New Approach for Timely Development of the 2005 Emission Inventory

Michael Smith, Chun Yi Wu, Todd Biewen, Paul Kim, and Nick Salkowski

Minnesota Pollution Control Agency

Two Emission Inventories

Criteria Air Pollutant EI (CAP EI)	Air Toxics EI (AT EI)
Permitted Facilities	Permitted Facilities
	Other TRI Reporting Facilities
	Non-point Sources
	Onroad Mobile Sources
	Nonroad Mobile Sources

CAP EI

- 7 pollutants
- State rule - mandatory submittal requirement
  - Used to calculate air emission fees
- Updated annually
- State developed database (DELTA)

Air Toxics EI (AT)

- In addition to > 500 air toxics
  - $PM_{2.5}$, and NH_3 for point
  - All CAPs for non-point and mobile
- Voluntary submittal requirement
  - Established on the Criteria EI
- Updated triennially
- Regional Air Pollutant Inventory Development System (RAPIDS)

Possible Targets for Improvement from Survey

- Pollutants
- Sources
- Temporal Resolution
- Spatial Resolution
- Inventory Timeliness
- Inventory Frequency

Adding New Pollutants

- Green house gases?
- Flame retardants, endocrine disruptors or others
  - New procedure for adding pollutants
  - Probably no Emission Factors available
  - Permits/Permit Rules only address HAPs

Improving Coverage on Sources

- Point
  - Collect data from more sources for AT EI
- Area
  - Add more source categories
  - Collect more state-specific activity data
- Mobile
  - Collect more state-specific activity data

Improving Temporal Detail

Monthly/Weekly/Daily/Hourly?

- Increasingly more complicated inventory with more detailed temporal resolution

- Data/Emission Factors may not be available

- Increasing number of records will overwhelm databases

Improving Spatial Detail

ZIP Codes?

- No ZIP code data for Area/Mobile Sources

Census Tracts?

- Some area source data available
- Post EI Processing Project

Improving Timeliness

Short Term Actions:

- Improve coordination between CAP EI and AT EI for point sources
- Use older activity data for area and mobile sources

Long Term Possibilities:

- Electronic data submission & Integrated CAP/AT reporting?
- Require large point source HAP recordkeeping/reporting?

Greater Air Toxics EI Frequency

Biennial?

- Doesn't match U.S. EPA's NEI cycle

Annual?

- Only possible if Inventory Timeliness increases dramatically

Why does it take so long?

CAP EI

- Submissions from facilities - April 1
- Most of the emission calculations - April to November (~8 months)

AT EI

- Point sources - after the CAP EI finishes
- Multiple information sources
- Multiple data formats or not at all
- Multiple pollutants
- Over a year to compile data for area and mobile sources

CAP EI History
Pre 2002

- December – Mail out CAP EI forms to facilities
- April 1 – CAP EI reports due
- April 15 – Nonsubmitters list to enforcement
- December - Complete processing inventories, QA/QC, mail out summaries
- February 1 – due date for corrections
- March 1 – finalize CAP inventory

