



# 2022 Mercury Emissions Inventory Update

## 2023 Statewide Mercury TMDL Oversight Committee Meeting

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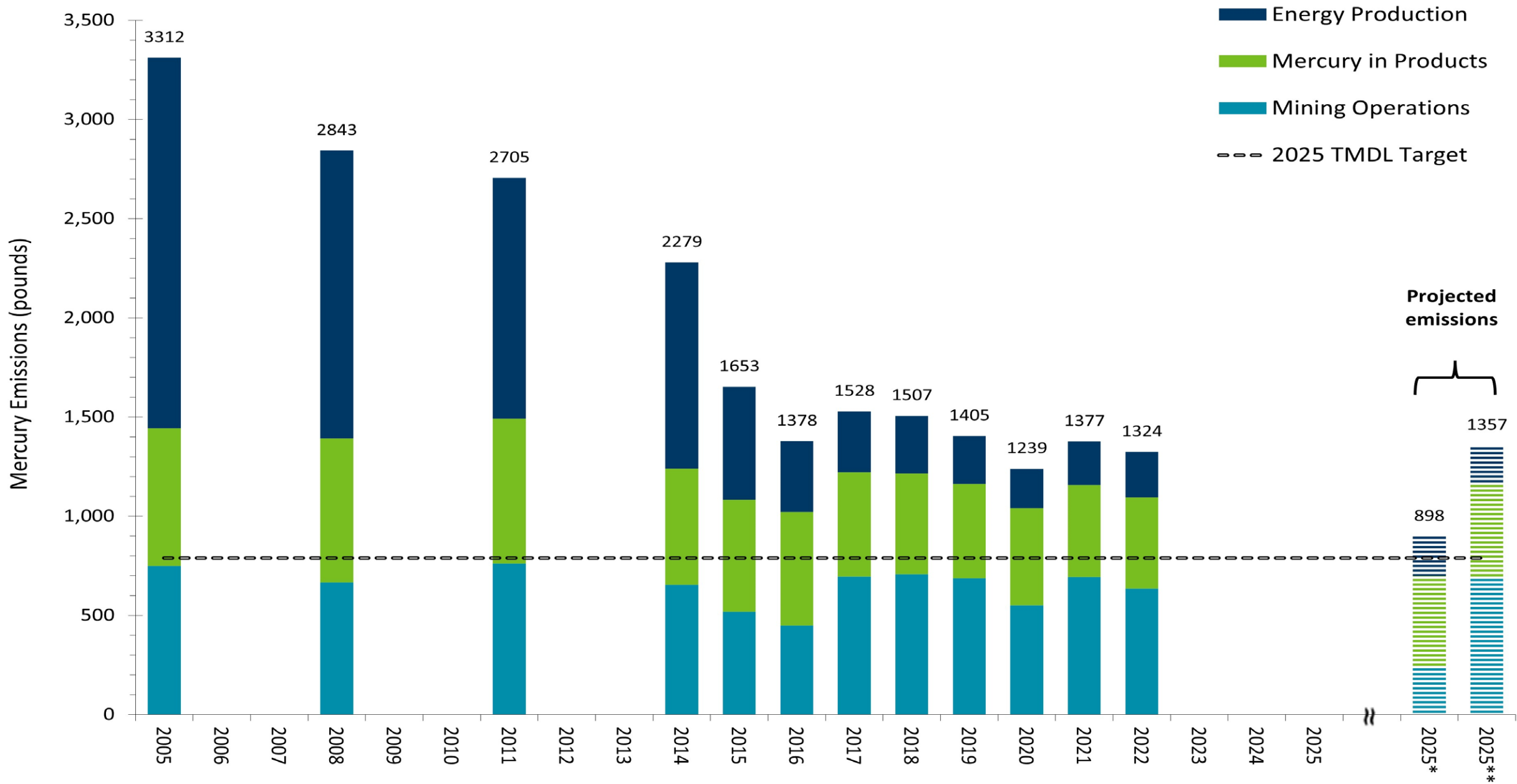
September 21, 2023

# Overview

- Mercury emission inventory (2020-2022)
- 2025 mercury emission projections
- In-depth mercury emissions inventory review
- EPA's National Emissions Inventory
- Moving forward
- Questions and answers

