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**Expert Group on Best Available Techniques and
Best Environmental Practices
Second meeting
Geneva, 19–24 November 2006**

**Report of the second meeting of the Expert Group on Best
Available Techniques and Best Environmental Practices**

Introduction

1. The second meeting of the Expert Group on Best Available Techniques and Best Environmental Practices was held at the Geneva International Conference Centre, Geneva, from 19 to 24 November 2006. Mr. Gang Yu (China) and Mr. Bo Wahlström (Sweden) served as co-chairs of the meeting.

I. Opening of the meeting

2. The Co-Chair declared the meeting open at 10.10 a.m. on Sunday, 19 November 2006.

3. The representative of the Secretariat, speaking on behalf of Mr. Maged Younes, Head of the Chemicals Branch of the Division of Technology, Industry and Economics of the United Nations Environment Programme (UNEP) and acting Executive Secretary of the Stockholm Convention on Persistent Organic Pollutants, welcomed participants and noted with satisfaction the considerable progress which had been made to develop, in accordance with the provisions of the Convention, a set of guidelines on best available techniques and best environmental practices. He also noted with satisfaction that the current draft of the guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention had been prepared by members with significant input from non-members and observers and would be developed further at the current meeting for submission to the Conference of the Parties for consideration at its third meeting, to be held in Senegal from 30 April to 4 May 2007.

4. In his opening statement, the Co-Chair welcomed the new members and non-members and thanked the Secretariat for its excellent preparations for the meeting. He also thanked all those who had been actively involved in the intersessional work.

II. Organizational matters

A. Adoption of the agenda

5. The Expert Group adopted the agenda set out below, on the basis of the provisional agenda which had been circulated as document UNEP/POPS/EGBATBEP.2/1:

1. Opening of the meeting.
 2. Organizational matters:
 - (a) Adoption of the agenda;
 - (b) Organization of work;
 - (c) Report by the Secretariat on the intersessional work requested by the Expert Group.
 3. Completion of further work on the enhancement or strengthening of the guidelines on best available techniques and provisional guidance on best environmental practices relevant to the provisions of Article 5 of the Stockholm Convention on Persistent Organic Pollutants.
 4. Process for presenting the report of the work of the Expert Group and for submitting the revised draft guidelines on best available techniques and provisional guidance on best environmental practices for consideration by the Conference of the Parties of the Stockholm Convention at its third meeting.
 5. Other matters.
 6. Adoption of the report.
 7. Closure of the meeting.
6. Following a suggestion by one member, the Expert Group agreed to discuss under agenda item 5 (“Other matters”) the issue of establishing a clearing-house mechanism for information on persistent organic pollutants.

B. Organization of work

7. The Co-Chair drew attention to the tentative schedule for the week (UNEP/POPS/EGBATBEP.2/INF/2), noting that the objective of the meeting was to complete the work on the draft guidelines and provisional guidance, as mandated in the terms of reference for the Expert Group (set out in decision SC-1/19 adopted by the Conference of the Parties at its first meeting), so that the text could be considered by the Conference of the Parties at its third meeting.
8. The Expert Group agreed to conduct its work in plenary and to establish such contact groups as necessary, which would be open to members of the Expert Group, non-members and observers.

C. Report by the Secretariat on the intersessional work requested by the Expert Group

9. The representative of the Secretariat gave a presentation on the intersessional work which had been carried out at the request of the Expert Group at its first meeting, in accordance with the schedule of work contained in annex II to the report of that meeting.¹ She apologized for any inconvenience caused by the change in venue and dates of the meeting.
10. Noting that a regional workshop had been held in Brno, Czech Republic, in October 2006 to raise awareness of the guidelines on best available techniques and best environmental practices, she said that three additional regional workshops would take place before the third meeting of the Conference of the Parties. It had become apparent at the workshop in Brno that such workshops would be most effective when the guidelines had been completed and translated into languages other than English.
11. She recalled that, at its first meeting, the Expert Group had agreed to convene, subject to the availability of funding, a meeting to consider further a request by the Conference of the Parties of the Basel Convention on the Transboundary Movement of Hazardous Wastes and Their Disposal at its seventh meeting inviting bodies of the Stockholm Convention to consider best available techniques and best environmental practices with respect to unintentionally produced persistent organic pollutants. Because of a poor response to the invitation by the Expert Group at its first meeting to provide the relevant information, it had not been possible to organize such a meeting.

