Inception Workshop – Mercury Storage and Disposal Project in the Caribbean (Jamaica, Suriname, Trinidad and Tobago)

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Port-of-Spain, Trinidad and Tobago

Country Profile: Trinidad and Tobago

Presented by: Environmental Management Authority

Sources of Mercury Wastes

- The National Hazardous Waste Inventory for Trinidad and Tobago (2009) reported that a large number of generators recorded small quantities of mercury wastes (wastes contaminated with mercury and mercury compounds) for the period 2004-2008.

- The main activities which contributed to the generation of mercury wastes were:
  1. Electrical maintenance and the changing of fluorescent bulbs (76.29%)
  2. Laboratory analysis (22.76%)
  3. General cleaning of building and equipment (0.48%)
  4. Electronics repair including phones and medical equipment and broken thermometers (0.39%)
  5. Cleaning of medical facilities and equipment (0.07%)
  6. Amalgam used for dentistry (0.01%)

Sources of Mercury Wastes (cont'd)

- The main economic sectors which conducted activities that generated mercury wastes are shown in Figure 1.

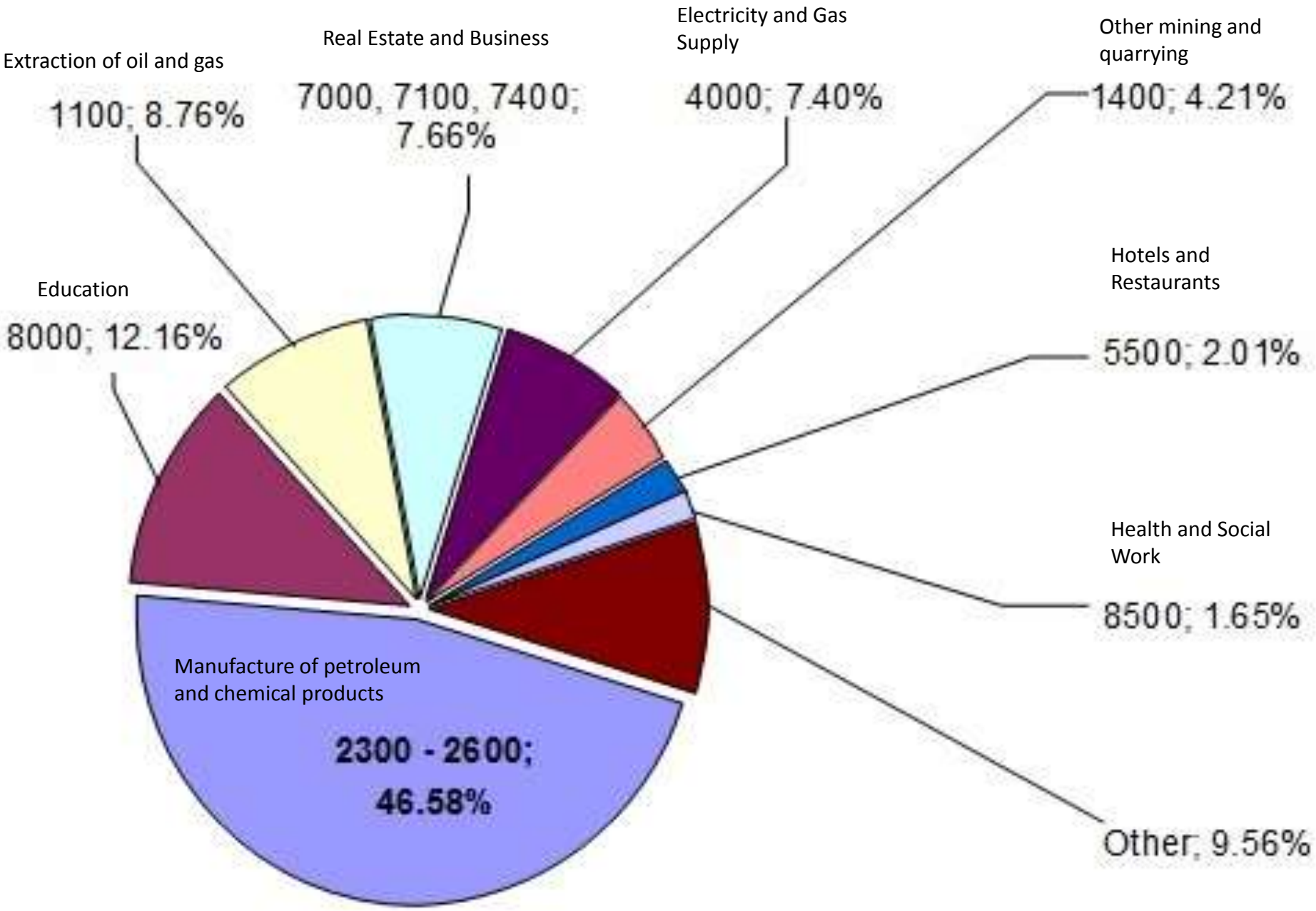

Figure 1: Contribution by Economic Sector to Mercury Waste generated for the period 2004-2008.

Other Studies on Mercury Contamination

Findings of studies on heavy metal concentrations including mercury in the environment:

- Mohammed et al. (2011): The study focused on heavy metal concentrations in nearshore marine sediments and fish tissue from the Sea Lots harbour, the Point Lisas harbour and offshore of the Caroni Swamp. It was found that there was a strong positive correlation between metal concentrations in fish tissue with sediment metals. Zinc, copper and mercury had a bioaccumulation factor (BAF) greater than one, which suggests a high bioaccumulation potential for these metals.

- Norville (2005): The study focused on heavy metal concentrations in sediments in the Gulf of Paria. Samples from the mouths of major rivers that flow into the Gulf of Paria were also analyzed. It was found that sediments at the river mouths tended to accumulate copper, lead, zinc and mercury while sediments further from the coast tended to accumulate iron, aluminium, manganese and chromium.

Other Studies on Mercury Contamination (cont'd)

