



**Economic and Social  
Council**

Distr.  
GENERAL

ECE/EB.AIR/WG.5/2010/9  
21 June 2010

Original: ENGLISH

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**ECONOMIC COMMISSION FOR EUROPE**

**EXECUTIVE BODY FOR THE CONVENTION ON LONG-RANGE  
TRANSBOUNDARY AIR POLLUTION**

Working Group on Strategies and Review

Forty-seventh session  
Geneva, 30 August–3 September 2010  
Item 4 of the provisional agenda

**OPTIONS FOR REVISING THE PROTOCOL ON HEAVY METALS**

Report by the Chair of the Task Force on Heavy Metals

1. This report, mandated by item 1.6 of the 2010 workplan for the implementation of the convention (ECE/EB.AIR/99/Add.2) and the request by the Parties to the Protocol on Heavy Metals (ECE/EB.AIR/99, para. 39 (d)), presents the results of the seventh meeting of the Task Force on Heavy Metals, held on 1 and 2 June 2010 in Stockholm.

**A. Attendance**

2. Experts from the following Parties to the Convention attended the meeting of the Task Force: Austria, Canada, Czech Republic, France, Germany, Netherlands, Norway, Sweden and United States of America. Also present were representatives of the International Cadmium Association and the International Zinc Association

**B. Organization of work**

3. Ms. K. Kraus (Germany) chaired the meeting, which was hosted by Sweden.

## **I. INTRODUCTORY REMARKS**

4. Ms. P. Hagström opened the meeting and welcomed the participants on behalf of the Swedish Environmental Protection Agency.
5. The Task Force acknowledged the work of experts from Canada and the United States of America who had prepared and provided documents and information for the meeting.
6. The members of the Task Force highly appreciated the valuable guidance, expertise and practical assistance provided in the past by the secretariat. They felt the fact that this help was no longer available was unfortunate.
7. The Chair reported on discussions and conclusions by the Working Group on Strategies and Review and the Executive Body concerning Heavy Metals.

## **II. OBJECTIVES OF THE MEETING**

8. In accordance with the request of the Parties to the Protocol on Heavy Metals represented at the twenty-seventh session of the Executive Body in December 2009 (ECE/EB.AIR/99, para 39 (d)), the Task Force carried out further work concerning the technical reviews of the proposal by the European Union (EU) member States that were Parties to the Protocol to add mercury-containing products to annex VI to the Protocol on Heavy Metals (referred to as the EU proposal). That was done in line with paragraph 5 of Executive Body decision 1998/1 and the procedures outlined in the generic guidelines for the technical review of additional metals, product measures or product groups (EB.AIR/WG.5/2005/2, annex IV), with a view to reporting to the Working Group on Strategies and Review at its forty-seventh session in September 2010.<sup>1</sup>
9. In line with the 2010 workplan, the Task Force assessed supplementary information provided by Canada and the United States of America for the track B review of mercury-containing products and explored management strategies for them.<sup>2</sup> For each product category, a corresponding control measure proposed by the EU has been referred to, followed by information provided on potential emission reductions and consumption, costs of mercury-free alternatives, and alternative measures in place in the United States and Canada.
10. The Task Force also discussed the information presented by the Chair and a representative of the Expert Group on Techno-economic Issues on:

(a) The joint workshop of the Task Force and the Expert Group on Techno-economic Issues, held in Saint Petersburg, Russian Federation, in October 2009, with the objectives to promote the ratification of the three most recent protocols to the Convention; to raise awareness and interest in Convention activities in countries in Eastern Europe, the Caucasus and Central Asia and South-Eastern Europe; and to provide information on the protocols, as well as on the possibilities for donor

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<sup>1</sup> Outcomes of this work are included in chapter III of the present report.

<sup>2</sup> Outcomes of this work are included in chapter IV of the present report.

countries and organizations to support those countries in ratifying those instruments.

(b) The status of the work related to the review of the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) and the results of the discussion by the ad hoc group of technical experts held in parallel to the forty-sixth session of the Working Group on Strategies and Review.