¹ UNEP/POPS/EGBATBEP.1/5.

D. Attendance

12. The meeting was attended by the following government-designated member experts: Mr. Luis Alberto Tournier (Argentina), Ms. Anahit Aleksandryan (Armenia), Mr. Chris Mobbs (Australia), Mr. Siegmund Böhmer (Austria), Mr. Chabi Séké Morakpai (Benin), Mr. Carlos Eduardo Komatsu (Brazil), Mr. Patrick G. Finlay (Canada), Mr. Fernando Marquez (Chile), Mr. Gang Yu (China), Mr. Ivan Holoubek (Czech Republic), Ms. Sirpa Silander (Finland), Mr. Emmanuel Fiani (France), Ms. Steffi Richter (Germany), Mr. Sam Adu-Kumi (Ghana), Mr. Stefan Einarsson (Iceland), Mr. Masaaki Hosomi (Japan), Ms. Ruta Bendere (Latvia), Mr. Bakary Touré (Mali), Mr. José Maria Lorenzo Alonso (Mexico), Mr. Fliur Z. Macaev (Moldova), Ms. Tuul Tudevbar (Mongolia), Ms. Louise Wickham (New Zealand), Ms. Aanu Sodeko (Nigeria), Ms. Katrina Solien (Papua New Guinea), Ms. Lina Margarida Guerreiro Morais Pereira (Portugal), Mr. Aloys Kamatari (Rwanda), Mr. Carlos Castillo (Spain), Mr. Bo Wahlström (Sweden), Mr. Hans-Peter Fahrni (Switzerland), Mr. Nares Chuersuwat (Thailand), Mr. Lotfi Ben Said (Tunisia), Ms. Nicola Lettington (United Kingdom of Great Britain and Northern Ireland), Mr. Tomas José Perruolo (Venezuela, Bolivarian Republic of) and Mr. Salem Abdullah Baquhaizel (Yemen).

13. The meeting was also attended by the following non-member experts: Ms. Heide Lore Fiedler (UNEP), Ms. Catalina Marulanda (World Bank), Mr. Jindrich Petrik (Arnika Association), Mr. Willem van Loo (The European Cement Association and Cement Sustainability Initiative), Mr. Jorge Emmanuel (Environmental Health Fund), Mr. William F. Carroll (International Council of Chemicals Associations), Mr. Alan Watson (International POPs Elimination Network) and Mr. Arseen Seys (World Chlorine Council).

14. A complete list of participants, including observers from Governments, observers from intergovernmental and non-governmental organizations and others, is set out in document UNEP/POPS/EGBATBEP.2/INF/6.

III. Enhancing and strengthening the guidelines on best available techniques and provisional guidance on best environmental practices

A. Completion of the guidelines

15. Introducing the item, the Co-Chair drew attention to the revised edited draft guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention (UNEP/POPS/EGBATBEP.2/3).² He invited the Expert Group to consider the document section by section.

16. The representative of the Secretariat summarized the work which had been carried out during the intersessional period to improve the introductory section. The coordinators of the work on other sections also outlined the efforts undertaken during that period to enhance and strengthen the document. A list of the names of the coordinators is provided in annex I to the present report.

17. The Expert Group established contact groups to consider the texts of some sections further. It agreed that the completion of other sections would be entrusted to the coordinators of the work on those sections, in consultation with others who wished to contribute, on the basis of comments raised in plenary. The results of that work were reported in plenary. In the ensuing discussions, one non-member expert indicated that he would have preferred to replace the negative waste list contained in the text on cement kilns firing hazardous wastes (section V.B.) with the shorter list proposed by the Cement Sustainability Initiative.

