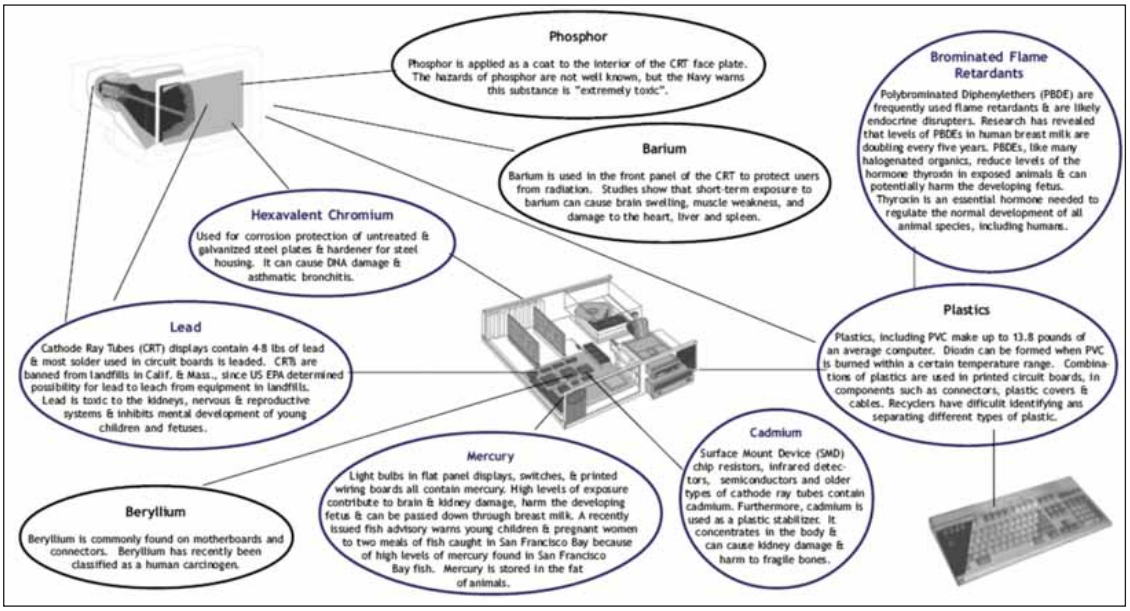
E-waste legislation in South Africa

by Lene Ecroignard, eWASA

With electronic waste (e-waste) considered a growing problem world-wide, a group of concerned South Africans have formed a working group to address these issues.

Initiated by a Swiss knowledge-partnership with projects in China, India and South Africa, the working group evolved into the South African e-waste Association (eWASA) that recently met in Greyton, Western Cape to discuss a blueprint for an e-waste management system in the country. The blueprint follows after an initial situation study completed in 2005 for Gauteng. In that report the existing legislation framework to manage e-waste was addressed as part of the system parameters. The following is a summary of that report's findings relative to legislation.



The South African Constitution establishes basic environmental rights including the right to an environment that is not detrimental to one's health; just administrative action and access to information. These form the basis for the country's environmental and waste legislation.

The National Environmental Management Act (Act 107 of 1998) (NEMA) provides a principal framework for sound environmental management practices for all development activities. Waste management is provided for in the Act with principles such as polluter pays and cradle to grave. NEMA refers to avoidance or minimisation and remediation of pollution, including waste reduction, re-use, recycling and proper waste disposal.

The Occupational Health and Safety Act (Act 85 of 1993) (OHSA) that provides for health and safety of persons at work and specific regulations that deal with waste management should also be considered as a background to specific legislation dealing with e-waste management.

The primary objective of The Environment Conservation Act (Act 73 of 1989) (ECA) is to provide for the effective protection and controlled utilisation of the environment. The ECA makes specific reference to waste disposal in Section 20 and defines the role of the Department of Water Affairs and Forestry (DWAF) in permitting waste disposal sites. This responsibility is addressed through the formulation of the "Minimum Requirements" series of documents guiding the disposal of waste by landfill. These minimum requirements state the requirements, standards and procedures that apply in the permitting of waste disposal and handling facilities. .

