

Emissions from Mexico

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Mexico NEI - Contents

- National Emission Inventory (NEI) Characteristics
- Data Availability
- Organization
- Results
- Strengths
- Weaknesses
- Current Activities

Mexico NEI - Characteristics

- **Base Year 1999**
- **Geographic Area**
 - Phases I, II: 6 Northern Border States
 - Phase III: National
- **Pollutants**
 - NO_x , SO_x , VOC, CO, PM_{10} , $\text{PM}_{2.5}$, NH_3

Mexico NEI - Characteristics

- **Spatial Resolution**
 - State
 - Municipality
- **Temporal Resolution**
 - Annual for 1999

Mexico NEI – Data Availability

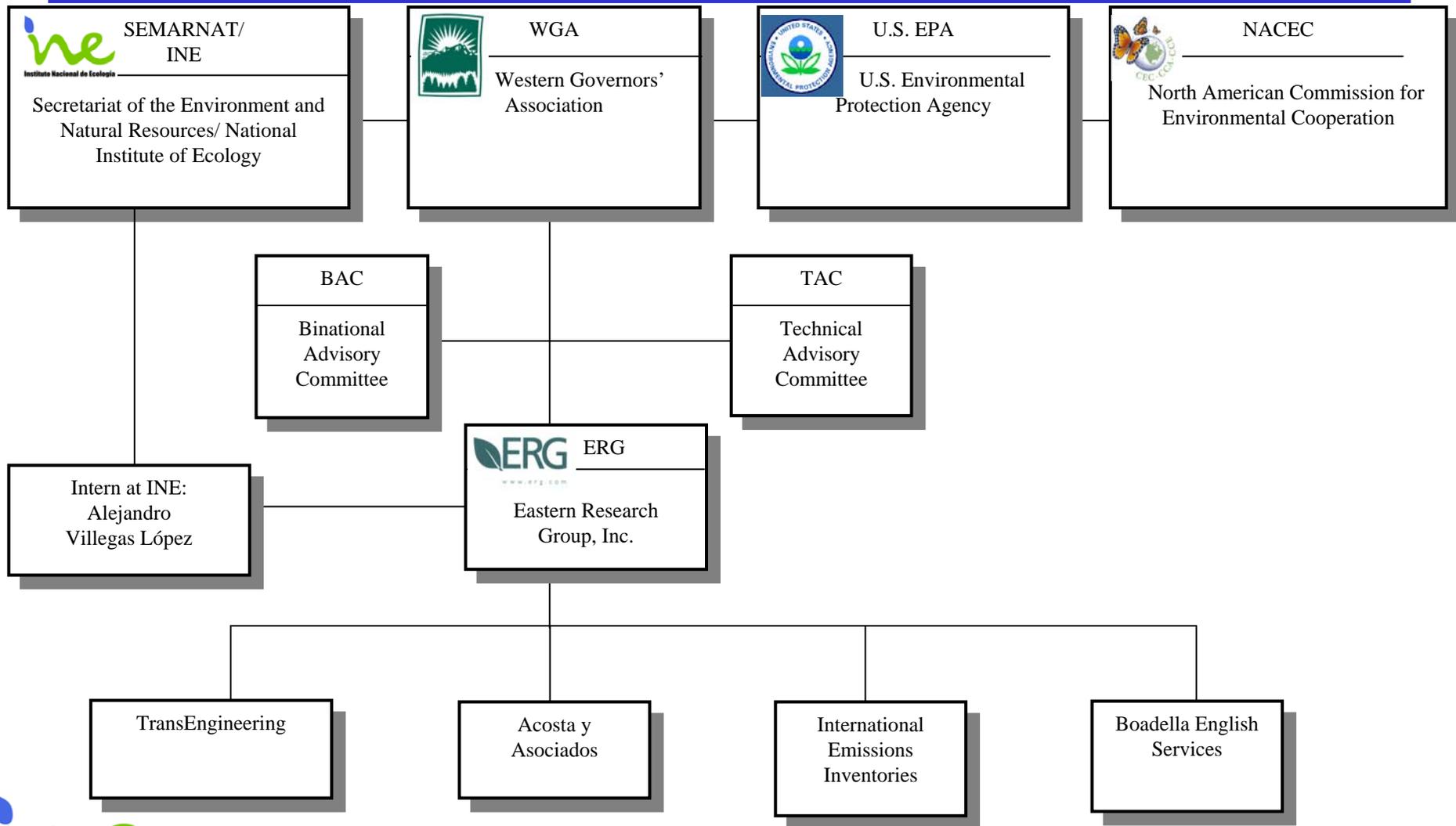
- Six Border States Inventory

Baja California, Sonora, Chihuahua, Coahuila, Nuevo León & Tamaulipas

- English and Spanish reports
- Data released in January 2006
- Data formats:
 - Inventory Data Analyzer (IDA)
 - National Emissions Inventory Input Format (NIF)
 - MS Excel - Summary files for point, area, on road and non-road

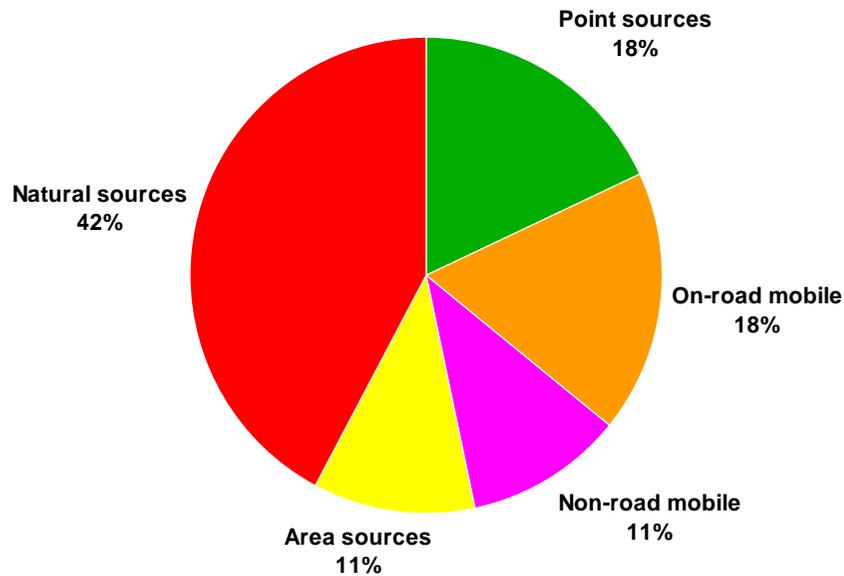
<http://www.epa.gov/ttn/chief/net/mexico.html>