18. Following its consideration of each section, the Expert Group approved the text of the guidelines, as amended, for submission to the Conference of the Parties for consideration at its third meeting.

B. Consideration of priority areas

19. In its decision SC-1/19, the Conference of the Parties of the Stockholm Convention had mandated the Expert Group to place emphasis on certain priority areas while completing its further

² For the purposes of the present report, the revised edited draft guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention, contained in document UNEP/POPS/EGBATBEP.2/3, are hereinafter referred to as “the guidelines”.

work on strengthening the guidelines on best available techniques and best environmental practices. The Expert Group considered the extent to which it had fulfilled its mandate in that respect.

1. Enhancement of the document to make it easier to understand and use

20. The representative of the Secretariat outlined some of the options that had been explored by the Secretariat to make the document easier to understand and use. She said, for example, that an editor had been engaged to ensure editorial consistency throughout the document and to make final editorial improvements. In addition, she suggested that the guidelines might be reproduced as a set of booklets, with one booklet containing sections I–IV and a separate booklet for each source category, presented either in a ring binder or as a box set. Each standalone booklet would be accompanied by a compact disk containing a complete set of the guidelines and other useful information, including links to relevant websites, and would contain a foreword indicating how its contents fitted into the guidelines as a whole. Each booklet could then be updated as and when necessary. Furthermore, a brochure could be prepared to provide some background information on the guidelines. The aim, she said, was to encourage use by a range of stakeholders and to direct users to sections of the guidelines that were of particular relevance to them. The Secretariat would continue to explore ways to present the document in a format that was as user-friendly as possible.

21. During the ensuing discussion, several members indicated their support for the suggestion to reproduce the guidelines as a set of separate booklets, noting that it provided users with the necessary flexibility. Some emphasized the need to make the guidelines accessible to as wide a range of users as possible. The representative of the Secretariat said that further consideration would be given to the issue and that the comments raised by members would be taken into account.

2. Enhancement of the guidelines to identify and more fully address the needs and circumstances of developing countries and regions

22. One member, speaking on behalf of the African region, said that developing countries lacked the technical expertise and financial resources to implement the guidelines effectively. In accordance with the provisions of the Convention, he said, efforts should be made to ensure that the necessary mechanisms were in place in those countries, especially in terms of the provision of financial and technical assistance, technology transfer and the upgrading of laboratories. In addition, he spoke in favour of introducing into the guidelines case studies relevant to the African region. Several other members, also from developing countries, supported his statement. One member called for the participation in the regional awareness-raising workshops of a broader range of stakeholders.

23. The representative of the Secretariat drew attention to some of the steps which had been taken to promote technical assistance and to make financial resources available, recalling that the Conference of the Parties had adopted guidance on both issues. The terms of reference for regional and subregional centres for capacity building and transfer of technology under the Stockholm Convention had been adopted by the Conference at its second meeting, in its decision SC-2/9, and the process of establishing centres was under way. In addition, she said that a workshop to raise awareness of the guidelines in the African region was scheduled to take place in Nairobi in March 2007. Although, because of budgetary constraints, each Party would receive funding from the Secretariat for only one representative, Parties were encouraged to find alternative funding to allow the participation of other stakeholders.

24. In the ensuing discussion, one member drew attention to a joint project funded by the Global Environment Facility to promote best available techniques and best environmental practices in health care waste management, which was currently being implemented in eight countries. An observer drew attention to the work of his organization to promote best available techniques and best environmental practices as part of its cleaner production programme, including through various projects supported by the Global Environment Facility and bilateral donors. He noted that those projects would provide useful case studies.

25. The Expert Group noted that efforts had been made within the guidelines to respond to the needs and circumstances of developing countries. Additional case studies were, nevertheless, needed. It further noted that, although a significant amount of work was already under way, there was a clear need for further capacity-building to promote the implementation of the guidelines. The matter should be brought to the attention of the Conference of the Parties at its third meeting, during the discussions on technical assistance and the financial mechanism. Members were urged to brief those representing them at the third meeting of the Conference, to ensure that the matter received the necessary attention.

