

Commentary

Mercury Emissions in South Africa

Perspective from the Department of Environmental Affairs

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Introduction

The Department of Environmental Affairs (DEA) recognises the need to protect human health and the environment from anthropogenic emissions of mercury. In 2003, various governments agreed on the need for global action on mercury based on its adverse health and environmental effects. Later, in 2009, they negotiated a legally-binding instrument on mercury and established the Intergovernmental Negotiating Committee (INC). Five INC negotiation sessions were held and in January 2013, the negotiations were finalised. The content of the convention, known as the Minamata convention, was adopted in October 2013 in Minamata, Japan and South Africa was a signatory of the convention.

South Africa enacted the Air Quality Act (NEM:AQA) and Waste Management Act (NEM:WMA) which provide for the enforcement of mercury emission limits, regulating mercury pollution, mercury storage, rehabilitation of contaminated sites, as well as the responsible management and disposal of mercury waste. Listed activities under NEM:AQA (Act No 39 of 2004) with mercury emission limits are waste co-feeding combustion installations (Subcategory 1.6), production and processing of zinc, nickel and cadmium (Subcategory 4.14), metal recovery (Subcategory 4.23), cement production (using alternative fuels and/or resources) (Subcategory 5.5), lime production (using alternative fuels and/or resources) (Subcategory 5.7), thermal treatment of general waste (Subcategory 8.1) and drum recycling processes (Subcategory 8.4).

Mercury Emissions Inventory in South Africa

Previous estimates of South Africa's anthropogenic mercury emissions were 256.7 tons in 2000 (Pacyna et al. 2003, Pacyna et al. 2006). The report considered coal combustion and gold mining as the most significant sources. Based on this estimate, South Africa was ranked as the second highest emitter of mercury in the world, accounting for 16% of global anthropogenic emissions. These findings prompted further local studies and the establishment of the South African Mercury Assessment (Leaner et al. 2009).

The DEA completed work funded by the United Nations Environment Program (UNEP) on mercury emissions in 2011. The work focused on mercury emissions from coal-fired power

stations. The total mercury emissions from coal-fired power stations for 2009 - 2010 was estimated to be 39.4 tons per annum. This was comparable with other studies (Leaner et al. 2009, Masekoameng et al. 2010). A level 1 inventory study was also undertaken in 2011 and a level 2 study is intended to do a detailed inventory using the UNEP Toolkit Level 2. The DEA is in the process of conducting the level 2 inventory study which will improve the accuracy of the data obtained from level 1 study. The introduction of the National Atmospheric Emissions Inventory System (NAEIS) will also assist in building a detailed mercury emission inventory in the country.

Conclusion

The integration of mercury into the national environmental agenda in South Africa requires accurate and detailed sector-based mercury inventory studies. These will add a component on cost-benefit analysis to gauge the socio-economic implications for South Africa if it ratifies the Minamata Convention on mercury for all affected sectors and industries.

References

Leaner J.J., Dabrowski J.M., Mason R.P., Resane T., Richardson M., Ginster M., Gericke G., Petersen C.R., Masekoameng E., Ashton P.J and Murray K., 2009., Mercury Emissions from Point Sources in South Africa. In *Mercury Fate and Transport in the Global Atmosphere*, Eds: N. Pirrone and R. Mason, Springer Science and Business Media.

Masekoameng E., Leaner J.J. and Dabrowski J.A., 2010. Trends in anthropogenic mercury emissions estimated for South Africa during 2000 to 2006, *Atmospheric Environment*, 44, 3007 – 3014.

Pacyna J.M., Pacyna E.G., Steenhuisen F. and Wilson S., 2003. Mapping 1995 global anthropogenic emissions of mercury, *Atmospheric Environment*, 37, 109 – 117.

Pacyna E.G., Pacyna J.M., Steenhuisen F. and Wilson S., 2006. Global anthropogenic mercury emission inventory for 2000, *Atmospheric Environment*, 40, 4048 – 4063.