Mexico NEI - Organization

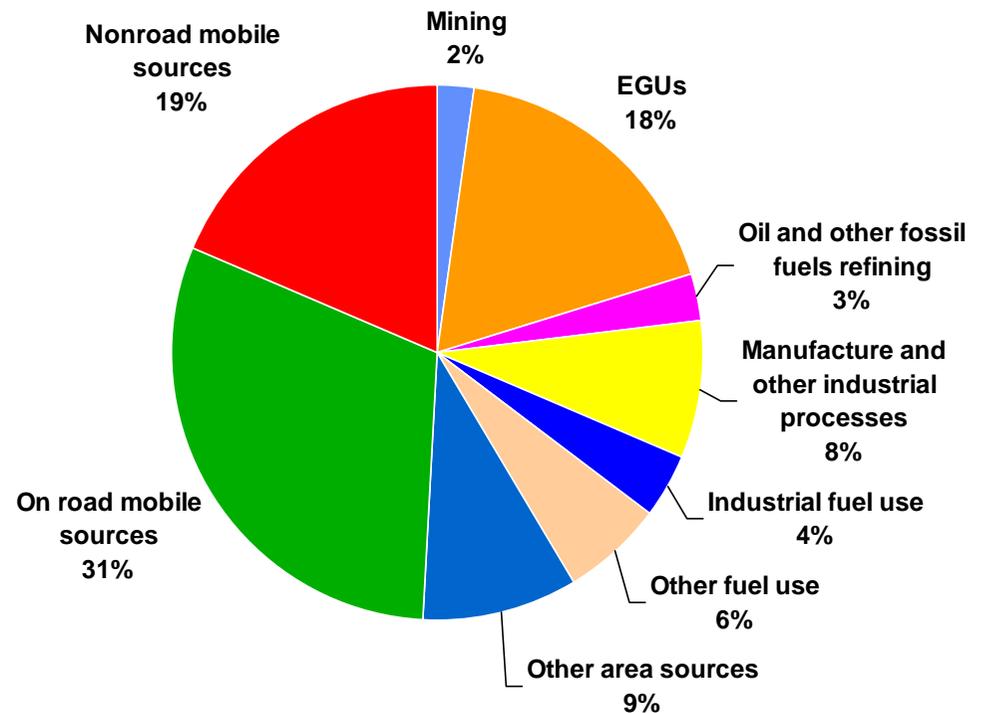


Mexico NEI- Results NOx Emissions by source type (%)

Total NOx emissions



Non-biogenic NOx emissions



Mexico NEI- Results NOx (2)

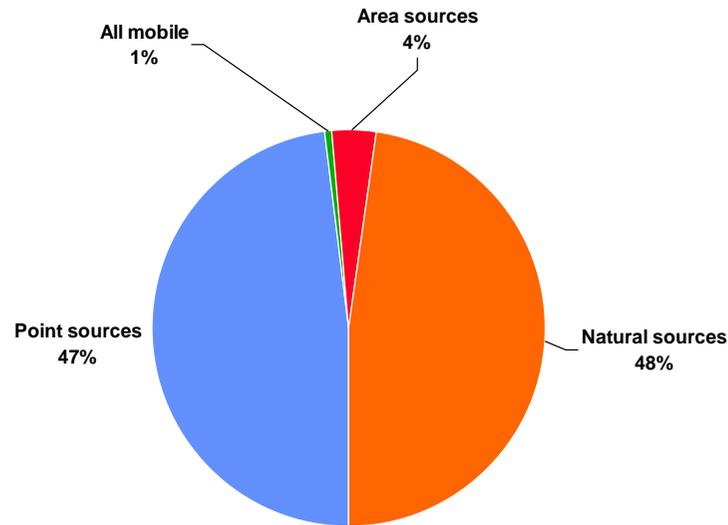
Spatial distribution

- Coahuila
 - Carbon-based EGUs
- Veracruz
 - EGUs, oil and gas extraction, refining activities, area sources (commercial marine vessels)
- Mexico City and the State of Mexico
 - mobile sources – HD diesel vehicles and LD gasoline vehicles

