





Reducing Mercury Emissions in the U.S.A. Status of U.S. EPA Regulations and Other Actions

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GLBTS Mercury Meeting
Chicago
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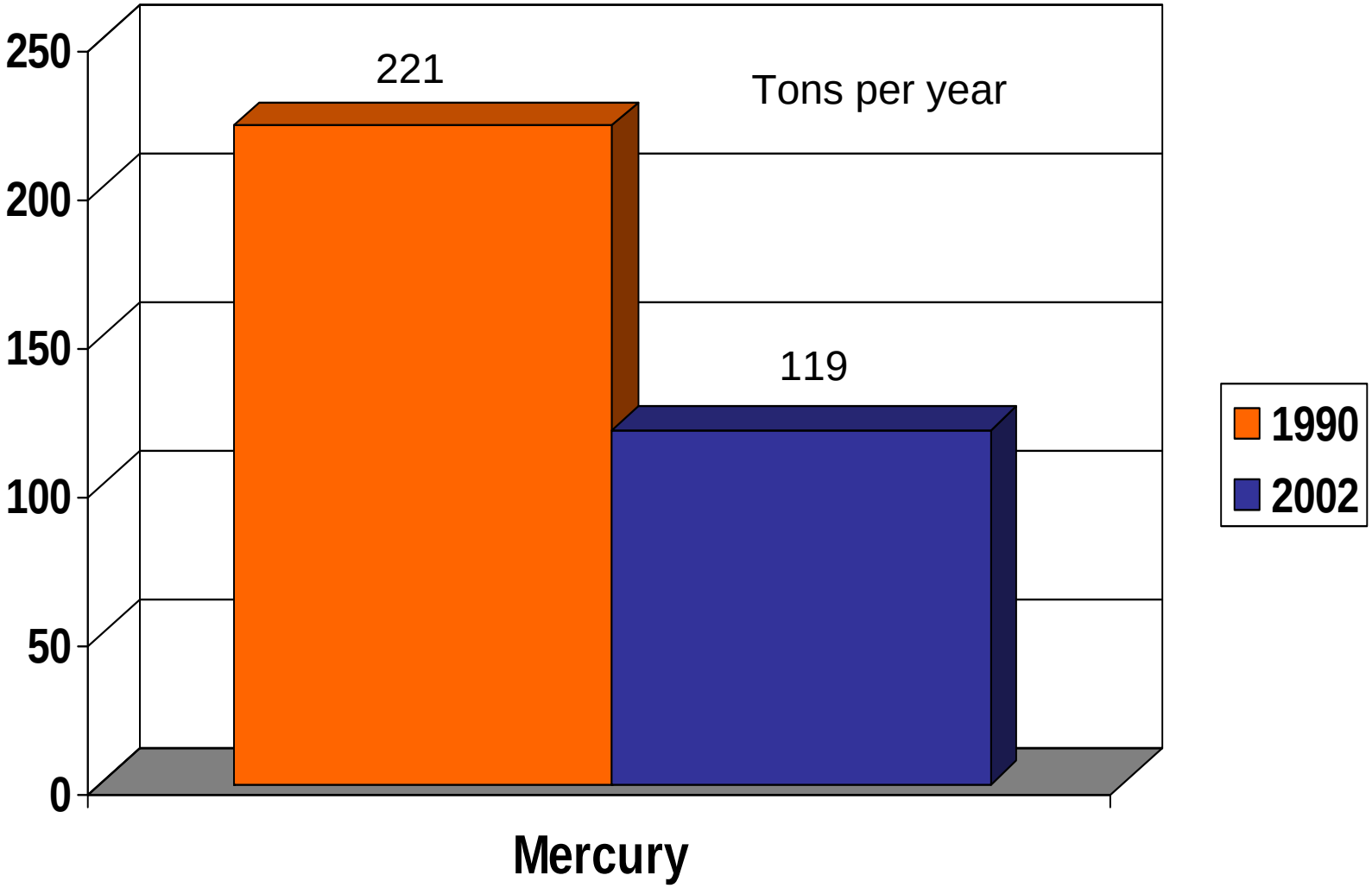
