出國報告（出國類別：會議）

參加「聯合國斯德哥爾摩公約第 10 次持久性有機污染物化學品審議委員會 (POPRC10)」

服務機關：行政院環境保護署

姓名職稱：袁紹英處長、許仲豪技正

派赴國家：義大利

報告日期：104 年 1 月 8 日

出國時間：103 年 10 月 23 日至 11 月 2 日

摘要

「聯合國斯德哥爾摩公約第 10 次持久性有機污染物化學品審議委員會(POPRC10)10 月 26 日至 10 月 30 日於義大利羅馬召開，與會人數約 200 人，其中包含各國代表、相關政府組織、非政府組織與聯合國機構等。本次會議達成多項決議，摘述如下：一、十溴二苯醚：決議通過其風險簡介草案，確認其具有長程傳播能力並導致人體與環境的負面影響，因此有必要針對此物質採取全球性的行動。二、大克蟎：審視大克蟎符合公約附件 D 之標準，決議可進入下一階段的審查。三、五氯酚及其鹽類和酯類：決議將提案至締約方大會(Conference of Parties, COP)建議將五氯酚及其鹽類和酯類列入公約附件 A 進行列管，並附帶相關豁免條件，可使用於木質電線桿及橫臂。四、全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟替代品評估程序：決議通過全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟(Perfluorooctane sulfonic acid its salts and perfluorooctane sulfonyl fluoride, PFOS)替代品的評估程序。五、全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟得使用用途及豁免項目：基於各國針對 PFOS 所提交資訊不足及商業機密等因素，POPRC 初步決議將進一步蒐集各國持久性有機污染物之國家實施計畫(National Implementation Plan, NIP)中有關 PFOS 之最新訊息及替代品資訊，以逐步淘汰 PFOS 於各國之使用情形，本次會議期間並完成評估。六、本次 POPRC 共成立四個會議間工作小組(Intersessional Working Groups)，其中針對大克蟎、十溴二苯醚及 PFOS 替代品指引，新成立三個會議間工作小組，並重啟短鏈氯化石蠟(Short-chained chlorinated paraffins)會議間工作小組。未來將此次會議結論整合於我國 NIP 跨部會相關會議，提供相關部會研析接軌國際公約之管制措施，並做為本署未來相關施政之參考。

目次

一、 目的

因臺灣非聯合國之會員，本次參與聯合國斯德哥爾摩公約第 10 次持久性有機污染物化學品審議委員會(POPRC10)，採行往例以非政府組織(Non-Governmental Organization, NGO)之觀察員身分申請出席參與，主要之目的如下：

(一) 資料收集，做為政策及法規制訂之參考依據：

目前我國非斯德哥爾摩公約之締約方，但以蒙特婁公約為鑒，國際公約會議中做成的相關決議,將可能對我國經濟及國際貿易造成相對的影響，有必要出席收集相關資訊,目前斯德哥爾摩公約相關化學品審議情形如表 1。目前我國已針對此公約規定中 23 種持久性有機污染物(Persistent Organic Pollutants, POPs)研擬相關管制作為；藉由本次參與會議，將國際上管制 POPs 之趨勢，納入毒性化學物質管制策略之重要參考，此外亦可瞭解國際未來之管理趨勢，供國內相關部會施政管理之參考。

表 1：斯德哥爾摩公約化學品審議情形

化學品	公約審議狀況	國內列管情形
氯化萘 (Chlorinated naphthalenes)（二至八氯萘）	COP7 討論列管於附件 A 或 C	六氯萘、八氯萘為已列管毒化物
六氯丁二烯 (Hexachlorobutadiene)	COP7 討論列管於附件 A 或 C	已列管毒化物
五氯酚及其鹽類和脂類 (Pentachlorophenol, its salts and esters)	PORPC10：附件 F	五氯酚、五氯酚鈉為已列管毒化物
十溴二苯醚 (Decabromodiphenyl ether)	POPRC10：附件 E	已列管毒化物
大克蟎(Dicofol)	POPRC10：審議列入附件 A、B 和/或 C 的提案	農委會列管農藥
全氟辛烷磺酸及其鹽類 (PFOS)	POPRC10：討論列管項目內容（附件 B）及替代品	已列管毒化物

(二) 瞭解聯合國針對 POPs 之化學品管制策略與未來影響，增加我國參與國際會議機會，推展環保外交：

截至 2014 年 7 月 1 日止此公約已有 178 個國家和 1 個區域性經濟一體化組織已成為斯德哥爾摩公約的締約方；參加此會議可有機會與各國家代表及國際環保組織彼此交換執行 POPs 及環保相關政策心得，並推廣臺灣在 POPs 執行的相關成效，達到環保外交之目的。

(三) 推廣我國執行 POPs 管制成效：

我國透過跨部會整合已達斯德哥爾摩公約要求撰寫完成 NIP，透過參與此會議可與世界各國分享我國執行持久性有機污染物之努力與成果，使世界各國更能瞭解我國於致力於環境保護之成果。

二、過程及會議結論重點

POPRC10 經過 5 天會議的討論及與會各國代表的協商後，會中達成相關化學品管制共識，我國可透過這些共識評估未來接軌國際公約相關管制作為，內容摘錄如下：

(一) 十溴二苯醚：決議通過其風險簡介草案，確認其具有長程傳播能力且導致人體與環境的負面影響，因此有必要針對此物質採取全球性的行動。

(二) 大克蟎：審視大克蟎符合公約附件 D 之標準，決議可進入下一階段的審查。

(三) 五氯酚及其鹽類和酯類：決議將提案至締約方大會(Conference of Parties, COP)建議將五氯酚及其鹽類和酯類列入公約附件 A 進行列管，並附帶相關豁免條件，可使用於木質電線桿及橫臂。

(四) 全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟替代品評估程序：決議通過全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟(Perfluorooctane sulfonic acid its salts and perfluorooctane sulfonyl fluoride, PFOS)替代品的評估程序。

(五) 全氟辛烷磺酸及其鹽類和全氟辛烷磺酸醯氟得使用用途及豁免項目：基於各國針對 PFOS 所提交資訊不足及商業機密等因素，POPRC 初步決議將進一步蒐集各國持久性有機污染物之國家實施計畫(National Implementation Plan, NIP)中有關 PFOS 之最新訊息及替代品資訊，以逐步淘汰 PFOS 於各國之使用情形。

(六) 本次 POPRC 共成立四個會議間工作小組(Intersessional Working Groups)，其中針對大克蟎、十溴二苯醚及 PFOS 替代品指引，新成立三個會議間工作小組，並重啟短鏈氯化石蠟(Short-chained chlorinated paraffins)會議間工作小組。

三、心得與建議

(一) 公約秘書處表示未來在審議委員會議的召開，需提早 3 至 4 個月進行報名及聯繫工作，此部分後續需將相關出國作業流程簽辦行政程序提前，始能因應公約秘書處安排會議作業時程上之需求。

(二) 104 年度公約將於日內瓦召開締約方大會，同時亦將為三公約（巴塞爾公約、鹿特丹公約及斯德哥爾摩公約）整合性會議，會議期間長達 12 天，並同時有數個化學物質可能於該會議上討論進行正式列管，包含此次會議結論提議至大會決議的五氯酚及其鹽類和酯類，以及之前提案的多氯萘及六氯丁二烯等物質。上述相關物質可能將於 104 年度於第 7 次締約方大會正式列管，將建議透過 NIP 跨部會機制予以充分告知，使行政部門及產業界能提早因應。

四、附錄

附錄一：行程

日期	地點	行程說明
10/23-10/24	臺北→法國巴黎→義大利羅馬	啟程，搭機前往義大利羅馬，10/24 抵達飯店（在巴黎轉機）
10/25	義大利羅馬	辦理報到
10/26-10/30	義大利羅馬	聯合國斯德哥爾摩公約第 10 次持久性有機污染物化學品審議委員會(10th Meeting of Organic Pollutants Review Committee, POPRC10)
10/31	義大利羅馬→法國巴黎	會議結束後，搭機前往法國巴黎，整理會議文件及出國報告資料彙整，等候班機返臺(轉機)
11/1-11/2	法國巴黎→臺北	返程，搭機返回臺灣

附錄二：POPRC10 會議實錄

POPRC-10 REPORT

On Monday, 27 October 2014, Chair Estefânia Gastaldello Moreira (Brazil) opened the tenth meeting of the Persistent Organic Pollutants Review Committee. David Ogden, Secretariat, welcomed participants on behalf of Rolph Payet, Executive Secretary of the Basel, Rotterdam and Stockholm Conventions, noting that since its creation the POPRC has recommended 11 chemicals to be listed under the Convention. Referring to a "post-synergy world" for the Basel, Rotterdam and Stockholm Conventions, he highlighted decisions taken by the tenth meeting of the Chemicals Review Committee (CRC) of the Rotterdam Convention on polychlorinated naphthalenes and short-chained chlorinated paraffins and underscored the importance of cooperation between the POPRC and CRC.

