Comments by the Government of Japan
on draft BAT/BEP guidance document - Waste incineration facilities

In response to the invitation from the co-chairs of the group of technical experts on air emissions under the Minamata Convention on Mercury to governments and other interested stakeholders to submit comments and contributions on draft guidance on best available techniques and best environmental practices (BAT/BEP) for controlling and where feasible reducing mercury emissions to the atmosphere, as set out in Article 8 of the Minamata Convention on Mercury, the Government of Japan submits the following comments on BAT/BEP guidance document - Waste incineration facilities.

1. Page 36 of the guidance document states "With these applications concentration of mercury below 10 μg/m³ (yearly average) has been reported (UNECE, 2013)". However, "I. Municipal, medical and hazardous waste incineration (annex II, categories 10 and 11)" of UNECE (2013) does not have any reference to yearly average. Therefore, the basis of the above mentioned statement is not clear. As paragraph 85 of UNECE (2013) states "The concentration of mercury can be reduced to a range of 0.001 mg/m³–0.02 mg/m³ (daily average, normalized to 11% O_2)", this fact should be quoted in the guidance document.

2. Page 32 of the guidance document states "With a suitable combination of primary and secondary measures associated with best available techniques, mercury emission levels not higher than 10 $\mu g/m^3$ (at 11 per cent O_2) have been reported (Daschner et al., 2011)". However, in "SCR + Scrubber + Adsorption" of Figure 8, data with value over 0.01mg/Nm^3 are present. The data in Figure 8 also show that measurement data have large standard deviations in most cases.

3. Actual measurement data from industrial waste and municipal waste incinerators in Japan that have introduced BAT are shown in the attached annex. The yearly average of mercury concentration is below 0.02 mg/m³ which is consistent with the description in UNECE (2013). However, in the case of industrial waste incinerators, there is a large deviation in mercury concentrations of flue gas..

4. We believe that as per comments 1 - 3 stated above, it is suitable to change the expression in the summary stating "With a suitable combination of primary and secondary measures, mercury emission levels in air emissions not higher than 1-10 $\mu g/m^3$ (at 11 per cent O_2) are associated with best available techniques" to "With a suitable combination of primary and secondary measures, mercury emission levels in air emissions in most cases are lower than 20 $\mu g/m^3$ (daily average value or yearly average value)." It is also important to add the point "data on mercury concentrations of flue gas have a large deviation" to the summary.

Annex: Example of actual measurement values of mercury concentrations in flue gas from waste incinerators in Japan.

1. Industrial waste incinerators

- Figure 1 shows mercury concentrations of flue gas from 45 industrial waste incinerators by flue gas treatment technology.
- The mercury concentrations of flue gas from the respective incinerators are not continuous measurement data but batch data measured according to JIS K 0222. However, for incinerators with multiple data, the arithmetic mean value is used (n number of the respective incinerators: 1-12 per year).

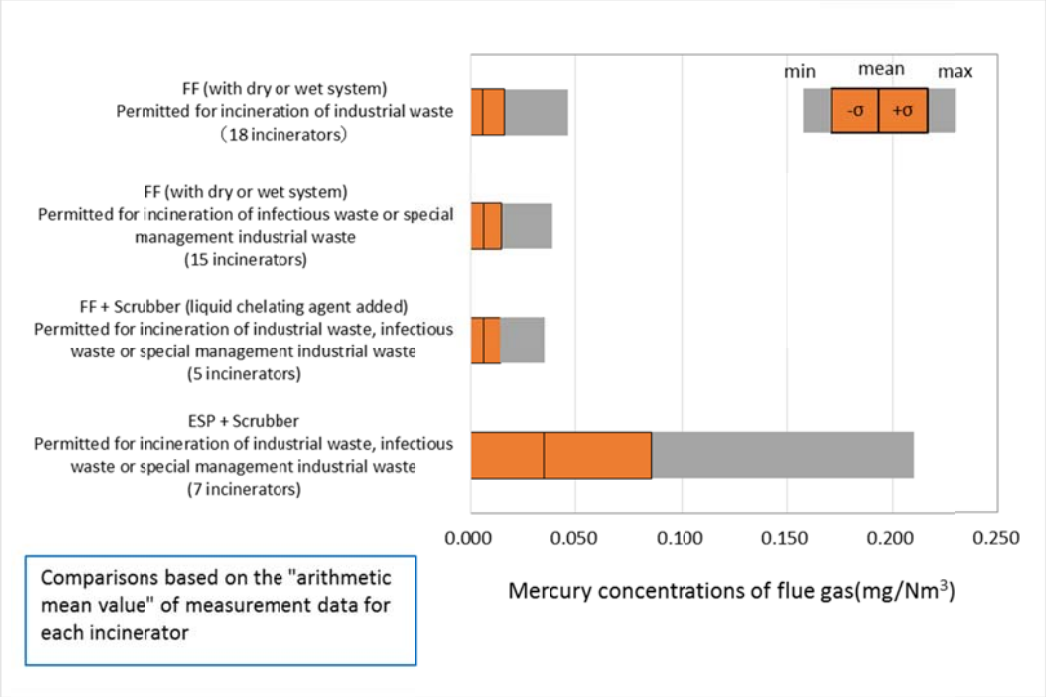

Figure 1: Comparison of mercury concentrations of flue gas by flue gas treatment technology (industrial waste incinerator)

