Summary

• Alpine analyzed the magnitude and geographic distribution of emission reductions associated with EPA’s various alternate NAAQS simulations
Technical Approach

• Obtained, reviewed, and recreated EPA’s 2025 base case and baseline emission scenarios (for NOx only) as described in ozone NAAQS RIA
  – Analysis was required as more detailed county and source type reviews were not provided by EPA in the technical documentation
Control Types

• Further applied emission reductions, by “known” and “unknown” control classification to baseline scenario in an effort to summarize EPA’s hypothetical approach to attaining each level of the proposed NAAQS
  – “Known” controls include documented end-of-pipe control technologies
  – “Unknown” controls defined as potential controls that come from sectors for which EPA has not sufficiently explored emission abatement opportunities
Control Application

- “Known” controls applied at unit and county/source category levels

- “Unknown” control emissions are assumed by EPA to come from entire regions as a collective and do not have or are not applied with sub-regional, geographic specificity
Recreating EPA’s Baseline

• Starting with EPA’s 2025 base case inventory, we applied EGU emission changes associated with EPA’s proposed Clean Power Plan rule
  – Option 1, State application of IPM simulation

• Also applied EPA methodology and incremental control measures to add “a portion of the explicit modeled controls” within Texas necessary to achieve the 75 ppb NAAQS at all monitors
EPA Projected Change in 2025 8-hr DVs (ppb) between Base Case and 111(d)
Incremental Reductions for Various Alternate Standards

- From recreated baseline inventory, we applied county-source level annual NOx reductions as provided by EPA for each of the proposed alternate NAAQS levels of 70, 65, and 60 ppb
EPA Sub-Regions for Control Strategy Application

EPA Proposed Ozone NAAQS Subregions
- Midwest (MW)
- Inside Northeast Buffer (NE_In)
- Outside Northeast Buffer (NE_Out)
- Southwest (SW)
- Central Inside Texas Buffer (TX_In)
- Central Outside Texas Buffer (TX_Out)
# Central Region “Known” Reductions

<table>
<thead>
<tr>
<th>Region</th>
<th>Sub-Region</th>
<th>Source</th>
<th>Baseline NOx Emissions (tpy)</th>
<th>Known Annual NOx Emission Reductions (tpy)</th>
<th>Known Annual NOx Emission Reductions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>70 ppb</td>
<td>65 ppb</td>
<td>60 ppb</td>
</tr>
<tr>
<td>Central</td>
<td>Within TX Buffer</td>
<td>Area</td>
<td>129,174</td>
<td>39,504</td>
<td>39,504</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EGU</td>
<td>55,404</td>
<td>19,632</td>
<td>19,632</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nonrd</td>
<td>78,915</td>
<td>573</td>
<td>573</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onrd</td>
<td>93,947</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Point</td>
<td>143,684</td>
<td>23,543</td>
<td>23,543</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>All Sources</strong></td>
<td></td>
<td>501,124</td>
<td>83,251</td>
<td>83,251</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Area</td>
<td>438,287</td>
<td>134,388</td>
<td>153,235</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EGU</td>
<td>140,875</td>
<td>0</td>
<td>49,258</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nonrd</td>
<td>264,104</td>
<td>2,017</td>
<td>3,807</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Onrd</td>
<td>196,119</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Point</td>
<td>426,632</td>
<td>121,159</td>
<td>184,542</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>All Sources</strong></td>
<td></td>
<td>1,466,017</td>
<td>257,564</td>
<td>390,841</td>
</tr>
</tbody>
</table>
## “Known” and “Unknown” Controls