### **III. CONCLUSIONS OF THE TRACK B REVIEW**

#### **A. General conclusions**

11. At its sixth meeting, in 2009, based on its work on the track A review of the EU proposal to add mercury-containing products to annex VI to the Protocol on Heavy Metals, the Task Force had concluded that all products included in the proposal intentionally contained mercury and contributed to emissions to air (ECE/EB.AIR/WG.5/2009/8). It had estimated the mercury emissions from the products and product groups were on the order of 81 to 102 tons in the UNECE region in 2005. Those emissions had the potential to lead to a bioavailable form and could cause adverse effects on human health and to the environment.

12. Furthermore, in 2009, the Task Force had carried out the track B review of the proposal based on information from Europe. The Parties to the Convention meeting within the Executive Body in 2009 had requested the Task Force to continue with the track B review, taking into account the information from the United States and Canada, as well as information made available from the countries in Eastern Europe, the Caucasus and Central Asia.

13. The Task Force updated its conclusions of the track B review based on information made available on Europe and North America. Information on product regulations, emission reduction, alternatives, costs and benefits in Eastern Europe, the Caucasus and Central Asia was not available for the meeting of the Task Force.

14. The Task Force concluded that:

(a) Any amount of mercury that was released to the environment was potentially hazardous for human health and the environment. Consequently, the proposed measures could reduce the amount of atmospheric emissions of mercury entering air, water and soil.

(b) For most products reviewed, mercury-free alternatives were widely available at comparable cost;

(c) Most releases of mercury from mercury-containing products occurred during disposal phases (e.g., discarded products, transit to disposal facilities, landfilling and incineration);

(d) Removing mercury from the waste stream before it entered the incinerator was much more cost-effective than capturing mercury later from flue gases using emission control devices;

(e) In many countries, states and provinces, waste collection and recycling systems existed for different mercury-containing products, but varied widely in their effectiveness and efficiency. Effective waste collection systems and sound waste treatment helped to reduce mercury emissions. However, as effective waste collection systems could be costly and difficult to achieve, collection and recycling was not seen as efficient in all countries;

(f) The proposed sales prohibitions would apply to new sales and imports of targeted mercury-containing products but not to products already in use. That distinction would affect the degree of emission reduction;

(g) The proposed measures to reduce mercury emissions from products could result in costs to the society. However, reducing mercury pollution could also result in benefits to society, including, for example, through reducing costs associated with negative impacts on human health and the environment, through preventing the loss of income from reduced commercial fisheries and through reducing administrative costs for scientific research and development, control and risk communication.

## **B. Product-specific conclusions**

15. The Task Force concluded that:

(a) Mercury-free alternatives for the following products or product groups were widely available at comparable costs: batteries including button cells, switches, relays, flame sensors, thermostats, barometers, manometers, and psychrometers. With respect to certain countries, it was noted that effective and economically feasible mercury-free alternatives did not currently exist for other specific mercury-containing products;

(b) For fluorescent lamps in general, the mercury content per lamp was decreasing. However, although the mercury content per unit was decreasing, the total mercury consumption in fluorescent lamps had been increasing due to the increasing use of “low energy” lamps. Mercury-free alternatives for fluorescent lamps existed. In some cases the alternatives were still more expensive (such as light-emitting-diode (LED) lamps) but used less energy and had a longer life span. In other cases they were less energy efficient (incandescent lamps) and therefore banned in some countries;

(c) Amalgam separators were cost-effective measures to help prevent mercury emissions. The separator stopped a significant amount of mercury from entering the wastewater stream and sewage treatment plants. Atmospheric emissions of mercury generally occurred when sewage sludge was spread on land or incinerated;

(d) In some countries, an amalgam separator efficiency of at least 95 per cent was required. A few countries (such as Denmark, Norway and Sweden) had completely banned the use of new amalgam fillings. In other countries, current approaches to dental amalgam were voluntary;

(e) For dental amalgam, mercury-free alternatives existed. In some countries studies showed that the alternatives were more expensive. In other countries studies showed that direct

costs were comparable. The indirect benefits (environment, health, cosmetics) of mercury-free filling materials could be substantial.

16. The Task Force also noted that:

(a) Fluorescent lamps (back lights) and switches could also belong to the mercury-containing product categories of Electric and Electronic Equipment (EEE) or vehicles;

(b) Tire balancer weights were identified as a further source of mercury. The Working Group on Strategies and Review might want to address that in possible future negotiations;

(c) In the UNECE region, most of the mercury consumed in batteries was contained in batteries that were not covered by the EU proposal (button cells and military equipment). Mercury-free button cells were available at comparable costs. Market restrictions for those types of batteries would lead to further reduction of mercury consumption and emissions.

