



Mercury substitution priority working list

An input to global considerations on
mercury management

Jakob Maag, COWI, Denmark

Lars D. Hylander, Uppsala University, Sweden

Nicola Pirrone, CNR Institute for Atmospheric Pollution, Italy

Ned Brooks, Minnesota Pollution Control Agency, USA

John Gilkeson, Minnesota Pollution Control Agency, USA

*Mark Smith, Massachusetts Dept. of Environmental Protection,
and NEG/ECP Mercury Task Force, USA*

*Misuzu Asari, Kyoto University, Environment Preservation
Center Kyoto, Japan*

Peter Maxson, Concorde East/West Sprl., Belgium

Mercury substitution priority working list

An input to global considerations on mercury management

TemaNord 2007:541

© Nordic Council of Ministers, Copenhagen 2007

ISBN 978-92-893-1507-4

This publication can be ordered on www.norden.org/order. Other Nordic publications are available at www.norden.org/publications

Printed in Denmark

Nordic Council of Ministers

Store Strandstræde 18
DK-1255 Copenhagen K
Phone (+45) 3396 0200
Fax (+45) 3396 0202

Nordic Council

Store Strandstræde 18
DK-1255 Copenhagen K
Phone (+45) 3396 0400
Fax (+45) 3311 1870

www.norden.org

Nordic cooperation

Nordic cooperation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and three autonomous areas: the Faroe Islands, Greenland, and Åland.

Nordic cooperation has firm traditions in politics, the economy, and culture. It plays an important role in European and international collaboration, and aims at creating a strong Nordic community in a strong Europe.

Nordic cooperation seeks to safeguard Nordic and regional interests and principles in the global community. Common Nordic values help the region solidify its position as one of the world's most innovative and competitive.

Content

Executive summary	7
1. Background	9
2. Methods.....	13
2.1 Inputs.....	13
2.2 Additional expert assessments.....	15
2.3 Synthesis	15
3. Results and discussion.....	17
3.1 Categorization of Hg uses by proposed transition time	17
3.2 Hg uses with special challenges for substitution	22
4. Conclusions	29
References	31
Resumé på dansk (summary in Danish).....	35
Appendix 1: Overview of review results by Hg use category.....	37
Appendix 2: Overview of additional expert assessments.....	47

Executive summary

Mercury (Hg) is among our most serious health and environmental hazards. Anthropogenic emissions of Hg result in direct human exposure and a build-up in the global environment and subsequent transfer to humans via consumed fish. The supply chain from virgin mined Hg over Hg-added products to final disposal is long. While the adverse environmental impacts are globally acknowledged, the understanding and mitigation of the problem is delayed, maybe because consumers and other public and private stakeholders are not always aware of the risks, and because environmental costs are, generally, not considered in the market price for devices containing Hg. To reduce or eliminate the risks, Hg substitution is one viable option. Here we present an input to global considerations on mercury management by presenting a mercury substitution priority working list; or: An identification of the least essential mercury uses. This may be used as inspiration for reducing intentional mercury uses globally, if politically desirable, by furnishing the list to stakeholders globally as an input to constructive discussions currently undertaken under auspices of UNEP towards reducing Hg releases. The list includes all identified intentional uses of Hg, the availability of relevant alternatives, and proposed Hg substitution order, and major challenges ahead.

No doubt, implementation of substitution of mercury in developing countries worldwide will need careful consideration of the potential impacts of mercury substitution, and probably substantial technical and financial support in some areas. However, the results of this study illustrate that significant mercury reductions may indeed be within reach, and that a reduction process involving a step-wise substitution approach taking major socio-economic challenges into consideration could be a way forward. Almost two thirds, or 43 out of the 72 identified uses of mercury, are deemed readily substitutable because alternatives are compatible and even dominate the market in many countries already. Many of these mercury uses are already used in marginal amounts in the global perspective, and restrictions of further input of these to society may therefore perhaps have relatively small economical consequences in the present situation. Some readily substitutable mercury uses do however represent significant inputs of mercury to society, which could be avoided without major technical difficulties (e. g. mercury-oxide batteries, certain other regionally sold old-type primary batteries and thermostats, and manometers). Other uses have alternatives available or well on the way, but face institutional (or structural), social or technical challenges indicating a need for longer phase-out periods. These are for example hospital and laboratory equipment, which use is often required in quite rigid standards, which take

time to change. Finally, a limited number of Hg uses (10 out of 72 identified) face substantial, but likely not insurmountable, challenges for mercury substitution or phase-out. In most cases, the socio-economic challenges are the main reasons; examples are small scale gold mining, every-man's fluorescent energy-saving lights, and dental amalgam.

In short, the results of our assessment indicate that:

- Many mercury uses may today be readily eliminated, if politically desired.
- Global mercury demand may be reduced significantly by substitution of the least essential uses.
- Applying a prioritized phase-out work list may help focusing on the main problems in mercury reductions and thereby securing a cost effective phase-out process.

Based on these findings we recommend that:

A prioritised phase-out work list for intentional mercury uses is discussed and developed further in international cooperation, for example as part of the Open-ended Working Group considering legal and other initiatives on mercury established under the auspices of the United Nation's Environment Programme (UNEP). This could serve:

- As a valuable tool in mutual communication and discussion of possible global mercury reductions
- As a tool for a step-wise reduction development, if desired politically
- As part of forming a common vision for global mercury reductions.

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_13941

