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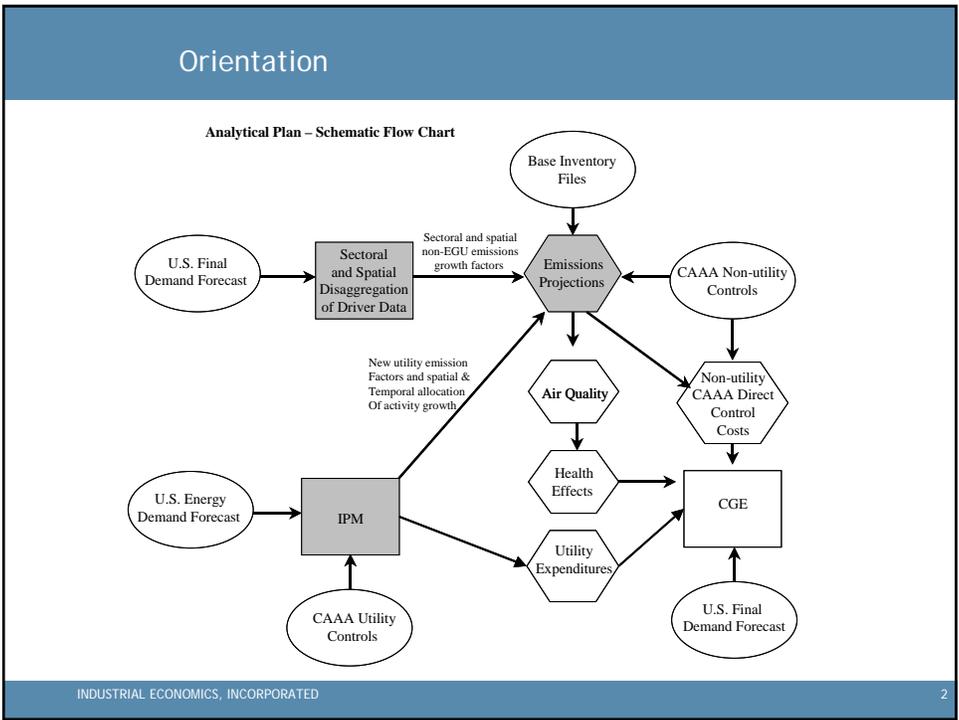
Second Section 812 Prospective Analysis
Emissions Estimation:
Status Update for EPA SAB Advisory Council on
Clean Air Act Compliance Analysis

James Neumann
Principal
March 15, 2007

And

James Wilson
President
EH Pechan & Associates

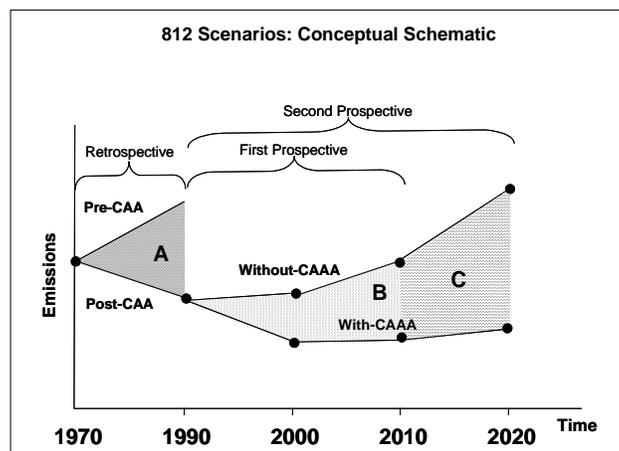
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Outline

- Summary of Methods
- Summary of August 2006 Draft Estimates
- Summary of AQMS Comments
- Changes to Draft Estimates Since AQMS Meeting
- Steps to Improve Documentation
- Next Steps and Schedule

Summary of Methods - A Reminder



Base Year Emission Data Sources

Sectors	<i>Without-CAAA Scenario – 1990</i>	<i>With-CAAA Scenario – 2000</i>
Non-EGU Point	1990 EPA Point Source NEI	2002 EPA Point Source NEI (Draft)
EGU	1990 EPA Point Source NEI	Estimated by the EPA Integrated Planning Model for 2001
Off-Road/Nonroad	NONROAD 2004 Model Simulation for Calendar Year 1990	NONROAD 2004 Model Simulation for Calendar Year 2000
On-Road	MOBILE6.2 Emission Factors and 1990 NEI VMT Database	MOBILE6.2 Emission Factors and 2000 NEI VMT Database. The California Air Resources Board (ARB) supplied estimates for California
Nonpoint	1990 EPA Nonpoint Source NEI with Adjustments for Priority Source Categories	2002 EPA Nonpoint Source NEI (Draft)