### **III. FURTHER WORK ON TRACK B REVIEW: INFORMATION FROM NORTH AMERICA**

17. Representatives of Canada and the United States provided supplementary information for the track B review of mercury-containing products, as well a description of potential emission reductions, costs of mercury-free alternatives and alternative measures in place in the United States and Canada.

#### **A. General remarks**

##### **(a) Canada**

18. On 10 April 2010, Canada submitted information in support of the technical review related to the addition of new product control measures to annex VI of the Protocol on Heavy Metals. That included information on atmospheric emissions associated with the manufacture, use and disposal of mercury-containing products within Canada, as well as information on domestic actions that Canada had taken to address the risks associated with the use of mercury-containing products. In addition, Canada was currently in the process of developing the proposed “Products Containing Certain Toxic Substances Regulations (Mercury-Containing Products)”. The proposed regulations would prohibit the use of mercury in new products entering the Canadian marketplace. The objective of those regulations was to minimize mercury releases from products used in Canada to the lowest level possible. Those regulations would enable Canada to control products containing certain toxic substances manufactured, imported or its sale after 2012 by:

(a) Prohibiting the manufacture, import and sale of most mercury-containing products (including batteries, switches and relays, measurement and control devices, thermometers and thermostats);

(b) Granting permits, specific exemptions and/or establish content limits for certain products that played an important role in protecting human health or the environment, and that had no viable alternatives (e.g., lamps and dental amalgam);

(c) Requiring product labelling and annual reporting of mercury used in products.

19. It was anticipated that the proposed regulations would be published in the *Canada Gazette*, Part I, in fall 2010 and that the regulations would come into force in 2012.

#### **(b) The United States**

20. In the United States, the Environmental Protection Agency (USEPA) was currently conducting economic, exposure, and risk assessments to support the development of regulatory actions for mercury in certain products, including button cell batteries, measuring devices (barometers, manometers, and psychrometers), and electrical and electronic equipment (switches, relays, flame sensors, and thermostats). As appropriate, publicly available data were provided to complement the product categories identified in the EU Proposal review process. However, USEPA was not currently considering regulatory actions for dental amalgam, fluorescent lamps and vehicles.

#### **Emission reduction**

21. At present, emission release and reduction estimates for specific categories were being developed and were not appropriate for public disclosure. Based on 2005 National Emission Inventory data, however, USEPA estimated unintentional air emissions of mercury from source categories related to waste combustion and incineration. Annual nationwide mercury emissions from municipal waste combustors had been reduced from about 57 tons per year in 1990 to 2.4 tons per year in 2005. Annual nationwide mercury emissions from hospital and medical/infectious waste incinerators had been reduced from about 51 tons in 1990 to 0.2 tons in 2005. For hazardous waste combustors, mercury emissions were estimated to be about 15.9 tons in 2002, 3.0 tons in 2005 and 2.8 tons in 2009. It was noted that the consumption trends described in product categories had been provided to illustrate declining use trends, but were not translatable into actual emissions reductions.

#### **Costs**

22. Assessments comparable to cost, benefit, and efficacy criteria were currently being developed as part of economic, exposure and risk assessments to support current USEPA rulemaking. Except as provided in product categories, additional cost assessment data were not appropriate for public disclosure. However, the current rulemaking was based on a preliminary determination that effective and economically feasible mercury-free alternatives currently existed for button cell batteries, switches, relays, flame sensors, thermostats, barometers, manometers, and psychrometers.

## **Alternative measures**

23. Assessments of various options to regulate mercury in certain products would consider a cost-benefit analysis of various regulatory measures, and a cost-benefit analysis of the market, human health, and environmental effects related to the implementation of various regulatory measures. Such assessments, which had not yet been completed, would consider seven regulatory options under the Toxic Substances Control Act, including: (a) prohibitions on manufacture (including import), processing or sales; (b) content limits for manufacturing (including import), processing or sales; (c) labelling requirements; (d) recordkeeping requirements; (f) commercial use requirements; (g) disposal requirements; and (h) other requirements applicable to manufacturers and processors. It was premature to indicate a preference for any single or a combination of the aforementioned options. However, states and localities had enacted a range of regulatory controls that applied to various mercury-containing products.

