

MERCURY STORAGE OPTIONS IN ASIA REGION

PRESENTED BY UNEP FOR DISCUSSION PURPOSES

Using data on the estimated excess mercury in Asia, the following may be options for the long term management of excess mercury generated within Asia. Some issues to be considered in the recommendation of the option/s are outlined here. It may be necessary for priority or weighting to be applied to each of these issues in assessing the most suitable option.

A. Long-term storage¹ options

1. Geographic consideration
 - i) Regional [large] central facility/facilities
 - ii) National [small] facilities
 - iii) Export to foreign countries
2. Technical consideration
 - i) Above-ground special engineered warehouse
 - ii) Below-ground storage in geological formation (*e.g.*, mines, special rock formations)

B. Issues to be considered long-term storage in Asia

I. Technological

1. Definition of mercury to be stored, *e.g.*, chemical species (elemental, ionic), concentration, volumes/mass
2. What is included in the definition of “long-term storage” (time period) and the conditions around, *e.g.*, possible to recover mercury? Maintaining a registry? Institutional owner and arrangements (private *vs.* governmental)?
3. Site-specific requirements:
 - geology
 - hydrology
 - natural disasters (earthquakes, floods, hurricanes)
 - location including accessibility (remote *vs.* road/railways infrastructure)
 - Decommissioning and long-term surveillance.
4. Storage-specific requirements:
 - Chemical-physical criteria for the waste itself, *e.g.*, inert, immobilized, encapsulated

¹ Long term management options will include management of elemental mercury, and associated volume and mass reduction and transport to the long-term management facility.

- Infrastructure capacity including building materials
 - Leaching prevention, *e.g.*, evaporation, erosion, corrosion,
 - Monitoring systems (*e.g.*, to control that all mercury captured)
 - Long-term documentation
5. Transport to the facility (including interim storage)
 6. Volume/Mass reduction including the need for pretreatment/stabilization of excess mercury before storage

II. Public Health and Safety, environmental concerns

1. Environmental impacts
2. Human health risk

III. Financial

1. Capital/Investment costs
2. Operating and maintenance and costs
3. Financial arrangements (fee for service)
4. Costs and benefits

IV Political Process/Social and Political Acceptability

1. National level including legal framework, political stability, stakeholder (NGO and community) participation
2. International level, including bilateral agreements for mercury owners how to use and access storage facility, and possible structures for shared responsibility
3. Long-term provisions for sustainability

V. Human resources/Manpower

1. Salaries
2. Training on operations and maintenance, emergency preparedness

VI. Legal / Regulatory

1. Legislation such as national import or export restrictions
2. Licensing procedures
3. Waste acceptance rules
4. Documentation procedures

VII. Other issues including barriers to pursuing each option and an assessment of likelihood of success

C. Screening and pre-selection of options

1. any particular trade-offs among the main options
2. any clear preferences evident