POPRC Chair Moreira then introduced the provisional agenda (UNEP/POPS/POPRC.10/1 and Add.1), which was adopted without amendment. On the proposed organization of work (UNEP/POPS/POPRC.10/INF/2), she suggested moving the discussions on perfluorooctane sulfonic acid (PFOS) its salts and perfluorooctane sulfonyl fluoride (PFOSF) to Monday afternoon in order to allow discussion of other matters on Tuesday. The organization of work was approved as orally amended.

The Secretariat then presented the outcomes of CRC-10, highlighting the establishment of an intersessional drafting group for short-chained chlorinated paraffins.

On rotation of membership (UNEP/POPS/POPRC.10/INF/3), the Secretariat reported that the 17 new POPRC members are: Australia, Austria, Belarus, Canada, Czech Republic, Ecuador, Gabon, Iran, Lesotho, Mauritania, Oman, Pakistan, Saint Vincent and the Grenadines, Senegal, Sri Lanka, Sweden and Venezuela. The other current members of POPRC are: Brazil, Cameroon, Cuba, France, India, Indonesia, Kenya, Kuwait, Madagascar, Netherlands, Norway, Republic of Korea, Sudan, and the former Yugoslav Republic of Macedonia. The members from India and the former Yugoslav Republic of Macedonia were unable to attend POPRC-10.

The Committee met in plenary throughout the week. Contact groups, open to observers, and drafting groups, limited to POPRC members, convened on a variety of topics. One item, the draft report for the evaluation of information on perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, was considered in a Friends of the Chair group, which included both members and observers. The summary of this meeting is organized according to the order of the agenda.

TECHNICAL WORK

Draft risk management evaluation on pentachlorophenol (PCP) and its salts and esters: On Monday, the Secretariat introduced the documents related to the draft risk management evaluation (RME) on PCP, its salts and esters (UNEP/POPS/POPRC.10/2 and INF/4). Kyunghee Choi (Republic of Korea), Chair of the intersessional working group, presented the chemical identity, data sources, status of PCPs under other international conventions and national control actions for PCP. Noting that PCP has already been replaced in many countries, she reported that consensus could not be reached in the working group on whether there is a net benefit for the environment or health of using alternatives to PCP for some applications. She highlighted that the group's conclusion that the POPRC list PCP in Annexes A, B and/or C remained in brackets.

Austria, supported by Sweden, the Netherlands, Sudan, Indonesia, and an observer from the Japanese government expressed support for not listing PCP in Annex C because there was no information that unintentional release occurs. Norway said POPRC needs to clarify the issue of releases of dioxins and furans from PCP-treated wood. Referring to Article 3.6 of the Convention (measures to reduce or eliminate releases from intentional production and use), the Netherlands noted that including PCP in Annex A or B would imply that all efforts to avoid unintentional production should be undertaken by parties without explicitly listing PCP in Annex C. Cameroon and Sudan expressed support for listing PCP in Annex A.

Noting that the draft RME states that is it not clear whether countries with similar climatic conditions to Canada have transitioned away from PCP use, Sweden and Norway stated that they are currently phasing out the use of PCP to treat utility poles.

Noting that there are alternatives to PCP and that it is used for wood utility poles in the US and Canada, France favored prohibiting the use of PCP. He underlined the importance of labelling to ensure that wood products treated with PCP are not exported or used as recycled wood for consumer uses.

Canada underlined that the draft RME states that the widespread uses and conditions under which PCP was used no longer exist, including as pesticides, biocides or disinfectants. Highlighting trend data showing that concentrations of PCP in the high Arctic have declined, she said that there is no net benefit for the environment or health to switching to alternatives and expressed support for a listing that would prevent historic uses from returning and would allow for critical uses with control measures, which could be achieved by listing PCP in Annex B.

Norway requested more information on the consequences of listing PCP in Annex A versus Annex B. The Secretariat responded that Annex A allows specific exemptions for five years from the date that the amendment enters into force while Annex B allows acceptable uses without a time limit, but she added that there is a process to review the continued need for these acceptable uses.

Canada observed that key consideration for deciding between the Annexes is the availability and feasibility of alternatives and not the number of parties that require exemptions.

Noting the difference between listing chemicals in Annex A and B is “a matter of time,” Kuwait suggested reviewing the information on economic impacts in the draft RME.

Senegal suggested listing PCP in Annex A and cautioned that listing PCP under Annex B should be informed by the toxicity of available alternatives. The Indian Chemical Council observed that a small amount of PCP used for particle boards and paint in India is not reflected in the document.

Alaska Community Action on Toxics (ACAT), for the International POPs Elimination Network (IPEN), recommended listing PCP in Annex A and C without specific exemptions, underlining the risks to human health and the existence of cost-effective alternatives.

An observer from the US, noting a lack of scientific and technical evidence in the RME, opposed listing PCP in the Convention. An observer from Canada underlined the value of PCP as an industrial wood preserver.

An observer from China supported listing in Annex A or B and not Annex C, citing the lack of evidence of unintentional release. An observer from India recommended inclusion in Annex B, as did Wood Preservations Canada

The American Galvanizers Association highlighted the cost effectiveness and availability of steel alternatives to PCP-treated wood poles.

POPRC Chair Moreira observed the general agreement on the high quality of the draft RME. The Committee established a contact group chaired by Kyunghee Choi (Republic of Korea). The contact group met Monday evening and Tuesday morning. On Tuesday evening, and throughout Wednesday, POPRC members met in a drafting group on the issue.

On Thursday, Sylvain Bintein (France) presented the revised draft RME on PCP (UNEP/POPS/POPRC.10/CRP.9) noting that changes included additional factual information provided by Canada in two new annexes to the draft RME. He reported that the group recommended PCP, its salts and esters should not be included in Annex C and should be considered for listing in Annex A or B, but that the decision between Annex A with or without specific exemptions or Annex B is a political issue to be taken by the COP, as there appears to be no technical basis for choosing one annex over the other. He further noted the recommendations that: no specific exemption be given to PCP salts and esters; production of PCP be restricted only to industrial wood preservation purposes for the treatment of utility poles and cross-arms under specific risk management procedures in order to minimize exposure; and measures should be implemented to easily identify PCP-treated articles by labelling or other means throughout the life cycle.

Observing that only 15% of the wood utility poles in Canada are treated with PCP, Kenya said this does not constitute a critical use and supported listing PCP in Annex A with a specific exemption. Gabon, Austria, and the Republic of Korea also supported listing PCP in Annex A with a specific exemption.

Sweden, supported by the Netherlands and Norway, suggested: moving the information provided by an observer from Canada from an annex to the draft RME to an information document. Sweden also suggested changing the statement that there is no technical basis to recommend Annex A or B to instead read that there is no agreement that there is a technical basis to choose one annex or another. Senegal suggested removing that statement. Norway, with Pakistan, stated her disagreement on the lack of a technical basis to make a recommendation and supported listing PCP in Annex A with a specific exemption.

Canada clarified that the statement meant that the drafting group had agreed on the soundness of the technical information but could not find consensus on the conclusions that could be drawn from that information.

Citing her country's unique conditions, Canada stated that wood utility poles are key to the utility infrastructure, and said that removing PCP may mean using chemicals that may also be of concern. She noted that an Annex B listing may not "open the door to other uses" because strict control measures can be specified to reduce or prevent exposure. Noting that socio-economic issues are part of Annex F criteria, she said these issues are likely to be important to Canada's decision on how best to ratify an amendment to list a new chemical in the Convention and said that these considerations are beyond her expertise as a POPs expert.