### **B. Information on potential emission reductions, costs of mercury-free alternatives, and alternative measures**

#### **(a) Batteries**

24. In accordance with the EU proposal, batteries that contained more than 0.0005 per cent of mercury by weight could not be placed on the market, regardless of whether they were incorporated into appliances or not. The value of 0.0005 per cent had been chosen to certify that no mercury was intentionally added in the batteries, but trace amounts/impurities could be possible. Not affected by the restriction would be button cell batteries with a mercury content of no more than 2 per cent mercury by weight.

## **Emission reduction**

25. In the United States in 2001, 2.7 tons of mercury had been contained in batteries sold. In 2004, available data indicated that 2.3 tons of mercury had been contained in all button cell batteries sold in United States. Recent estimates from 2007 indicated that 1.9 tons of mercury had been contained in all button cell batteries sold in the United States that year. Thus, recent trends indicated a 33 per cent decline in domestic consumption of mercury in button cell batteries since 2001. From 2000 to 2005, global consumption for the same category had decreased by 67 per cent.

26. According to estimates outlined in a study prepared for Environment Canada, total releases from batteries in Canada in 2008 had been 2.5 tons, with approximately 14 per cent released into the air.

## **Costs**

27. Alternatives to mercury-containing button cell batteries included lithium batteries and mercury-free versions of the zinc air, silver oxide and alkaline manganese button cell batteries. Lithium batteries were currently widely available and were equivalent in cost to their mercury-containing counterparts. Mercury-free zinc air, silver oxide and alkaline manganese batteries were only beginning to appear on the market and were being sold at prices slightly higher than

their mercury-containing counterparts; the price differential was expected to decrease as the market matured.

### **Existing measures**

28. In the United States, the Mercury-Containing and Rechargeable Battery Act of 1996 intended to phase out the sale of mercury-containing batteries, except for certain military and medical equipment. The Battery Act prohibited the sale of:

- (a) Alkaline manganese batteries, except button cell batteries containing no more than 25 mg of mercury;
- (b) Zinc-carbon batteries with mercury intentionally added during the manufacturing process;
- (c) All mercuric-oxide button cell batteries; and
- (d) Non-button cell mercuric-oxide batteries, unless certain waste collection information was provided by manufacturers or importers.

29. In 2006, the United States battery industry had announced its commitment to eliminate mercury-containing button cell batteries by 30 June 2011.

30. In the United States and Canada, collection systems and systems for recycling batteries were in place in some states and provinces.

### **(b) Measuring devices**

31. In accordance with the EU proposal for measuring devices, mercury could not be placed on the market: (a) in fever thermometers; or (b) in other measuring devices intended for sale to the general public (e.g., manometers, barometers, sphygmomanometers and thermometers other than fever thermometers). Some exceptions were suggested.

### **Emission reduction**

32. In 2001, 5.4 tons of mercury had been contained in measuring devices sold in the United States. In 2004, available data indicated that 4.4 tons of mercury had been contained in measuring devices sold in the United States. In 2007, estimates indicated that 1 ton of mercury had been contained in all measuring devices sold in the United States. Thus, recent trends indicated a decline of 81 per cent in domestic consumption of mercury in measuring devices since 2001 in the United States. From 2000 to 2005, global consumption for the same category had increased by 96 per cent.

33. According to estimates outlined in a study prepared for Environment Canada, estimated total releases of mercury from measuring devices in Canada in 2008 had been 0.5 tons, with approximately 28 per cent released into the air.



## **Costs**

34. Alternatives to mercury-containing measuring devices (sphygmomanometers, non-fever thermometers, manometers, barometers, psychrometers) were widely available at comparable costs. In many cases, when calibrated correctly those alternatives were just as effective as their mercury-containing counterparts.

## **Alternative Measures**

35. The United States participated in domestic and international voluntary partnerships to eliminate the use of mercury-containing devices and to substitute mercury-free alternatives in health care facilities.

### **(c) Electrical and electronic equipment**

36. In accordance with the EU proposal, new electrical and electronic equipment exceeding 0.1 per cent mercury by weight in homogenous materials could not be put on the market. Some exceptions were suggested.