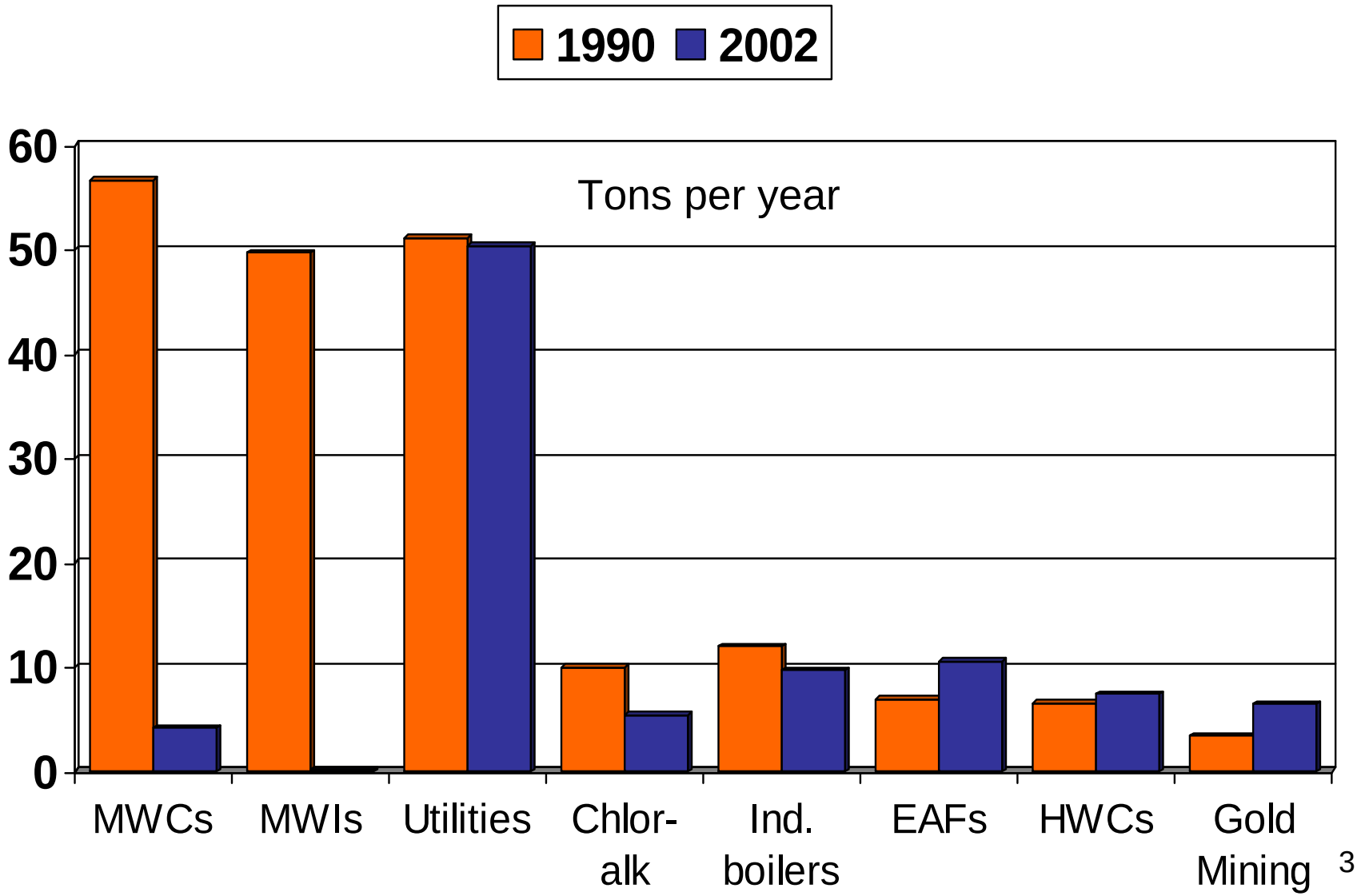
Total Estimated Anthropogenic Emissions of Mercury in U.S.A. for 1990 & 2002



Mercury Emissions Estimates in U.S.A. for 8 Source Categories for years 1990 and 2002



Mercury Emissions in U.S.A.