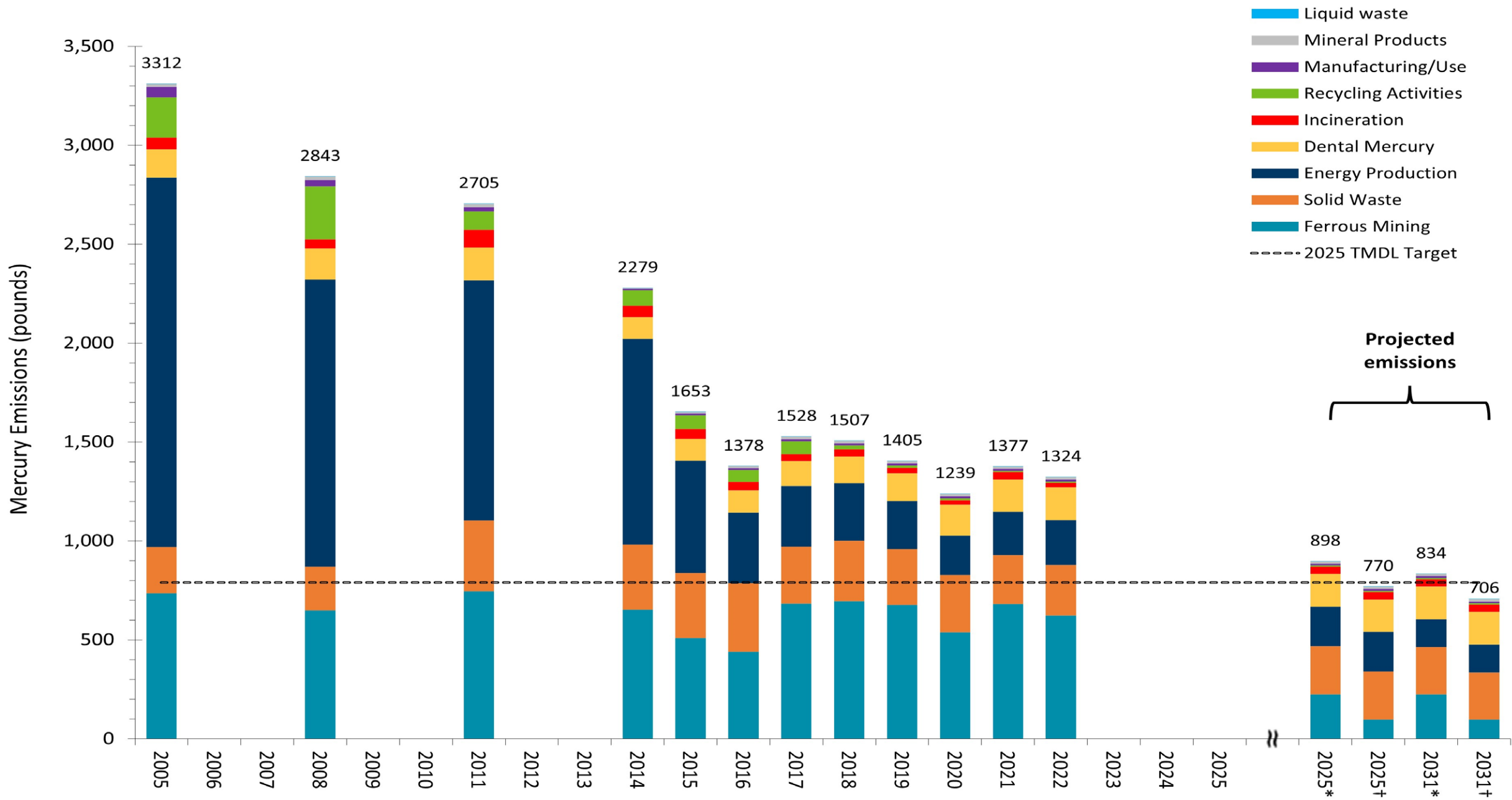
# Minnesota's annual mercury emissions

- Mercury emission inventory updates
  - 2021 and 2022 point source emissions
  - New data available from EPA's 2020 National Emissions Inventory
  - New off-year Minnesota estimates for nonpoint mercury from solid waste
- Notable takeaways
  - Emissions from energy production and mining increase from pandemic low
  - Emissions from mercury in products continues to decrease



\* This projection is based on the ferrous mining/processing industry in northern MN meeting the required 72% reduction specified in Minn. R. 7007.0502.