37. The information from the United States and Canada about electrical and electronic equipments was related to switches, relays and thermostats. The United States data also included flame sensors.

## **Emission reduction**

38. In 2001, 68.3 tons of mercury had been contained in switches, relays and thermostats sold in the United States. In 2004, available data indicated that 60 tons of mercury had been contained in switches, relays, flame sensors and thermostats sold in United States. Recent estimates, from 2007, indicated that 31.4 tons of mercury had been contained in switches, relays and thermostats sold in the United States. Thus, recent trends indicated a 54 per cent decline in domestic consumption of mercury in switches, relays and thermostats since 2001, whereas, from 2000 to 2005, global consumption in that category had increased by 23 per cent.

39. According to estimates outlined in a study prepared for Environment Canada, estimated total releases of mercury from switches, relays and thermostats in Canada in 2008 had been 2 tons, with approximately 14 per cent released into the air.

## **Costs**

40. Mercury-free alternatives for switches, relays, thermostats and flame sensors were widely available. The cost of alternatives was generally equivalent to mercury-containing switches, relays, thermostats and flame sensors. However, at present, mercury-free alternatives might not meet the requirements necessary for all retrofitting situations. In addition, for both switches and relays, design parameters could affect the specification and selection of each component for a particular product or application.

## **Alternative Measures**

41. In the United States, current regulatory efforts in the category under discussion focused on switches, relays, flame sensors and thermostats.

42. In the United States and Canada, collection systems and recycling of electrical and electronic equipment were in place in some states and provinces.

### **(d) Fluorescent lamps**

43. In accordance with the EU proposal, mercury-containing fluorescent lamps could not be put on the market if their mercury content exceeded: (a) 5 mg mercury per lamp for compact fluorescent lamps; (b) 10 mg Hg per lamp for lamps with halophosphate for straight fluorescent lamps for general purposes; and 5 mg Hg per lamp for lamps with triphosphate and normal lifetime.

44. The Task Force noted that some fluorescent lamps could also be classified as part of EEE or part of vehicles.

45. The information from the United States about lamps included fluorescent lamps, mercury-containing non-fluorescent lamps and components of larger products, such as liquid crystal displays, flat-panel televisions, projectors, and a variety of other electronic applications.

## **Emission reduction**

46. In 2001, 9.7 tons of mercury had been contained in lamps sold in the United States. In 2004, available data indicated that 9.1 tons of mercury had been contained in lamps sold in the United States. Data from 2007 indicated that 9.6 tons of mercury had been contained in lamps sold in the United States. Since 2001, there had been a slight decline in domestic consumption of mercury in lamps; however, there had been a 5 per cent increase between 2004 and 2007. From 2000 to 2005, global consumption for the same category increased by 48 per cent.

47. In 2001, Canada published a *Canada-wide Standard for Mercury-Containing Lamps*. The objective of that voluntary standard was to reduce releases of mercury to the environment from mercury-containing lamps. The standards numeric targets and timeframes were a 70 per cent reduction by 2005 and an 80 per cent reduction by 2010 in the average content of mercury in all mercury-containing lamps sold in Canada, from a 1990 baseline. Under Canada-wide Standards (CWS) on mercury lamps, members of the Canadian association for the lamp industry had reduced the average mercury content in lamps of all kinds sold in Canada from 43 mg to 7.9 mg from 1990 to 2006.

48. According to estimates outlined in a study prepared for Environment Canada, estimated total releases of mercury from fluorescent lamps in Canada 2008 had been 1.4 tons, with approximately 20 per cent released into the air.

**Costs**

49. In the United States, USEPA had made a preliminary determination that there currently were no effective and economically feasible mercury-free alternatives to fluorescent lamps.

**Alternative measures**

50. Alternatives to fluorescent lamps included traditional incandescent bulbs and halogen lamps. Those lamps could not be available in the United States or Canada in the future if they did not meet the energy-efficiency requirements set in new legislations. However, while there were very few alternatives for the moment to mercury-containing lamps, LED technology might be a viable alternative to replace mercury-containing lamps in the future.