New draft Environmental Impact Assessment regulations under NEMA were approved by Minister Marthinus van Schalkwyk in July 2005. The amended final draft was launched by the Minister on 19 April 2006. These regulations were Gazetted on 21 April 2006 and came into effect on 1 July 2006.

The White Paper on Integrated Pollution and Waste Management outlines the principles for the allocation of environmental and waste management functions as well as powers for national, provincial and local governments. The National Waste Management Strategy (NWMS) and action plans followed, through a joint venture between the Department of Environmental Affairs and Tourism and the Department of Water Affairs and Forestry (DWAF) in an initiative supported by the Danish donor agency. The action plans developed under the NWMS initiative focuses on the following:-

- Integrated waste management planning
- Waste information system
- General waste collection
- Waste treatment and disposal
- Capacity building, education, awareness and communication.

Implementing instruments

Priority areas that need to be addressed in the short term are: recycling, waste information systems and health care waste (HCW). "One of the key objectives for recycling is to extend and increase the concept of recycling to other waste streams (apart from the ones already in place) where recycling opportunities exist. The South African e-waste recycling initiative therefore presents such an opportunity." Widmer & Lombard 2005.

Healthy living and working conditions are provided for under the Health Act: Act No. 63

Why e-waste is considered hazardous waste

Computers and other electronic equipment are manufactured from natural as well as man-made materials. While some naturally occurring substances, such as chromium, are relatively harmless in nature, their use in the manufacture of electronic equipment often results in compounds which are toxic being especially harmful to human health and the environment if not disposed of carefully.

Arsenic is a poisonous metallic element which is present in dust and soluble substances. Chronic exposure to arsenic can lead to various diseases of the skin and decrease nerve conduction velocity and can cause lung cancer.

Barium is a metallic element that is used in sparkplugs, fluorescent lamps and "getters" in vacuum tubes. Being highly unstable in the pure form, it forms poisonous oxides when in contact with air. Short-term exposure to barium could lead to brain swelling, muscle weakness, damage to the heart, liver and spleen.

Beryllium has been classified as a human carcinogen since exposure to it can cause lung cancer. The primary health concern is inhalation of beryllium dust, fumes or mist. Workers who are constantly exposed to beryllium, even in small amounts, and who become sensitised to it can develop chronic beryllium disease (beryllicosis) - a disease which primarily affects the lungs. Exposure to beryllium causes a form of skin disease that is characterised by poor wound healing and wart-like bumps. Studies have shown that people can still develop beryllium diseases many years after the their last exposure.

Brominated flame retardants (BFRs) - the three main types of BFRS used in electronic and electrical appliances are polybrominated biphenyl, polybrominated diphenyl ether and tetrabromobisphenol - A BFRs have been found in indoor dust and air through migration and evaporation from plastics. Combustion of halogenated case material and printed wiring boards at lower temperatures releases toxic emissions including dioxins which can lead to severe hormonal disorders. Major electronic manufacturers have begun to phase out BFRs because of their toxicity.

Cadmium components may have serious impacts on the kidneys. Cd is adsorbed through respiration and taken up with food. Due to the long half-life in the body, cadmium can easily be accumulated in amounts that cause symptoms of poisoning. Acute exposure to cadmium fumes causes flu-like symptoms of weakness, fever, headache, chills, sweating and muscular pain. The primary health risks of long term exposure are lung cancer and kidney damage.

CFCs (chlorofluorocarbons) are compounds composed of carbon, fluorine, chlorine, and sometimes hydrogen. Used mainly in cooling units and insulation foam, it has been phased out because when released into the atmosphere, it accumulates in the stratosphere and has a deleterious effect on the ozone layer, which results in an increased incidence of skin cancer in humans and in genetic damage to many other organisms.

Chromium and its oxides are widely used because of their high conductivity and anti corrosive properties. While some forms of chromium are non toxic, Chromium (VI) is easily absorbed in the human body and can produce various toxic effects within cells. Most chromium (VI) compounds are irritating to eyes, skin and mucous membranes. Chronic exposure to chromium (VI) compounds can cause permanent eye injury, unless properly treated. Chromium VI may also cause DNA damage.