Norway noted that listing PCP would not affect articles currently in use. She said that a specific exemption under Annex A would provide time to switch to alternatives such as steel poles or other chemicals.

Indonesia said he could support either an Annex A or Annex B listing recommendation, with specific exemptions, and encouraged parties to label products containing PCP.

Canada reiterated that the preference for a time-limited option is based on the availability and feasibility of alternatives and the ability of parties to convert to those alternatives, not

the number of parties using a chemical. She said that the "ultimate goal" of both Annex A and B is elimination, except that Annex B provides sufficient time for parties to find and implement alternatives.

The Indian Chemical Council said that there is a "strong reason" for allowing continued use of sodium pentachlorophenate for a specific period. Saying the revised RME was not developed in an inclusive manner, an observer from India emphasized that the use of sodium pentachlorophenate in India must be taken into account.

An observer from the US stated that, based on a technical analysis, the US concluded that the benefits of using PCP outweigh the risks to society and said a "better case" needs to be made to support a recommendation to the COP to list PCP.

Wood Preservation Canada said currently there are "no better alternatives" than PCP when treating wood utility poles and cross-arms and suggested listing PCP under Annex B, saying that "sound regulatory decision making" in North America can ensure safe use of PCP. Stating support to list PCP in Annex A, the Inuit Circumpolar Council, on behalf of IPEN, Pesticide Action Network (PAN) and ACAT, said the use of PCP in the treatment of utility poles in one developed country does not constitute a critical use, and suggested including non-chemical alternatives in the risk management evaluation.

Noting that the draft RME report now included reference to findings that PCP is more carcinogenic than previously understood, an observer from South Africa underscored the need to protect human health and the environment and stressed that the POPRC's role is as a subsidiary technical body to the Convention, which should not "entertain politics.'

The American Galvanizers Association reiterated that steel utility poles could be viable alternatives and could lead to 10-20% cost savings throughout the lifecycle.

Oman said that sufficient information is available to recommend the listing in Annex A with specific exemptions and limited time. Saint Vincent and the Grenadines said health and safety should not be compromised, and supported an Annex A listing with a time-bound exemption.

Responding to the comments made on his presentation, France said that he endorsed the comments on the inappropriateness of the paragraph on the lack of technical basis and supported recommending listing in Annex A with specific exemption.

POPRC Chair Moreira noted agreement in the Committee on: not recommending listing PCP in Annex C; the need for an exemption or allowable purpose; and the need to redraft the paragraph referring to the technical basis of the decision regarding under which Annex to list PCP. She then asked whether the Committee could agree on recommending to list PCP under Annex A with specific exemptions.

Canada reiterated her concern with the time-limited nature of specific exemptions for chemicals listed in Annex A.

POPRC Chair Moreira asked the Secretariat to clarify the timeline of a possible exemption under Annex A. The Secretariat explained that a specific exemption for PCP if it were listed under Annex A would begin from the date of entry into force of the amendment to list PCP. She explained that this would not occur until August or November 2016, and that the exemption would expire in 2021. She noted that Canada is one of the parties that have chosen an opt-in approach to new listings and said that all parties have the option to opt out from any amendment.

Observing that consensus could still not be reached, POPRC Chair Moreira called for an informal group to meet during the lunch break.

In the afternoon, the Secretariat introduced the revised draft RME, which removed reference to the technical basis for choosing to list PCP in Annex A or B. The Secretariat also introduced the revised draft decision that recommended listing PCP under Annex A with specific exemptions for the production and use of PCP for utility poles and cross-arms.

France, with Norway, appreciated the flexibility shown by members and underlined that restrictions could also be linked to measures to control emissions. The Committee then adopted the further amended draft RME and draft decision as introduced by the Secretariat.

Canada requested that the meeting report reflect that, in her view, the RME contains equivocal information regarding recommending only an Annex A listing.

Final Decision: In its decision (UNEP/POPS/POPRC.10/CRP.8), the POPRC adopts the risk management evaluation for PCP and its salts and esters and recommends to the COP that it consider listing PCP and its salts and esters in Annex A to the Convention with specific exemptions for the production and use of PCP for utility poles and cross-arms.

Draft risk profile on decabromodiphenyl ether (commercial mixture, c-decaBDE): On Monday, the Secretariat introduced the draft risk profile on commercially available decabromodiphenyl ether (c-decaBDE) (UNEP/POPS/POPRC.10/3), its supporting information (UNEP/POPS/POPRC.10/INF/5) and comments and responses on the draft risk profile (UNEP/POPS/POPRC.10/INF/6). He explained c-decaBDE is a polybrominated diphenyl ether (PBDE) formulation consisting of decaBDE (mostly BDE-209) with small amounts of nona- and octa-BDE, and that it is used as a flame retardant in many applications worldwide, especially in electronic equipment and textiles. Jack Holland (Australia), Chair of the intersessional working group on c-decaBDE, presented the draft risk profile, including sources, environmental fate, and exposure and hazard assessments for the endpoints of concern. Highlighting c-decaBDE's widespread uses and releases to the environment, he said the group concluded that c-decaBDE is likely, as a result of its LRET, to lead to significant adverse human health and environmental effects such that global action is warranted.

Heather Stapleton, Duke University, an invited expert on debromination, presented evidence of photolytic and metabolic debromination of decaBDE. On photolytic debromination, she said that debromination of decaBDE does occur with exposure to natural and artificial sunlight and noted that hepta-and octa-BDE have been identified as "markers" for decaBDE in indoor dust samples. She observed that, in soils, shielding by organic matter or light attenuation with depth will significantly reduce photolytic debromination in the environment. On metabolic debromination, she reported evidence in fish, mammals and birds. The studies on fish and rodents, she underlined, show that the relative accumulation of lower brominated congeners are from debromination of decaBDE and not impurities in the dose or mixtures. Drawing on evidence of debromination near landfills, in rivers and in wildlife, she concluded that debromination of decaBDE occurs in the environment, and not only in the laboratory.

France praised the succinct synthesis provided by Stapleton, given the large amount of data available on decaBDE.

Iran inquired about the low water solubility and bioavailability and Norway clarified that evidence exists of both LRET and bioavailability of BDE-209.

Pakistan asked if there are health impacts posed by decaBDE from dismantling electronic equipment in developing countries, to which Norway responded that there are several studies of exposure to decaBDE from dismantling activities, for example in China and Nigeria.

An observer from Japan suggested that scientific information on LRET was missing and suggested revising the document intersessionally unless more scientific information is made available during the week.

An observer from the US suggested the risk profile should focus on BDE-209 and not on the commercial mixture.

The Bromine Science and Environmental Forum (BSEF) stated that there may be many equivocal or contradictory data in the draft risk profile.

BSEF further questioned the definition of "accumulation" and the research methodology in the expert presentation. Stapleton explained that both *in vivo* and *in vitro* approaches led to the conclusion that bioaccumulation does occur and she offered to provide three relevant peer-reviewed studies. POPRC Chair Moreira referred participants to the definitions of bioconcentration, bioaccumulation and biomagnification contained in Annex III of the POPRC-1 meeting report (UNEP/POPS/POPRC.1/10/AnnexIII). She also emphasized that parties should not expect a risk assessment in the risk profile stage.

Underscoring that the debromination of decaBDE leads to lower congeners that are POPs listed in the Stockholm Convention, IPEN said the draft risk profile provided a "compelling picture" of the bioaccumulation of decaBDE.

POPRC Chair Moreira proposed, and the Committee agreed, to establish a contact group to amend the draft risk profile on c-decaBDE, chaired by Jack Holland (Australia). The contact group met Monday evening, converted to a drafting group on Tuesday morning, and continued to meet Tuesday evening and Wednesday morning and afternoon.

On Thursday, Holland introduced the revised draft risk profile (UNEP/POPS/POPRC.10/CRP.4), noting the additional information and references provided and the changes to the draft. He reported that the group concluded that c-decaBDE with its main constituent BDE-209 is likely, as a result of its LRET, to lead to significant adverse human health and environmental effects, such that global action is warranted.

