ENVIRONMENTAL and HEALTH NGOs[i] POSITION ON INCLUSION OF NON-INDUSTRIAL THERMOSTATS WITHIN RoHS DIRECTIVE[1]

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Introduction

Under Article 4(1) of the RoHS Directive,[2] new electronic equipment placed on the market after July 1, 2006 cannot contain mercury and other specified toxic contaminants.[3] However, this general prohibition does not apply to medical devices, and monitoring and control instruments (Categories 8 and 9 of Annex 1A to the WEEE Directive – 2002/96/EC). For these product categories, the Commission is required to review the products falling within these categories, and present proposals regarding their inclusion into the prohibitions of the RoHS Directive.

Under Article 5(1)(b), materials and components are properly exempt from the RoHS Directive against the use of mercury if either replacement of the mercury is "technically or scientifically impracticable", or where the "negative environmental, health, and/or consumer safety impacts caused by substitution are likely to outweigh the environmental, health, and/or consumer safety benefits thereof". As explained below, there can be no question regarding the practicability of marketing non-mercury thermostats since there are many models manufactured and sold today. Moreover, the non-mercury thermostats generally are equal to or better than mercury thermostats in function and performance.

The information presented below is largely derived from reports and government actions in the United States of America. However, given similar experiences in the Nordic countries with mercury product bans, and the EU presence[4] of the leading US manufacturers, there is no reason to believe the situation in Europe is markedly different. Indeed, at least one prior EU report indicates European mercury consumption for electrical control equipment may be underestimated given comparable demand in the United States,

[1] The term "thermostat" used in this paper refers to control devices used to control the ambient temperature within a structure, such as a residential or commercial building. For the purposes of this paper, the term does not include a thermostat used to control temperature in an appliance or an industrial process.
[2] Directive 2002/95/EC, dated January 27, 2003.
[3] In Directive 2005/618/EC, dated August 18, 2005, the general prohibition was amended to allow a maximum concentration of 0.1% mercury in homogeneous materials by weight.
[4] E.g. http://europe.hbc.honeywell.com/ and http://www.invensyscontrolseurope.com/lwwcm/connect/Invensys+Controls+Europe/Home

suggesting the US and European markets are quite similar absent RoHS Directive or comparable mandates in the United States.[5]

The Practicability of Non-Mercury Thermostats

Non-mercury thermostats are clearly practicable to manufacture and market, because a large number of manufacturers already produce an even larger array of models, as documented herein. In fact, in North America, non-mercury thermostats occupy the largest and growing share of the market.

In thermostats, approximately three grams of mercury is used as a component of a mechanical tilt switch, within a glass bulb also filled with inert gas. This switch activates the heating/cooling equipment connected to the thermostat by opening or closing an electrical circuit depending upon the position of the mercury in the switch. Single-stage systems, where a thermostat controls only heating or cooling, typically require one switch, while multi-stage heating and cooling systems generally require more than one switch.[6]

Non-mercury thermostats fall into three categories: electromechanical, electronic non-programmable and electronic programmable. Electromechanical thermostats work like mercury thermostats, except a bimetal sensor is used to activate a snap switch to open or close the electric flow. Electronic non-programmable thermostats use thermistors or other integrated circuits to sense temperature change and activate the heating/cooling system. Electronic programmable thermostats work in a similar way, but can be programmed to set back the desired temperature at predetermined times or days, like nights or weekends. Significantly, for each type of non-mercury thermostat, there are multiple manufacturers and models which achieve the same or better performance level as mercury thermostats at comparable costs.[7]

Indeed, non-mercury electronic thermostats captured almost 84% of the North American market in 2002, and represent the market's fastest growing segment.[8] In contrast, the sales of mercury thermostats are expected to decline by over 11% annually due to greater demand for energy efficient, programmable thermostats; state legislation restricting mercury

[5] Maxson, Mercury Flows in Europe and the World: The Impact of Decommissioned Chlor-Alkali Plants, prepared for the European Commission, February 2004, p. 39.

[6] Sass et al. 1994. Mercury Usage and Alternatives in the Electrical and Electronics Industries, EPA/600/R-94/047 pp. 24-25. According to the latest information provided by the three largest manufacturers, almost 12 MT of mercury is consumed annually in the United States to manufacture non-industrial thermostats for structure heating/cooling systems. See http://www.newmoa.org/Newmoa/htdocs/prevention/mercury/imerc/notification/details.cfm?Org=829&Prod=354&filing=107.

