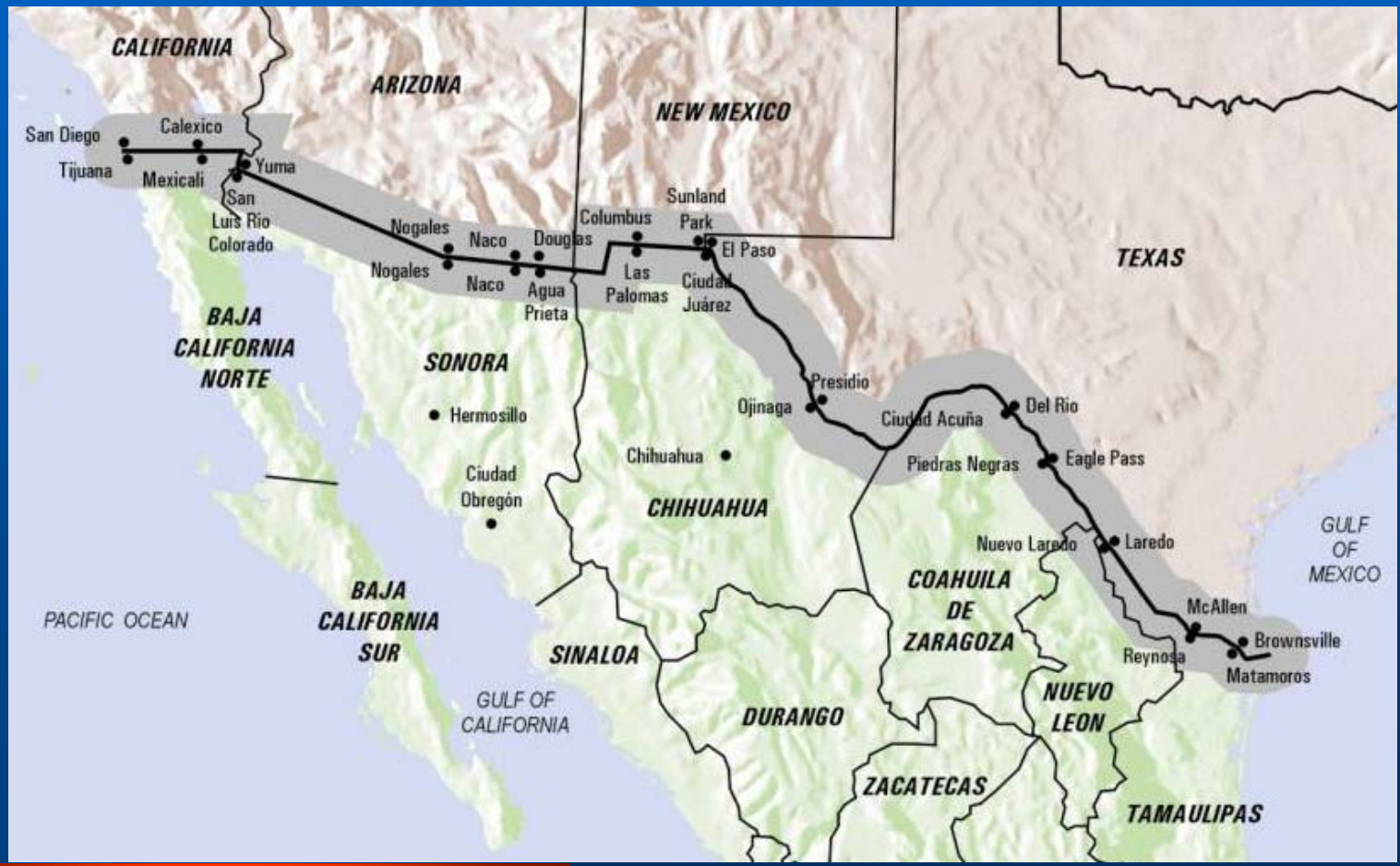
Phase III Mexico National Emissions Inventory: Point Sources and Future Activities

