ZMWG Comments on the Guidance on BAT/BEP for Cement clinker production facilities
1 August 2015

General comments:

1. *Comments on the introduction:*

   It should be clearly noted in this section that inputs of mercury to the cement making process will inevitably lead to mercury releases into the environment, both from the fuel and the feedstock. Narrower approaches which only rely on managing the mercury-containing plant-internal streams such as filter dust from bag filters or electrostatic precipitators or from scrubbers lack a more comprehensive approach.

   Techniques such as switching to low or no mercury fuels and avoiding the addition of mercury--containing wastes/fuels and additives to the process are critical and these need to be more prominently incorporated into the BAT/BEP guidelines. In addition, testing the mercury levels entering the process from the raw feedstocks used to produce cement is another key element to include in the development of any comprehensive mercury abatement strategy. In particular, identifying areas of limestone quarries which are lower in mercury and mining those areas for the cement making feedstocks can also be used as an effective mercury reduction technique.

   While the production of cement is a critical activity for countries, efforts to make cement in an environmentally friendly manner need to focus on both reducing mercury inputs and emissions. For example, natural gas fired kilns may be feasible in certain situations and can significantly reduce mercury emissions from this sector. This is because, unlike burning coal, natural gas produces far less mercury emissions. Cement makers which make a deliberate effort to mine lower-mercury limestone and avoid utilizing mercury-containing wastes and additives for fuel need to be encouraged. All of these possible strategies for the reduction of mercury from the cement industry should be considered as part of each countries' mercury emission reduction strategy.

2. *Comments on Chapter 3:*

   i. *Chapter 3 describes a number of techniques which can be considered as BAT. It should be clarified which are BAT and which are BEP. It is appreciated that reduction rates are mentioned but it is important to also mention the achievable emission levels associated with BAT, as provided to a limited extent in Section 5.*

   ii. *ii. Each country should be encouraged to adopt limit values for all their inputs into the cement making process, including the mercury content in their fuels, additives, and wastes. An adequate monitoring plan should be established for these inputs with sufficient frequency to maintain the adopted limit values for mercury.*

iii. *In Chapter 3, distinction is made between "secondary measures" (3.2) and multi-pollutant control measures (3.3). This does not make sense as sorbent injection is also a multi-pollutant control measure. As a consequence, just secondary measures should be described and the techniques described under 3.3. should just be added to 3.2. So, the heading "multi-pollutant control measures" should be deleted.*

3. *Comments on Chapter 6:*

   The monitoring chapter (Chapter 6) needs severe improvement (see specific comments) as it does not reflect BAT.

Specific comments:

1. Under 3.2.1 Dust Shuttling

   The selective bleeding off of mercury enriched dust from the cement manufacturing process, while a strategy for the prevention of mercury emissions from the stack, does not ultimately lead to the prevention of mercury releases from the cement production process. This is due to the lack of adequate management of these dust shuttling residues in the industry.

   To be clear, dust shuttling is not a mercury control strategy at all. Cement plants routinely recycle or shuttle their cement kiln dust back into their kilns for economic reasons. Because this shuttled dust tends to be highly contaminated with mercury, compared to other inputs, dropping this practice or at least reducing the amount of mercury-contaminated dust that gets put back into the kiln is a strategy that can reduce mercury emissions out of the stack.

   That said, plants must then handle this mercury-contaminated dust safely so that the mercury it contains doesn't just get released into the environment somewhere else. One approach would be a dedicated retort to capture the mercury from the dust, followed by safe storage of the captured mercury and safe disposal of the remaining dust.

   Duration studies on the use of this high mercury content dust have not been performed. Duration studies done in the United States on mercury matrices with cement did not show permanent sequestration with this technique. http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20159Rev1.pdf) . For this reason, dust shuttling should not be relied upon as a control strategy for mercury reduction from the cement industry.

2. Under 3.3.3, first paragraph, the words "NH4 compounds, HCL, HF§ shall be deleted as these compounds are not reduced by activated carbon filters. Under "achieved environmental benefit", it should be mentioned that Hg concentrations below 5 µg(Nm3 are usually achieved when applying the filter.

3. Under 6.1: Add at the end of the second paragraph: Emissions measurements can be used both for providing the proof that the emission limit value is met and to use the measurement signal for operating the control devices such as the dosage of sorbent injection.

The proposed amendment indicates as such that the continuous emission monitoring provides the possibility to minimise mercury emission by means of control techniques

4. Under 6.3:

Add after the first sentence of the second chapter (which is “Regarding stack measurements, mercury may be in the form of elemental mercury or it can be in the oxidized form ((Hg(I) or Hg(II)), in vapour form”) following text: (see Chapter 7.1).

5. Under 6.4.1: This chapter should be completely deleted as it is practically impossible to reliably determine the emission of mercury by material balances.

Rationale: Compared to the bulk of raw materials and dust, the quantity of mercury is very low. For determining the mercury emissions to air, the huge quantity of input and output materials have to be multiplied by the mercury concentration which is associated with a high uncertainty. As a consequence, the resulting estimation of mercury emission is not reliable. Therefore, this method should not be taken into consideration and should be deleted. There are better alternatives such as semi-continuous and continuous emission monitoring.

6. Under 6.4.2: It is common to use the manual methods as reference methods. Therefore, the term “Impinger Methods” should be replaced by “Reference methods”.

Rationale: The term “reference methods” is more precise and well introduced in international literature. On the global level, it is easier to understand. So, it represents the preferable term.

7. Under 6.4.4: After the last sentence of paragraph 2 which is “Instruments were modified and improved over time, as part of the experience gained with their use”, following sentence should be added: “Today, monitors are available which are highly reliable requiring a reasonably low level of maintenance.

Rationale: Mercury monitors are in use for about 20 years now. While the first generations of monitors had weaknesses and were difficult to operate and calibrate, the monitors available today are highly reliable and easy to maintain.

The last part of the last sentence under disadvantages which is “requires calibration for both raw mill on and raw mill off operation because mercury levels typically go beyond the calibrated mill on span during mill off operation.” Must be deleted as it simply does not reflect existing situations. A continuous monitor is usually calibrated for the whole range of vales including the compound (mill on) and direct (mill off) operating mode. It is not true that “mercury levels typically go beyond the calibrated mill on span during mill off operations. This may happen in very exceptional cases when calibration is not correctly performed. Thus, the sentence must be deleted.