Hearing no comments from the members of the Committee, POPRC Chair Moreira invited observers to comment. An observer from the US suggested the risk profile should focus on the single fully brominated decaBDE itself instead of the commercial mixture.

BSEF questioned the conclusion on bioaccumulation and adverse effects of decaBDE, and said the new studies incorporated in the revised draft were not made available to observers with sufficient time for review. In response, an observer from the University of Manitoba outlined that the additional studies he brought forward "reinforced" the information on the bioaccumulation and trophic magnification factors of decaBDE that were already provided.

IPEN reiterated that the evidence presented in the risk profile is "solid and clear."

An observer from Japan stated that the revised draft did not fully reflect the issues discussed in the contact group, which he felt did not complete its work by discussing all the issues.

Indonesia highlighted a possible inconsistency in the data regarding the persistence of decaBDE, notably that the risk profile notes that the evidence for sediment-related long-term transformation processes is almost 30 years, whereas in the table of POP characteristics it says it is more than 30 years. Holland responded that it can seem an "enigma" that a persistent chemical also degrades, but that this is linked to where the chemical is found: it is very persistent in deep sediments and when exposed to light, in biota particularly, it can debrominate very quickly.

The Committee then adopted the draft risk profile. The Secretariat introduced the draft decision, which was also adopted.

Final Decision: In its decision (UNEP/POPS/POPRC.10/CRP.1), the POPRC:

• adopts the draft risk profile for c-decaBDE;
• decides that the decaBDE component BDE-209 of c-decaBDE is likely, as a result of its LRET, to lead to significant human health and environmental effects such that global action is warranted;
• decides to establish an *ad hoc* working group to prepare a draft risk management evaluation that includes any possible control measures for c-decaBDE in accordance with Annex F of the Convention; and
• invites parties and observers to submit to the Secretariat the information specified in Annex F before 5 January 2015.

Proposal for the inclusion of dicofol in Annexes A, B and/or C to the Convention: On Monday, the Secretariat introduced a proposal to list dicofol in Annexes A, B and/or C to the Convention (UNEP/POPS/POPRC.10/4), explaining it contained the proposal to list dicofol as submitted by the European Union to POPRC-9 and, in brackets, the outcome of discussions at POPRC-9.

POPRC Chair Moreira recalled the "intensive and exhaustive" discussions on dicofol at POPRC-9 and requested Committee members' comments on whether the proposal fulfils the Annex D criteria.

The Republic of Korea, France, Kenya, Indonesia, Canada, Norway, Austria, Saint Vincent and the Grenadines, and Sudan stated that the proposal fulfils all the screening criteria.

Iran asked if there is more information on the degradability of dicofol at different pH levels in water bodies, noting that the proposal says that dicofol meets the Annex D criteria for persistence in water bodies with a pH value of 5 or less.

An observer from India questioned whether dicofol meets the criteria for persistence and LRET because many lakes in the countries cited in the proposal have a pH greater than 6 and monitored levels in remote areas are inadequate to show LRET.

An observer from Japan highlighted that dicofol is found in seawater in remote areas, saying this is evidence of persistence and LRET.

An observer from the US supported moving forward to the Annex E phase, saying that dicofol is expected to increase the environmental loading of DDT and its degradates.

Stating that all criteria are met, PAN reported that pH levels of 5 are common in Arctic waters, and noted that Arctic ecosystems are singled out in the Convention as particularly at risk.

An observer from China noted that much of the section on LRET discussed DDT and not dicofol.

An observer from India said that more evidence is required before moving forward because the half-life "varies widely" depending on the pH value of water.

Iran supported moving to the Annex E stage, at which point more information on pH levels could be provided. Indonesia reported that water bodies in Sumatra can have pH levels below 6 and said there is sufficient information to move forward.

POPRC Chair Moreira suggested, and the Committee agreed, to establish a drafting group chaired by Zaigham Abbas (Pakistan). Observers were invited to submit written comments to the group, which met on Tuesday evening.

On Thursday afternoon, the Secretariat introduced the draft decision on dicofol (UNEP/POPS/POPRC.10/CRP.3). After no members commented, POPRC Chair Moreira invited observers to comment.

An observer from India stated his objections to the process, saying that a contact group should have been established and said that the submission from India was not considered.

POPRC Chair Moreira clarified that all submissions were taken into consideration by the drafting group.

The Committee then adopted the decision without amendment.

Final Decision: In its decision (UNEP/POPS/POPRC.10/CRP.3), the POPRC:

• decides that dicofol fulfils the Annex D screening criteria;

• decides to establish an *ad hoc* working group to review the proposal further and to prepare a draft risk profile in accordance with Annex E to the Convention; and

• invites parties and observers to submit to the Secretariat the information specified in Annex E before 5 January 2015.

Process for the evaluation of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF): On Monday, the Secretariat introduced: the process for the evaluation of PFOS, its salts and PFOSF for the various acceptable purposes and specific exemptions (UNEP/POPS/POPRC.10/5); the draft report on the assessment of alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/7); draft factsheets on alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/8); comments and responses relating to the draft report and factsheets (UNEP/POPS/POPRC.10/INF/9); and the draft report for the evaluation of information on PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/10).

Martien Janssen (the Netherlands), Co-Chair of the intersessional working group for the assessment of alternatives to PFOS, its salts and PFOSF, recalled that the assessment used the same methodology that was approved for the assessment of chemical alternatives to endosulfan (UNEP/POPS/POPRC.8/INF/28). He explained it comprised a two-step approach, first screening for persistency and bioaccumulation, then for all POP characteristics. He highlighted the draft report's conclusions that alternatives are available for most exemptions and acceptable purposes. He noted that of these alternatives, octamethyl cyclotetrasiloxane, was identified as likely to meet all Annex D criteria; chloropyrifos as meeting all of the Annex D criteria but with equivocal data; and a further 18 substances were classified as unlikely to be POPs. Janssen underscored that substances not meeting all POP criteria are not necessarily harmless and stressed the need for in-depth assessment of the alternatives before they are applied. He stated that the information gaps are due to the confidentiality of information on industrial chemical PFOS alternatives, which he characterized as the "main challenge" for the assessment.

France suggested presenting the results on the basis of the acceptable use or specific exemption rather than by substance. Sweden proposed specifying that some alternatives do meet some criteria in Annex D, although not all of them. Cameroon asked clarification on chloropyrifos as a substitute for PFOS.

Norway reported high levels of decamethyl cyclopentasiloxane and dodecamethyl cyclohexasiloxane were found in Arctic air according to recent results of their national monitoring programme.

Kuwait asked how the confidentiality issue could be solved. IPEN pointed out that it is in the power of countries to control the confidentiality information regimes.

Canada supported the evaluation and assessment of alternatives, but raised concerns with the characterization of manufacturing intermediates as alternatives to PFOS.

An observer from the US characterized the methodology applied for endosulfan as "problematic" in this case and said other options would have been preferable to evaluate the

alternatives to PFOS, such as the guidance on alternatives for listed POPs and candidate chemicals (UNEP/POPS/POPRC.5/10/Add.1).

International Council of Chemical Associations (ICCA) noted missing information and technical inaccuracies in the draft report. Global Silicones Council questioned the use of siloxanes identified in the draft report as PFOS alternatives.

Responding to a query by Sweden, the Secretariat clarified that the draft report on the assessment of alternatives will be amended with comments made at POPRC-10 and further information provided by parties. She also clarified that amendments to acceptable purposes or specific exemptions can be recorded in a footnote to the Convention text as done under similar circumstances for other chemicals listed in Annexes A and B.

POPRC Chair Moreira then invited comments from members on the draft report on the evaluation of information on PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/INF/10).

France requested, *inter alia*, information on the link between the draft report and the submission of information that will allow the COP to decide whether or not an exemption or use should be renewed, and called for more discussion regarding the dearth of information provided by the parties. Noting the difficulties identifying the presence of PFOS in textiles and other articles, he suggested further discussion of labelling.

Norway noted inconsistencies in the draft report, particularly regarding information on Norway's use of PFOS in fire-fighting foams and as a pesticide for fire ants. She queried if similar inconsistencies are present for other countries, and supported France's suggestion to discuss labelling of products.