\*\* This projection is based on the ferrous mining/processing industry's proposed reductions in each mercury reduction plan applied to the baseline emissions as calculated by MPCA.

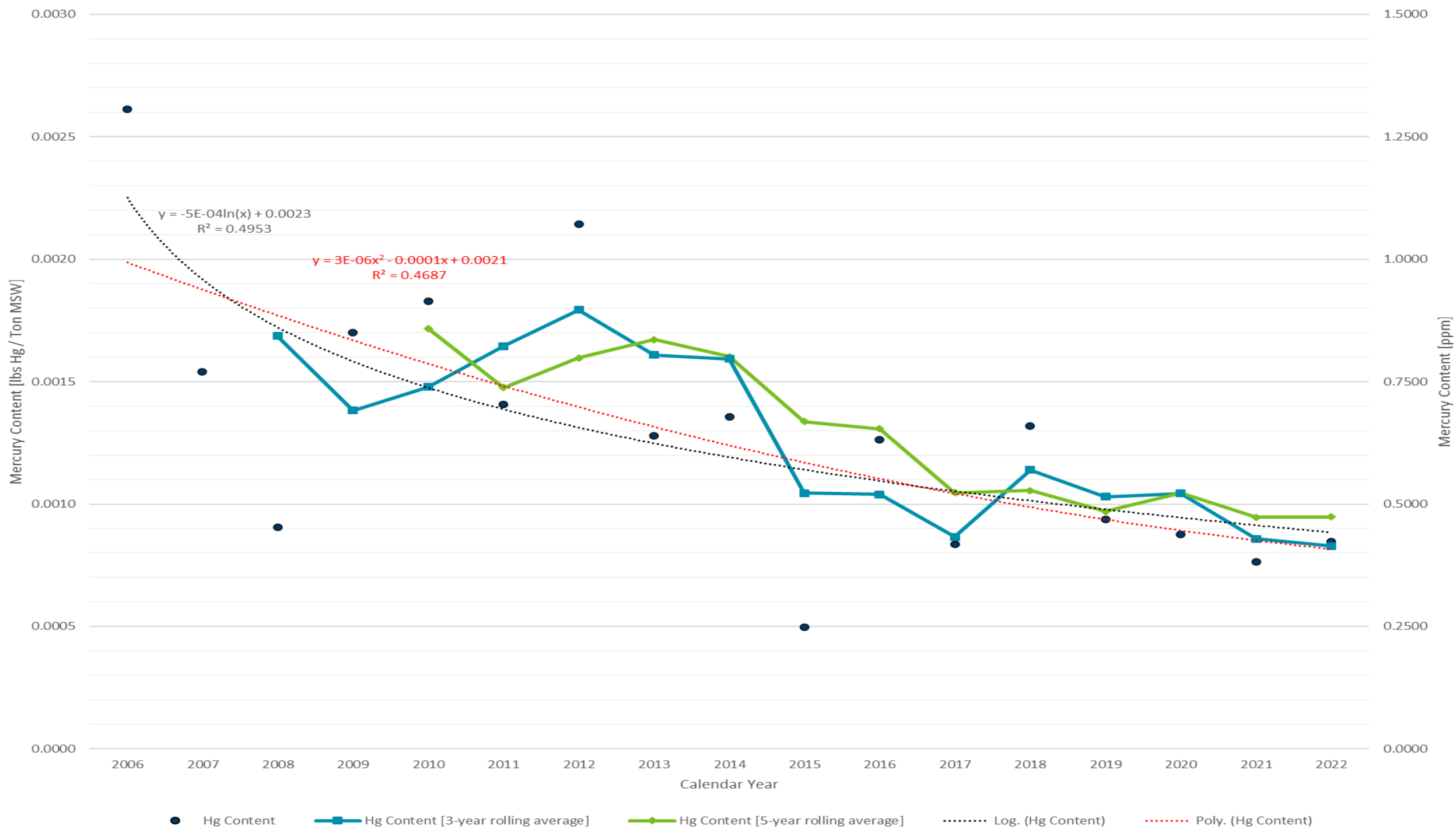


\* This projection is based on the ferrous mining/processing industry in northern MN meeting the required 72% reduction specified in Minn. R. 7007.0502.  
 † This projection is based on the ferrous mining/processing industry implementing ACI and setting future projected emissions from Mesabi Metallica and Mesabi Nugget to zero.