- Mercury Emissions reduced about 47% between 1990 to 2002, largely due to huge reductions from waste incineration.
- Further reductions will be achieved between 2002 to 2020 from at least 5 categories
  - Coal-fired Power Plants
  - Secondary Steel Production (EAFs)
  - Chlor-alkali Production
  - Gold Mining
  - Waste Incineration (including municipal, medical, and hazardous waste combustors)

Two Rules promulgated in March 2005 to reduce emissions from Coal-fired Power Plants

- Clean Air Interstate Rule (CAIR)
  - Creates a two-phase program with declining emission caps
    - for NOx in 2009 and 2015, and
    - for SO_2 in 2010 and 2015
    - based on application of cost effective controls to large Power Plants.
    - mercury emissions will also be reduced as a co-benefit
- Clean Air Mercury Rule (CAMR)

Clean Air Mercury Rule (CAMR)

- CAMR establishes a mechanism by which mercury emissions from coal-fired power plants are capped at specified, declining nationwide levels in two phases.
  - **Phase I (2010):** Cap is 38 tons (which is a reduction of about 10 tons from the 1999 levels);
    - most mercury reductions resulting from "co-benefit" of controls installed to meet CAIR.
  - **Phase II (2018):** Cap is 15 tons; additional mercury-specific control technologies will likely be necessary…
  - **Total emissions reduction:**
    - from about 48 tons mercury (in 1999) to about 15 tons (in 2020), nearly a 70% reduction.

CAMR Reconsideration

- In 2005, EPA received 2 petitions for reconsideration.
  - one from 14 States; and the other from 5 environmental groups.
- EPA agreed to reconsider certain aspects, including:
  - legal issues underlying the decision; and
  - the methodology to assess the amount of utility-attributable mercury levels in fish and the public health implications.
- In May 2006, after carefully considering the petitions, EPA made some adjustments to the rule, but generally reaffirmed the rules as promulgated.

CAMR Litigation Status

- Also in 2005, 11 States and several environmental groups filed suit against EPA challenging CAMR and the determination under Section 112 of the Clean Air Act.
  - Oral arguments occurred on December 6, 2007.
  - Waiting for a decision from the court.

Secondary Steel Production: Electric Arc Furnaces (EAFs)

- Facilities produce steel using scrap metal (e.g., old/damaged cars, trucks, appliances, etc…..) using EAFs
- This category emits about 10 tons per year mercury in the U.S. (based on 1999 and 2002 inventories)
- Mercury emissions are largely due to presence of mercury-containing switches in scrap vehicles built before 2003
  - Convenience lighting in hoods, trunks
  - Some anti-locking brake systems

2006 National Vehicle Mercury Switch Recovery Program (NVMSRP)

- Result of collaboration between U.S. EPA, States, environmental organizations and industry.
- Designed to remove mercury-containing switches from scrap vehicles before they are recycled in steel mills.
- Estimate about 67 million switches are available for recovery.
- This Program, along with a few state mercury switch programs, are expected to reduce mercury emissions by about 75 tons over the next 15 years.
  - Average of about 5 tons reductions per year

National Emissions Standard for Hazardous Air Pollutants (including mercury) for EAFs

- In addition to the switch program, U.S. EPA is developing a regulation under Section 112 of the Clean Air Act that will limit mercury emissions from EAFs .
- Proposed rule on Sept. 20, 2007.
  - Standard for mercury based on Maximum Achievable Control Technology (MACT)
  - Standard for other HAPs based on Generally Available control Technologies (GACT)
- Final rule to be promulgated by December 15, 2007.

Summary of Proposed MACT rule for Mercury for EAFs

- Focused on work practice requirements for facilities to address mercury emissions, with 3 options:
  - Participate in the NVMSRP, or
  - Develop their own equivalent approach, or
  - Certify facility does not use auto scrap with mercury switches.