CAP EI History 2002 - 2004
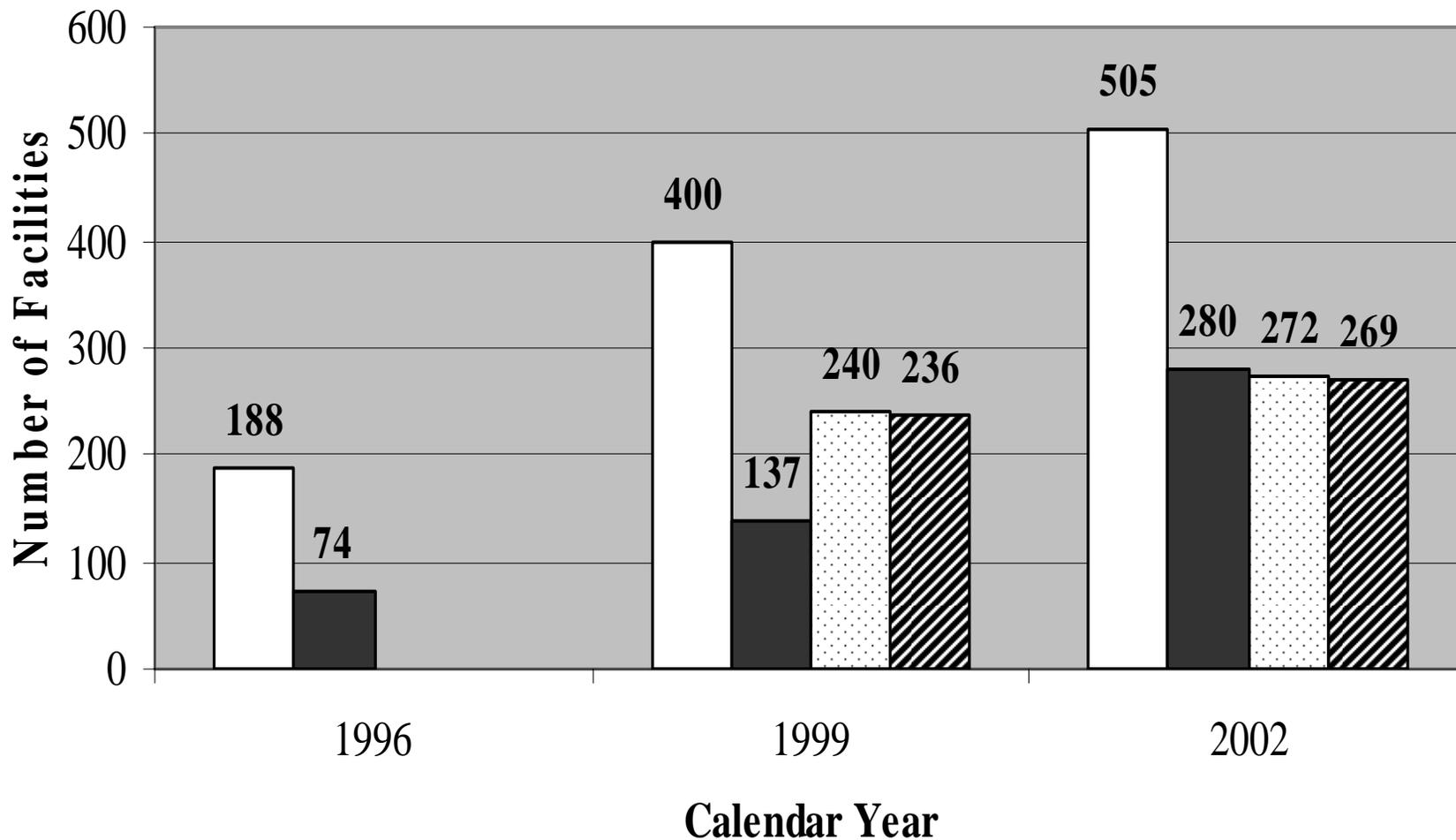
- December – Mail out CAP EI forms to facilities
- April 1 – CAP EI reports due
- April 15 – Nonsubmitters list to enforcement
- October 1 - Complete processing inventories, QA/QC, mail out summaries
- 45 days after summary mailing – due date for corrections
- January 1 – finalize CAP inventory

AT EI for Point Sources

- 3rd quarter of the EI year - Planning
- After CAP EI reports due - Mail out AT forms
- 12 Months after CAP EI complete
  - Converting data from Delta to Rapids
  - Entering voluntary submitted data
  - Estimating emissions
  - Incorporating TRI data
- QA/QC period – state, regional, and national
- 29 months after the end of EI year - Complete