SEMARNAT INE WGA EPA CCA

Las Vegas, Nevada, April 14, 2005

Background

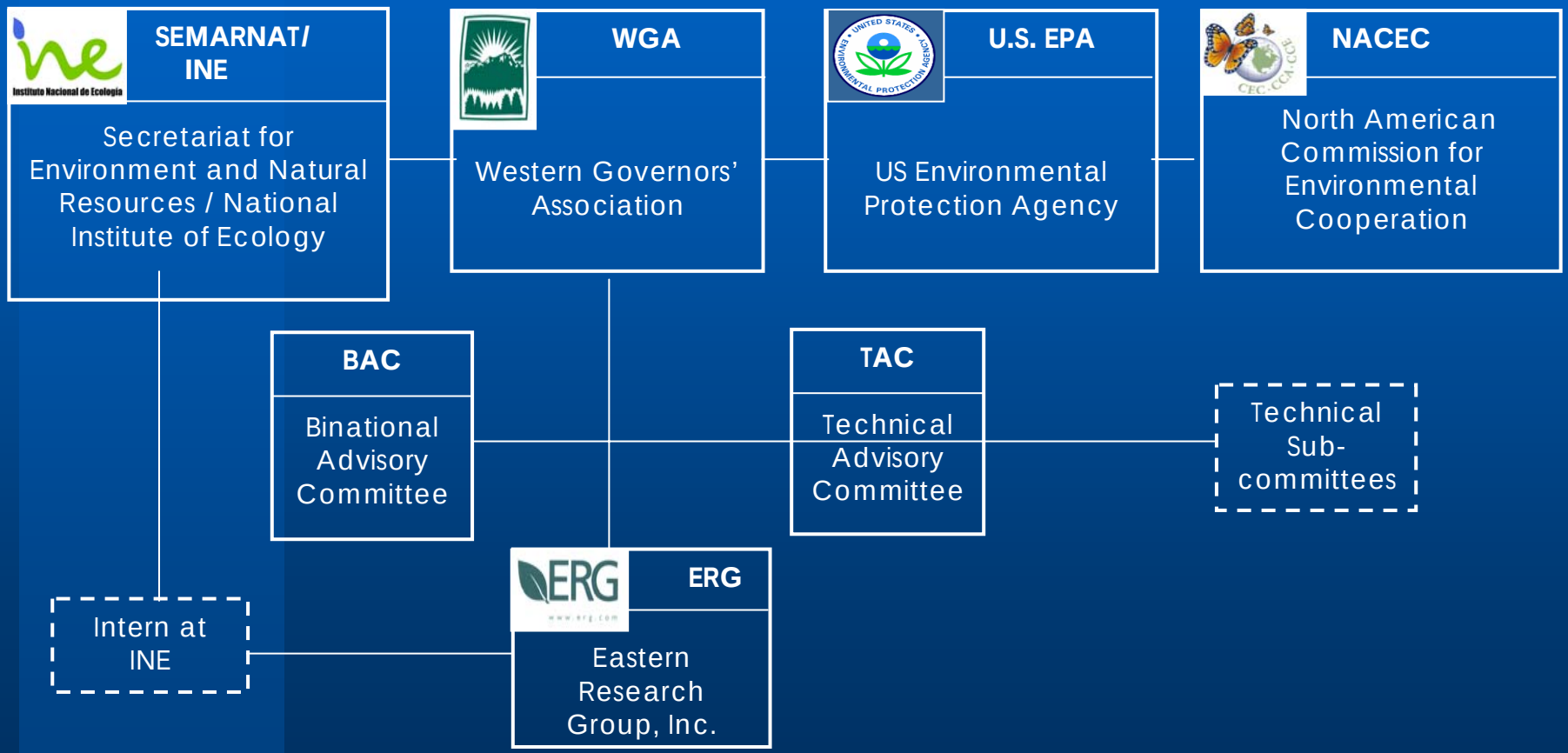
- La Paz Agreement (late 1980s)



Background

- **Started in 1995**
- **1996-2000**
  - **Capacity building**
    - **Training and Workshops**
    - **Technical studies (Mobile 5 Mexico, e.g.)**
  - **Methodology Testing**
    - **Manuals**
    - **Advanced Workbooks**
    - **Inventories for Tijuana and Mexicali**

Organization



Project Scope

- **Mexico's First National Emissions Inventory Project (NEI)**
- **Emissions Inventory Manuals**
- **Other studies:**
  - **Technical Studies**
  - **NONROAD-Mexico Model Development**

Mexico NEI Objectives

- **Develop the first National Emissions Inventory for Mexico to help institutional efforts in the areas of air quality and health impacts**
- **Comply with Federal Environmental Law mandate to integrate and update a National Emissions Inventory for Mexico**
- **Support NACEC efforts in the development of a regional emissions inventory**
- **Promote institutional capacity-building**
- **Support regional haze compliance**

Inventory Scope

- Point, area, biogenic and mobile sources
- Base year: 1999
- Pollutants: NO_x, SO_x, VOCs, CO, PM_{10}, $PM_{2.5}$ and NH_3
- Coverage
  - Phases I, II: Border States (August/04)
  - Phase III: Rest of the country + MCMA (June/05)
  - State and municipal level

Border states inventory

- 6 – State point source inventory served as pilot case
- State Environmental Authorities (SEAs) from Baja California, Sonora, Chihuahua, Coahuila, Tamaulipas and Nuevo León coordinated with the consultant to hand-in, process and validate point source information
- Federal point sources processed at SEMARNAT's Under-Secretariat of Environmental Management

INEM Objectives : Phase III

- **Compilation and processing of State and Federal point sources information for the 26 remaining entities**
- **Metodology development for projections**
- **MNEI draft**
- **Final publication of the MNEI**

Phase III point source inventory

- **Federal vs. state jurisdiction**
  - **Different reporting requirements**
    - **Federal reporting (COAs) vs. State reports**
  - **Different formats (i.e. electronic or paper files)**
  - **Disperse location**
    - **Federal COAs at SEMARNAT central offices**
    - **Federal COAs at SEMARNAT Delegations**
    - **PROFEPA data**
    - **State reports at each SEA**
  - **Variable data quality**

How to compile available information?