<table>
<thead>
<tr>
<th>Region</th>
<th>Sub-Region</th>
<th>70 ppb (Incremental NOx Reductions from Baseline) - TPY</th>
<th></th>
<th>65 ppb (Incremental NOx Reductions from Baseline) - TPY</th>
<th></th>
<th>60 ppb (Incremental NOx Reductions from Baseline) - TPY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Known Control Reductions</td>
<td>Unknown Control Reductions</td>
<td>Total Reductions</td>
<td>Known Control Reductions</td>
<td>Unknown Control Reductions</td>
<td>Total Reductions</td>
</tr>
<tr>
<td>Central</td>
<td>TX_In</td>
<td>83,251</td>
<td>68,811</td>
<td>152,062</td>
<td>83,251</td>
<td>180,496</td>
<td>263,747</td>
</tr>
<tr>
<td>Central</td>
<td>TX_Out</td>
<td>257,564</td>
<td>0</td>
<td>257,564</td>
<td>390,841</td>
<td>169,610</td>
<td>560,452</td>
</tr>
<tr>
<td>Northeast</td>
<td>NE_In</td>
<td>122,717</td>
<td>85,532</td>
<td>208,249</td>
<td>122,717</td>
<td>289,784</td>
<td>412,501</td>
</tr>
<tr>
<td>Northeast</td>
<td>NE_Out</td>
<td>30,946</td>
<td>0</td>
<td>30,946</td>
<td>48,434</td>
<td>46,744</td>
<td>95,178</td>
</tr>
<tr>
<td>Midwest</td>
<td>MW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>364,877</td>
<td>65,527</td>
<td>430,405</td>
</tr>
<tr>
<td>Southwest</td>
<td>SW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>108,246</td>
<td>0</td>
<td>108,246</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>Sub-Region</th>
<th>70 ppb (Incremental NOx Reductions to Baseline) - %</th>
<th></th>
<th>65 ppb (Incremental NOx Reductions to Baseline) - %</th>
<th></th>
<th>60 ppb (Incremental NOx Reductions to Baseline) - %</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Known Control Reductions</td>
<td>Unknown Control Reductions</td>
<td>Total Reductions</td>
<td>Known Control Reductions</td>
<td>Unknown Control Reductions</td>
<td>Total Reductions</td>
</tr>
<tr>
<td>Central</td>
<td>TX_In</td>
<td>17%</td>
<td>14%</td>
<td>30%</td>
<td>17%</td>
<td>36%</td>
<td>53%</td>
</tr>
<tr>
<td>Central</td>
<td>TX_Out</td>
<td>18%</td>
<td>0%</td>
<td>18%</td>
<td>27%</td>
<td>12%</td>
<td>38%</td>
</tr>
<tr>
<td>Northeast</td>
<td>NE_In</td>
<td>15%</td>
<td>11%</td>
<td>26%</td>
<td>15%</td>
<td>36%</td>
<td>52%</td>
</tr>
<tr>
<td>Northeast</td>
<td>NE_Out</td>
<td>10%</td>
<td>0%</td>
<td>10%</td>
<td>15%</td>
<td>14%</td>
<td>29%</td>
</tr>
<tr>
<td>Midwest</td>
<td>MW</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>21%</td>
<td>4%</td>
<td>25%</td>
</tr>
<tr>
<td>Southwest</td>
<td>SW</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>16%</td>
<td>0%</td>
<td>16%</td>
</tr>
</tbody>
</table>
EPA “Known” Control NOx Emission Reduction from 2025 Baseline – 70 ppb
EPA “Unknown” Control NOx Emission Reduction from 2025 Baseline – 70 ppb

"Unknown" Control NOx Emission Reduction (%)
Proposed 70ppb From Baseline

- 75 to 100 (0)
- 50 to 75 (0)
- 25 to 50 (0)
- 10 to 25 (321)
- 5 to 10 (0)
- 0 to 5 (0)
EPA “Known” Control NOx Emission Reduction from 2025 Baseline – 65 ppb

Annual NOx Emissions Reduction (%)
Proposed 65 ppb from Baseline

- 75 to 100: 3
- 50 to 75: 108
- 25 to 50: 270
- 10 to 25: 337
- 5 to 10: 263
- 0 to 5: 1037
- No Control Applied: 20
- CA Not Included: 58
EPA “Unknown” Control NOx Emission Reduction from 2025 Baseline – 65 ppb

"Unknown" Control NOx Emission Reduction (%)
Proposed 65ppb From Baseline

- 75 to 100 (0)
- 50 to 75 (0)
- 25 to 50 (321)
- 10 to 25 (830)
- 5 to 10 (0)
- 0 to 5 (707)
- CA Not Included (58)
EPA “Known” Control NOx Emission Reduction from 2025 Baseline – 60 ppb

Annual NOx Emissions Reduction (%)
Proposed 60 ppb from Baseline

- 75 to 100 (3)
- 50 to 75 (111)
- 25 to 50 (271)
- 10 to 25 (353)
- 5 to 10 (271)
- 0 to 5 (1009)
- No Control Applied (20)
- CA Not Included (58)
EPA “Unknown” Control NOx Emission Reduction from 2025 Baseline – 60 ppb

"Unknown" Control NOx Emission Reduction (%)
Proposed 60ppb From Baseline

- 75 to 100 (0)
- 50 to 75 (501)
- 25 to 50 (1537)
- 10 to 25 (0)
- 5 to 10 (0)
- 0 to 5 (0)
- CA Not Included (58)
Observations

• It is noted than no NOx emission reductions beyond the baseline level were applied by EPA in any of the alternate proposed standard scenarios for the following counties in Texas
  – Austin, Bastrop, Burleson, Collin, Cooke, Dallas, Denton, Erath, Falls, Fannin, Gonzales, Grimes, Hunt, Kaufman, Lee, Madison, Milam, Parker, Somervell, and Walker
Observations

• EPA makes the assumption with the application of “unknown” controls that emission reductions achieved from anywhere within a sub-region will have an identical ozone concentration impact on all monitors within that sub-region
Observations

• EPA conducted no modeling to test any of the proposed alternate NAAQS levels
  – This potentially assumes first ton reduced gives same ozone change as last ton reduced, failing to account for the non-linearity of emission reductions and associated ozone concentration changes