Modeling Approach by Major Sector

Sector	Growth Forecast	Controls Modeling Approach
Non-EGU Point	U.S. Department of Energy (DOE) <i>Annual Energy Outlook 2005</i> forecasts	Based on control factors developed by the five Regional Planning Organizations (RPOs), and California information from the ARB
EGU	DOE <i>Annual Energy Outlook 2005</i> forecasts	Integrated Planning Model (IPM)
Nonroad	EPA NONROAD Model growth forecasts are largely based on historical trends in national engine populations by category/sub-category of engine	EPA NONROAD Model
Onroad	National VMT Forecast from <i>Annual Energy Outlook 2005</i>	MOBILE6.2 emission factors
Nonpoint	DOE <i>Annual Energy Outlook 2005</i> forecasts	Based on control factors developed by the five RPOs, and California information from the ARB

Major Rules That are Part of the "Wedge"

EGUs:

- Title IV SO₂ and NO_x
- NO_x SIP call
- CAIR/CAMR/CAVR
- NSR settlements
- State regulations

Onroad Mobile:

- Tier 1 and 2 tailpipe;
- Reformulated gasoline;
- 49-state LEV;
- California LEV2 (in CA only);
- *Heavy-duty diesel fuel and engine standards*

Nonroad Engines:

- Phase I and II engine standards;
- *Nonroad Diesel Rule*

Non-EGU Point and Nonpoint:

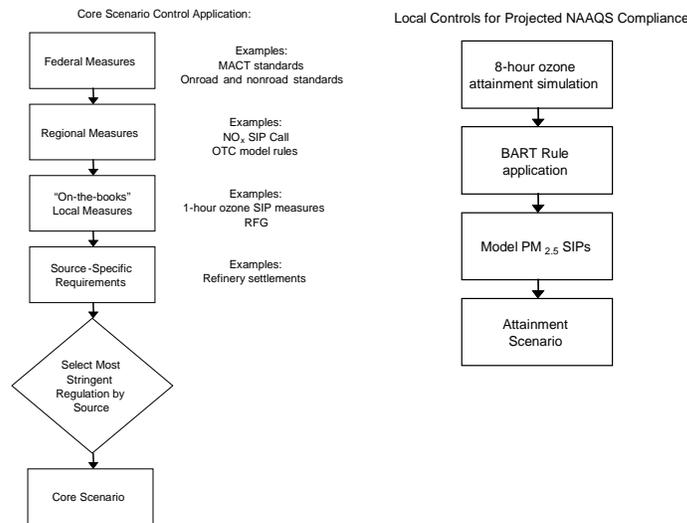
- 2-yr, 4-yr, 7-yr, and 10-yr MACT standards
- petroleum refinery settlements