[7] See A Review of Thermostat Energy Efficiency and Pricing, prepared for the Maine Department of Environmental Protection by the Lowell Center for Sustainable Production, May 2003, available at http://www.maine.gov/dep/rwm/mercury/lcspthermostatfinalreport051203.doc. In the United States, mercury thermostat costs in mid-2003 ranged from $18-$34 USD. Electromechanical thermostats without mercury switches cost between $15-$39, electronic non-programmable cost between $18-$77, and electronic programmable cost between $29-$151, depending upon the model and its features. These costs do not take into account the energy savings associated with the more efficient models.

[8] North American HVAC Thermostat Markets, Frost & Sullivan, 2003, pp. 1-7, 1-8.

thermostat sales (see below); and the diminishing price advantage mercury thermostats may provide at the present time.[9]

Indeed, to encourage the use of energy efficient thermostats, the U.S. government and industry created the Energy Star partnership, under which performance specifications are set, and thermostats meeting those specifications can be marketed using a now well-recognized Energy Star trademark. All Energy Star thermostats must be non-mercury electronic programmable models by specification, and the list of Energy Star qualified products includes 35 different brands and six pages of models.[10]

As of the end of 2005, seven states (California, New York, Vermont, Oregon, Maine, Connecticut, and Rhode Island) have enacted legislation restricting the sales of mercury thermostats. These states account for over 22% of the US population.

The Alleged Benefits of Mercury Thermostats

Mercury thermostat manufacturers typically acknowledge the widespread availability of non-mercury alternatives, since most of the same manufacturers produce the non-mercury alternatives. However, some of these manufacturers contend mercury thermostats offer consumer and environmental benefits over non-mercury thermostat models. These alleged benefits include energy efficiency, reliability, ease of use (particularly for the visually impaired), and installment flexibility in retrofit situations.

These alleged benefits formed the basis for a petition seeking an exemption from a statutory sales ban in the State of Maine, filed by the National Electronic Manufacturers Association (NEMA). In addressing this petition, the Maine Department of Environmental Protection (MDEP) conducted an extensive inquiry into these alleged benefits. MDEP ultimately denied the exemption request, and its decision was upheld by the Maine Board of Environmental Protection (MBEP), a Board consisting of nine laypersons appointed by the Governor and confirmed by the Maine Senate. We attach both the MDEP (annex 1) and MBEP (annex 2) formal decisions, because of the detailed rebuttal provided indicating the alleged benefits are illusory, and the inquiry and decision reached in Maine mirrors the analysis anticipated in the RoHS Directive.

[9] Id. at pp. 3-8, 3-11.
[10] http://www.energystar.gov/ia/products/prod_lists/thermostats_prod_list.pdf.

Conclusion

The widespread availability of non-mercury thermostats, coupled with their performance capabilities, demonstrate mercury thermostats are not needed and thus represent a significant source of mercury demand that can be eliminated by applying the marketing prohibitions of the RoHS Directive to mercury thermostats.

Further to these comments, and considering the links between tilt-mercury switches and thermostats, the Environmental and Health NGOs response to the 3rd Stakeholder consultation on Adaptation to scientific and technical progress under Directive 2002/95/EC for the purpose of a possible amendment of the annex, should also be considered (annex 3), including references related to the non-need of mercury use in thermostats.

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The **European Environmental Bureau, (EEB)**, www.eeb.org, is a federation of more then 140 environmental citizens' organisations based in all EU Member States and most Accession Countries, as well as in a few neighbouring countries. These organisations range from local and national, to European and international. The aim of the EEB is to protect and improve the environment of Europe and to enable the citizens of Europe to play their part in achieving that goal.

The **Ban Mercury Working Group**, www.ban.org/Ban-Hg-Wg/, is an international coalition of 28 public interest non-governmental organisations from around the world formed initially in 2002 by 2 US based NGOs, the Basel Action Network (www.ban.org) and the Mercury Policy Project (www.Mercurypolicy.org). working to end pollution from the toxic metal -- Mercury.

The Natural Resources Defense Council is a private, U.S. not-for-profit environmental organization that uses science, law, and the support of more than 1 million members and activists nationwide to protect the planet's wildlife and wild places, and to ensure a safe and healthy environment for all living things.

European Public Health Alliance Environment Network (EEN), http://www.env-health.org**/** is an international non-governmental organisation advocating environmental protection as a means to improving health and well-being. Member groups and organisations represent health, environment, women, health professionals and others. The group has a diverse membership of 41 member groups (6 international organisations, 11 European networks and 24 national/local organizations) including non-governmental organisations, professional bodies representative of doctors, nurses and other healthcare workers, academic institutions and other not-for-profit organisations.

Health Care Without Harm Europe (HCWH), www.noharm.org, is an international coalition of hospitals and health care systems, medical and nursing professionals, community groups, health-affected constituencies, labour unions, environmental and religious organisations. HCWH is dedicated to transforming the health care industry worldwide, without compromising patient safety or care, so that it is ecologically sustainable and no longer a source of harm to public health and the environment.