**Other measures**

51. In the United States, USEPA was pursuing voluntary options to increase rates of recycling of spent fluorescent lamps, including safe mercury management in recycling operations. USEPA was also developing a guidance document to address mercury exposure from broken compact fluorescent lamps (CFLs). Among other tasks, USEPA was working with states to improve clean-up guidance for CFLs broken in households. In the United States collection systems and recycling for fluorescent lamps were in place in some states.

52. In 2007, the National Electrical Manufacturers Association's lighting manufacturers voluntarily committed to capping the total mercury content to 5 mg per unit in CFLs sold in the United States that used less than 25 watts, and 6 mg per unit in CFLs that used 25 to 40 watts.

53. The Government of Canada would examine how releases of mercury into the environment could be further reduced through environmentally sound end-of-life management of mercury-containing lamps. In that regard, the federal government will work with the provincial and territorial authorities.

**(e) Dental amalgam**

54. In accordance with the European Union's proposal, a Party should ensure the installation of amalgam separators at dentist practices within its territory.

**Emission reduction**

55. In 2001, 27.9 tons of mercury had been contained in dental amalgam sold in the United States. In 2004, available data indicated that 27.6 tons of mercury had been contained in dental amalgam sold in United States. Recent estimates, from 2007, indicated that 15 tons of mercury had been contained in dental amalgam sold in the United States that year. Thus, recent trends showed a 46 per cent decline in domestic consumption of mercury in dental amalgam since 2001. From 2000 to 2005, global consumption for the same category had increased by 28 per cent.

56. According to estimates outlined in a study prepared for Environment Canada, estimated total releases of mercury from dental amalgam in Canada in 2008 had been 4 tons, with approximately 19 per cent released into the air.

### **Costs**

57. Alternatives to amalgam included composite resin fillings, glass ionomers and various types of crowns, onlays and inlays. Composite fillings and glass ionomers were the most direct substitutes for amalgam. According to the American Dental Association those restorative materials were generally more expensive than amalgam.

### **Alternative measures**

58. In the United States, dental amalgam could not be regulated under general Toxic Substances Control Act (TSCA) authorities that applied to “chemical substances” because it fell under “devices” subject to the Federal Food, Drug, and Cosmetic Act, and therefore was excluded from the definition of “chemical substance”.

59. In July 2009, the United States Food and Drug Administration (FDA) had issued a final regulation classifying dental amalgam and its component parts — elemental mercury and a powder alloy — used in dental fillings. The FDA classified dental amalgam as class II (moderate risk). By classifying a device as class II, the FDA could impose special controls (in addition to general controls, such as good manufacturing practices that applied to all medical devices regardless of risk) to provide reasonable assurance of the safety and effectiveness of the device. The special controls that the FDA imposed on dental amalgam were contained in a guidance document that contained, among other things, recommendations on performance testing, device composition, and labelling statements. Specifically, the FDA recommended that the product labelling included: (a) a warning against the use of dental amalgam in patients with mercury allergy; (b) a warning that dental professionals use adequate ventilation when handling dental amalgam; and (c) a statement discussing the scientific evidence on the benefits and risks of dental amalgam, including the risks of inhaled mercury vapour. The statement would help dentists and patients make informed decisions about the use of dental amalgam.

60. In May 2010, Environment Canada had published a *Final Notice Regarding Pollution Prevention Planning in Respect of Mercury Releases from Dental Amalgam Waste*. The objective of the Notice was to contribute to a 95 per cent national reduction in mercury releases to the environment from dental amalgam waste, from a base year of 2000. Dental facilities targeted by the Notice had to consider implementing best management practices, which included, but were not limited to, installing an International Organization for Standardization (ISO)-certified or equivalent amalgam separator, contacting a waste carrier for recycling or disposal of the amalgam waste and avoiding the disposal of amalgam waste in the trash, down the drain, in the sharps container or with biomedical wastes.

### **Other measures**

61. In the United States, USEPA regulated the discharge of pollutants (such as mercury-containing dental amalgam residues) to wastewater, but did not currently regulate mercury discharges from dental offices. USEPA had established national regulations known as effluent

guidelines and pre-treatment standards to reduce pollutant discharges from specific industries that discharged either directly to surface waters or indirectly through publicly owned treatment works (POTWs). As part of an annual review of effluent guidelines and pre-treatment standards, USEPA evaluated dental mercury management and potential impacts on POTWs. USEPA compiled information on state and local dental amalgam control programmes, mercury discharges from dental offices, best management practices and control technologies, such as amalgam separators. USEPA also conducted a POTW pass-through analysis on mercury for dental practitioners. At this time, USEPA did not think national pre-treatment standards for dental mercury discharges were appropriate in the United States.