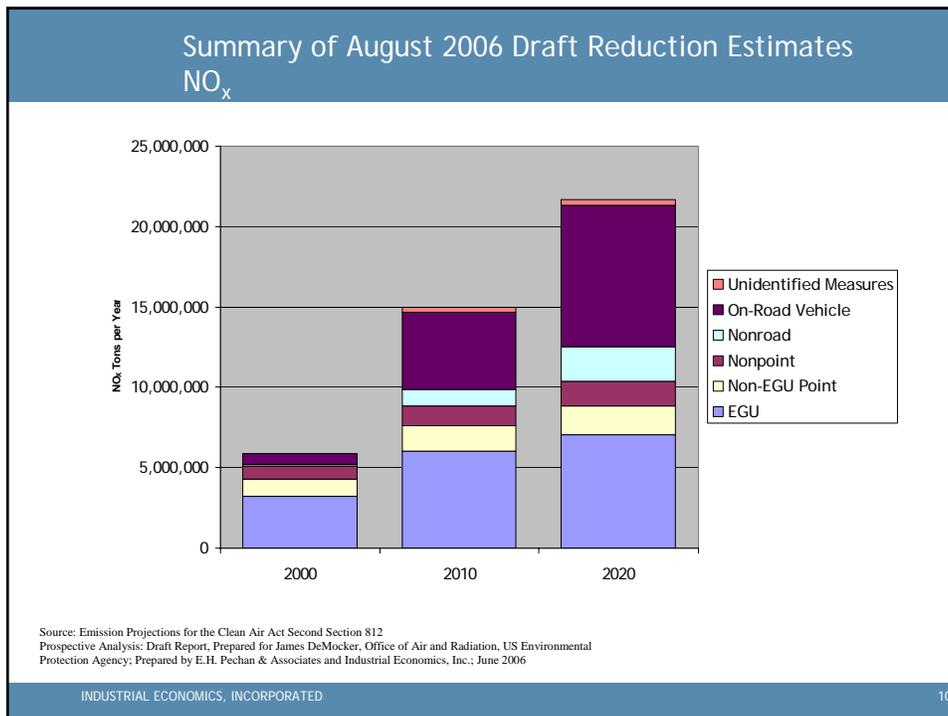
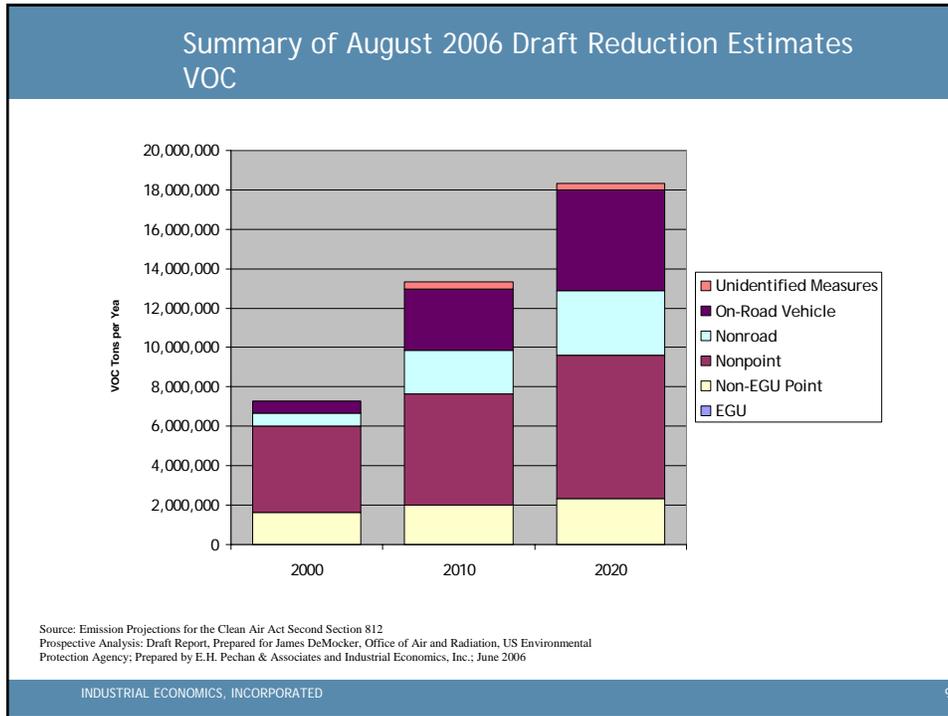
NAAQS:

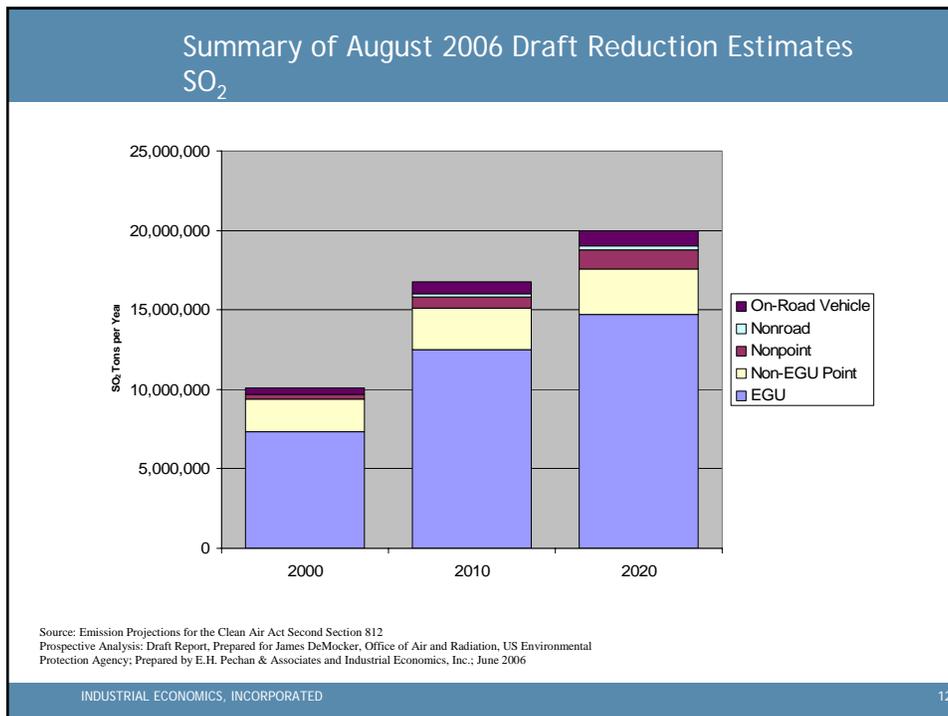
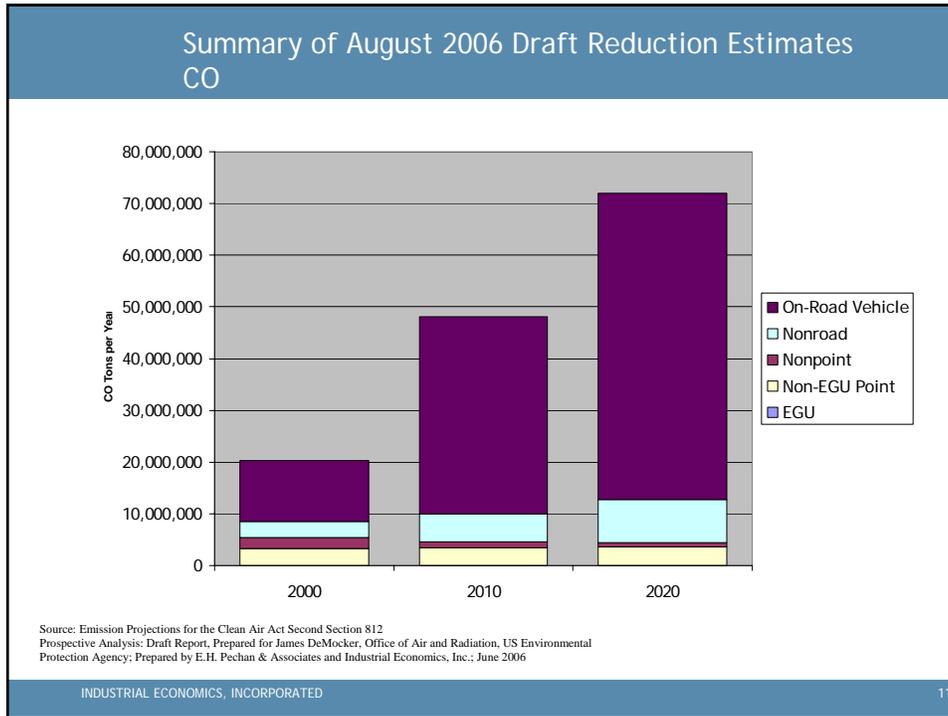
- PM-10 and 1-hour ozone (for 2000);
- *PM-2.5 and 8-hour ozone (for 2010 and 2020)*

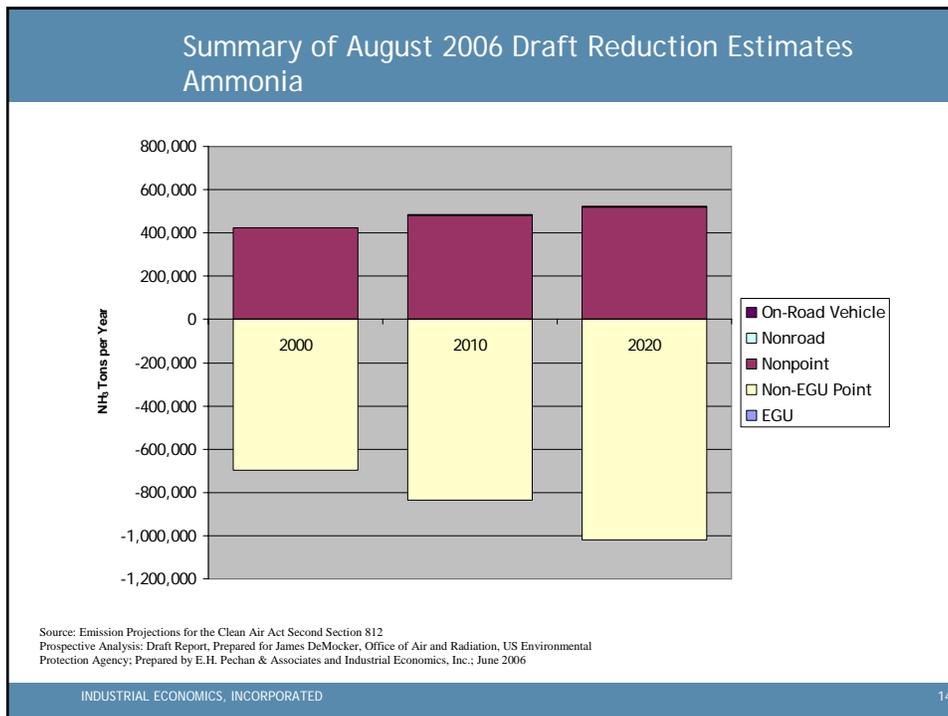
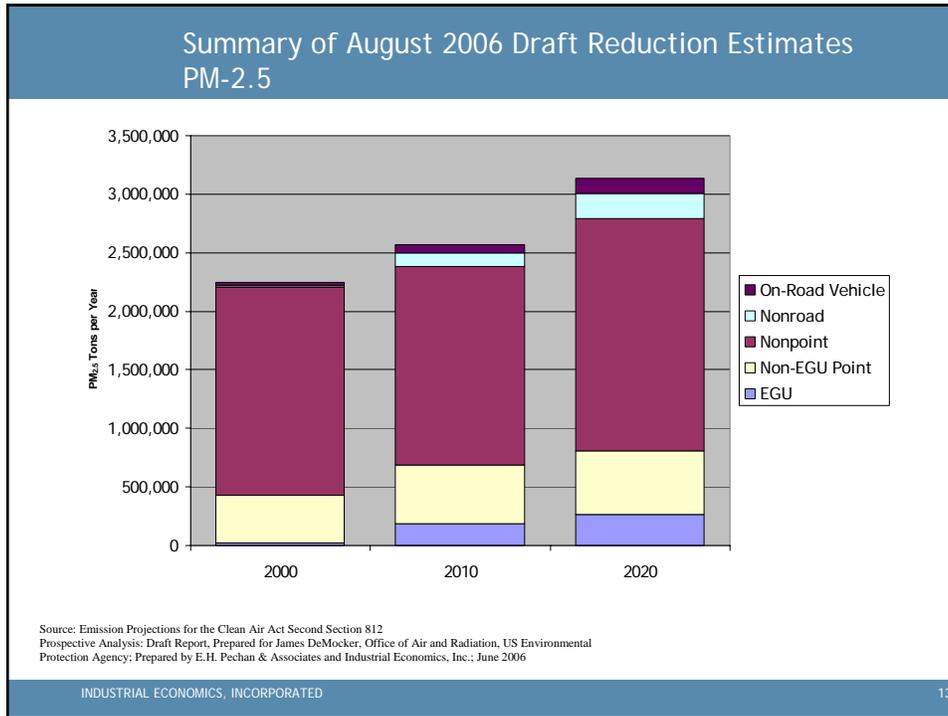
Note: Not a complete list; see Exhibit 1-5 in draft emissions report for full list.