IPEN observed that for only one acceptable purpose and two specific exemptions has a country reported use. She recalled previous POPRC recommendations to eliminate "open uses" of PFOS and underlined the need to reflect this decision in the draft documents. Reiner Arndt, an invited expert and former POPRC Chair, recalled that POPRC previously recommended to COP-6 that certain open uses of PFOS had alternatives and that specific exemptions for those uses could end. He also suggested further clarifying whether continued use of PFOS for a specific exemption or acceptable use meant that the country was using up a stockpile, or if there was ongoing production. He further suggested including the expiry date for the specific exemptions in the report.

Belarus suggested developing a registry of the goods, preparations and formulations for PFOS based on existing databases and registries of countries. Norway explained that they had previously attempted to set up such a registry, but encountered problems because perfluorinated substances are generally used in very small amounts, below what was is reported on the safety data sheets provided by industry.

POPRC Chair Moreira suggested, and members agreed, to establish a contact group that would consider both the process of the evaluation of alternatives as well as the guidance on alternatives to PFOS, its salts and PFOSF and their related chemicals. She suggested that the contact group, co-chaired by Martien Janssen (the Netherlands) and Agus Haryono (Indonesia), could shift to a drafting group when appropriate, and later reopen as a Friends of the Chair group to discuss the draft report for the evaluation of information on PFOS, its salts and PFOSF and other issues such as labelling. The contact group met to consider the process for evaluating alternatives on Monday evening and Tuesday evening before converting to a drafting group, which met Wednesday morning and evening. The Friends of the Chair group met on Wednesday evening.

On Thursday, the Secretariat introduced the revised report on the assessment of alternatives to PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/CRP. 6), the revised factsheets on alternatives (UNEP/POPS/POPRC.10/CRP.7) and comments by the Committee on the revised report for the evaluation of information on PFOS, its salts and PFOSF (UNEP/POPS/POPRC.10/CRP.10). Janssen highlighted the changes to the documents. On the draft report, he reported that the categories were renamed to align with POPRC's previous decision regarding the alternatives to endosulfan, to now read: potential POPs (category I), candidates for further assessment (category II), candidates for further assessment with limited data (category III), and those not likely to fulfillthe criteria on persistence and bioaccumulation in Annex D (category IV). He also highlighted changes to distinguish between PFOS alternatives and manufacturing intermediates. On the factsheets, he said that the only change is to clarify why only nine factsheets are presented.

On the revised report, France queried whether category IV included substances unlikely to fulfill only the bioaccumulation and persistence criteria or all Annex D criteria. He further reiterated his suggestion that it would be more useful to present the PFOS alternative by acceptable uses and not by substances. Janssen clarified that a table with acceptable purpose and exemptions and alternatives is included in the revised report for the evaluation of information.

Norway reiterated her comment on the high levels of decamethyl cyclopentasiloxane and dodecamethyl cyclohexasiloxane in the Arctic and that, based on this data, these chemicals should be recategorized. The Leaf-Cutting Ant Baits Industries Association emphasized that deltamethrin is used in complementary methods.

ICCA said the "preliminary nature" of the document should be emphasized, and the screening should not be considered a conclusive assessment of the POPs characteristics of the substances included in the report.

IPEN suggested specifying that information in the report for the evaluation of information refers to individual country applications. An observer from the US expressed concern with some information contained in the documents, including that the European classification is presented as a harmonized global classification for chemicals.

The Global Silicones Council said that the methodology for assessing the POP characteristics and the identification of other hazard indicators for the assessment of alternatives to PFOS are not fully in line with the screening criteria in Annex D to the Convention.

France observed inconsistencies between the screening criteria in the revised assessment of alternatives and the factsheets, and suggested resolving these inconsistences without changing the conclusion. Janssen welcomed the proposal, and the two worked together to revise the texts during a brief suspension of plenary.

Returning to plenary, Janssen presented revised versions of the report on the assessment and the factsheets and highlighted, *inter alia,* that category IV was renamed to "Substances that are not likely to meet all Annex D criteria." He said that decamethyl cyclopentasiloxane was consequently moved to the substances that are difficult for classification due to insufficient data.

Norway noted with concern that the changes do not help present a clearer document for the evaluation of alternatives to PFOS at COP-7.

Janssen then introduced the draft decision on the process for the evaluation of PFOS, its salts and PFOSF for the various acceptable purposes and specific exemptions (UNEP/POPS/POPRC.10/CRP.5) noting the same changes as in the assessment (CRP.6)

and stressed that lack of information was a limitation in the evaluation process. The Committee adopted the draft decision as amended.

Final Decision: In its decision (UNEP/POPS/POPRC.10/CRP.5), the POPRC:

- decides to submit to COP-7 the summary of the report on the assessment of alternatives to PFOS, its salts and PFOSF with the full report on the assessment of alternatives to PFOS, its salts and PFOSF and the factsheets on alternatives to those chemicals;
- requests the Secretariat to finalize the report for the evaluation of information on PFOS, its salts and PFOSF on the basis of comments and suggestions provided by the Committee and submit it to COP-7 for its consideration;
- recommends that the COP encourage parties that have registered or will register for specific exemptions for the production and use of PFOS, its salts and PFOSF to take measures necessary to ensure that articles containing these chemicals that are allowed to be produced and used can be easily identified by labelling or other means throughout their lifecycle; and
- recommends that the COP encourage parties that have or will register for production and use for an acceptable purpose by notifying the Secretariat in accordance with Annex B to take measures necessary to ensure that articles containing PFOS, its salts and PFOSF that are allowed to be produced and used can easily be identified by labelling or other means throughout their lifecycle.

Guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals: On Tuesday, the Secretariat introduced the guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals (UNEP/POPS/POPRC.10/6) noting the Committee could decide to establish an intersessional working group to revise the guidance endorsed by POPRC-9 (UNEP/POPS/POPRC.9/INF/11/Rev.1), taking into account the assessment of alternatives (UNEP/POPS/POPRC.10/INF/7) and the technical paper on the identification and assessment of alternatives to the use of PFOS, its salts, PFOSF and their related chemicals in open applications (UNEP/POPS/POPRC.8/INF/17/Rev.1).

An observer from the US welcomed the idea of preparing a single document that combines the information available but suggested postponing this work for one year. IPEN noted the need for moving forward and suggested that the intersessional working group report to COP-7, and, with the Global Silicones Council and an observer from South Africa, supported establishing an intersessional working group.

The Secretariat, responding to the Netherlands on the timeline for the work of intersessional group, clarified that the group would develop a proposal for consideration at POPRC-11 with a view of submitting the revised guidance to COP-8.

France, supported by Sweden, suggested the POPRC decision on this item should explicitly refer to merging the information contained in the various documents.

POPRC Chair Moreira suggested, and the Committee agreed, to ask the Secretariat to re-word the draft decision to reflect the discussion.

On Wednesday afternoon, the Secretariat introduced the revised draft decision on the guidance on alternatives to PFOS, its salts and PFOSF and their related chemicals.

Noting no comments were made by members, POPRC Chair Moreira opened the floor to observers. An observer from the US suggested the decision should include asking COP-7 for guidance on the next evaluation of PFOS alternatives.

The Global Silicones Council inquired whether the intersessional working group would consider information from newer sources in addition to those in the draft decision. France supported this point and noted that the draft decision should be clear about including new information in the revision.

The Netherlands asked whether information submitted by parties in their national reporting could be included. Kenya queried whether the revision would also include the issue of labelling of articles containing these chemicals.

The Secretariat responded that the introduction to the draft decision refers to "any other pertinent information," and that the scope of the revision is limited to the guidance of alternatives and therefore labelling is not included.

The Committee adopted the draft decision as presented.

Final Decision: In its decision (UNEP/POPS/POPRC.10/CRP.2), the POPRC, *inter alia*:

- concludes that the guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals should be revised to incorporate pertinent information contained in the report on the assessment of alternatives to PFOS, its salts and PFOSF, in addition to the information contained in the technical paper on the identification and assessment of alternatives to the use of PFOS, its salts, PFOSF and their related chemicals in open applications and should be submitted to COP-8;
- decides to establish an intersessional working group to prepare, for consideration and adoption by POPRC-11, a proposal for preparing a revision of the guidance on alternatives to PFOS, its salts, PFOSF and their related chemicals that consolidates the information on alternatives to these chemicals for consideration by POPRC-12; and
- invites parties and observers in a position to do so to provide financial support to enable the Secretariat to engage a consultant to support the activities referred to in the decision.

