Best Available Techniques and Best Environmental Practices

Peter Nelson
Department of Earth & Environmental Sciences
Macquarie University
Sydney, Australia

Co-lead UN Environment Mercury Control in Coal Combustion Partnership
Lead author, Non Ferrous Sector, BAT/BEP Guidance
Provisions of Article 8

- Article 8 concerns controlling and where feasible reducing emissions of mercury and mercury compounds through measure to control emissions from the point sources falling within the source categories listed in annex D
- For new sources, each Party shall require the use of best available techniques and best environmental practices
- For existing sources, each Party shall implement one or more of the measure:
  - A quantified goal
  - Emission limit values
  - BAT/BEP
  - Multi-pollotant control strategy
  - Alternative measures
Coverage of Article 8

- Article 8 covers sources in 5 categories listed in Annex D
  - Coal-fired power plants
  - Coal-fired industrial boilers
  - Smelting and roasting processes used in the production of non-ferrous metals (lead, zinc, copper and industrial gold)
  - Waste incineration facilities
  - Cement clinker production facilities
Guidance on emissions within the convention

Article 8 refers to four guidance documents to be adopted by the Conference of the Parties:

➢ Best Available Techniques and Best Environmental Practices (7/6/Add1)
➢ Support for Parties in implementing measures for existing sources, in particular guidance on determining goals and setting emission limit values (7/6/Add2)
➢ Guidance on criteria relating to relevant sources (7/6/Add3)
➢ Guidance on the methodology on preparing inventories of emissions (7/6/Add4)
Diplomatic Conference

• *Established* a group of technical experts, as a subsidiary body from all UN regions, with 2 co-chairs and made up of experts in pollution control and/or one or more of the source categories in Annex D,

• Group to take into account experience gained through, inter alia, the UNEP Global Mercury Partnership,

• Invited the participation of eight experts from industry and civil society as observers.

• Invited input from other governments, intergovernmental organizations, industry and civil society organizations to assist it in completing its work;
Overview of BAT/BEP guidance

- Guidance includes some common sections relevant to all source categories:
  - Introduction
  - How to select the «best available techniques»
  - Common techniques
  - Monitoring

- Also includes chapters specific to each source category (note that the two ‘coal’ source categories are presented as a single chapter)
Nature of guidance

➢ It’s guidance, to help Parties: **it’s not mandatory, and it doesn’t limit national discretion.**
➢ It doesn’t define what is BAT: it provides information about a range of techniques to help Parties make decisions
➢ Parties’ decisions will need to take account of national circumstances
➢ The guidance reflects the knowledge and information available to the group at the time it was written: the guidance should be a living document, which improves and develops over time.
Coal-fired power plants and coal-fired industrial boilers

- Mercury emission control technologies are generally similar for all coal-fired boilers.

- Mercury emissions from coal-fired combustion plants are affected by a number of variables:
  ① mercury concentration and speciation in coal
  ② coal type and composition
  ③ type of combustion technology
  ④ control efficiency of existing pollution control systems
Coal-fired power plants and coal-fired industrial boilers

➢ BAT/BEP

➢ Primary measures to reduce the mercury content of coal
  ➢ Coal washing, selection or blending (does not alone constitute BAT)

➢ Measures to reduce mercury emissions during combustion
  ➢ Use of a fluidized bed boiler (does not alone constitute BAT)

➢ Mercury removal by co-benefit of conventional APCS\(^1\)s

  ➢ Combination of SCR, ESP and FGD can remove mercury up to 95% and result a concentration of less than 1 μg/Nm\(^3\) of mercury in the flue gas.
  ➢ Combination of SCR, FF and FGD can remove mercury up to 99% and result a concentration of <0.5 μg/Nm\(^3\) of mercury in the flue gas.

\(^1\) Air Pollution Control Systems
Coal-fired power plants and coal-fired industrial boilers

➢ BAT/BEP

➢ Dedicated mercury control technologies
  ➢ Activated carbon injection technology has been adopted for coal-fired power plants in the United States.
  ➢ The operations of activated carbon injection technology in the United States show that the mercury concentration in flue gas after activated carbon injection and fabric filters may be lower than 1 μg/Nm³.

➢ BEPs
  ➢ Improving the energy efficiency for whole plant
  ➢ improving the efficiency of APCSs
  ➢ environmentally sound management of the plant
  ➢ environmentally sound management of coal combustion residues
Coal-fired power plants and coal-fired industrial boilers

- Major issues raised in public comment phase
  - Performance levels of BAT
  - Cross-media effects of control measures
  - Costs of the control measures
  - Emerging techniques
  - Mercury monitoring issues

*as a daily average, or average over the sampling period, at reference conditions 273 K, 101.3 kPa, 10 per cent oxygen and dry gas
Questions