Summary of Comments on proposed EAF rule for mercury

- Some stakeholders commented that:
  - Rule should include additional monitoring and recordkeeping to assure accountability and enforceability.
  - Rule should establish a mercury emission limit, and/or require add-on emission controls and monitoring.
  - Rule should address other sources of mercury in scrap.
- Other stakeholders supported the approach as outlined in the proposed rule.

Chlor-alkali Production – Mercury Reductions

- The Chlor-alkali industry has made significant progress reducing mercury use and emissions
  - Mercury use was reduced about 94% between 1995 to 2005 in the U.S. (from about 160 tons in 1995 to 10 tons in 2005);
  - In 2000 there were 12 plants operating in the U.S. By 2009 there will be only 4 plants.
  - Emissions decreased from an estimated 10 tons in 1990 to about 5 tons in 2002, and are expected to decrease further to roughly about 2 to 3 tons by 2009 (~~75% reduction).

Chlor-alkali Production Emissions Regulation

- National Emissions Standard promulgated in 2003, with compliance deadline in 2006.
  - Based on MACT
  - Prohibits building new plants with Hg process
  - For existing plants, rule includes mercury emissions limits for the process vents (stacks).
  - For cell rooms, no emission limit is specified; however, stringent work place standards are required to minimize emissions; or
    - As an alternative, plants implement a cell room continuous mercury measurement and monitoring program.

Reconsideration of the Chlor-alkali Emissions Rule

- In February 2004, NRDC filed:
  - a petition for review of rule to U.S. Court of Appeals, and;
  - a petition for Administrative reconsideration of the rule, which EPA granted.
- EPA began an extensive emissions testing project at 2 facilities (in Tennessee and Delaware) to gain a better understanding of emissions, especially fugitive emissions.
  - Testing is completed and reports are in the EPA Docket.
- Currently, EPA is reconsidering the rule in light of comments by the petitioners, the emissions testing results, and progress by industry to refine their mercury inventory.
- EPA plans to propose a decision on the “reconsideration” in May 2008, and promulgate a final decision in May 2009.

Industrial Gold Mining and Production

- Mercury emissions estimated to be about 8 to 11 tons in 1999
- About 95% of the emissions were coming from 5 mines in Nevada, and a successful Voluntary Mercury Reduction Program (VMRP) was established between the Industry, State of Nevada, and U.S. EPA to reduce these emissions
- Emissions reduced to an estimated 6.5 tons by 2002, and about 2.5 tons by 2005 (about 75% reduction from 1999).
- In 2006, State of Nevada established the mandatory Nevada Mercury Regulatory Program
  - To further reduce mercury emissions…

Mercury Reductions through the VMRP

- These facilities apply various effective control technologies and pollution prevention measures to limit mercury emissions, including:
  - gas condensers
  - carbon adsorption units
  - wet scrubbers
  - fabric filters
  - mercurous chloride scrubbers
  - wet venturi scrubbers
  - chemical additives to improve mercury capture.