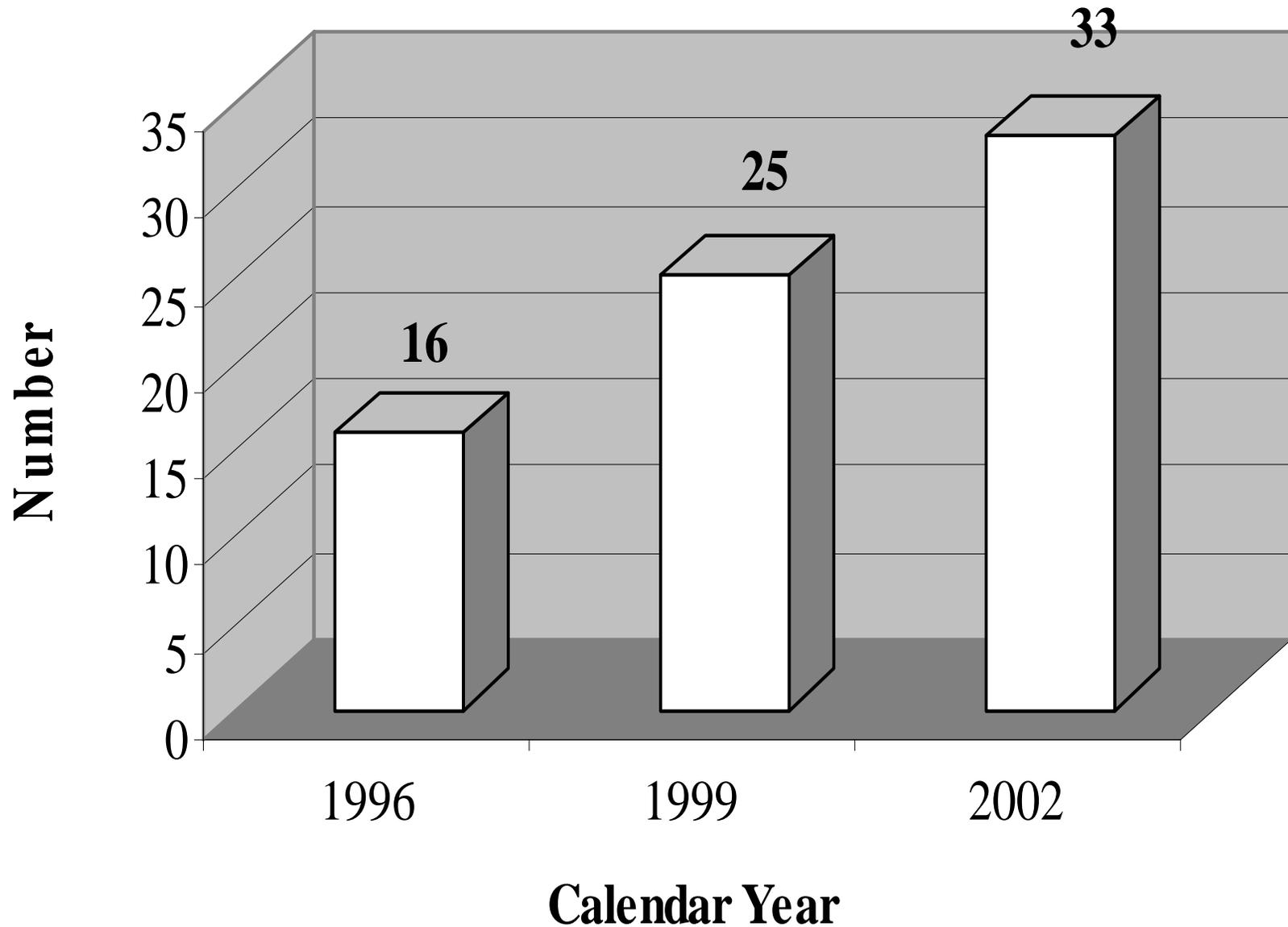Figure 1: Analysis of Responding Rate from Point Sources to AT EIs

Legend:
- ☐ Large facilities that received the letter
- ■ Large facilities that responded
- ⊡ Option D facilities that received the letter
- ▨ Option D facilities that responded

Data values:

Calendar Year	Large facilities that received the letter	Large facilities that responded	Option D facilities that received the letter	Option D facilities that responded
1996	188	74		
1999	400	137	240	236
2002	505	280	272	269

AT EI for Non-Point Sources and Mobile Sources

- Non-Point
  - Increasing source categories
  - Multiple information sources
  - Different levels of activity data
- Mobile sources
  - on-road, non-road, aircraft, commercial marine vessels, and locomotives
- Duplicating EPA efforts for some categories
- About 30 months for completion

Figure 2: Number of non-point source categories for AT EIs

Air toxics emission data sources for mobile sources.

(S – State estimated, N – NEI values adopted, C – CENRAP values adopted)

Mobile Source Categories	1996	1999	2002
On-road	S	N	S
Non-road	S	N	N*
Aircraft	S	S	S
Commercial Marine Vessels		N**	C
Locomotives	S	S	S

* MPCA used state-specific data to spatially allocate recreational marine and snowmobile emissions, and used state-specific weather data to estimate snowmobile emissions.

** MPCA made two modifications to the distribution of in port emissions. These modifications did not affect the total emissions for the state.

New Strategy

- Data collection
- Creative changes in staff work distribution
- Integrated schedule
- Integrated approach to non-point and mobile sources EI
- Complete AT EI in 18 months after the end of EI year

Data Collection

- Emphasis on point sources
- Mail CAP EI and AT EI forms together
- Set lower cut off of VOC emission levels for AT mailing for Option D permittees
- Added Option C permittees to AT mailing
- New submittal deadline date for AT EI - May 1

Creative Changes in Staff Work Distribution

- Additional staff person added - work on smaller, less complex facilities and help with data entry for larger facilities

- Experienced Inventory staff - work on larger more complex facilities

Integrated Schedule

- Process CAP EI for largest 24 facilities (power plants, taconite, refineries) as soon as selected facilities submit inventory

- AT EI starts with these 24 selected facilities - a seven month head start

Integrated Approach to Non-Point and Mobile Sources EI

- Non-point
  - Focus on categories with state specific information
  - Use the NEI data for other categories
- Non-road
  - Focus on aircraft and locomotives
  - Review NEI input files and use NEI results for other categories
- On-road

  Review NEI input files and use NEI results

Looking Forward

- Rule Updates
  - move CAP submittal deadline
  - reporting requirement for point AT EI
- Modeling Ready EIs
  - currently only one geographic point for facility
  - receive better stack locational coordinates
- Electronic Reporting
  - create electronic reporting process
- Combined Submittals
  - combining CAP and AT inventory