3. Considerations that countries might take into account when establishing requirements for best available techniques, including economic and social considerations

26. The representative of the Secretariat recalled that, at its first meeting, the Conference of the Parties, in adopting the guidance for assisting countries in the preparation of national implementation plans, had requested the Secretariat to develop additional guidance on social and economic assessment. She noted that the Secretariat was in the process of preparing a guidance document in response to that request, which would be completed for consideration by the Conference of the Parties at its third meeting and should be viewed as complementary to the guidelines on best available techniques and best environmental practices.

27. The Expert Group agreed that a reference to the guidance document on social and economic assessment could be incorporated into the foreword to the guidelines.

4. Available alternatives, including indigenous ones, and the use of substitute or modified materials, products and processes, and development of criteria for evaluating alternatives

28. The Expert Group noted that the guidelines contained a cross-cutting section on the consideration of alternatives in the application of best available techniques. The issue of alternatives was also reflected in the text on each source category.

C. Response to the request by the Conference of the Parties to the Basel Convention at its seventh meeting

29. The coordinator of the work on the item provided an overview of the work which had been undertaken to consider further the request by the Conference of the Parties of the Basel Convention at its seventh meeting, inviting bodies of the Stockholm Convention to consider best available techniques and best environmental practices with respect to unintentionally produced persistent organic pollutants, including the more recent technologies for destruction and irreversible transformation listed in the Basel Convention's general technical guidelines.

30. He recalled that, of the ten processes listed in the Basel Convention's technical guidelines for the purpose of destruction and irreversible transformation of the persistent organic pollutant content in wastes when applied in such a way as to ensure that the remaining wastes and releases did not exhibit the characteristics of persistent organic pollutants, two (on cement kilns firing hazardous waste and hazardous waste incineration) were already covered in the current guidelines on best available techniques and provisional guidance on best environmental practices.

31. After a general discussion, the Expert Group established a contact group, chaired by the coordinator, to prepare a response on the issue, for consideration by the Conference of the Parties to the Stockholm Convention at its third meeting, to be held in May 2007.

32. The Expert Group considered the outcome of the contact group discussions and agreed to submit a report to the Conference of the Parties of the Stockholm Convention at its third meeting, outlining its response to the request of the Conference of the Parties of the Basel Convention. The text is reproduced in annex II to the present report.

IV. Process for presenting the report of the work of the Expert Group and for submitting the revised draft guidelines for consideration by the Conference of the Parties at its third meeting

33. The representative of the Secretariat outlined the process for presenting the work of the Expert Group and for submitting the draft guidelines to the Conference of the Parties for consideration at its third meeting. She said that the Secretariat would prepare a note outlining the mandate of the Expert Group, introducing the guidelines and recommending their adoption. Attached to that note would be a report by the co-chairs of the Expert Group and the report of the work of the meeting. The guidelines themselves would be submitted to the Conference as an information document, in the six official languages of the United Nations. Efforts would be made to have the document available in appropriate languages prior to the planned regional workshops.

34. In addition, she said that final editing of the guidelines should be completed by the end of December 2006 and that any discrepancies in the final text or the translation should be indicated to the Secretariat, which would endeavour to incorporate the necessary changes.

35. The Expert Group invited the co-chairs to prepare a report for submission to the Conference of the Parties at its third meeting, outlining, among other things, the process undertaken to prepare the guidelines and a recommendation that the Conference should adopt the draft text. The report should indicate that the Expert Group had fulfilled its mandate, which was due to expire at the end of the third meeting of the Conference of the Parties. In addition, the report should highlight the importance of field testing the guidelines, reflect the concern of the Expert Group regarding the lack of capacity among developing countries to put the guidelines into practice and encourage the Conference to continue to provide technical and financial assistance for implementation of the guidelines. In addition, the Conference might be invited to explore ways of updating the guidelines in the future.