# Minnesota's mercury emissions inventory

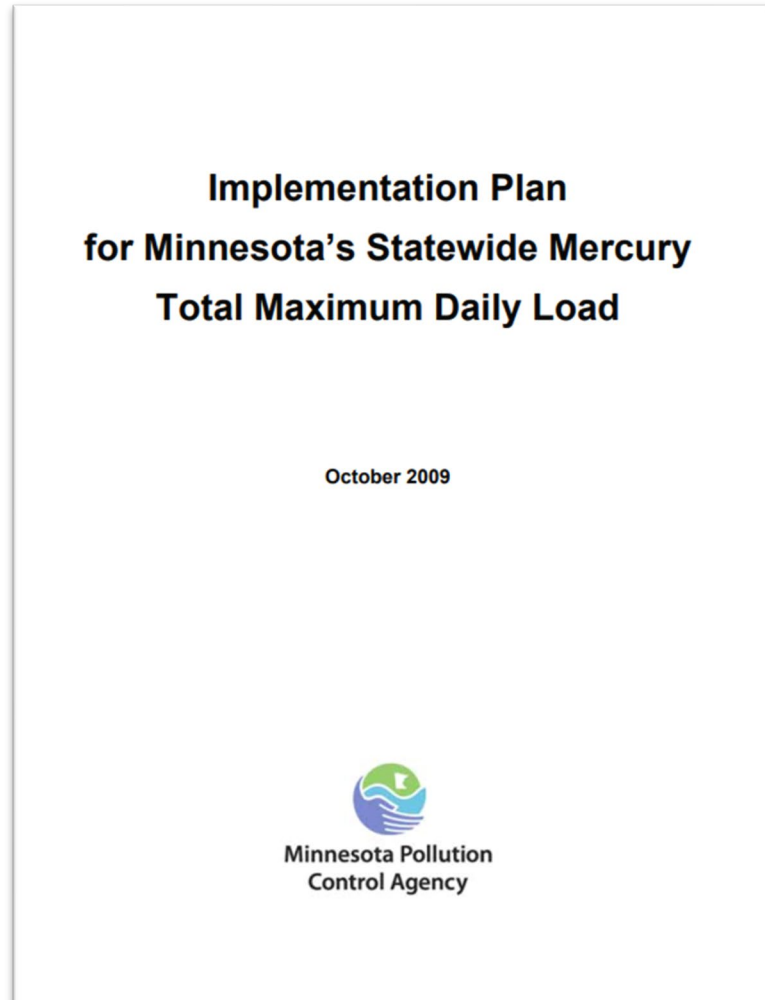
- Detailed review of the updated 2020-2022 emissions inventory
- Statewide Mercury TMDL Emissions Inventory Spreadsheet





# Regional & national mercury emissions

## Mercury reduction goals & updates



- Statewide Mercury TMDL Implementation Plan
  - Recognized that mercury emission reductions are needed from out-of-state sources as well
  - National emissions data from EPA
- EPA's National Emissions Inventory (NEI)
  - Triennial inventory of air emissions
  - Regional & national emissions comparison

