factors by SIC and SIC-link for a specific base and projection year
  - SIC-linked Growth

- General MACT Reductions
- Specific MACT Reductions
- User Defined Reductions

Projected Inventory
Assignment and Application of Growth Factors

Assigned on National, State, or County level

- **MACT-based Growth Factors**
  - Based on MACT category code

- **2-digit SIC-based Growth Factors**
  - Based on first 2 digits of SIC code

- **“SIC-linked” Growth Factors**
  - Match 8 digit SCC to 2-digit SIC for point
  - Match category name to 2-digit SIC or 4-character ‘pseudo-SIC’ code (e.g. Consumer Products).

*MACT-based growth factors are NEVER replaced by SIC-based growth factors*
Overview of Growth Options

- No Growth
- MACT
- SIC
- SIC-linked

No Growth

MACT

SIC

MACT & SIC

SIC & SIC-linked

MACT, SIC, & SIC-linked
Two Ancillary MACT Files For MACT Reductions

Temporally Allocated Emissions

MACT Growth

SIC Growth

SIC-linked Growth

General MACT Reductions

Specific MACT Reductions

User Defined Reductions

Projected Inventory

Reduction Percentages by MACT code

Reduction Percentages by MACT code and pollutant and/or process
Basic Variables Used to Reduce Emissions

• Two Reduction Efficiencies: Existing and New Sources

• Percentage of Emissions at Existing Sources expected to come from New sources

• Application Reduction Flag
  Determines whether or not to apply reductions

• Source Reduction Flag
  Applies reductions to particular source types

• Compliance Year and/or Bin
  Used to determine if standard is in effect for the entire future year
## Assignment Order for Applying MACT Reduction Information

<table>
<thead>
<tr>
<th>Assignment Order</th>
<th>MACT</th>
<th>HAP</th>
<th>6-digit SCC</th>
<th>8-digit SCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (least specific)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6 (most specific: supercedes all others)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*Most Specific MACT-based information possible when projecting the non-point inventory*
Temporally Allocated Emissions

MACT Growth

SIC Growth

SIC-linked Growth

General MACT Reductions

Specific MACT Reductions

User Defined Reductions

Projected Inventory

Reduction Percentages by facility, process, county, HAP, or various combinations
Applying User-defined Reduction Information

For Point Inventory

EMS-HAP applies MOST SPECIFIC of 36 possible combinations of: ACT_ID, MACT, SIC, SCC, HAP, and County-code information

For Non-point Inventory

EMS-HAP applies MOST SPECIFIC of 8 possible combinations of: Category name, MACT, HAP, and County-code information
Input Data For EMS-HAP

Toxics Emissions Inventory

• 1996 NTI -point & non-point
• Detailed Local Scale Inventory – point & non-point (formatted similar to 1996 NTI)

Growth Factors and Emission Reductions

• EGAS -- Economic Growth and Analysis System (v4.0)
• Emission reductions from MACT program, other programs that effect toxics emissions

For a local-scale projection, facility-specific MACT reductions should be used
Example Application: 2 Future Years

Demonstrates Progress of Programs

Base Year
Future #1
Future #2
Future #2-no Reduction
Limitations

• Inputs should be reliable to get meaningful results

• Not really designed to project mobile inventories

• Growth cannot be applied on facility level
Conclusions

• EMS-HAP can project emissions inventories using multiple reduction strategy scenarios

• Growth is MACT and SIC based and can be applied on a national, state, or county basis

• Projected emissions can be fed into ISCST3 or ASPEN air quality dispersion models