Dioxins and furans are a family of chemicals comprising 75 different types of dioxin compounds and 135 related compounds known as furans. "Dioxins" refer to the family of compounds comprising polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. Although never intentionally manufactured, dioxins form as unwanted by-products in the manufacture of some pesticides as well as during combustion. They are known to be highly toxic to animals and humans because they bio-accumulate in the body and can lead to malformations of the foetus, decreased reproduction and growth rates and impairment of the immune system,among other things.

Lead is the fifth most widely used metal after iron, aluminium, copper and zinc. It is commonly used in the electrical and electronics industry in solder, lead-acid batteries, electronic components, cable sheathing, in the glass of CRTs, etc. Short-term exposure to high levels of lead can cause vomiting, diarrhoea, convulsions, coma or even death. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

It is particularly dangerous for young children because it can damage nerves and cause brain and blood disorders.

Mercury is one of the most toxic yet widely used metals in the production of electrical and electronic applications. It is a toxic heavy metal that bioaccumulates causing brain and liver damage if ingested or inhaled. In electronics and electrical appliances, mercury is concentrated in batteries, some switches and thermostats, mercury vapour and fluorescent lamps.

Polychlorinated biphenyls (PCBs) are a class of organic compounds use in a variety of applications, including dielectric fluids for capacitors and transformers, heat transfer fluids and as additives in adhesives and plastics.

PCBs have been shown to cause cancer in animals and a number of serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system and other health effects. PCBs are persistent contaminants in the environment.

Due to the high lipid solubility and slow metabolism rate of these chemicals, PCBs accumulate in the fat-rich tissues of almost all organisms (bioaccumulation). The use of PCBs is prohibited in OECD countries, however, due to its wide use in the past, it still can be found in e-waste and in some other wastes.

Polyvinyl chloride (PVC) is the most widely-used plastic, used in everyday electronics and appliances, household items, pipes, upholstery etc. PVC is hazardous because it contains up to 56% chlorine which when burned produces large quantities of hydrogen chloride gas, which combine with atmospheric moisture to form hydrochloric acid which when inhaled, leads to respiratory problems.

Selenium exposure to high concentrations of selenium compounds cause selenosis.

The major signs of selenosis are hair loss, nail brittleness, and neurological abnormalities (such as numbness and other odd sensations in the extremities). Source: www.ewaste.ch

of 1977. The potential health risk implications of waste and specifically hazardous waste make this Act pertinent. Section 20 places the obligation on local authorities to ensure that their areas of jurisdiction are maintained in a clean hygienic condition. Sections 34 and 38 authorise the minister of health to make regulations which have relevance to waste management.

Many substances contained in e-waste are considered hazardous waste and these are listed in Annex 1 of The Basel Convention for the Control of Transboundary Movement of Hazardous Waste. South Africa is a party to the Convention which came into force in 1992 and currently has 162 parties world-wide. As a party to the convention the South African government is obliged to develop national legislation in line with the provisions of the convention.

The Hazardous Substances Act: Act No. 15 of 1973 provides the regulations to control the management of hazardous substances and the disposal of hazardous waste.

With this background the eWASA Blueprint for e-Waste Management in South Africa envisages an industry-led take back system with legislative requirements for producers/importers/distributors to take back old and end-of life products. In a successful system, the focus will be on reduce, repair, reuse, recycle effectively, minimising waste and hazardous waste disposal. A visible advanced recycling fee (ARF) will be charged from the producer down to the consumer. These funds will be used to fund the logistics of an e-waste management system and the non-economically viable part of e-waste recycling as well as final disposal of material that cannot be recycled.

The ARF will be adjusted according to market forces to ensure that it is as low as possible at all times. The funds will be managed by an industry body/initiative similar to Swiss Association for Information, Communications and Organisation Technology (SWICO) in Switzerland. A third party will audit the operation of the system to ensure that the system is not abused.

See http://www.e-waste.org.za/report.htm for the full Gauteng e-Waste Report and Appendix 3 to the report for a full list of the existing South African legislative framework with regard to the hazardous substances contained in e-waste.

Contact Lene Ecroignard, eWASA,
Tel (012) 349-1130,
lene@baselpretoria.org.za ❐