Global emission of mercury to the atmosphere from anthropogenic sources in 2005 and projections to 2020

Global atmospheric emissions of mercury from human activities in 2005 were estimated to be approximately 1930 tonnes. Burning of fossil fuels (primarily coal) is the largest single source of emissions from human sources, accounting for about 45% of the total anthropogenic emissions. Artisanal/small-scale gold mining was responsible for about 18%, with industrial gold production accounting for an additional 5-6% of global emissions from human activities. Other mining and metal production activities are responsible for about 10% of global anthropogenic releases to the atmosphere. Cement production releases a similar amount.

Power plants are the largest single source in most countries with high mercury emissions, although in Brazil, Indonesia, Columbia, and some other countries (in South America, Asia and Africa in particular) artisanal/small-scale gold mining is the largest single source.

Geographically, about two-thirds of global anthropogenic releases of mercury to the atmosphere appear to come from Asian sources, with China as the largest contributor worldwide. The United States of America and India are the second and third largest emitters, but their combined total emissions are only about one-third of China’s.

The uncertainties associated with estimates of mercury emissions are largely related to the application of various assumptions that are required to make up for a lack of actual measurement data. The figures for anthropogenic emissions are based on governmental emission data where available, combined with estimates for countries that did not provide such data. Some countries that are major mercury emitters did not provide national emissions reports. Other countries, such as South Africa and Japan, provided updated information and more accurate emissions estimates than were available in the past. Measurements made at major point sources such as power plants are few, but where available they were used as the basis for some emission estimates. The reliability of industrial activity statistics and other statistics used for the purposes of estimating emissions, and the accuracy of various assumptions about specific practices and technologies as they relate to mercury emissions are additional sources of uncertainty. Despite the uncertainties involved, the 2005 emissions inventory and its underlying data are considered to represent a robust inventory of contemporary global anthropogenic emissions of mercury to air, provide a picture of regional and national patterns and give insight into global trends.
Scenarios of future emissions have been prepared to help explore the prospects for reducing mercury emissions and the implications of not taking any action in this regard. These scenarios suggest that, if current trends in industrial development and resource use were to continue, mercury emissions in key selected sectors (those where mercury is an incidental pollutant and also the chlor-alkali industry) are likely to rise. However, if emission controls currently in place or planned in Europe were to be extended worldwide, considerable reductions in mercury emissions from these sectors in 2020 are projected. Under a scenario of maximum technologically feasible reduction measures, emissions from by-product sectors in 2020 are projected to further decline.