V. Other matters

36. One member, speaking on behalf of several others, suggested the establishment of a mechanism to facilitate the exchange of information on best available techniques and best environmental practices, noting that such a mechanism would respond in part to the concerns raised by some Parties about the difficulties of implementing the guidelines in developing countries and countries with economies in transition. He outlined a number of possible measures which, he suggested, would make it possible to maintain the momentum for information exchange achieved by the Expert Group and drew attention to a number of activities which were under way or scheduled to take place in the future – both within the United Nations system and in other forums – which were consistent with the provisions of the Stockholm Convention relating to information exchange.

37. Among other things, he suggested holding a side event at the third meeting of the Conference of the Parties, prior to the consideration of the guidelines by the Conference, to raise awareness of the content of the document among Parties and potential users. The Expert Group agreed that the Secretariat, in consultation with a few members of the Expert Group, would examine the means and possibility of holding a side event at the third meeting of the Conference. The Expert Group further agreed that issues related to the establishment of a clearing house mechanism lay beyond the mandate of the Group and would not, therefore, be considered further.

VI. Adoption of the report

38. The Expert Group adopted its report on the basis of the draft text circulated during the meeting, as amended and on the understanding that finalization of the report would be entrusted to the co-chairs working in consultation with the Secretariat.

VII. Closure of the meeting

39. Following the customary exchange of courtesies, the co-chairs declared the meeting closed at 12.10 p.m. on Friday, 24 November 2006.

Annex I

Coordinators of the work of the Expert Group

Task		Coordinator
Section I: Introduction		
I.A-E		Secretariat
Section II : Consideration of alternatives in the application of best available techniques		
II.A-C	Consideration of alternatives in the Stockholm Convention	Mr. José Maria Lorenzo (Mexico)
Section III: Best available techniques and best environmental practices: guidance, principles and cross-cutting considerations		
III.A	Guidance	Mr. Stefan Einarsson (Iceland)
III.B	General principles	
III.C	Cross cutting considerations: (i) Chemicals listed in Annex C: formation mechanisms (iii) Co-benefits of best available techniques for chemicals listed in Annex C (iv) Management of flue gas and other residues (v) Training of decision makers and technical personnel (vi) Testing, monitoring and reporting	
III.C	Cross cutting considerations: (ii) waste management considerations	Mr. Hans-Peter Fahrni (Switzerland)
Section V: Guidance/guidelines by source categories: source categories in part II of Annex C		
V.A	Waste incinerators	Mr Siegmund Bohmer (Austria) and Mr. Gang Yu (China)
V.B	Cement kilns firing hazardous waste	Mr. Steffi Richter (Germany)
V.C	Production of pulp using elemental chlorine or chemicals generating elemental chlorine	Ms. Sirpa Silander (Finland)
V.D	Thermal processes in the metallurgical industry	Mr. Patrick Finlay (Canada)
Section VI: Guidance/guidelines by source categories: source categories in part III of Annex C		
VI.A	Open burning of waste including burning of landfill sites	Dr. Hans-Peter Fahrni (Switzerland)
VI.B	Thermal processes in the metallurgical industry not mentioned in Annex C Part II	Mr. Patrick Finlay (Canada)
VI.C	Residential combustion sources	Ms. Louise Wickham (New Zealand)
VI.D	Fossil fuel fired utility and industrial boilers	Mr. Chris Mobbs (Australia)
VI.E	Firing installations for wood and other biomass fuels	Mr. Chris Mobbs (Australia)
VI.F	Specific chemical production processes releasing chemicals listed in Annex C	Ms. Ruta Bendere (Latvia)
VI.G	Crematoria	Ms. Nicola Lettington (United Kingdom of Great Britain and Northern Ireland)
VI.H	Motor vehicles, particularly those burning leaded gasoline	Mr. Masaaki Hosomi (Japan)
VI.I	Destruction of animal carcasses	Ms. Nicola Lettington (United Kingdom of Great Britain and Northern Ireland)
VI.J	Textile and leather dyeing and finishing	Ms. Lina Margarida Guerreiro Morals Pereira (Portugal)
VI.K	Shredder plants for treatment of end-of- life vehicles	Mr. Masaaki Hosomi (Japan)
VI.L	Smouldering of copper cables	Mr. Patrick Finlay (Canada)
VI.M	Waste oil refineries	Mr. Tomas Perruolo (Venezuela)
Response to the request by the Conference of the Parties to the Basel Convention at the seventh meeting		Mr. Chris Mobbs (Australia)