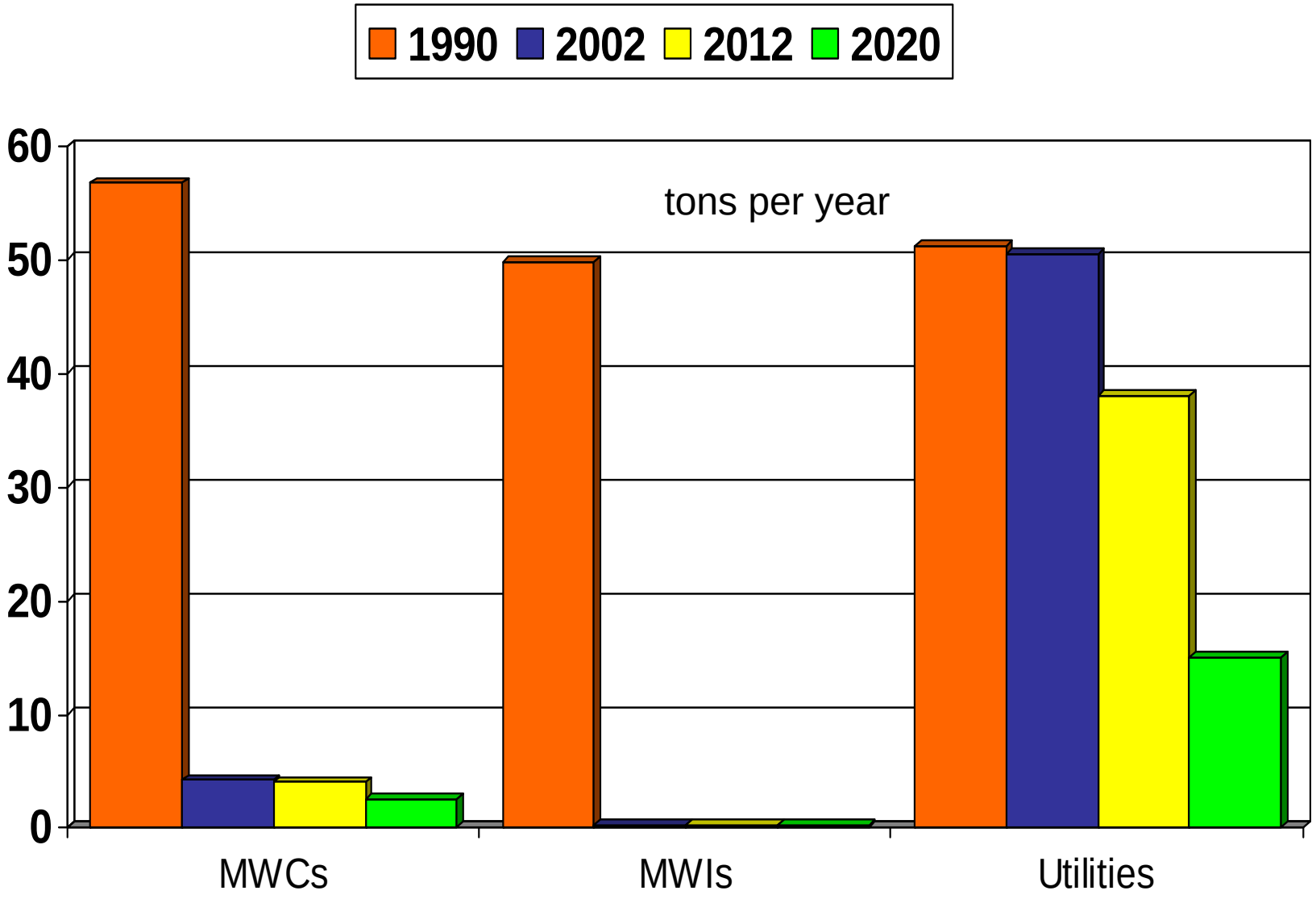
Nevada Mercury Regulatory Program

- In May 2006, Nevada established the Mercury Air Emissions Regulatory Program to further reduce emissions
- The mandatory program includes:
  - enhanced monitoring, testing, recordkeeping and reporting requirements;
  - expanded coverage to all primary gold and silver production operations in Nevada; and
  - additional controls.