Country regionalization proposal:

- 4 groups / regional workshops
- To facilitate the handling an processing of information
- Considers geography, and common basins
- Industrial and productive activities
- Impacts and influences between federal entities

National regions for processing of State and Federal point sources information

How to compile available information? (2)

- Retrieve all available emission reports (Federal and State) from 1999, 2000 and 2001
- Scan all available emission reports and other relevant information for:
  - general information (facility name, location and contact details),
  - raw materials,
  - main products,
  - fuel use, and
  - reported emissions

How to compile available information? (3)

- Merge all relevant information into DATGEN database
- Classify sources (encoding)
  - CMAP
  - NAICS
- Follow QA/QC procedure

QA/QC procedure

- Measurements: Whenever measurements were reported (e.g. federal COAs), checked for consistency with reported annual emissions (using information on fuel type and operating conditions).
- Reported emissions: When no measurements were available (i.e. a significant number of State facilities or incomplete Federal COAs), checked for consistency against fuel consumption and equipment capacity (using emission factors).

QA/QC procedure (2)

- Fuel use: When no emissions were reported or were inconsistent, used AP-42 emission factors. PM factors used correspond to industrial boilers under poor maintenance conditions with predominantly old burner technologies, an assumption valid for year 1999.

QA/QC procedure (3)

- Raw materials and process data: Process emissions not mandatory for most point sources. These were estimated using emission factors.
  - Used mainly CARB PM10/PM2.5 ratios.
  - When information was not sufficient, a rule of thumb of PM10= (0.7) PM and PM2.5= (0.35) PM was applied.
  - Specific AP-42 emission factors used to estimate process PM and SO2 emissions
  - VOCs emissions estimated by mass balance

Results

- Information of 6,685 state jurisdiction industries plus 1,607 of federal jurisdicción facilities, that represent some tipe of atmospheric emissions report
- Information on annual emissions from State facilities often incomplete, incorrect or inconsistent
- Fuel consumption to obtain the emissions. A large amount of the emissions of the State sources were calculated based on AP-42 emission factors

REGIONAL RESULTS

REGION 1	INFORMATION		TOTAL
	STATE	FEDERAL	
BAJA CALIIFORNIA	1° Et	1° Et	--
SONORA	1° Et	1° Et	--
BAJA CALIFORNIA SUR	30	9	39
SINALOA	50	51	101
NAYARIT	50	2	52
DURANGO	720	40	760
ZACATECAS	S/IR[2]	9	9
SAN LUIS POTOSÍ	70	51	121

REGION 2	INFORMATION		TOTAL
	STATE	FEDERAL	
CHIHUAHUA	1° Et	1° Et	--
COAHUILA	1° Et	1° Et	--
JALISCO	1200	53	1253
COLIMA	100	12	112
GUANAJUATO	155	57	212
QUERÉTARO	600	70	670
MICHOACÁN	120	38	158
AGUASCALIENTES	105	32	137
TLAXCALA	120	47	167
MORELOS	30	38	68

REGION 3	INFORMATION		TOTAL
	STATE	FEDERAL	
NUEVO LEÓN	1° Et	1° Et	--
TAMAULIPAS	1° Et	1° Et	--
VERACRUZ	100	62	162
OAXACA	40	26	66
CHIAPAS	15	23	38
QUINTANA ROO	S/IR[2]	5	5
CAMPECHE	7	6	13
GUERRERO	S/IR[2]	8	8
YUCATÁN	30	9	39

REGION 4	INFORMATION		TOTAL
	STATE	FEDERAL	
ESTADO DE MÉXICO	1296	129	1425
PUEBLA	200	71	271
HIDALGO	58	53	111
DISTRITO FEDERAL	1572	642	2214
TABASCO	11	98	109

1.- First phase 2.- Without report instrument

Results (2)

- 75 additional sources were incorporated, using other information available to SEMARNAT
- Process emissions of VOCs from PEMEX were included as reported in their emissions inventory

Conclusions

- The extended use of emission factors contributes considerably to the uncertainty of Mexico's point source inventory figures.
- Workshops were excellent ocassions to promote networking between SEAs and Federal authorities
- Action plan for future activities partly based on needs expressed at workshops

Future activities

- Regional training workshops
  - share the results from the inventory
  - train State officials in basic emission inventory skills
- Workbook and intensive (20-hour) course on emission inventories
- Web-based course.
- Revision and update of the emission inventory manuals

Future activities (2)

- Single emissions database project (*Sistema Nacional de Datos de Inventarios de Emisiones Contaminantes – SNDIEC*)
  - Criteria pollutants
  - Greenhouse gases
  - Toxics (RETC)
  - Tools and methodologies for emission estimation

Future activities (3)

- SNDIEC
  - Restricted access to calculate, load, retrieve and update emissions information
  - Preset queries for the general public and researchers

Contacts

- Password protected project website

  http://www.erg.com/mnei

- INE's website

  http://www.ine.gob.mx/dgicurg/calaire/lineas/inventario_nacional.html

Any question ?

Hugo Landa

hlanda@semarnat.gob.mx

+(52-55) 56.24.35.61