Annex II

Response to the request by the Conference of the Parties to the Basel Convention at its seventh meeting

1. The Expert Group on Best Available Techniques and Best Environmental Practices has considered the request by the Conference of the Parties to the Basel Convention at its seventh meeting inviting bodies of the Stockholm Convention to consider best available techniques and best environmental practices with respect to unintentionally produced persistent organic pollutants, including the more recent technologies for destruction and irreversible transformation listed in the general technical guidelines (see decision VII/13 of the Conference of the Parties to the Basel Convention).
2. The Basel Convention has identified ten processes that are listed in the general technical guidelines for the purpose of destruction and irreversible transformation of the persistent organic pollutant content in wastes when applied in such a way as to ensure that the remaining wastes and releases do not exhibit the characteristics of persistent organic pollutants.
3. The Expert Group notes that two processes (cement kiln co-incineration¹ and hazardous waste incineration) are already covered in the current draft guidelines on best available techniques and provisional guidance on best environmental practices.
4. At its first meeting, in November 2005, the Expert Group established a working group to assess the remaining processes. It found, however, that there were insufficient data on the releases of unintentionally produced persistent organic pollutants from these processes to undertake this assessment.
5. At its first meeting, the Expert Group invited Parties and others to provide any data on releases of unintentionally produced persistent organic pollutants, and any other relevant operation information they had available, on any of the following processes operating in their country (see report of the first meeting of the Expert Group, contained in document UNEP/POPS/EGBATBEP.1/5):
 - Alkali metal reduction
 - Base catalysed decomposition (BCD)
 - Catalytic hydro-dechlorination (CHD)
 - Gas phase chemical reduction (GPCR)
 - Photochemical dechlorination (PCD) and catalytic dechlorination (CD) reaction
 - Plasma arc
 - Potassium tert-Butoxide (t-BuOK) method
 - Supercritical water oxidation (SCWO) and subcritical water oxidation
6. In response to this request and subsequent intersessional requests to Parties and other organizations, the Expert Group received reports and data from several countries having processes that had ceased operation or were currently operating on a pilot or commercial basis. Information on processes that are under development and not listed above was also provided, but was not assessed.
7. At its second meeting, the Expert Group assessed that information. Its findings are attached in the appendix to the present document.

¹ “Cement kiln co-incineration” is the term used in the general technical guidelines of the Basel Convention, while Annex C, part II (b) of the Stockholm Convention refers to “cement kilns firing hazardous waste”.

Appendix

Assessment of eight processes for the destruction and irreversible transformation of the persistent organic pollutant content in wastes

The following information is provided for commercially operating plants, unless indicated.

A. Alkali metal reduction

1. Of the eight processes assessed, the alkali metal reduction process had the greatest number of plants operating, most of these in Japan. The plants were treating oils contaminated with polychlorinated biphenyls (PCB). A number of plants treated PCB with concentrations in the range of 100 parts per million, while some plants were treating concentrations up to 10 per cent. In all plants, the exhaust gas was treated with activated carbon.

2. Information provided by Japan showed that emissions of dioxin (PCDD), furan (PCDF) and dioxin-like PCBs to air and water were very low, in the order of <0.002 ng TEQ/m³N in air and 0.00005–0.0001 ng TEQ/L in waste water. Levels in solid residues were also low (1.7–54 µg/kg for PCB and 0.0018 µg TEQ/kg for PCDD/PCDF/dioxin-like PCBs). No data are yet available on air pollution control residues (activated carbon), but these are expected to be low as the input to the treatment was itself very low in PCDD/PCDF.