Sequencing of Federal, Regional, and Local Controls









Summary of AQMS August 7, 2006 Comments

Endorsed the following:

- Use of 1990 and 2002 NEI as base for without- and with-CAAA scenarios, respectively.
- Use of AEO 2005 as basis for growth factors
- Use of 2002 NEI for ammonia to correct certain anomalous results

Discussed without clear resolution:

- Use of an alternative approach for year 2000 EGU results
- Use of more detailed growth data from NONROAD rather than AEO, for that source category

Other results:

- Concluded that \$10K per ton threshold for unidentified controls was reasonable but needed further justification
- Requested comparison of EMFAC and MOBILE
- Asked about state adoption of California onroad standards
- Requested clarification of use of PM transport factors

Additional AQMS Comments - August 31, 2006

- *A second, non-812 supplemental AQMS review was conducted in late August 2006 to address concerns about projection methods in the context of the PM NAAQS RIA.*
- OAQPS proposed use of flat growth to project emissions from 1990 to 2002 for purposes of identifying PM NAAQS NAAs.
- 812 Project Team chose not to adopt the flat-growth approach.
- However, OAQPS-AQMS discussion prompted us to re-examine certain sectors to ensure that growth factors applied to 1990 base were reasonable.

Changes to Draft Results

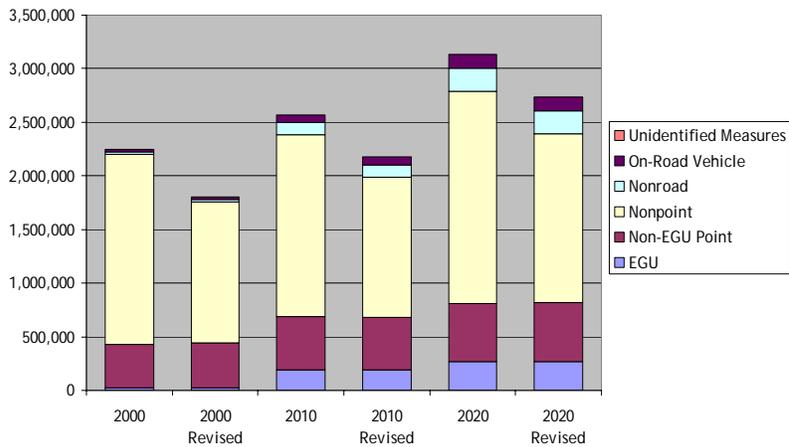
Prompted by AQMS review:

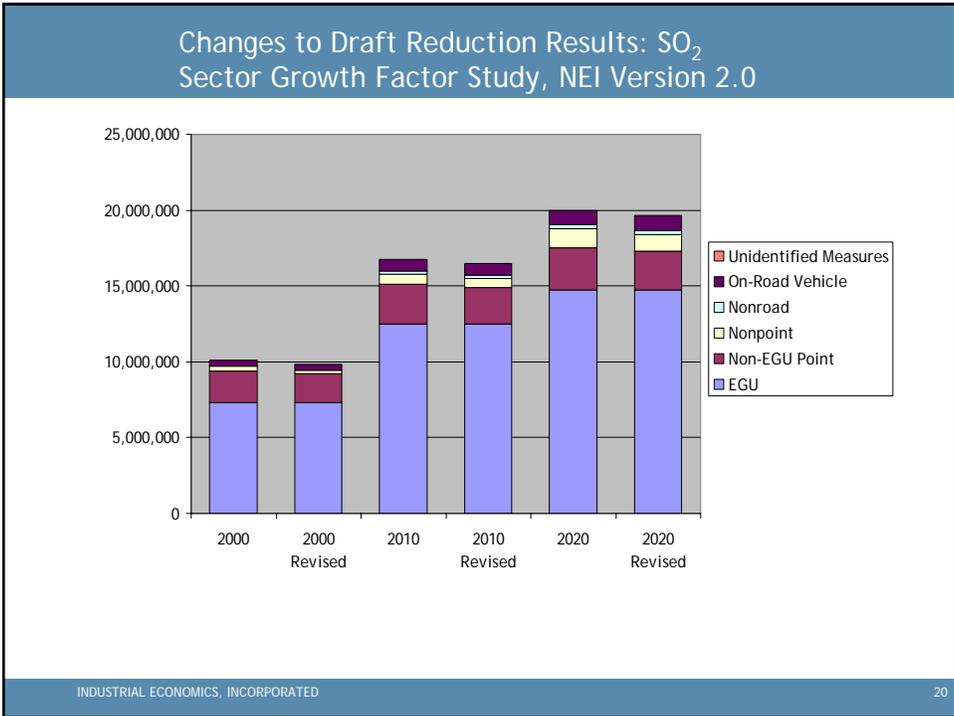
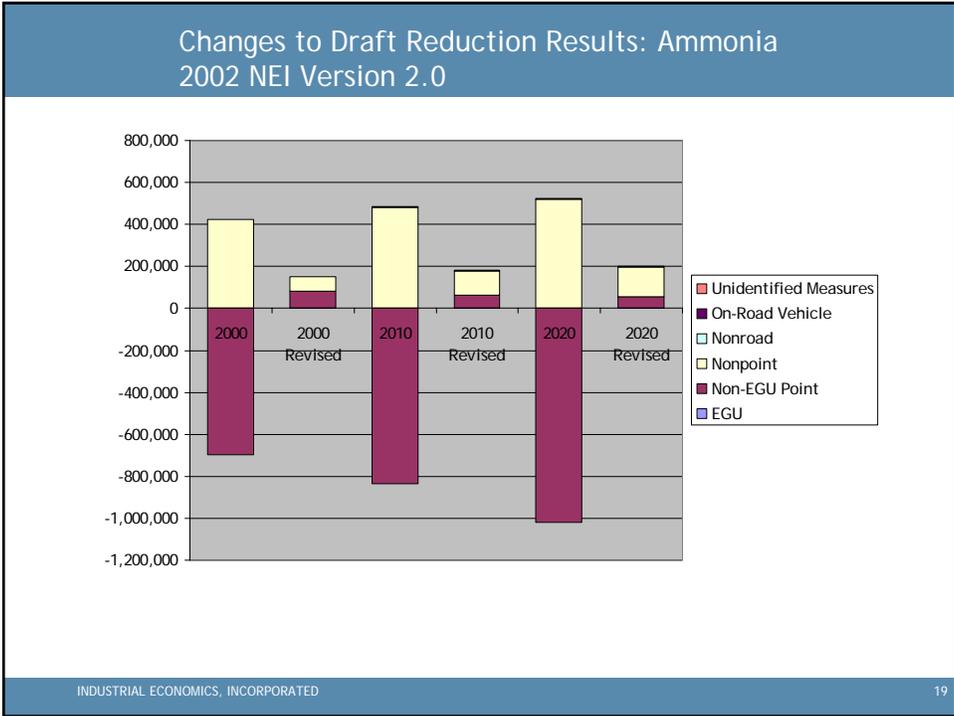
- Examine projection accuracy for selected sectors (e.g., copper smelters, auto assembly, petroleum refining)
- Revise ammonia estimates