# Regional & national mercury emissions

## Mercury reduction goals

|                                                   | Mercury Emissions (pounds) |                |                |                |               |               | Goals         |               |
|---------------------------------------------------|----------------------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|
|                                                   | 2005                       | 2008           | 2011           | 2014           | 2017          | 2020          | 2018          | 2025          |
| <b>Minnesota</b><br><i>(% reduction vs. 2005)</i> | 3,312<br>0%                | 2,843<br>14%   | 2,705<br>18%   | 2,279<br>31%   | 1,528<br>54%  | 1,239<br>63%  | 1,464<br>56%  | 789<br>76%    |
| <b>Regional</b><br><i>(% reduction vs. 2005)</i>  | 22,170<br>0%               | 16,970<br>23%  | 14,328<br>35%  | 12,389<br>44%  | 5,715<br>74%  | 5,609<br>75%  | 9,755<br>56%  | 5,232<br>76%  |
| <i>Minnesota</i>                                  | 3,312                      | 2,843          | 2,705          | 2,279          | 1,528         | 1,239         |               |               |
| <i>Michigan</i>                                   |                            | 4,545          | 3,915          | 3,864          | 1,316         | 1,280         |               |               |
| <i>Wisconsin</i>                                  |                            | 3,315          | 1,631          | 1,405          | 848           | 1,040         |               |               |
| <i>North Dakota</i>                               |                            | 3,105          | 2,973          | 2,320          | 987           | 1,084         |               |               |
| <i>South Dakota</i>                               |                            | 269            | 269            | 226            | 116           | 107           |               |               |
| <i>Iowa</i>                                       |                            | 2,893          | 2,835          | 2,295          | 921           | 859           |               |               |
| <b>National</b><br><i>(% reduction vs. 2005)</i>  | 225,491<br>0%              | 122,278<br>46% | 112,873<br>50% | 103,626<br>54% | 65,668<br>71% | 64,451<br>71% | 99,216<br>56% | 53,216<br>76% |
| <b>Global</b>                                     |                            |                | 4,321,055      | 4,850,170      |               |               |               |               |

# Regional & national mercury emissions

## Mercury reduction goals

|                  | Energy Production          |        |        |        |        |
|------------------|----------------------------|--------|--------|--------|--------|
|                  | Mercury Emissions (pounds) |        |        |        |        |
|                  | 2008                       | 2011   | 2014   | 2017   | 2020   |
| <b>Minnesota</b> | 1,451                      | 1,214  | 1,039  | 308    | 198    |
| <b>Regional</b>  | 14,020                     | 11,013 | 9,456  | 2,959  | 3,015  |
| <b>National</b>  | 91,173                     | 81,625 | 73,979 | 36,168 | 38,772 |

|                  | Mercury in Products        |        |       |        |        |
|------------------|----------------------------|--------|-------|--------|--------|
|                  | Mercury Emissions (pounds) |        |       |        |        |
|                  | 2008                       | 2011   | 2014  | 2017   | 2020   |
| <b>Minnesota</b> | 726                        | 730    | 586   | 525    | 489    |
| <b>Regional</b>  | 950                        | 1,372  | 1,129 | 1,373  | 1,395  |
| <b>National</b>  | 10,544                     | 12,009 | 9,456 | 13,113 | 11,898 |

|                  | Material Processing        |        |        |        |        |
|------------------|----------------------------|--------|--------|--------|--------|
|                  | Mercury Emissions (pounds) |        |        |        |        |
|                  | 2008                       | 2011   | 2014   | 2017   | 2020   |
| <b>Minnesota</b> | 666                        | 762    | 655    | 696    | 552    |
| <b>Regional</b>  | 2,000                      | 1,943  | 1,805  | 1,383  | 1,200  |
| <b>National</b>  | 20,536                     | 19,185 | 19,898 | 15,798 | 13,578 |

- EPA's National Emissions Inventory (NEI)
  - Sectors (e.g., fuel combustion, industrial processes)
  - Subcategories (e.g., fuel type, industry type)
- Organized by Minnesota's mercury categories
- Largest contributors
  - Energy production (electricity generation)
  - Mercury in products (waste disposal)
  - Material processing (ferrous metals & cement manufacturing)

# Moving forward

- Greater emissions reductions are needed to meet the goal of the statewide mercury TMDL.
  - Minnesota met our 2018 reduction goals, but more work is needed to meet the 2025 goal
  - Statewide mercury emissions temporarily declined largely due to Covid-related production decreases
  - Further reductions are needed from mining-related mercury and mercury in products category
- Continue to promote mercury emission reductions within the state as well as regionally, nationally and globally