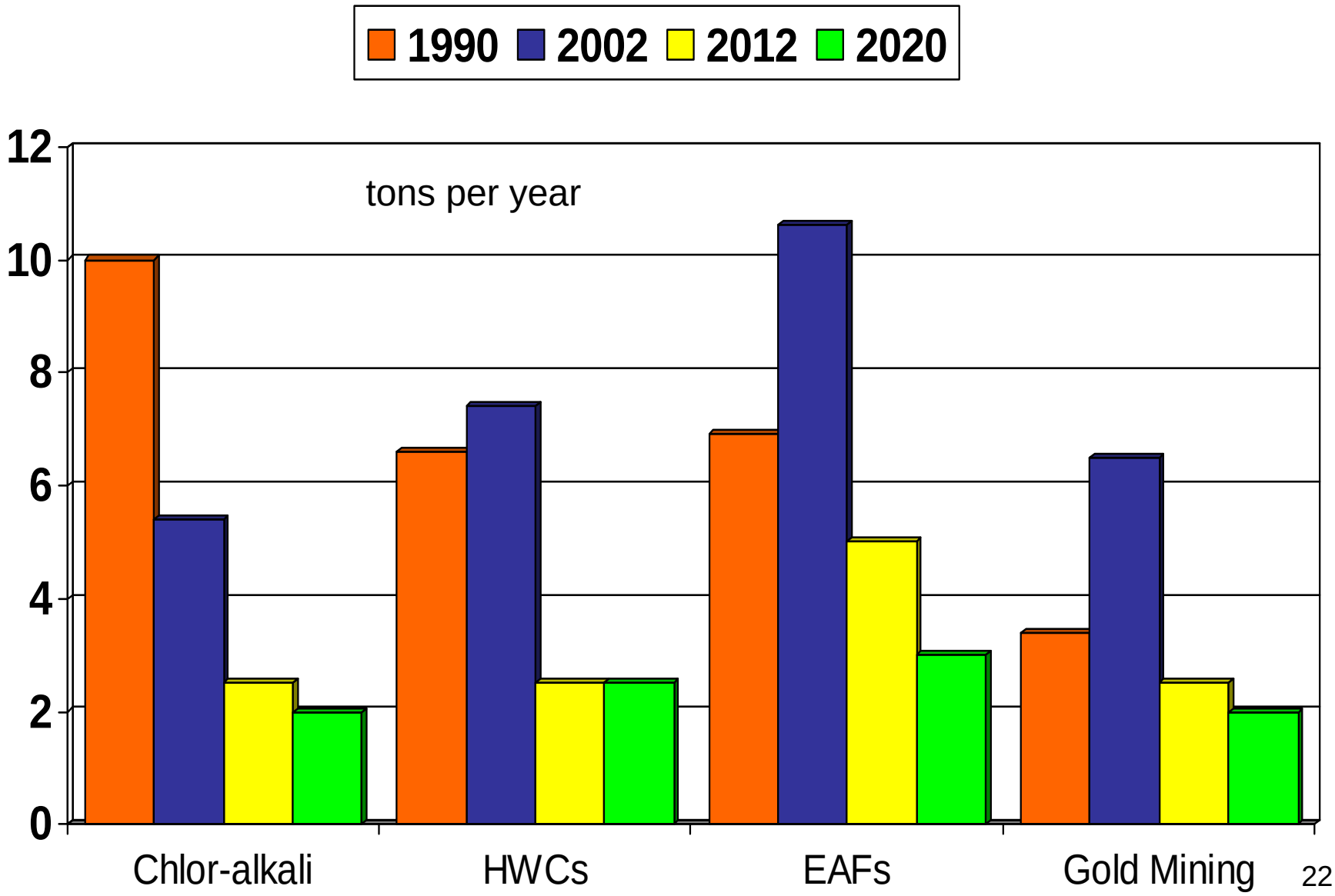
Hazardous Waste Combustors

- EPA promulgated emissions regulations for hazardous waste combustion in October 2005, with compliance due in 2008.
- Following promulgation of the final rule, 5 entities filed petitions for judicial review of the rule.
  - Litigation is currently pending
- On September 27, 2007, EPA published a Notice in the *Federal Register* seeking public comment on several aspects of the 2005 rule.
  - After considering public comments, EPA plans to issue a final Notice by February 29, 2008.