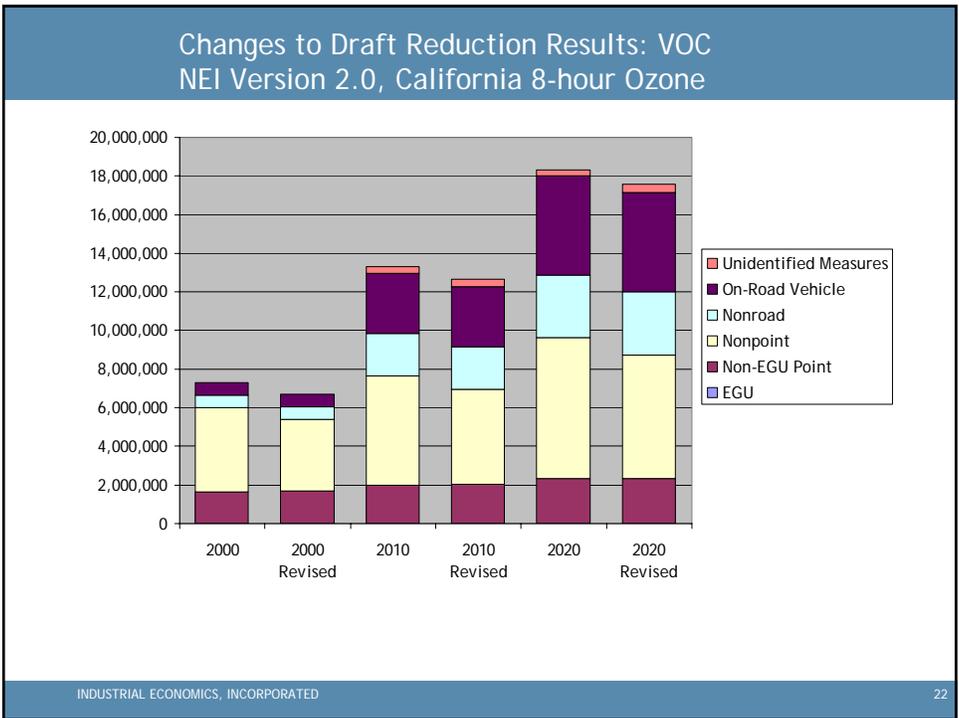
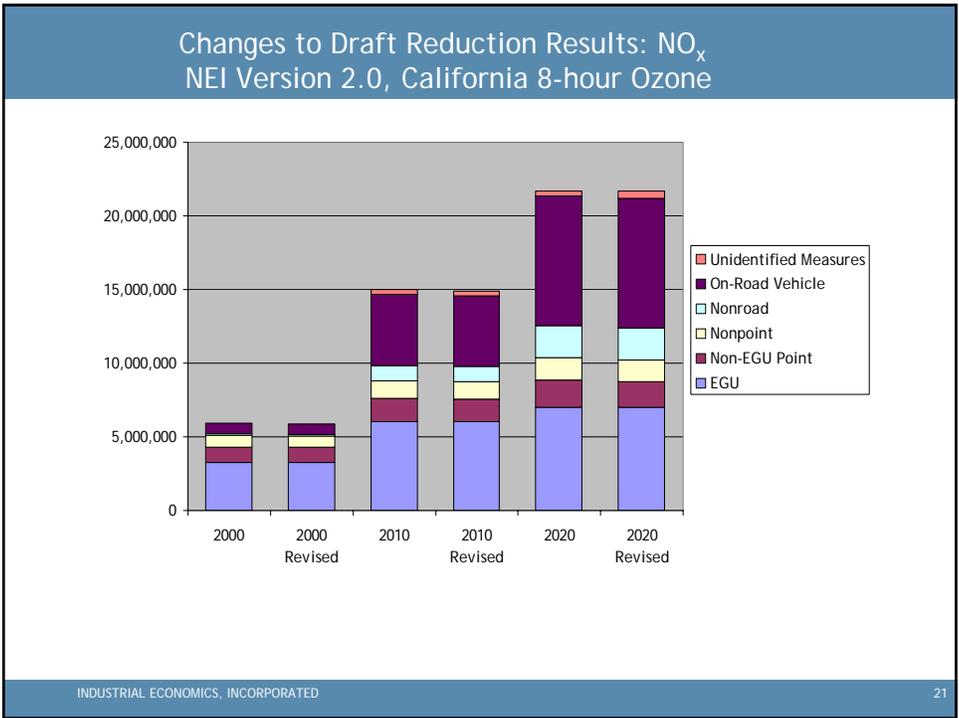
Prompted by other motivations:

- Re-run with-CAAA scenario for non-EGU point sources using updated 2002 NEI (Version 2.0)
- Re-estimate without-CAAA scenario for nonpoint sources using updated PM augmentation methods applied to 1990 NEI (adds condensable PM, PM-10 primary, and PM-2.5 primary emission estimates for fuel combustion sources)
- Add revised estimates for California 8-hour ozone compliance (not complete for August draft)

Changes to Draft Reduction Results: PM-2.5 PM Augmentation, NEI Version 2.0







Steps to Improve Documentation

- Clarify use of fugitive dust transport factors.
- Clarify application of aggregate AEO growth factors to disaggregated Source Category Code emissions estimates
- Add text on wildfire and prescribed burning estimation and projection methods
- Add text on Canadian and Mexican emissions estimates
- Clarify how existing approach addresses state adoption of LEV and California LEV-II standards

Fugitive Dust Transport Factors

Recommended Capture Fraction (%) for Five Land Cover Types

Land Cover Type	Average Height (m)	Recommended CF (%)	Estimated CF Range (%)	Comment
Forest	18 to 20	100	80 to 100	Forested areas will capture dust effectively.
Urban	5 to 50+	50	25 to 75	Structures are interspersed with open areas.
Scrub, Sparsely Wooded & Grasses	1 to 2	25	10 to 40	Portion of plume is below sparse vegetation.
Agricultural	1 to 2	25	10 to 40	Portion of plume is below crop (seasonally).
Barren / Water	0	0	0 to 10	Impediment-free surfaces are ineffective to capture dust.

Wildfires and Prescribed Burning

Forest Wildfires:

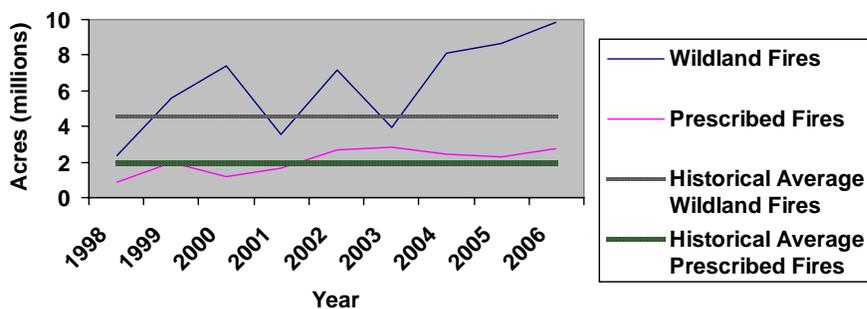
- Project team adjusted actual 2002 wildfire emission estimates from draft NEI to reflect historical average wildfire activity.
- Applied a factor (0.635) that represents ratio of national average acres burned in wildfires over the 1990-2003 period to the actual acres burned in 2002. 1990-2003 wildfire acres burned from the National Interagency Fire Center (NIFC, 2005).

Prescribed Burning:

- Project team adjusted the 2002 actual prescribed burning emission estimates to reflect the historical national average acres burned in prescribed fires, was calculated from 1996-2003 data (EPA, 2005).
- Applied adjustment factor of 0.730 to the 2002 NEI prescribed burning emission estimates.
- For both wildfires and prescribed burning, used the adjusted 2002 emission estimates to represent emissions in each analysis year (2000, 2010, 2020) under both scenarios. "No change" forecast assumption used by EPA in CAIR RIA (Houyoux, 2004b).

Wildfires and Prescribed Burning

Figure 1. Wildland Fire Statistics



Canadian and Mexican Emissions

Canadian Emission Estimates:

- EPA-OAQPS has new 2002 base year emission files from Environment Canada. Project Team expects that consistent 2015 and 2020 Canadian emission projections will be available later this spring.

Mexican Emission Estimates:

- The Phase III inventory of 1999 criteria pollutant emissions was completed in the fall of 2006 and covers the entire country at the municipality level. This database is available at EPA.

State Adoption of California LEV-II Standards

- California has adopted a stringent LEV standard (LEV-II).
- Emissions (and cost) results reflect adoption of that standard in California only.
- While some states have adopted the stricter California standard, our analysis only includes LEV-II in California. Neither the cost or emissions estimates reflect adoption by any other state.

Next Steps and Schedule

- Working to finalize the analysis
 - Local controls estimates will change if strategy for estimating identified and unidentified controls changes
 - Generate low and high economic growth scenario estimates (using AEO low and AEO high)
 - Use sectoral breakouts as basis for analysis of contribution of each sector to benefits
 - Generate SMOKE IDA files for CMAQ input
 - Complete mercury and CO₂ emissions estimates (both with important limitations)
- Full revised report available in Spring 2007

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617.354.0074