COORDINATION AND COLLABORATION WITH OTHER SCIENTIFIC SUBSIDIARY BODIES

On Tuesday, the Secretariat introduced its notes on coordination and collaboration with other scientific subsidiary bodies (UNEP/POPS/POPRC.10/7); draft guidance to assist parties to the Rotterdam Convention and CRC when a chemical under consideration is a POP listed under the Stockholm Convention and related comments and responses (UNEP/POPS/POPRC.10/INF/11 and 12); and responses to the questionnaire on the experience in the organization and benefits of the back-to-back meetings and the first joint meeting of POPRC and CRC (UNEP/POPS/POPRC.10/INF/13). The Secretariat highlighted that the draft guidance was adopted at CRC-10 and that a revised draft guidance will be presented to COP-7.

Azhari Abdelbagi (Sudan), Co-Chair of the joint intersessional working group, reported that the draft guidance is structured along the standard sequence of the process of the Rotterdam Convention, including the: notification of a final regulatory action; review of notifications by the CRC; development of a draft decision guidance document; and submission of import responses for a chemical listed in Annex III to the Rotterdam Convention. Abdelbagi highlighted that POPRC risk profiles or risk management evaluations could provide important input as "bridging information" to the CRC's work, and that, for chemicals listed in the Rotterdam Convention that are also POPs listed in the Stockholm Convention, the national decisions on POPs could help countries establish their import responses under the Rotterdam Convention. He noted this could be particularly useful for developing countries.

Saying that there is more overlap between the work of the Open-ended Working Group under the Basel Convention and POPRC, France queried on the possibility of a joint meeting. The Secretariat clarified that no request for a joint meeting has been received and noted the informal invitation to POPRC members to participate in the Open-ended Working Group.

Noting the general agreement on the draft guidance, POPRC Chair Moreira encouraged the Committee to adopt the draft decision (UNEP/POPS/POPRC.10/7). Sweden, with Gabon, suggested that the negative impacts of the back-to-back and joint meetings should also be reported to COP-7. With that amendment, the Committee adopted the draft decision.

Final Decision: In the decision (UNEP/POPS/POPRC.10/7), the POPRC: requests the joint intersessional working group to finalize the draft guidance, taking into account the comments provided by POPRC and CRC, and submit it to the COP-7 for its consideration; and requests the Secretariat to report to COP-7 on the benefits gained and negative impacts of the back-to-back meetings of the two committees and the joint meeting, on the basis of the information gathered and comments provided by the committees.

EFFECTIVE PARTICIPATION

On Tuesday, the Secretariat introduced the reports on activities for effective participation in the work of the Committee (UNEP/POPS/POPRC.10/8) and on capacity-building and training activities organized by the Secretariat to enhance effective participation in the work of the Committee (UNEP/POPS/POPRC.10/INF/14). Highlighting the training manual for chairs of the various committees and the related training session as particularly useful, POPRC Chair Moreira asked for members' input and suggestions for future work to support effective participation in the Committee.

Senegal, Pakistan, Oman and Gabon suggested training sessions for new members.

Kenya and Gabon observed that it is difficult to attend the webinars at the times scheduled and POPRC Chair Moreira reminded members that the webinars are available on the website for download, with a "Frequently Asked Questions" document that shows all the questions and answers asked during the webinar. Sweden queried if there is feedback collected on members' experiences with the webinars and reminded members of the handbook on effective participation that is useful for new members.

The Secretariat explained that the practice is to invite newly designated members to attend a POPRC meeting as an observer the year before they become members. She relayed the Chair's suggestion that newly designated members that are attending as observers could have an orientation session during the meeting. The Secretariat also offered, in line with CRC practice, to provide a "welcome package" of relevant documents to new members.

On the draft decision (UNEP/POPS/POPRC.10/8), Sweden suggested adding "when possible" when referring to the support of Committee members in the organization of capacity-building activities, and France suggested also including former Committee members. Pakistan suggested adding industries to the stakeholders to be involved in the work of the Committee.

The Committee adopted the decision as orally amended.

Final Decision: In its decision (UNEP/POPS/POPRC.10/8), the POPRC:

• invites the Secretariat to continue activities related to supporting effective participation in the work of the Committee, including: organization of webinars and online meetings; organization of workshops and other face-to-face activities, with the support of former and current Committee members when possible, regional centres, and the regional offices of UNEP and FAO; facilitation of the development of pilot projects to stimulate the involvement of different stakeholders, such as the academic community, research institutes and universities, and industries;

• invites regional centres to play an active role and in facilitating the effective participation in the work of the Committee; and
• invites parties and observers in a position to do so to provide financial support to facilitate the effective participation by parties in the work of the Committee.

WORKPLAN FOR THE INTERSESSIONAL PERIOD

On Thursday afternoon, the Secretariat presented the draft workplan for the preparation of the draft risk profile and draft RMEs during the intersessional period between POPRC-10 and POPRC-11 (UNEP/POPS/POPRC.10/9), highlighting that three intersessional working groups had been established to: develop a draft RME for decaBDE; develop a draft risk profile for dicofol; and to revise the PFOS alternatives guidance. She noted that the intersessional working group temporarily suspended at POPRC-8 on the revision of the draft risk profile for short-chained chlorinated paraffins would restart work in the period between POPRC-10 and POPRC 11.

The Committee adopted the workplan without amendments.

VENUE AND DATE OF THE NEXT MEETING

On Thursday, the Committee agreed the next meeting will be held 19-23 October 2015 in Rome, Italy, at FAO headquarters, recognizing that the duration of the meeting could be decided during the intersessional period, taking into account the number of chemicals the Committee has to consider. The Secretariat noted that CRC will hold its meeting the week following POPRC.

OTHER MATTERS

On Tuesday, POPRC Chair Moreira introduced the two issues under this agenda item: a discussion of a compilation of suggestions for including the quality of information in draft risk profiles and RMEs, and the Science Fair to be held on the margins of the 2015 COPs to the Basel, Rotterdam and Stockholm Conventions.

On the quality of information in draft RMEs and draft risk profiles, the Secretariat introduced the compilation of suggestions (UNEP/POPS/POPRC.10/INF/15).

Saying the robustness of POPRC's process relies on the information provided by members and observers, Canada suggested exploring ways to encourage the provision of information.

ICCA suggested, *inter alia*: reinforcing mandatory requirements for information under paragraph 2 of Annex D (a statement of the reasons of concern); developing further guidance on transformation and degradation of products; and, encouraging more information where it is lacking, cautioned against making "quick decisions."

Noting that several substances under evaluation have endocrine disruption properties, IPEN suggested a side event on the UNEP and WHO report on the state of the science.

Reiner Arndt drew the Committee's attention to previous POPRC discussions and guidance documents on Annex D and Annex E, in which he said there are some "open questions" that could only be based on experience, not "theoretical thinking." He opposed allowing some groups to directly work with the Secretariat to alter these documents.

Norway supported this statement, highlighting the Committee's previous decision on the Annex E guidance.

France concurred and suggested exploring ways to increase the provision of information while maintaining confidentiality of the data. The Netherlands agreed that a lack of data creates impediments for the Committee's work, and also recalled POPRC's previous discussions on Annex D, paragraph two.

The Committee took note of the report.

On the Science Fair, the Secretariat introduced the proposal (UNEP/POPS/POPRC.10/INF/16). She highlighted that one topic of the Fair is the scientific processes under the Conventions and reported on CRC-10 ideas on this topic. POPRC Chair Moreira asked interested members to work informally with the Secretariat. That group met Thursday morning before plenary convened.

On Thursday, Caroline Wamai (Kenya) reported from the informal group and highlighted several ideas for the Secretariat to consider in the organization of the Science Fair, including: to present the Arctic Monitoring Programme; to highlight the outcomes of POPRC; to provide question and answer forums; to help disseminate information on updating national implementation plans; and to create awareness on the synergies between the Conventions, including the consequences of listing chemicals in one Convention for the other Conventions.