Table 1: Distribution of mercury concentration (mg/Nm^3) of flue gas by flue gas treatment technology (industrial waste incinerator)

Type of flue gas treatment, business permit		Min.	Arithmetic mean	Max.	Standard deviation σ
FF (with dry or wet system) Permitted for incineration of industrial waste[1] (18 incinerators)	*1	0.0001	0.0057	0.046	0.010
FF (with dry or wet system) Permitted for incineration of infectious waste or special management industrial waste (15 incinerators)	*1	0.0002	0.0062	0.039	0.0084
FF + Scrubber (liquid chelating agent added) Permitted for incineration of industrial waste, infectious waste or special management industrial waste (5 incinerators)	*2	0.0004	0.0064	0.035	0.0077
ESP + Scrubber Permitted for incineration of industrial waste, infectious waste or special management industrial waste (7 incinerators)	*3	0.0001	0.035	0.210	0.051

*1 : Incinerators with flue gas treatment by fabric filters (FF) and one or more of the following: scrubbers (water or alkali washing), activated carbon injection, activated carbon adsorption tower or catalytic reactor

*2 : Incinerators with flue gas treatment by a combination of FF and scrubbing solution added with liquid chelating agent for mercury removal.

*3 : Incinerators with flue gas treatment by a combination of electrostatic precipitator (dry or wet) and scrubbers. Some of the incinerators also have activated carbon injection (continuous) or activated carbon adsorption towers.

2. Municipal waste incinerators

- Figure 2 shows mercury concentrations of flue gas from 367 municipal waste incinerators by flue gas treatment type.
- The mercury concentrations of flue gas from the respective incinerators are not continuous measurement data but batch data measured according to JIS K 0222. However, for incinerators with multiple data, the arithmetic mean value is used (n number of the respective incinerators: 1-12 per year).

[1] The term “industrial waste” here does not include special management industrial waste.

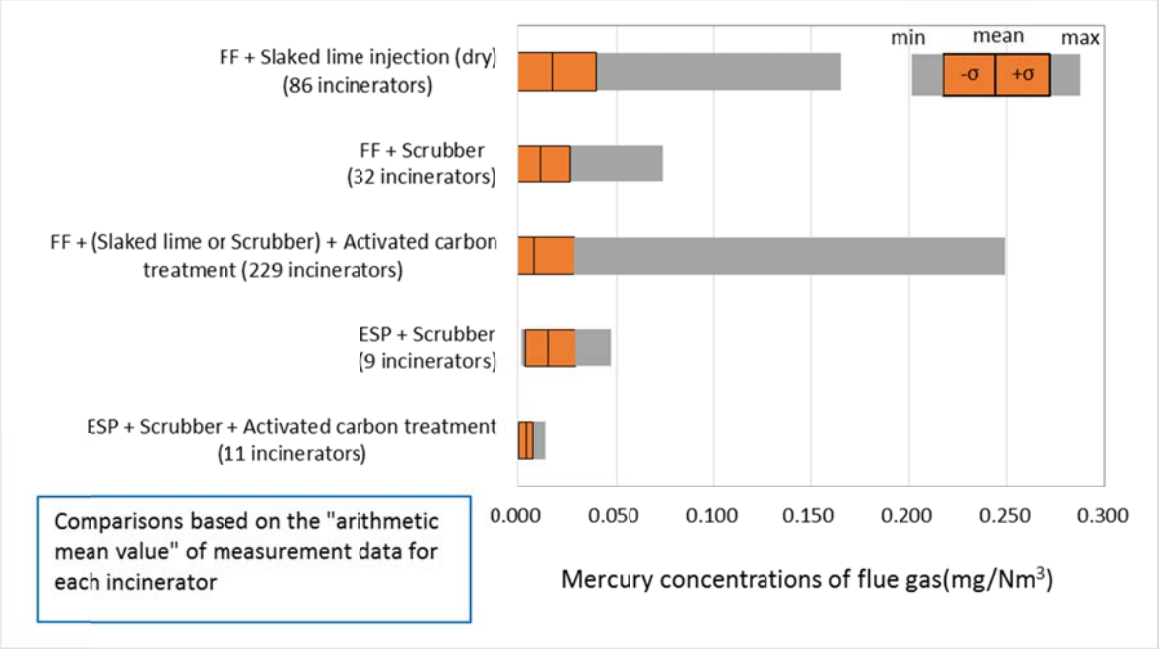

Figure 2: Comparison of mercury concentrations of flue gas by flue gas treatment technology (municipal waste incinerator)

Table 2: Distribution of mercury concentration (mg/Nm^3) of flue gas by flue gas treatment technology (municipal waste incinerator)

Flue gas treatment type	Min.	Arithmetic mean	Max.	Standard deviation σ
FF + Slaked lime injection (dry) (86 incinerators)	0.0005	0.0176	0.165	0.022
FF + Scrubber (32 incinerators)	0.0002	0.0114	0.074	0.015
FF + (Slaked lime or Scrubber) + Activated carbon treatment (229 incinerators)	0.0002	0.0081	0.249	0.020
ESP + Scrubber (9 incinerators)	0.004	0.0154	0.047	0.014
ESP + Scrubber + Activated carbon treatment (11 incinerators)	0.0005	0.0043	0.014	0.004

FF: fabric filter
ESP: Electrostatic precipitator
Activated carbon treatment: Activated carbon injection, activated carbon adsorption tower or activated coke adsorption