B. Catalytic hydro-dechlorination

3. There are currently only two plants operating, both in Japan, and limited emission data are available. One has been operating only since October 2006 and has a capacity to treat 2 tons of PCB per day. Two performance test measurements provided by Japan showed that emissions of PCDD/PCDF/dioxin-like PCBs to air for this plant were very low, in the order of 0.0001 ng TEQ/m³N. The other plant has a capacity of 30 kg/day at concentrations of 10 per cent and has no emissions of exhaust gas and no discharge to water, as the main product is biphenyl, which has levels of PCDD/PCDF/dioxin-like PCBs of around 0.00001–0.0001 ng TEQ/g. The treated oil, including biphenyls, is incinerated.

C. Base catalysed decomposition (BCD)

4. Data on emissions from base catalysed decomposition for two plants operating in Japan, one plant operating in Australia and one plant operating in the Czech Republic were provided. They all treated PCB at varying levels up to 10 per cent. It was noted that a former plant which treated soil contaminated with a range of persistent organic pollutants at the Sydney Olympic site in Australia had been decommissioned in 2003. Information on the only plant currently operating in Australia showed that the levels of emissions of PCDD/PCDF to air were very low, in the order of 0.0119–0.05 ng TEQ/m³N.

5. The levels of emissions of PCDD/PCDF to air was <0.01 ng TEQ/m³N at one small plant in Japan, treating 10kg/4 hours of high (10%) concentrations of PCB.

6. For the plant in the Czech Republic, the residual amounts of PCDD/PCDF in the output oil were less than 0.016 ng TEQ/g and hexachlorobenzene (HCB) <0.2 µg/g. Levels of PCDD/PCDF in the process off-gas (combined off-gas from soil treatment and BCD reactors) ranged between 0.013 and 0.031 ng TEQ/m³N; for PCBs between 0.005 and 0.0014 ng TEQ/m³N; for HCB between <6.7 and 187 ng/m³N; and for Σ of organochlorine pesticides, between 17 and 235 µg/m³N.

D. Gas phase chemical reduction (GPCR)

7. It was noted that the only gas phase chemical reduction plant in Australia closed in 2002 and there were no emissions data available for this plant. A Danish review (2004) noted that emissions of PCDD/PCDF from the gas phase chemical reduction process to all media were lower than those from the base catalysed decomposition process. While there was some uncertainty of the current status of the licence for this process and its availability, it was noted that there is a plant in Japan that is close to commercial operation.

E. Photochemical dechlorination (PCD) and catalytic dechlorination (CD) reaction

8. Only one small plant was commercially operating and it was located in Japan. It was noted that it had a very small capacity of 4.6 kg/2 days of high concentration PCB. The levels of emissions of PCDD/PCDF/dioxin-like PCBs to air were very low, in the order of 0.00007 ng TEQ/m³N.

F. Plasma arc

9. It was noted that the Plascon™ process was operating in Australia, in the same facility as the base catalysed decomposition process, and that the levels of PCB in effluent discharge to waste water were less than 2 parts per billion.

G. Potassium tert-Butoxide (t-BuOK) method

10. This process is used in Japan on a commercial level for oils with low concentrations of PCB (reported to be 17–180 mg/kg). One commercial plant with a capacity of 36m³/day generated no gaseous emissions. Concentrations of PCB in the treated oils are in the range of < 5 ng/g. Sludges from water cleaning are incinerated.

H. Supercritical water oxidation (SCWO) and subcritical water oxidation

11. Information was provided on three plants operating in Japan. One commercial plant, treating 0.25 kg/hour (as 100 per cent PCB) using supercritical water oxidation, had emissions to air of PCDD/PCDF/dioxin-like PCBs of 0.001–0.002 ng TEQ/m³ and to water of 0.0000005 ng TEQ/L.

12. One commercial plant, with a capacity of 12 kg/day (as 100 per cent PCB) using subcritical water oxidation, had emissions of PCDD/PCDF/dioxin-like PCBs to air of 0.00009 ng TEQ/m³ and to water of 0.0006–0.004 ng TEQ/L. The remaining plant also uses subcritical water oxidation: there are no data as it has just begun operation.