CLOSURE OF THE MEETING

On Thursday, the Committee reviewed the draft report of the meeting (UNEP/POPS/POPRC.10/L.1 and Add.1) and adopted the report with a minor amendment. Observing that some participants were "exposed to high doses of work, perhaps approaching their thresholds," POPRC Chair Moreira thanked everyone for the efforts and gaveled the meeting to a close at 5:44 pm.

附錄三：**POPRC10** 審議及相關評估資料

POPRC10 審議及我國相關評估之結果列表

化學物質	**POPRC10** 審議結果	目前國內列管情形（本次與會評估摘要）
十溴二苯醚(Decabromodiphenyl ether)	通過風險簡介草案，有必要採取全球性的行動	已列管毒化物(附件一)
大克蟎(Dicofol)	符合附件 D 之標準，決議進入下一階段審查	農委會列管農藥（附件二）
五氯酚及其鹽類和脂類(Pentachlorophenol, its salts and esters)	提案 COP 討論，並建議列入附件 A 進行列管，並附帶豁免條件：可使用於木質電線桿及橫臂	五氯酚、五氯酚鈉為已列管毒化物（附件三）
全氟辛烷磺酸及其鹽類(PFOS)	通過替代品的評估程序；而其使用用途及豁免項目則持續蒐集各國之 NIP 中之最新訊息，逐步淘汰使用	已列管毒化物

附件一

十溴二苯醚風險簡介草案（附件 E）評估摘要

一、前言

2013 年挪威提交建議將十溴二苯醚（BDE-209，為商用十溴二苯醚之主要成分，約占 90%以上）列入公約附件 A、B 和/或 C 之提案，持久性有機污染物審查委員會(POPRC)在第九次會議上通過了十溴二苯醚附件 D 篩選標準，目前已編撰十溴二苯醚附件 E 風險簡介草案，在今年 POPRC10 審議，有關風險簡介草案摘要如下。

二、十溴二苯醚的化學特性

1.英文名稱 Decabromobiphenyl ether，縮寫 DecaBDE

2.化學文摘社編號 1163-19-5

3.分子式 C12Br10O

4.分子量 959.17

5.化學結構式

三、十溴二苯醚的來源及用途

目前中國是最大的商用十溴二苯醚製造商和供應商，每年的產量約為 21,000 噸。中國約有 20 家公司聲稱供應商用十溴二苯醚。日本目前每年製造約 600 公噸商用十溴二苯醚。印度有六家製造商和/或供應商，但全球總產量不明。在歐洲，商用十溴二苯醚已於 1999 年退出生產，但仍大量進口。在美國，主要生產商和進口商都承諾到 2013 年底結束所有用途。加拿大於 2008 年禁止製造八溴、九溴和十溴二苯醚，三個主要製造商都承諾到 2013 年自願淘汰所有對加拿大的出口。

商用十溴二苯醚是一種通用的添加型阻燃劑，可廣泛用於多種塑膠製品和紡織品中。在塑膠製品中，商用十溴二苯醚用於電腦和電視機等電氣和電子設備的外殼、交通運輸和航空領域，以及建築和施工行業，如用於電線電纜、管道和地毯等；在紡織製品中，商用十溴二苯醚用於紡織品中，主要供公共建築和交通運輸行業使用，也用於家用傢俱紡織製品中。

四、十溴二苯醚向環境之排放

十溴二苯醚可能在原料產製過程、添加使用於及塑膠、橡膠、電線電纜、防火阻燃劑和紡織產品的製造過程、含有十溴二苯醚產品使用、廢棄處置或電子電器回收再利用等過程釋放至環境中。一些國家向公約報告排放量，如歐洲的十溴二苯醚之大氣排放量自 1970 年以來一直穩定增長，並於 2004 年達到 10 噸/年的高峰值。對土壤和水域的排放量較低，但自 1970 年以來也以類似的趨勢增長，並於 2000 年晚期達到高峰值（如對土壤的排放於 2000 年達到 4 噸/年的高峰值，而對水域的排放則於 2010 年達到 3.5 噸/年的高峰值），此後開始下降。

五、十溴二苯醚對環境與人類健康之影響

研究顯示十溴二苯醚在環境中具有持久性，因為其不易溶於水（<0.124 微克/升，24°C），在環境中易吸附於有機物，並累積於沉積物和土壤，在這些環境介質中的半衰期通常超過 180 天，範圍在>180 天至 50 年之間，如研究發現在以往曾施用含有十溴二苯醚淤泥的農業土壤中檢測多溴二苯醚含量，即便已多年未施用淤泥，其多溴二苯醚含量仍在 0.015-22,000 ng/g 土壤乾重範圍內。

十溴二苯醚在魚類、鳥類和哺乳動物中具有生物累積性和生物放大性。亦有證據表明該物質能對魚類、蚯蚓、小鼠和大鼠的生殖健康造成不良影響，還會對兩棲類、齧齒類和人類產生發育、神經毒性作用。十溴二苯醚也可降解為低溴的多溴二苯醚，已知這些降解產物亦具有持久性、生物累積性和毒性等特性。

十溴二苯醚廣泛地殘留在全球環境中，在十溴二苯醚來源地區和偏遠地區，甚至在北極之空氣、沉積物、雪層、冰層和生物群（包括在鳥類、哺乳類等較高營養級的物種）等都可發現十溴二苯醚，監測研究包括在城市和農村環境中檢測到的大氣濃度在 4.1 至 60 pg/m3 之間，而在北極空氣中的濃度範圍在 ND 至 41 pg/m3 之間。有報告稱北極以外的背景濃度範圍在 ND 至 29 pg/m3 之間。全球污染地區土壤濃度水準範圍在 ND 至 8,600 ng/g 乾重之間，甚至可能更高。特別是，在中國的電子電器業回收廠和工業用地等電子廢棄物堆放處的土壤中，十溴二苯醚的濃度極高。有報告稱在全球範圍內，十溴二苯醚在沉積物中的濃度範圍在 ND 至 16,000 ng/g 乾重，比土壤中的濃度水準略高，高濃度沉積物通常位於工業區附近。以上監測資料證明其具有遠距離環境遷移特性，也顯示對人類健康和環境將造成影響，因此有必要採取全球行動。

在人類接觸部分，灰塵、室內空氣和食物，被視為是人類接觸多溴二苯醚的最重要來源和途徑。美國研究評估顯示家用消費品被確認是室內灰塵所含多溴二苯醚的主要來源。加拿大的一項評估確認食物和灰塵是成人接觸該物質的主要來源。在德國、瑞典和英國，在室內空氣中觀察到的BDE-209 濃度範圍在<LOQ (定量極限)至 651 pg/m3 之間，灰塵中的濃度範圍則為 63 至 10 ,000 ng/g。此外，乘坐的汽車和飛機可能是接觸多溴二苯醚的重大來源。在汽車灰塵中，在一項研究指出 BDE-209 的中位數濃度約比室內灰塵中濃度高出 20 倍，但該濃度水準在不同研究中會有所差異。德國研究亦發現汽車、住房和辦公室灰塵樣本中的 BDE-209 濃度中位數分別為 940、45 和 120 ng/g。住房灰塵中的 BDE-209 與母乳中的 BDE-209 有關，這表明 BDE-209 在室內環境中的濃度對哺乳期兒童接觸該物質有影響。

六、結論

目前仍然有一些國家在生產和使用十溴二苯醚作為阻燃劑，我國已將十溴二苯醚列入毒性化學物質管理法第四類毒性化學物質進行運作行為管制，主要作為阻燃劑及教育、試驗用途使用，我國將持續關注公約管理現況，並與跨部會討論以持續檢討評估相關管理工作，以因應後續公約未來列管趨勢。

附件二

關於大克蟎(Dicofol)列入持久性有機污染物的斯德哥爾摩公約附件 A、B 和/或 C 的提案評估摘要

一、前言

持久性有機污染物審查委員會(POPRC)在第九次會議上審議了由歐盟提交的關於把大克蟎列入持久性有機污染物的斯德哥爾摩公約附件 A、B 和/或 C 的提案。提案中有關大克蟎是否符合公約附件 D 所列篩選標準已有初步評估結果，今年 POPRC10 即針對評估結果進行審議。

