Overview

- **Background**
  - Two Forecasting Components – Emission Activity & Emission Rates (via Emission Control %)
  - EPA 2006 PM NAAQS Regulatory Impact Analysis

- **Ongoing LADCO Region Study**
  - Review Historical Data to Inform Forecasts of Emission Activity and Emission Rates
  - Methods/Sample Analyses
  - Next Steps
Background

- Equation Typically Used:
  \[ \text{Forecast Year Emissions} = \text{Base Year Emissions} \times \text{Emission Activity Change} \times \text{Emission Control Change} \]

- Challenges
  - How Good are We at Projecting Future Activity Levels?
  - How Good are We at Projecting Future Emission Rates?
Background (cont’d)

- Emission Activity Projections
  - EGAS Defaults—Typically Use Regional/National Fuel Consumption Projections from DOE or State-level Industry Sector Sales Projections from REMI
  - How Closely Do Growth Surrogates Match Each Emission Activity?
  - How Well Do the Surrogate Forecasts Project Actual Emission Activity Changes?
Background (cont’d)

- Emission Rate Projections
  - Model Available Estimates of Emission Reductions from “On-the-Books” Controls
  - Limitations
    - Reduction estimates not available for certain controls (e.g., New Source Performance Stds.)
    - Unanticipated control programs
    - Other emission rate reductions (i.e., reductions from technology/process changes not mandated by emission control programs)
Background (cont’d)

- EPA 2006 PM NAAQS Regulatory Impact Analysis
  - Non-EGU Stationary Source Emissions
    - Comparison of total NOx and SO2: NEI actual vs. forecast from 1997 PM NAAQS RIA
EPA 2006 PM NAAQS
Regulatory Impact Analysis

- Non-EGU Stationary Source Emission Trends

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1 Emissions shown reflect non-utility stationary point and non-point sources only, excluding fires. Source: National Emissions Inventory
EPA 2006 PM NAAQS Regulatory Impact Analysis (cont’d)

- Comparison of Total NOx and SO2: NEI Actual vs. Forecast from 1997 PM NAAQS RIA

1 Sources: National Emissions Inventory and Regulatory Impact Analysis for the Ozone and PM NAAQS, 1997.
EPA 2006 PM NAAQS Regulatory Impact Analysis (cont’d)

- Interim Forecasting Approach-No Emissions Growth
- Future Projection Improvements Based on Category-Specific Analyses
LADCO Emission Activity Trend Analysis

- Use as “Reality Check”/to Improve Upon Current Default Activity Forecast
  - Source Category Prioritization
    - Magnitude of projected emissions increase
    - Availability/ease of compiling historical data
LADCO Emission Activity Trend Analysis (cont’d)

- Activity Trend Analysis Data Sources
  - Inventory Throughput
  - Earlier Versions of Data Sources Used to Develop Base Year Inventory
  - Other, Including Government/Trade Association Sources (e.g., U.S. Geological Survey Cement Production Statistics)
Sample Emission Activity Trend Analysis – Industrial Natural Gas

Consumption in billion cubic feet

Year

LADCO Region Actual  AEO 2001  AEO 1998
## LADCO Industrial Natural Gas Trend Analysis (cont’d)

<table>
<thead>
<tr>
<th>Source</th>
<th>2004 Consumption (trillion cu ft)</th>
<th>% Difference vs. Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>LADCO Region Actual</td>
<td>1,285</td>
<td></td>
</tr>
<tr>
<td>Projected from 1996 (AEO 1998)</td>
<td>1,667</td>
<td>+30%</td>
</tr>
<tr>
<td>Projected from 1999 (AEO 2001)</td>
<td>1,651</td>
<td>+28%</td>
</tr>
</tbody>
</table>
LADCO Emission Trend Analysis

❖ Use as “Reality Check”/to Improve Upon Current Modeling of Emission Rate Changes

❖ Source Category Prioritization
  » Point sources
  » Size of historical emission reductions
  » Existence of control in historical period
  » Known emission estimation changes
Sample LADCO Emission Trend Analysis

Throughput

NOx Uncontrolled

NOx Controlled

5.0%

8.0%
Next Steps

- **Emission Activity Trend Analysis**
  - Compile Historical Activity Data and Compare Historical Trend with Forecast Trend; Revise where Historical Trend is Clear/Persistent

- **Emission Trend Analysis**
  - States Quality Assure Emissions and Throughput, & Estimate Effect of Post-1999 Control Programs
  - Compute Historical Change in Emission Rate
  - Research Potential Reasons for Change and Apply in Forecast unless Reason to Contrary
Conclusions

- **Importance of:**
  - Accurate Forecasts for Policymaking
  - Historical Information for Informing Forecasts
  - Throughput Data in Analyzing Historical Trends

- **Future Research**
  - Analysis of Sales-Emission Activity Link
  - Further Analysis of Emission Rate Changes Not Currently Modeled in Forecasts
    - Explanations/identification of drivers for changes (e.g., attainment vs. nonattainment areas)
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