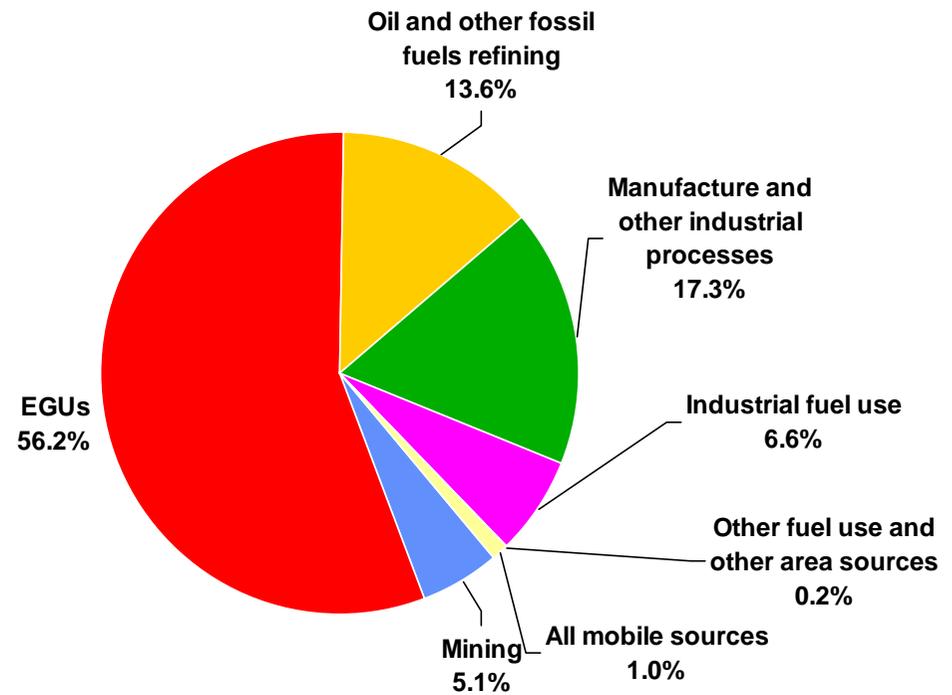
Mexico NEI- Results SOx

Emissions by source type (%)

Total SOx emissions



Non-geogenic SOx



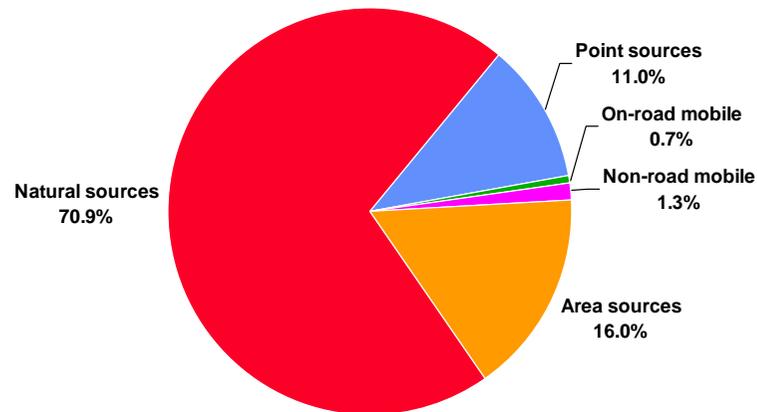
Mexico NEI- Results SOx (2)

Spatial distribution

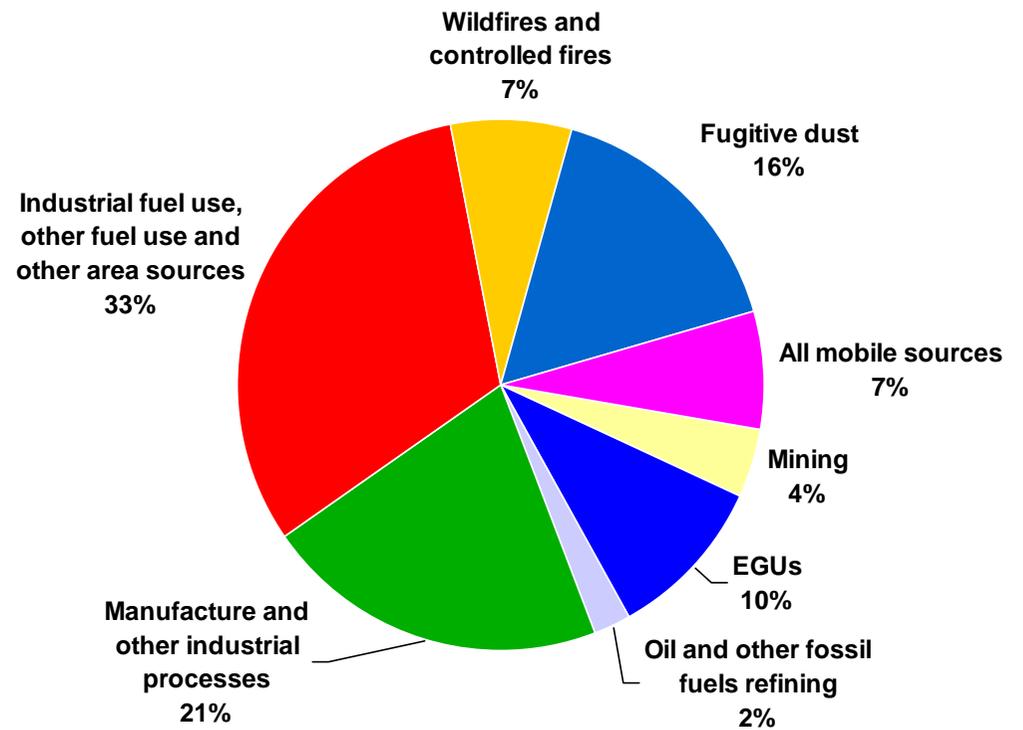
- Veracruz, Sonora, Coahuila, Tamaulipas, Colima, Guerrero
 - Mainly EGUs
- Hidalgo and Campeche
 - Oil refining
 - Oil and gas extraction activities