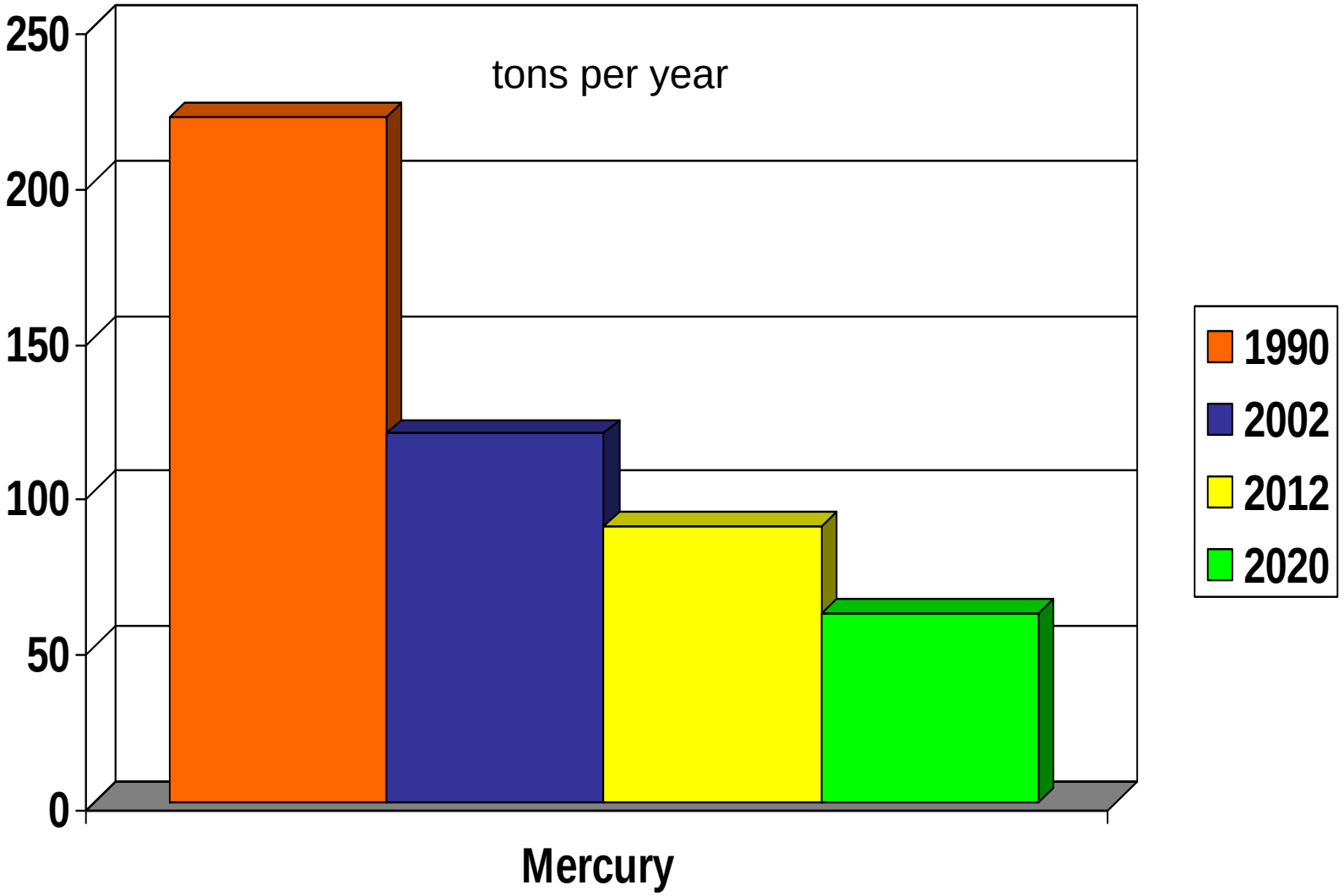
Mercury Emissions Estimates and Projections in U.S.A. for 3 Categories for years 1990, 2002, 2012, and 2020



Mercury Emissions Estimates and Projections in U.S.A. for 4 Categories for years 1990, 2002, 2012, and 2020



Total Estimated and Projected Anthropogenic Emissions of Mercury in U.S.A. for years 1990, 2002, 2012 and 2020



Project about 72% reduction in mercury emissions between 1990 to 2020.

- **Glossary:**
  - MWIs = Medical Waste Incinerators
  - MWCs = Municipal Waste Combustors
  - HWCs = Hazardous waste Combustors
  - Utilities = Coal-fired Electric Utility Power Plants
  - I. Boilers = Industrial/Commercial/Institutional Boilers & Process Heaters
  - Chlor-alkali = Mercury-Cell Chlor-Alkali Production
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  - Miller and Jones, 2005. Mercury and Modern Gold Mining in Nevada.