62. In December 2008, USEPA had signed a memorandum of understanding (MOU) with the American Dental Association (ADA) and the National Association of Clean Water Agencies, to promote voluntary use of ADA best management practices for handling amalgam waste. The goal of the voluntary discharge reduction plan was to have dental offices follow ADA best management practices, which included installation and proper maintenance of an amalgam separator and recycling of all amalgam waste collected in dental offices. The focus of the voluntary programme was on dentists who used or remove dental amalgam. However, the MOU imposed no requirements on dental offices or wastewater treatment facilities beyond what existing laws and regulations required. Nor did the MOU prohibit USEPA, State or tribal establishment of mandatory separator programmes.

63. In 2009, USEPA and the Marquette University's School of Dentistry had developed an environmentally responsible dentistry teaching module to educate dental students on proper amalgam waste management. The module aimed to raise dental students' awareness of the dental amalgam waste issue and to provide them with practical steps to reduce the release of amalgam waste into the environment. The module, entitled "Dental Amalgam Recycling: Principles, Pathways, and Practices", highlighted actions to properly manage amalgam waste, i.e. the proper handling, separating and recycling of dental amalgam waste, including the installation of amalgam separators. The module highlighted ADA best management practices for amalgam waste and encouraged dental students to practice environmentally responsible dentistry.

#### **(f) Vehicles**

64. In accordance with the EU proposal, vehicles placed on the market after 1 July 2012 should not contain mercury-containing materials and components exceeding 0.1 per cent mercury by weight in homogenous materials. Exempted were discharge lamps for headlights and fluorescent tubes used in instrument panel displays. Those components should be labelled or made identifiable to facilitate removal at the end of their life.

#### **Emission reduction**

65. As noted in last year's report (ECE/EB.AIR/WG.5/2009/8), in North America and Europe, mercury-containing switches were not used anymore in new cars. The emissions were expected to decrease considerably during the next 10 to 15 years, when most of those cars would have been recycled.

66. The Task Force noted that mercury-containing tire-balance weights could be a source of mercury emissions of vehicles.

### **Alternative Measures**

67. Removing mercury switches from scrap vehicles before processing them in the steel mills was an effective way to ensure the mercury contained in the switches was not released into the environment.

68. In 2007, Canada had published *A Final Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Mercury Releases from Mercury Switches in End-of-Life Vehicles Processed by Steel Mills*. That Notice required vehicle manufacturers and steel mills to prepare and implement a pollution prevention plan. Targeted companies had to consider the participation and funding of a switch management programme, with the objective of capturing and diverting 90 per cent of mercury switches in end-of-life vehicles currently processed by steel mills within four years. Steel mills also had to consider the establishment of a purchasing policy of mercury-free steel scrap and vehicle manufacturers had to consider the distribution of educational material to vehicle recyclers.

69. In October 2007, USEPA had issued a significant new use rule pertaining to mercury-containing switches used in motor vehicles. That rule was based on findings that mercury-containing switches were no longer used in the manufacture of new automobiles.

70. In the United States, the National Vehicle Mercury Switch Recovery Program — a collaboration among USEPA, automobile manufacturers, steel makers, scrap recyclers, automotive recyclers, states and environmental groups — provided dismantlers with information, materials, support and incentives to remove those switches from end-of-life vehicles before they were crushed and sent to furnaces that recycled the steel. The goal was to capture 80 to 90 per cent of available vehicle mercury switches by 2017, when most pre-2003 vehicles were expected to be off the road, and the programme was scheduled to end.

71. USEPA was also a partner in the Suppliers Partnership for the Environment (SP), a non-profit organization of auto manufacturers and suppliers. The Agency supported the work of an SP Chemicals committee in the development of a Materials Assessment Strategy, which aimed to determine the chemical composition and potential hazards/risks of components that made up a typical automobile. The initial focus was the interior of an automobile, where it was likely that most human exposure to toxic substances would occur. While that assessment did not specifically target mercury, the mercury content in any interior component would be a key concern in that assessment.

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