Mexico NEI- Results PM₁₀ Emissions by source type (%)

Total PM₁₀ emissions



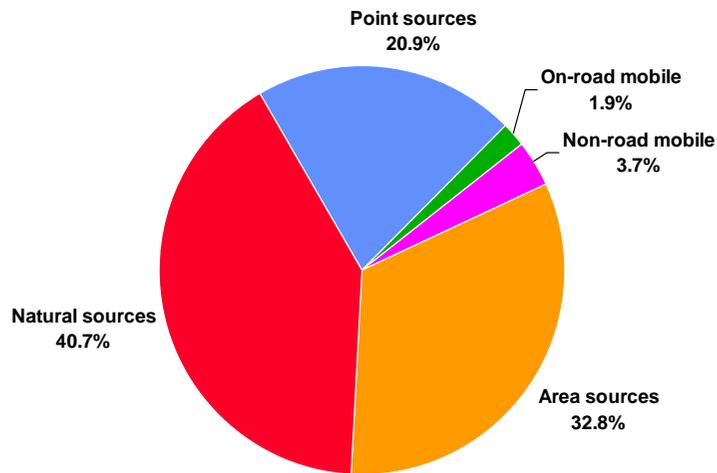
Non-geogenic PM₁₀ emissions



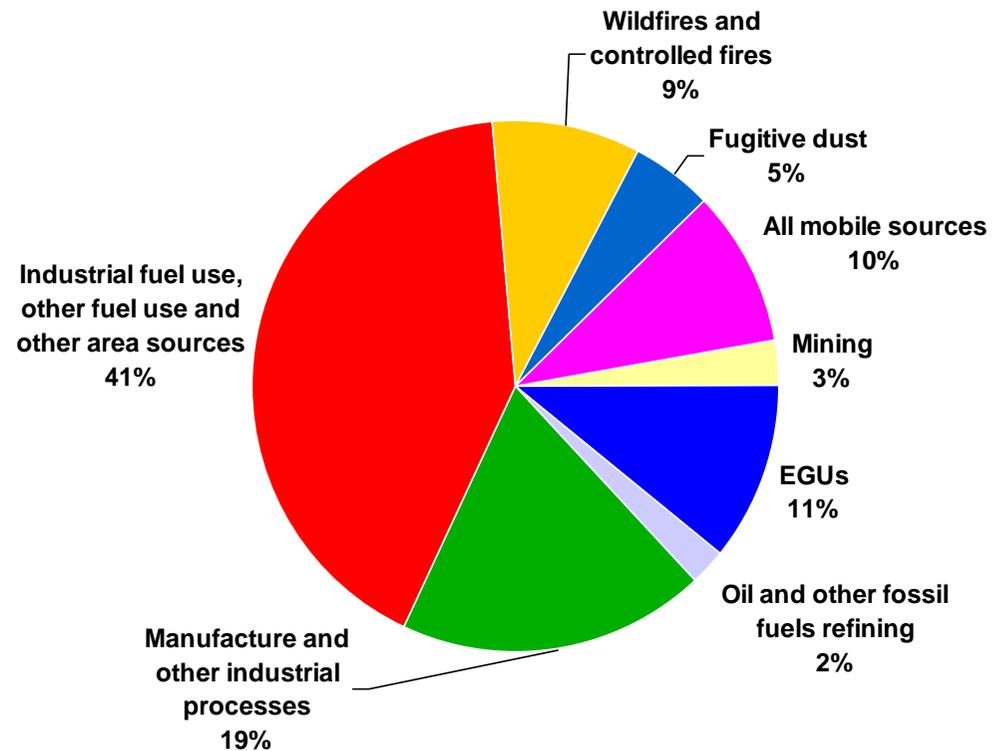
Mexico NEI- Results PM_{2.5}

Emissions by source type (%)