- Astudillo et al. (2005): The study focused on heavy metals concentrations in oysters, green mussels and sediments from the Gulf of Paria. It was found that mercury in sediments at all sites in Trinidad and Venezuela exceeded United States National Oceanic and Atmospheric Administration Guidelines and Canadian Sediment Quality Guidelines. The findings of the study suggested that mussels may be better biological indicators of heavy metal pollution in sediments. The study also mentioned that the elevated concentrations of mercury in sediments from the Gulf of Paria and Northern Venezuela may be due to run-off from gold mining operations in the Orinoco River watershed.

- Astudillo et al. (2002): Heavy metal concentrations were monitored in edible soft tissues of shellfish (green mussel and oysters) from Trinidad and Venezuela. It was found that the highest mercury concentrations in oysters were from Chaguaramas but did not exceed the maximum permissible limit for human consumption.

Other Studies on Mercury Contamination (cont'd)

- Klekowski et al. (1999): The study focused on an association of mangrove mutation, scarlet ibis and mercury contamination in Trinidad. The study found biological pathways of transport of mercury via the scarlet ibis which had a six-fold higher concentration of mercury, thought to be methylmercury, compared to black-crowned night-heron which also nested at that site. It was found that decades of molted feathers of ibises promoted an unusually high incidence of mutations in a local population of red mangroves in Trinidad due to locally elevated mercury levels in the underlying sediments. The high concentrations of mercury were probably acquired by the birds during their annual migration to wetlands in South America contaminated with run-off from gold mining operations.

Management of Mercury Wastes

- The Hazardous Waste Inventory found that large generators contracted local waste handlers to collect, treat and dispose of wastes, while small generators generally discarded the waste in the municipal waste stream.

- The treatment and disposal methods used to manage wastes generated by main activities highlighted earlier were as follows:
  - *Electrical Maintenance and Lighting*: Wastes were either encapsulated or discarded as municipal waste.
  - *Dental Amalgam* : The waste was sent to the hospitals for disposal via incineration.
  - *Laboratories*: The waste was collected, treated and disposed of by waste handlers.
  - *Cleaning of facilities and equipment*: The waste was discharged into drains or collected by waste handlers for incineration or disposal in the landfill/controlled dump.
  - *Electronics Repair*: The waste was sent to the hospital for incineration, discharged into the drains or collected by waste handlers for treatment and disposal.

