Developing a National Emissions Inventory for Mexico

Phase II: Northern States Emissions Inventory

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SEMARNAT/INE
Secretariat of the Environment and Natural Resources/ National Institute of Ecology

WGA
Western Governors’ Association

U.S. EPA
U.S. Environmental Protection Agency

NACEC
North American Commission for Environmental Cooperation

BAC
Binational Advisory Committee

TAC
Technical Advisory Committee

ERG
Eastern Research Group, Inc.

Intern at INE: Alejandro Villegas López

TransEngineering

Acosta y Asociados

International Emissions Inventories

Boadella English Services
Capacity Building and Special Studies 1994-2003

- Mexico Emissions Inventory Manuals
- Mexicali and Tijuana Inventories
- 1998 ZMVM emissions inventory evaluation
- Unregistered vehicle study
- MOBILE5- and MOBILE6-Mexico models
- NONROAD-Mexico model
Mexico National Emissions Inventory (NEI)

- Objectives:
  - Promote capacity building
  - Support air quality analyses along the Mexico/U.S. border by INE
  - Develop a first-ever, comprehensive emissions inventory for Mexico
  - Support regional haze compliance by WRAP, CenRAP
  - Support tri-national inventory efforts by NACEC
Mexico NEI - Characteristics

- **Base Year:** 1999
- **Geographic Area:**
  - Phases I, II: 6 Border States
  - Phase III: National
- **Pollutants:**
  - NO\textsubscript{x}, SO\textsubscript{x}, VOC, CO, PM\textsubscript{10}, PM\textsubscript{2.5}, NH\textsubscript{3}
- **Spatial Resolution:**
  - State
  - Municipality
- **Temporal Resolution:**
  - Annual for 1999
  - Temporal profiles for finer resolution
- **Chemical Speciation:**
  - Identify available data
# Mexico NEI - Schedule

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Mexico NEI Phase II Overview

- Status of Point Source Inventory
- Status of Area Source Inventory
- Deliverables and Inventory Review Cycle
Point Source Data Collection

- Point sources = federal and state jurisdiction
- Approach:
  - Collect existing data from:
    - DATGEN database
    - Cédula de Operación Anual (COA) reports
  - Quality assure
  - Estimate emissions for any significant missing facilities
- Goal: Compile a comprehensive database of all point source emissions
DATGEN Emissions Data

- Federal facilities operating in areas with air quality improvement plans:
  - Tijuana, Mexicali, Cd. Juárez, La Laguna, Monterrey, Mexico City, Toluca, Guadalajara

- Combustion emissions, only

- Years = Various (1995-2001)

- Approximately 1,000 facilities in border areas
DATGEN Quality Assurance

• Check for and correct:
  – Out-of-range records
  – Duplicate records
  – Incomplete/missing emission factors, production rates, control efficiency, facility location

• Significant sources to receive detailed QA:
  – Most emissions are emitted by 10% of the facilities
  – If >10 Mg/year then verify, replace, recalculate emissions for most significant emitters
DATGEN Data Summary

PM Emissions

% Facilities >100 Mg
% Emissions >100 Mg
% Facilities >10 Mg
% Emissions >10 Mg

Monterrey  Cd.Juárez  Mexicali  Tijuana
COA Emissions Data

- Federal and state facilities throughout the country with operating permits
- Combustion, process, some fugitive emissions
- Detailed operation and equipment information
- Years = 1999, 2000
- Approximately 600 federal facilities collected to date
- Currently compiling data from state environmental agencies and performing data entry of hard copy forms
COA Quality Assurance

- Check for and correct duplicate records
- Findings to date include:
  - Solvent usage but no VOC emissions
  - Incorrect emission factors
  - Unreported emissions (e.g., combustion sources with no NO\textsubscript{x} emissions)
- Significant sources (>10 Mg/year) to receive detailed QA
Area Source Data Collection

- Area sources = small industries, services, fugitives
- Approach:
  - Collect all available data based on area source matrix
  - Fuels and solvents balances
- Goal: Estimate emissions for each source category using the best methodology that the data support
Area Source Data Sources

- National Institute of Statistics, Geography, and Information (INEGI)
- Mexican Institute of Transportation (IMT)
- National Chamber of the Dry Cleaning Industry (CANALAVA)
- National Chamber of the Perfume and Cosmetics Industry (CANIPEC)
- Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA)
- Secretariat of Energy (SENER)
- Mexican National Oil Company (PEMEX)
- National Association of Paint and Ink Manufacturers (ANAFAPYT)
National Fuel Balance

- Commercially available fuels:
  - Gasoline
  - Fuel oil
  - Diesel
  - LPG
  - Natural gas
  - Other

- Fuel consumption and usage:
  - Production
  - Imports, exports

- National and regional data obtained from SENER and PEMEX

- Municipality-level data being developed
1999 Fuel sales in 1,000,000 m³

Western Zone = 20
Northern Zone = 15
Southern Zone = 11
Valley of Mexico = 14
Central Zone = 12
1999 Mexico NEI Deliverables

• Draft: 6 Border States
  – All source types (P, A, M, NRM, N)
  – Some missing categories due to missing data
• Draft Final: 32 States
  – All source types and categories
  – Fill gaps using alternative methods as necessary
• Mexico NEI Final Report:
  – Address comments on draft final
  – National Emissions Inventory Format (NIF)
1999 Mexico NEI Review Cycle

- June 30, 2003: Draft (6 States)
- July, 2003: 2-Day Workshop (Chihuahua)
- September 1, 2003: Comments due
- February 27, 2004: Draft Final (32 States)
- May 1, 2004: Comments due
- June 30, 2004: Final
Conclusions

- Mexico NEI is the first comprehensive emissions inventory for Mexico (criteria pollutants)
- National, state, and municipality level
- Heavy reliance on existing point source emissions reporting requirements (COA)
- Extensive data collection efforts underway for area source categories
Conclusions – cont.

• Capacity building continues:
  – New tools being developed (MOBILE6- and NONROAD-Mexico
  – Transition of Mexico NEI from U.S. entities to INE and SEMARNAT
  – Working together to achieve tri-national goals for consistency and comparability of emissions inventories