Total PM_{2.5} emissions



Non-geogenic PM_{2.5} emissions

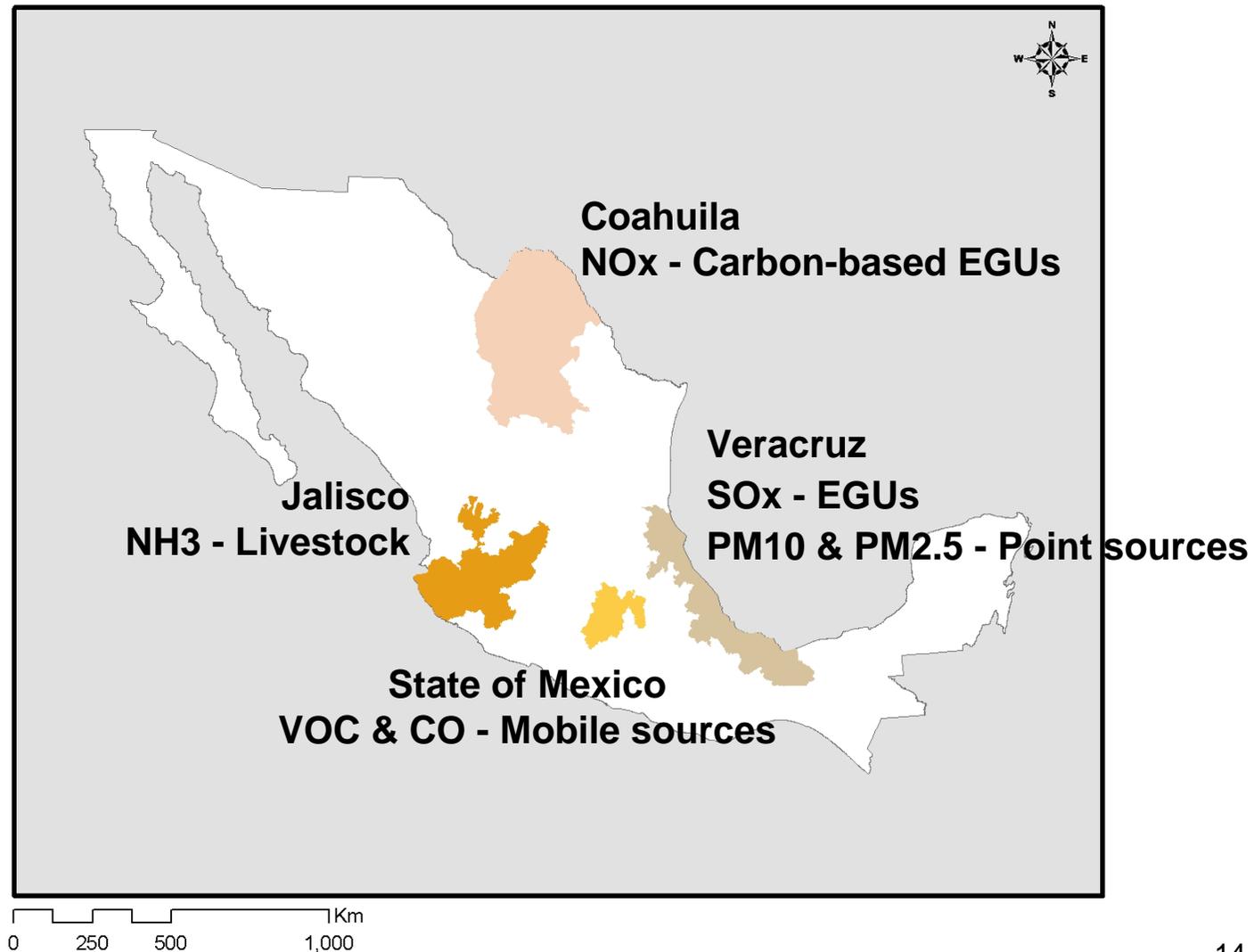


Mexico NEI- Results PM (3)