Management of Mercury Wastes (cont'd)

- Beyond the Hazardous Waste Inventory: Mercury wastes are also exported by generators and local waste handlers under the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.

- The types of mercury wastes which have been exported to date are waste electrical and electronic equipment (e-waste) and spent adsorbent from the oil and gas industry.
  - The e-waste comprises mainly computers and I.T. equipment from administrative and technical functions in the public and private sectors.
  - The adsorbent material from mercury removal beds is a desiccant used to remove moisture from feed gas to prevent downstream corrosion. The spent adsorbent may contain trace to non-detectable quantities of mercury.

- The e-waste is exported for recycling while the spent adsorbent is exported for recovery of mercury.

Regulatory Control Measures

- Certificate of Environment Clearance Rules (2001) and Certificate of Environmental Clearance (Designated Activities) Order, as amended
  - Based on the type of activity, a person may be required to conduct monitoring and testing of mercury emissions, and ensure safe disposal of mercury and mercury-contaminated wastes from its activities. The CEC may specify regulatory requirements and standards from enacted and draft regulations.

- Water Pollution Rules, as amended
  - The Second Schedule of the Rules lists permissible levels for 'Total Mercury' for different receiving environments.

Regulatory Control Measures (cont'd)

- Pesticides and Toxic Chemicals Act (1979 amended 2005) – Toxic Chemicals Regulations (2013)
  - Mercury and its compounds are listed as a toxic industrial chemical under the Act.

- Air Pollution Rules (2014)
  - The Rules lists permissible levels for mercury and its compounds for ambient air and stack emissions.

- Draft Waste Management (Hazardous Waste) Rules (2014)
  - The wastes identified as hazardous waste in the Draft Rules includes any waste comprised of or containing the substances listed in Annexes 1, 3, 8 and 9 of the Basel Convention. Wastes which contain mercury or mercury compounds as constituents, as stated in the Convention, are included.

Status of Implementation of the Minamata Convention in Trinidad and Tobago

- Development of a National Interest Analysis Country Brief to determine the merits of Accession to the Minamata Convention.
- Development of a Comparative Review of the Minamata Convention and Trinidad and Tobago's Waste and Chemicals MEAs.
- Consultations conducted with key stakeholders to solicit the extent of use of mercury nationally in order to determine the implications of accession to the Minamata Convention.
- Participation in the Caribbean Regional Minamata Workshop (Port-of-Spain, Trinidad, January 2015).
- Participation in the Regional Workshop in Support of the Ratification and Effective Implementation of the Minamata Convention on Mercury (Montevideo, Uruguay, April 2015).
- Endorsement for participation in a two year project entitled: "*Development of Minamata Convention Initial Assessments in the Caribbean- An Enabling Activity in support of the Minamata Convention on Mercury*".

Conclusion – The Way Forward

- Legislative and Regulatory Framework:
  - The enactment of the draft Waste Management (Hazardous Waste) Rules 2014 will outline requirements for the generation, storage, transport, treatment, and disposal of hazardous wastes (including mercury/mercury-contaminated wastes).

- Enhancing Public Awareness and Education:
  - Small and medium-size operations including those in the informal sectors are often less likely to have waste management systems in place. Public Awareness and Education and Sensitization Programmes should be focused on the promotion of best practices (use, storage, disposal) among small generators.

Conclusion – The Way Forward

- Development of Minamata Convention Initial Assessments in the Caribbean
  - Goal: To protect human health and the environment from the risks from unsound use, management and release of mercury.
  - Objective: To facilitate ratification and early implementation of the Minamata Convention.
  - Project Components:
    - Establishment of a coordination mechanism
    - Assessment of national infrastructure and capacity
    - Development of a mercury inventory
    - Identification of challenges, needs and opportunities
    - Produce MIA Reports and implement awareness activities
    - Information exchange, capacity building, knowledge generation

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QUESTIONS / COMMENTS