二、提案中大克蟎符合公約附件 D 篩選標準之評估結果

(一) 化學特性

提案中提供了大克蟎（化學文摘社編號：115 32-2）及其異構體（p,p'-大克蟎，化學文摘社編號：115-32-2；o,p'-大克蟎，化學文摘社編號：10606-46-9）資料。

(二) 持久性

已有足夠證據表明大克蟎符合持久性標準，其理由如下：該化學品在 pH 值為 5 的水中的半衰期為 85 天;該化學品在土壤中的半衰期為 313 天。

(三) 生物累積性

現已有充分證據表明大克蟎符合生物累積性標準，其理由如下：生物濃縮係數(BCF)約 8050~13500，超過 5000。另日本提供了兩種異構體在常見鯉魚體內的生物濃縮係數值（分別為 8200 和 6100），這與其針對斑馬魚的研究得出的數值範圍相同。

(四) 遠距離環境遷移潛力

已有足夠的證據表明大克蟎符合關於遠距離環境遷移潛力的標準，其理由如下:已在北極環境中檢測到三氯殺蟎醇大克蟎。大克蟎大氣半衰期的估算值 3 至 10.5 天超過了 2 天的篩選標準。計算得出的大克蟎在歐洲的飄移距離為 1,650 公里。

(五) 不利影響

現已有足夠的證據表明大克蟎符合不利影響標準。動物研究資料表明，大克蟎可能對人體健康造成不利影響，包括影響肝臟、腎臟、腎上腺和膀胱。大克蟎對水生動物具有劇毒性。歐盟分類、標籤和包裝法規將其歸為水生急性和慢性 1 類。依據奧斯巴公約資料，魚類的最低半致死濃度值為 0.053 毫克/升，甲殼類動物的最低半致死濃度值為 0.06 毫克/升。許多研究也指出大克蟎對內分泌會有影響，如水蚤體內大克蟎濃度達到 0.1 毫克/升時會導致性別比例大幅度偏向雄性，且大克蟎會明顯抑制蚯蚓的生殖能力。

三、小結

我國農委會目前核准大克蟎使用在落花生、豆類害蟎防治，建議未來應關注公約最新管理趨勢以為因應。

附件三

五氯酚及其鹽類和酯類(Pentachlorophenol, Its Salts and Esters)的風險管理評估草案（附件 F）評估摘要

一、前言

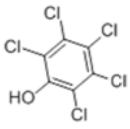
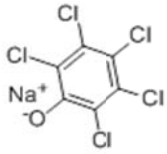
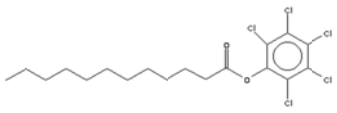
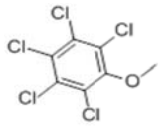
歐盟在 2011 年提案建議將五氯酚(PCP)及其鹽類(五氯酚鈉，Na-PCP ）和酯類（月桂酸五氯苯酯，PCP-L）列為候選的持久性有機污染物。持久性有機污染物審查委員會在第九次會議上認定，五氯酚及其鹽類和酯類很可能（包括考慮到其轉化產物五氯苯甲醚，PCA）因其遠距離環境遷移而給人類健康和環境造成重大不利影響，因此必須對之採取全球性行動（第 POPRC-9/3 號決定），目前審查委員會已編制一份風險管理評估草案（附件 F），在今年 POPRC10 審議，有關此份草案摘要如下。

二、五氯酚及其鹽、酯類的化學特性及用途

有關五氯酚及其鹽、酯類的化學特性詳下表。五氯酚首先作為木材防腐劑投入使用。此後，五氯酚具有多種其他用途（生物殺滅劑、殺蟲劑、消毒劑、枯葉劑、防變色劑、抗微生物劑、木材防腐劑及用於生產月桂酸五氯苯酯）。五氯酚鈉(Na-PCP)的用途與五氯酚類似，並且容易降解為五氯酚。月桂酸五氯苯酯(PCPL)用在紡織品和皮革的防腐處理。五氯苯甲醚是五氯酚主要代謝物，並未用作商業化學品或農藥，也未直接有意釋放到環境中。

五氯酚及其相關化合物化學特性

	五氯酚	五氯酚鈉	月桂酸五氯苯酯	五氯苯甲醚
英文名稱	Pentachlorophenol	Sodium Pentachlorophenate	Pentachlorophenyl laurate	Pentachloroanisole
縮寫	PCP	Na-PCP	PCP-L	PCA
化學文摘社編號	87-86-5	131-52-2 和 27735-64-4（五氯酚鈉水合物）	3772-94-9	1825-21-4
分子式	C_6HCl_5O	C_6Cl_5ONa 和 C_6Cl_5ONa x	$C_{18}H_{23}Cl_5O_2$	$C_7H_3Cl_5O$

		H_2O （五氯酚鈉水合物）		
分子量	266.34	288.32	448.64	280.36
化學結構式				

三、五氯酚及其鹽、酯類對環境與人體健康之影響

五氯酚和五氯苯甲醚具有肝毒性、致癌性、免疫毒性、神經毒性和生殖毒性，要注意的是其中部分危害可能由一種內分泌行為模式引發，因此對環境影響不能排除。此外，五氯酚和五氯苯甲醚對水生有機物具有高毒性。風險概況得出結論認為，五氯酚及其相關化合物可能導致對人類健康和環境造成重大不利影響。此外，經五氯酚處理過的木材，在製造及使用時還是戴奧辛和呋喃的來源，且含有五氯酚的庫存和廢棄物應遵守公約第 6 條的規定進行處置，因為焚燒處理過程亦可能無意生成戴奧辛和呋喃。

四、有關風險管理評估草案內容摘要

五氯酚是由在墨西哥的一家製造商製造（6,600 噸/每年），並由美國一處工廠製成濃縮物（7,000 噸/每年）。另外，印度每年也生產並消耗 1,500 噸的五氯酚鈉（僅供用於木材的處理）。根據公約締約方和觀察員表示，一些國家（包括歐盟各成員國、摩洛哥、斯里蘭卡、新西蘭、印尼、厄瓜多爾和澳大利亞）已經禁止或嚴格限制在木材處理中使用五氯酚，表示在這些國家可以獲得替代品。五氯酚在美國和加拿大被用作一種重型工業木材防腐劑（僅限於工業使用）。此外，五氯酚鈉主要是在印度使用。目前並沒有國家向公約報告關於月桂酸五氯苯酯的使用情況。

風險管理評估草案指出目前存在一些化學替代品（例如：鉻化砷酸銅、雜酚油、環烷酸銅、氨溶砷酸銅鋅和硅酮聚合物），在價格和應用技術方面可與五氯酚媲美。然而，這些替代產品並不能直接替換，其中部分具有毒性問題（例如鉻化砷酸銅和雜酚油），這些物質可能需要制定一些管理策略。此外，目前一些替代品存在技術方面的可行性問題，例如會受氣候條件影響。為克服立即禁止但確存在替代品技術可行性問題，該草案有提

出公約得給予附帶有時間限制的特定豁免用途，分階段來限制五氯酚使用，亦可達到逐步淘汰之目的。

四、結論

該草案已確定五氯酚及其鹽類和酯類，包括它的轉化產物五氯苯甲醚可能由於遠距離環境遷移而對人類健康和環境產生重大不利影響，必須對其採取全球行動，建議的控制措施是將五氯酚及其鹽類和酯類列入公約附件 A 或 B 和 C，以逐步淘汰其生產和使用。我國目前已依據毒性化學物質管理法禁用五氯酚及五氯酚鈉，未來必須關注月桂酸五氯苯酯管理及含有五氯酚及其鹽類和酯類相關產品及其廢棄物管理事宜，以符合公約趨勢。

附錄四：剪影

圖 1：POPRC10 會議於會場前合影

圖 2：前 POPRC 主席 Reiner Arndt（左）與現任 POPRC 主席 Estefânia Gastaldello Moreira （右）