Spatial distribution

- PM_{10}
 - State of México – area sources
 - Jalisco - area sources
 - Veracruz - point sources
- $PM_{2.5}$
 - Veracruz - point sources
 - Puebla and Jalisco - area sources
- NH_3
 - Jalisco, Veracruz, Chiapas and Michoacán – livestock

Spatial Distribution of Main Emission Sources



Mexico NEI- Strengths (1)

- First-ever national emission inventory in Mexico
- Consistent methodology for the whole country
- Stepping stone for state and local authorities to build upon

Mexico NEI- Strengths (2)

- New tools for emissions estimation, adapted from US models
 - MOBILE6-Mexico & NONROAD-Mexico: Most-up-to-date and representative models for use in Mexico
- Identification of data gaps and needs

Mexico NEI- Weaknesses

- Point sources
 - Emission factors: Mostly from EPA's AP-42
 - Not representative of Mexico's technologies, operating conditions, maintenance, fuels, control devices, etc.
 - Primary data source:
 - Annual Operating Reports (COAs)
 - # of reporting facilities needs to be increased
 - Improve quality of reporting

Mexico NEI- Weaknesses (2)

- Point sources (cont.)

 - Insufficient or incorrect data from COAs

 - Emissions data - mostly recalculated with fuel consumption information
 - Process emissions: not sufficient information
 - Stack parameters: not sufficient or incorrect

 - No data (not required in COAs)

 - NH₃
 - VOC

Mexico NEI- Weaknesses (3)

- Mobile sources
 - Activity data and fleet characteristics
 - VKT – per-capita emission rates derived from modeled traffic and congestion levels
 - Seven “representative” urban areas extrapolated to all municipalities in Mexico
 - Emission factors:
 - MOBILE6-Mexico based on limited vehicle testing from MCMA, Cd. Juárez and Aguascalientes

Mexico NEI- Weaknesses (4)

- Non-road emissions
 - Includes agricultural and construction equipment:
 - Limited population & activity information
 - Does not include other equipment types
 - Industrial, commercial, logging, garden equipment; recreation vehicles and boats; and, airport service support equipment
 - Population and activity data lacking

Mexico NEI- Weaknesses (5)

- Not included categories
 1. Paved and unpaved road dust
 - Insufficient silt content and silt loading data
 - Overestimation of preliminary estimates
 2. Wind erosion emissions
 - Lack of reliable methodology

Mexico NEI- Weaknesses (6)

- Informal data collection processes
 - Lack of formal mechanisms to obtain information for emission estimation (i.e. fuel and solvent use, equipment population, crop calendars, etc.)
 - Federal vs. state jurisdiction facilities
 - Differences in information processing: paper vs. electronic format, reporting requirements, QA/QC procedures, etc.

What is being done? (1)

- Final Spanish Report – In press
 - Appendices
 - NIF and IDA files – In process
 - EPA and INE web sites
 - Official release in Mexico – September 2006

What is being done? (2)

- Improve COA reporting (SEMARNAT)
 - Electronic vs. paper format
- “Infrastructure Plan” (SEMARNAT-CEC)
 - Includes specific needs to be covered in order to guarantee Mexico-NEI updates (e.g. training, regulatory modifications, process improvements, computational capacity, etc.)

What is being done? (3)

Activities at INE (2006-2007)

- Mobile sources study
 - Diagnosis on available information and methodologies
 - Selection of suitable tools
 - Development of a guide to estimate mobile source emissions
- Air quality modeling study
 - Development of a suitable tool for air quality modeling in Mexico for both primary and secondary pollutants, based on MNEI data
 - Evaluation of inventory performance
 - Development of institutional capacity to use air quality models
- Capacity-building activities
 - Workbook for Guide I
 - Guide II (point source emissions estimation)

The development of the Mexico
NEI has just begun...

Thank you

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